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THE

PENNY CYCLOPÆDIA

OF

THE SOCIETY

FOR THE

DIFFUSION OF USEFUL KNOWLEDGE.

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PREFACE TO VOLUME THE FIRST.

In the course of the regular publication of the Numbers and Parts of the Penny Cyclopædia, the purchasers of the work will have been enabled to compare its general execution with the announcements of the original Prospectus. The completion of a volume appears to call upon the Conductors for a few explanatory observations.

The plan of this work differs in a considerable degree from most other Cyclopædias. These have generally given elaborate treatises on each branch of knowledge, often referring for the explanation of each term, as it occurs in the alphabetical order, to the general treatise. The plan of the Penny Cyclopædia, as it is specially intended as a book of reference, is not to attempt to form systems of knowledge, but to give pretty fully, under each separate head, as much information as can be conveyed within reasonable limits. But whilst it endeavours to present in detail the explanation of those terms of Art and Science, the right understanding of which is independent of any system, it also attempts to give such general views of all great branches of knowledge, as may help to the formation of just ideas on their extent and relative importance, and to point out the best sources of complete information.

As this plan excludes all long essays and treatises, it necessarily leads to giving more ample space to the separate heads than is done in most Cyclopædias; and in doing this, it is often found difficult to determine the point where the selection of terms must end. This is particularly the case as to names of Persons and Places, which unavoidably form a large part of every book of general reference. It is hardly possible to fix any rule which will not either exclude something that ought to be admitted, or include names of very little importance. Something, therefore, must be left to the judgment of those who contribute to, and superintend, such a publication. It will be observed that the plan of the Cyclopædia has rather been enlarged, since the earlier Numbers, as to the names admitted, and somewhat also, perhaps, in the length of the more important articles. It would appear that, in the proper conduct of such a work, some practice and experience are peculiarly necessary. The difficulty of forming a complete and satisfactory list of words can only be estimated by those who have made the experiment. On looking into the best works of this class already published, it will be found that, while they all differ very considerably as to the words inserted, none are without some omission that would be better supplied. Nor can the Editors of the Penny Cyclopædia congratulate themselves on having inserted *every* term or name that ought to have found a place, though they hope that in the progress of the Work they will be better able to guard against any omission.

As to errors in the articles themselves, either of incorrect statements of facts, or of false deductions from premises, some such are unavoidable in every large work, however carefully the subject-matter has been weighed, or however scrupulously the writer may have discharged his duty. In a periodical publication, in which a number of writers are necessarily combined, and where the matter is almost infinitely varied, the causes of error are still more numerous. The experience of one year, however, enables the Conductors of this Cyclopædia to state with confidence, that whatever errors there may be in the first volume, (and they trust they are neither very numerous nor very important,) they feel no doubt that the work in its progress will continue to improve. At least, no exertions will be spared to procure sound information on all subjects and to convey it in clear and perspicuous language. The Conductors have to express their thanks to numerous correspondents, both for valuable suggestions and criticisms, of which, in many cases, they have been enabled to avail themselves. In some instances, where the accuracy of statements has been called in question, they believe that the Cyclopædia is correct; and in other instances, the difference is no more than may be expected where authorities are at variance, and opinions may naturally be expected to differ somewhat as to their precise value. As most of the communications referred to were anonymous, the Editors have no other means of thanking the writers than by this general acknowledgment.

It may be necessary to mention that a few of the more trifling errors that are most obvious—such as the breaking off of a letter, or a stop at the end of a line—are the unavoidable consequence of the process of stereotyping. Before this process commences, the usual labour of revision is complete; but in producing the stereotype plate new errors are sometimes created. It is the intention of the Conductors of this Work to subject even the stereotype plates to a careful examination, so that injuries of this mechanical nature may be repaired.

In the commencement of their undertaking, the Editors, bearing in mind the difficulty of securing at once an efficient body of contributors, recommended to the Committee only to attempt the publication of Six Numbers in each month. Their present stock of materials, and their reliance upon their numerous coadjutors, founded upon ample experience, have induced them to desire that the work should proceed at a quicker rate. In this they feel satisfied that they only second the wishes of the great body of its purchasers. The work will therefore continue upon the following arrangements:—

1. The *First Volume* of the Penny Cyclopædia—containing Eleven Parts—is now concluded; and will be sold, handsomely bound in cloth, lettered, at Seven Shillings and Sixpence.

2. Commencing with December, 1833, *Two Numbers* of the work will be published *regularly every Week, without Supplements,* so that sometimes Eight, and sometimes Ten Numbers will appear in each calendar month.

3. On the 1st of January, 1834, *Part XII.* will be published, price *Ninepence,* and the *Monthly Parts* regularly continued at that price.

4. On the 1st of September, 1834, the *Second Volume,* containing Eight Ninepenny Parts, will be published, bound uniformly with Vol. I., at Seven Shillings and Sixpence;—and the future volumes will be completed every *Eight* Months.

November 13, 1833

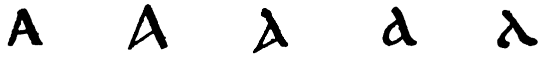
THE PENNY CYCLOPÆDIA

OF

THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

A.

A, the first letter of the alphabet in the English, and many other languages. As a sound, its power in the English language is at least fourfold, as in the words *father*, *call*, *tame*, and *hat*. The first of these sounds is that which generally prevails in other languages. The modified pronunciation of the vowel in *tame* is partly due to the vowel *e* at the end of the word; in *call* and similar forms, the peculiarity arises from the letter *l*; so that the only true sounds of the vowel are perhaps the long sound in *father*, and the short one in *hat*. The printed forms of this letter, viz., the capital A, the small character a, and the italic *a*, are all derived from a common form, differing but slightly from the first of the three. In the old Greek and Latin alphabets, from which our own has descended, the following were the ordinary figures of this letter:—



among which, the fourth and fifth only differ from the rest in the rounding of the angle: the form consisting of straight lines being well adapted for writing on stone, metal, &c.; the rounded letter, on the other hand, being better suited for expeditious writing, with softer or more flexible materials. From this last our two small characters are easily deduced.

A (in music), the sixth note in the diatonic scale, answering to the *la* of the Italians and French. It also stands for the *alto* parts.

A or **AN**, the indefinite article. Of the two, *an* is used before a vowel. Where the following word begins with a consonant, it being more troublesome to express the final *n*, this letter, from not being pronounced, ceased to be written. Thus we say *an emperor*, but instead of *an king*, we find it more convenient to say *a king*. Sometimes a virtual consonant exists at the beginning of a word without being written, as in *union* and *once*, where the ear catches the initial sounds of *y* and *w*, *younion* and *wunce*. Before such words it is customary to drop the final letter of the article, at least in pronunciation, and there can be no good reason for not writing *a union*, *a once beloved monarch*. On the other hand, whenever *h* is mute, we should retain the *n* both in writing and speaking, thus, *a history*, but *an historical work*. That *an* and not *a* is the primitive form of the article, is proved by the Anglo-Saxon *an*, and the German *ein*; indeed, our own numeral *one* is only another and fuller form of the same word. In such phrases as *three shillings a pound*, the article evidently has this meaning. The double shape of our article has led to a corrupt mode of writing certain words, thus from *an eft* was deduced *a neft*, *a newt*; and the reverse seems to have taken place in the change of *a nadder* to *an adder*. The letter *a* often appears prefixed to nouns so as to constitute a kind of adverb, as *afoot*, *aside*, *aboard*, *now-a-days*, &c. These, as Horne Tooke observes, are all abbreviations of *on fote*, *on syde*, *on borde*, *now-on-daies*, &c., which thus occur in our old English poets. This *on* is an Anglo-Saxon preposition with the meaning of *in*. In many words now in use the *a* in the beginning takes the place of *on*. Alive, for instance, means on life, *i. e.*, in life. So 'he fell asleep,' in the old translation of the New Testament is, *he fell on sleep*.

The *a*, formerly often prefixed to our participles in *ing*, both in the active and passive sense, as *the house is a-preparing*, *he is gone a-walking*, has the same origin.

AA, a small river which flows into the Ems, on the east bank, in the district of Lingen, which is in the kingdom of Hanover. The little town of Freeren stands on the Aa. The singularity of the name, rather than the importance of the river itself, deserves a short notice. *Aa* is possibly a corruption of the word *aue*, which means *green pastures* or *meadows*, and may also have been used to denote the low flat lands along the banks of the river. *Aue* is the name of a small tributary of the Elbe, and also of a brook in the principality of Schaumbourg-Lippe. *Aue* is also the name of a mountain village, situated in a romantic valley of the Erzgebirg circle of the kingdom of Saxony.

AA, a branch of the Aar, in the canton Aargau; a small river of Jutland; also the name of one of the streams at the confluence of which Breda stands, and the name of a tributary to the Dommel in N. Brabant. The wide diffusion of such a name shows it must have some *general* signification, applicable to all the rivers to which it belongs.

The word *Aa* is a contraction of the old German *aha*, Gothic *ahva*, water, evidently allied to the Lat. *aqua*, and probably to the Celtic *Ac* or *Ack*, water. *Aach*, the name of several German rivers, is another form of the same word.

AALBORG, one of the four divisions, and the most northern part, of the peninsula of Jutland, properly so called. It contains about 2820 English square miles, and perhaps about 162,000 inhabitants. The principal town, which is also called Aalborg, stands on the south side of the narrow channel which joins the Liimfiord with the sea, and is a sea-port, with a considerable trade in grain and herrings. From 400 to 500 vessels enter the port annually. The number of inhabitants is about 8000. Aalborg is a bishopric, and has a good academy or cathedral school founded in 1553, with some manufactures of leather, sugar, and tobacco. The name Aalborg means Eel-town, a great number of eels being caught in the neighbourhood: it is in N. lat. 57° 8′, E. long. 9° 55′. All the other towns of the district are small. Thistedt, the next in size, contains about 2200 inhabitants.

AAR, the principal branch of the Rhine in Switzerland. [See Aargau.]

Another small stream of the same name falls into the Lahn, in the duchy of Nassau; and a third Aar joins the Rhine in the Prussian province of the Lower Rhine, on the west side, about twelve miles above Bonn.

AARD-VARK (*Orycteropus*, Geoffroy*), in Zoology, a genus of animals belonging to the class *Mammalia*, and order *Edentata*.

In a work, like the Penny Cyclopædia, where knowledge is communicated under separate heads arranged in alphabetical order, it is an unavoidable consequence of the

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* It is usual, in works of Natural History, to place the scientific name of a species after the popular or local name. By the scientific name the species is recognised in every country, while the popular or local name is limited in its use. But as the same species is often called by several scientific names, each of which has been given to it by a different naturalist, it is also usual to place the name of the naturalist after the word which he has invented or adopted. Thus, Aard-vark is the Dutch name of the animal in question; Orycteropus the scientific name, from the Greek words ορυσσω, I dig, and πους, a foot; and Geoffroy St. Hilaire (generally abridged Geof.), the name of the naturalist who gave it that scientific denomination.

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general plan that terms must be occasionally employed which have not been previously defined, and of which, in a regular treatise, the explanation would necessarily precede the use. To obviate this inconvenience as much as possible, it is proposed, without entering into the minute details of the subject, or anticipating information which properly belongs to a different part of the work, to give a brief explanation of such terms as they occur; so that the general reader may be enabled to comprehend their meaning and import without the trouble of referring to other sources.

Before commencing the history and description of the genus which more properly constitutes the subject of the present article, we shall, therefore, give a short explanation of the terms *Mammalia* and *Edentata*, as well as of the technical import of the words *Class*, *Order*, *Genus*, and *Species*, which are of constant occurrence in Zoology: these terms would otherwise be obscure or unintelligible to an ordinary reader.

The word Mammal (Mammalia is the Latin form of the plural) was formed by Linnæus from the Latin mamma, signifying a breast or udder, in the same manner as our common word animal is formed from anima, life or soul; and was intended to denote those animals which suckle their young, and for which there is no generic name in any known language sufficiently definite and comprehensive. The common word Quadruped, which more nearly expresses the exact idea than any other, has no relation to the natural affinities which we observe among animals, since it excludes man and the cetaceous tribes (such as whales), at the same time that it comprehends the lizards, tortoises, and other reptiles, which have but a very remote analogy to the true Mammalia.

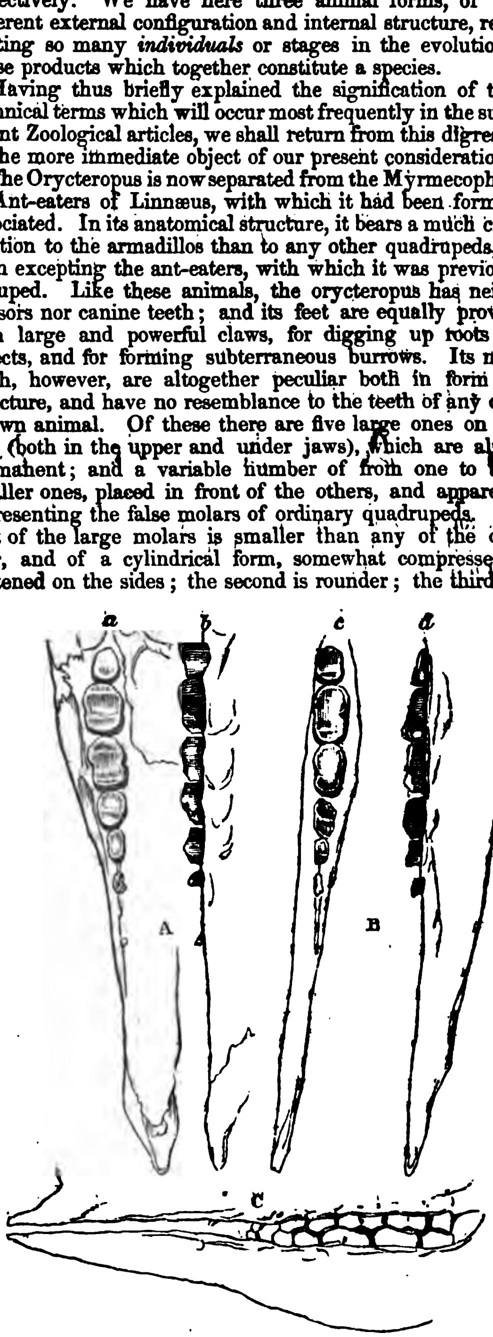
The vernacular term Beast, which we often use in opposition to Birds and Fishes, is still more vague and indeterminate. The word Mammal, however, so happily imagined by the great Swedish naturalist, is liable to none of these objections, but expresses, in a distinct and definite manner, the most prominent functions and natural limits of this class of animals. In the constant use which we shall be obliged to make of this term, we shall adopt the common English form of the plural, *Mammals*, instead of the Latin form, *Mammalia*, though the latter is most generally used by British zoologists. The word *Mammals* is as regularly formed, and therefore as admissible into the English language, as animal and animals.

Mammals, therefore, in the technical language of zoologists, constitute a *class*, or primary division of the animal *kingdom*; and are, in this respect, co-ordinate with Birds, Fishes, Reptiles, and Insects; all of which are so many *Classes*. The term *Order* denotes a subordinate division, and bears the same relation to a class which this latter does to a kingdom; so that a class is made up of orders, in the same manner as a kingdom is made up of classes. The next inferior sub-division to an order is a *Genus*; and this is itself composed of *Species*, the lowest link in the chain of scientific classification, and that which admits of no further division. A species, then, comprehends all those animals which may reasonably be supposed to be descended from one common, original stock; and in this sense all men compose but a single species, all horses compose but a single species; and in the same manner all oxen, sheep, goats, dogs, &c. compose respective and appropriate species. Difference of climate, variety of food, and other local and extraneous circumstances, undoubtedly produce striking changes in the form, size, and colour of different individuals, even of the same species; examples of which are sufficiently abundant among all domestic animals, and that, too, in exact proportion to the degree of their domestication, and to the care and attention which have been bestowed upon them by man. But these variations are confined within certain prescribed limits, and the utmost power and ingenuity of man have been exerted in vain to produce and perpetuate a new race or species of animals. He has succeeded, to be sure, in procuring the Mule from the intercourse of the Horse and the Ass, two very distinct species, though in some respects closely allied to one another; but this mule is itself a barren, unproductive being, which Nature regards as a monster, and to which she has denied the power of continuing its race.

An example will best illustrate the true import of the terms which we have been here endeavouring to explain. Thus the dog, the fox, the wolf, and the jackal, are all so many *species* of one common *genus*; as are likewise the lion, the tiger, the panther, the lynx, and the common cat, species of another genus. These are respectively called the genus *Canis*, or the dog kind, and the genus *Felis*, or the cat kind; and compose, together with the hyænas, civets, weasels, bears, badgers, &c. the natural *Order* of *Carnivora*, or flesh-eaters, which have six incisor or front teeth in each jaw, and live upon the flesh of other animals. There is another term—namely, *Individual*—of frequent occurrence in natural history descriptions, the precise meaning of which it is very necessary to understand. Used in a zoological sense, the word *individual* signifies any organised being possessed of certain constant characters at a given period of its development. Many animals pass through several well-marked *individual* forms, by a process of what is termed *metamorphosis;* and it is the sum-total of all these phases of growth which constitutes the *species*. The distinction between *individual* and *species* is well illustrated; for example, when we speak of a caterpillar or *larva*, of a chrysalis or *pupa*, and of a butterfly or *imago*, separately and collectively. We have here three animal forms, of very different external configuration and internal structure, representing so many *individuals* or stages in the evolution of those products which together constitute a species.

Having thus briefly explained the signification of those technical terms which will occur most frequently in the subsequent Zoological articles, we shall return from this digression to the more immediate object of our present consideration.

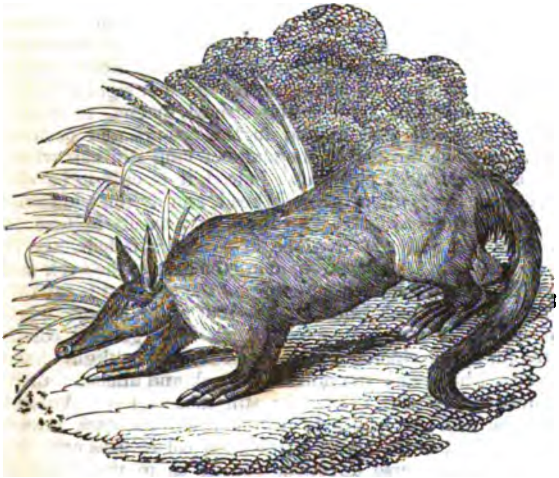
The Orycteropus is now separated from the Myrmecophaga, or Ant-eaters of Linnæus, with which it had been formerly associated. In its anatomical structure, it bears a much closer relation to the armadillos than to any other quadrupeds, not even excepting the ant-eaters, with which it was previously grouped. Like these animals, the orycteropus has neither incisors nor canine teeth; and its feet are equally provided with large and powerful claws, for digging up roots and insects, and for forming subterraneous burrows. Its molar teeth, however, are altogether peculiar both in form and structure, and have no resemblance to the teeth of any other known animal. Of these there are five large ones on each side (both in the upper and under jaws), which are always permanent; and a variable number of from one to three smaller ones, placed in front of the others, and apparently representing the false molars of ordinary quadrupeds. The first of the large molars is smaller than any of the other four, and of a cylindrical form, somewhat compressed or flattened on the sides; the second is rounder; the third and



Teeth of the Aard-vark (Orycteropus Capensis).
A Two views of the upper jaws, showing, *a* the surface of the teeth, *b* the sides
B, *c*, *d*, Ditto of the lower jaw.
C The teeth in their natural position.

fourth are each composed of two similar cylinders, as it were, soldered together, and the last is a simple cylinder, like the first and second. Immediately in front of these are the small or false molars, which, being of a deciduous nature (falling annually), vary in number according to the individual. In their internal structure these teeth differ from those of all other animals. They are pierced throughout their whole length with an infinite number of small capillary tubes, running in the same longitudinal direction, and opening at the root or under part of the teeth. The crowns or upper surfaces of the teeth are covered with enamel, but after this has been worn away by the continued process of mastication, as in very old animals, the openings of these small canals may be plainly distinguished upon the surface also; and in this state, the teeth, to use the appropriate comparison of Baron Cuvier, resemble the joint of a cane cut across, and exhibiting the numerous minute vessels which perforate its interior. These teeth are of a composite character, the canals representing the true pulp-cavities of several small teeth, which have become united to one another. They are also furnished with a system of radiating tubuli, which open into the capillary tubes or pulp-cavities, and the compound tooth thus resembles the structure of the teeth in certain fishes.

In the form of the extremities the orycteropus resembles the armadillos still more nearly than in the nature of its dental system. The legs are remarkably short and stout; the feet plantigrade (that is to say, the animal walks upon the whole sole of the foot, as man and the bear, instead of bringing the point of the toe only in contact with the ground, as may be observed in the dog, horse, &c.); and the toes, of which there are four on the fore feet and five on the hind, are armed with extremely large, powerful claws, flattened horizontally, and scooped or hollowed out on the under surface, so as to form a most efficient instrument for digging and burrowing beneath the surface of the earth. This process is still further facilitated by the oblique form of the anterior extremities, arising from the unequal length of the toes; the two interior being considerably longer than the others, and the whole diminishing gradually from the index (or toe corresponding with the fore-finger) outwards. In other parts of its anatomy the orycteropus resembles both the armadillos and the ant-eaters, and particularly in the form and structure of the stomach and alimentary canal. The reader who is desirous of further information upon these subjects may consult Cuvier's *Leçons d'Anatomie Comparée*, and his great work *Sur les Ossemens Fossiles*, from which the details here given are for the most part abridged.



The only species of this curious genus with which zoologists are at present acquainted is the *Aard-Vark* (Orycteropus Capensis), called *innagu* by the Korah Caffres, and *goup* by the Hottentots. It is an animal extremely common in some parts of Southern Africa, though, from its nocturnal habits and extreme timidity, it is not so frequently seen as many others which are in reality scarcer. Its colonial name of aard-vark, or earth-pig, by which it is known among the Dutch inhabitants of the Cape of Good Hope, is derived as well from its habit of burrowing as from the general appearance which it bears, at first sight, to a small, short-legged pig. This animal, when full grown, measures about three feet five inches from the snout to the origin of the tail; the head is eleven inches long; the ears six inches; and the tail one foot nine inches. The head is long and attenuated; the upper jaw projects beyond the lower, and ends, as in the common hog, in a truncated, callous snout, having the nostrils pierced in the end of it; the mouth is small for the size of the animal, and the tongue flat and slender, not cylindrical as in the true ant-eaters, nor capable of being protruded to such an extent as in these animals: it is, however, covered in like manner with a viscous or glutinous saliva, which firmly retains the ants upon which the animal lives, and prevents those which once come into contact with it from escaping afterwards. The ears are large, erect, and pointed; and the eyes, which are of moderate size, are situated between them and the snout, about two-thirds of the distance from the extremity of the latter. The body of the aard-vark is thick and corpulent; the limbs short and remarkably strong; the hide thick, tough, and nearly naked, having only a few stiff hairs, of a pale reddish-brown colour, thinly scattered over it, excepting on the hips and thighs, where they are more numerous than elsewhere. The tail is about half the length of the body and head together, and, like the body, is nearly naked; it is extremely thick and cylindrical at the base, but decreases gradually towards the extremity, and ends in a sharp point.

Thus formed, the aard-vark is in all respects admirably fitted for the station which Nature has assigned to it in the grand economy of the animal kingdom. It feeds entirely upon ants, and in this respect fulfils the same purpose in Southern Africa which is executed by the pangolins in Asia, the myrmecophaga in America, and the echidna in New Holland. To those who are only acquainted with the size and nature of these insects in the cold northern climates of Europe and America, it may seem surprising how an animal so large as the aard-vark can support itself exclusively upon ants, and yet be invariably found fat and in good condition. But the ants and termites of tropical countries are infinitely more numerous than those which inhabit more northern latitudes, and so large as sometimes to measure an inch or an inch and a half in length. The bodies of these ants are, besides, of a soft, unctuous nature; and travellers inform us that the Hottentots themselves frequently collect them for food, and even prefer them to most other descriptions of meat. Patterson affirms that prejudice alone prevents the Europeans from making a similar use of them; and says that, in his different journeys, he was often under the necessity of eating them, and found them far from disagreeable. However this may be, their importance in fattening poultry is well understood at the Cape, and the farmers collect them by bushels for this purpose.

These insects raise mounds of an elliptical figure to the height of three or four feet above the surface of the ground; and so numerous are these gigantic ant-hills in some parts of Southern Africa, that they are frequently seen extending over the plains as far as the eye can reach, and so close together that the traveller's waggon can with difficulty pass between them. They abound more especially in the Zeure-velden, or sour districts, so called from producing a kind of sour grass; are seldom found on the karroos or downs, and never in very dry or woody districts. By constant exposure to the rays of a powerful tropical sun they become so hard and indurated on the outer surface that they easily support the weight of three or four men, and even a loaded waggon will sometimes pass over without crushing them. Internally these mounds are of a spongy structure, something resembling a honeycomb, and are so completely saturated with animal oil that they inflame without difficulty, and are an excellent substitute for wood or coal.

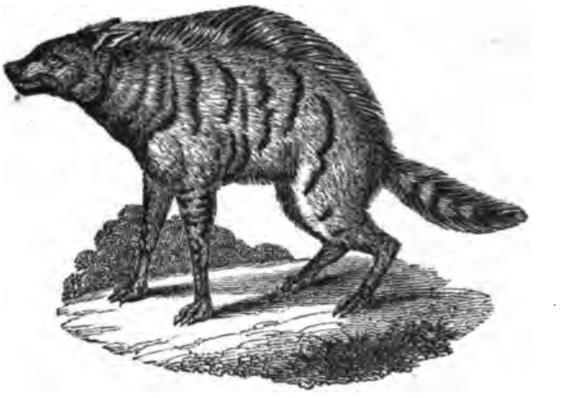
Wherever ant-hills abound the aard-vark is sure to be found at no great distance. He constructs a deep burrow in the immediate vicinity of his food, and changes his residence only after he has exhausted his resources. The facility with which he burrows beneath the surface of the earth is said to be almost inconceivable. We have already seen how admirably his feet and claws are adapted to this purpose; and travellers inform us that it is quite impracticable to dig him out, as he can in a few minutes bury himself at a depth far beyond the reach of his pursuers; and, further, that his strength is so great as to require the united efforts of two or three men to drag him from his hole. When fairly caught, however, he is by no means retentive of life, but is easily dispatched by a slight blow over the snout. The aard-vark is an extremely timid, harmless animal, seldom removes to any great distance from his burrow, being slow of foot and a bad runner, and is never by any chance found abroad during the day-time. On the approach of night he sallies forth in search of food, and, repairing to the nearest inhabited ant-hill, scratches a hole in the side of it just sufficient to admit his long snout. Here, after having previously ascertained that there is no danger of interruption, he lies down, and, inserting his long slender tongue into the breach, entraps the ants, which, like those of our own country, fly to defend their dwellings upon the first alarm, and, mounting upon the tongue of the aard-vark, get entangled in the glutinous saliva, and are swallowed by whole scores at a time. If uninterrupted, he continues this process till he has satisfied his appetite; but on the slightest alarm he makes a precipitate retreat, and seeks security at the bottom of his subterranean dwelling. Hence it is that these animals are seldom seen even in those parts of the country in which they are most numerous. Like other nocturnal animals, which pass the greater part of their lives in sleeping and eating, they become exceedingly fat, and their flesh is considered to be a wholesome and palatable food. The hind-quarters, particularly when cut into hams and dried, are held in great esteem, and are much sought after by colonial epicures.

AARD-WOLF (*Proteles*, Is. Geof.), in Zoology, a genus of digitigrade carnivorous mammals founded by M. Isidore Geoffroy St. Hilaire for the purpose of giving a place to a new and singular quadruped brought from the interior of Caffraria by the late traveller Delalande. The three specimens of this interesting animal procured by M. Delalande were all, unfortunately, of an immature age, and had not acquired their permanent teeth, so that the characters of their adult dentition still remain to be determined. Enough, however, is known to enable us to assign the most prominent and influential characters of the genus, and to infer, with a tolerable degree of accuracy, the habits and economy of the animal.

It is an observation at least as old as Pliny, that Africa is a land of wonders, which continually produces a succession of new and singular objects. In zoology, the maxim of the Roman philosopher, as to African wonders, is verified almost daily. Among the most recent examples of this fact we may adduce the discovery of the *proteles;* an acquisition of peculiar interest to the zoologist, as forming the intermediate link which connects the civets with the dogs and hyænas, three genera which have hitherto stood, as it were, insulated from surrounding groups, and widely separated from one another. The dogs and hyænas, indeed, had been united a short time previous by the discovery of an intermediate species in the same locality which has since produced the proteles; but it is this latter species alone, which, uniting the characters of all these three genera, enables us to trace their natural affinities, and to assign to them their proper position in the scale of existence.

To the external appearance and osteological (bony) structure of a hyæna, this truly singular animal unites the head and feet of a fox, and the teeth and intestines of a civet. It has five toes on the fore feet, and four only on the hind; the innermost toe of the fore foot is placed, as in the dogs, at some distance above the others, and therefore never touch the ground when the animal stands or walks. The legs also are completely digitigrade; that is to say, the heel is elevated, and does not come into contact with the surface, as in man and other similarly formed animals which walk upon the whole sole of the foot, and are thence said to be plantigrade. It is of great importance to remark the difference between these two modifications of the locomotive organs, because they have a very decided and extraordinary influence upon the habits and economy of animal life. Digitigrade animals, which tread only upon the toes and carry the heel considerably elevated above the ground, have much longer legs than plantigrade animals, and are therefore especially fitted for leaping and running with great ease and rapidity. Accordingly, it will be observed that the horse, the stag, the antelope, the dog, and other animals remarkable for rapidity of course, partake strongly of this formation; and even their degree of swiftness is accurately measured by the comparative elevation of the heel. Inattentive observers sometimes misapprehend the nature of this peculiar conformation of the extremities of digitigrade animals, and are apt to confound the hough with the ankle, and to mistake for the knee what is really the heel of the animal. Thus we have heard it said that, in the hind legs of the horse, the knee was bent in a contrary direction to that of man. This is by no means true: a little attention to the succession of the different joints and articulations will show that what is called the cannon-bone in the horse, and other digitigrade animals, in reality corresponds to the instep in man, and that what is generally mistaken for the knee really represents the heel.

In the particular case of the proteles the natural effect of the digitigrade formation is, in some degree, lessened by the peculiar structure of the fore legs, which, contrary to the general rule observable in most other animals, are considerably longer than the hind. In this respect, also, the proteles resembles the hyænas; and in both genera this singular disproportion between the anterior and posterior extremities abridges the velocity properly due to their digitigrade conformation. It has been already observed that the only individuals of this genus which have been hitherto properly observed were young specimens, which had not acquired their adult dentition; but it was sufficiently obvious to the experienced eye of M. Cuvier, who first examined them, that the dental system of the mature animal must very closely resemble, if it be not actually identical with, that of the civets and genets. The young animal presented three small false molars and one tuberculous tooth on each side both of the upper and under jaws; and we shall find, in the sequel, that the approximation of M. Cuvier is fully justified by the evidence of another accurate observer, who had an opportunity of examining this animal in its native regions. The genus proteles contains but a single species, and this is the *Aard-wolf*, or earth-wolf (*Proteles cristata*), so called by the European colonists in the neighbourhood of Algoa Bay, in South Africa, the locality in which M. Delalande procured his specimens of this animal. The size of the aard-wolf is about that of a full-grown fox, which it further resembles in its pointed muzzle; but it stands higher upon its legs, its ears are considerably larger and more naked, and its tail shorter and not so bushy. At first sight it might be easily mistaken for a young striped hyæna, so closely does it resemble that animal in the colours and peculiar markings of its fur, and in the mane of long stiff hair which runs along the neck and back: indeed, it is only to be distinguished by its more pointed head, and by the additional fifth toe of the fore feet. The fur is of a woolly texture on the sides and belly, but a mane of coarse, stiff hair, six or seven inches in length, passes along the nape of the neck and back, from the occiput to the origin of the tail, and is capable of being erected or bristled up, like that of the hyæna, when the animal is irritated or provoked. The general colour of the fur is pale cinereous (ash-coloured), with a slight shade of yellowish-brown: the muzzle is black and almost naked, or covered only with a few long stiff moustaches. Around the eyes, and on each side of the neck, are dark brown marks; eight or ten bands of the same colour pass over the body in a transverse direction, exactly as in the common striped hyæna; and the arms and thighs are likewise marked with similar transverse stripes. The legs and feet are an uniform dark brown in front, and grey behind. The long hairs of the mane are grey, with two broad rings of black, the second of which occupies the point; those of the tail are similarly marked, and equally long and stiff; whence it appears as if the mane and tail were clouded with an alternate mixture of black and grey. The ears are grey on the interior, and dark brown on the outer, surface.



In its habits and manners the aard-wolf resembles the fox: like that animal it is nocturnal, and constructs a subterraneous burrow, at the bottom of which it lies concealed during the day-time and only ventures abroad on the approach of night to search for food and satisfy the other calls of nature. It is fond of the society of its own species; at least, many individuals have been found residing together in the same burrow; and, as they are of a timid and wary character, they have generally three or four different entrances to their holes, so that if attacked on one side they may secure a retreat in an opposite direction. Notwithstanding the disproportionate length of their fore legs they are said to run very fast; and so strong is their propensity to burrow, that one of M. Delalande's specimens, perceiving itself about to be run down and captured, immediately ceased its flight, and began to scratch up the ground, as if with the intention of making a new earth.

M. Isidore Geoffroy St. Hilaire, in his paper on the Proteles, inserted in the eleventh volume of the *Mémoires du Muséum*, has bestowed upon this species the name of *Proteles Lalandii*. He has done so, in the belief that the species has not been indicated by any previous traveller. We have considered it proper, however, to substitute the specific name of *Proteles Cristata*, for that proposed in honour of M. Lalande, for both Sparrman and Levaillant have mentioned the aard-wolf long before the date of M. Delalande's journey; and the former has not only described it with tolerable accuracy, but has even ascertained its true generic characters, and associated it with the civets, under the denomination of *Viverra cristata*. The passage alluded to will be found in the English translation of *Sparrman's Travels*, vol. ii., p. 177.

In the *Second Voyage* of Levaillant, vol. ii., p. 360, mention is likewise made of this animal under the appellation of 'loup de terre,' which is a simple translation of its colonial name aard-wolf.

Sparrman mentions having found ants in the stomach of the proteles, and these, it may be observed, are also a favourite food of the bear. It is very destructive to young lambs, and it is stated to attack the large fatty growths which envelop the tails of the African sheep.

AARGAU, one of the twenty-two Swiss cantons. On the north the Rhine separates it from the grand duchy of Baden: the canton of Basel bounds it on the west, and that of Zürich on the east. It takes its name from the river Aar, which rises in the glaciers that form the southern limits of the canton of Bern; and, after flowing through the lakes of Brienz and Thun, and past the towns of Bern, Soleure, and Aarau, falls into the Rhine on the south bank, about fourteen miles above Laufenburg. The whole length of its course is about 160 miles. The canton takes its name from the river, the word *Aar-gau* signifying the *province* or *district* of the Aar: the same termination frequently occurs in other names, such as Thurgau.

The canton of Aargau is a pleasant, and in many parts a fertile, district, diversified by hills, mountains, and valleys. The chain of the Jura mountains runs through part of the canton, but they hardly attain the height of 3000 feet. The number of inhabitants is about 199,000. Aargau is one of the most industrious cantons of Switzerland, and perhaps more a manufacturing than agricultural country. This canton has paid great attention to the education of its people. The chief town is Aarau, which contains 4600 inhabitants; and has manufactures of silk, cotton, and leather; and good establishments for education. At Laufenburg are some falls in the Rhine, which impede the navigation of the river. A bridge here leads over the Rhine to the little village of Laufenburg, in Baden. Aargau contains many neat, industrious towns; such as Zofingen with a good library, Lenzburg, Klingnau, Schinznach having near it the castle of Hapsburg, which is the original seat of the Imperial Austrian family, and Baden, which has warm baths, and a good Lyceum. Each of the eight districts into which Aargau is divided has a secondary school. [See *Journ. of Educ.*, No. 6.] The area of the canton is estimated at about 550 English square miles.

AARHUUS, a division of Jutland, containing 1890 English square miles, and 137,000 inhabitants; with a considerable portion of good soil. Aarhuus, the chief town, stands in N. lat. 56° 10′, E. long. 10° 13′, between the sea and a small lake, which, at its outlet, forms a port. The town is pretty well built, and contains a large cathedral church: the manufactures are cotton and woollen cloth, gloves, sugar-refining to a small amount, tobacco, and leather. The number of inhabitants is about 8000. Aarhuus is the point in Jutland from which passengers generally set out to the island of Zealand, where they land at a place called Kallundborg, whence a road leads to Copenhagen. Aarhuus is about 100 miles W.N.W. from the capital. Randers, N.N.W. of the town of Aarhuus, on the Guden, a small navigable river, has about 7100 inhabitants, whose branches of industry are similar to those of Aarhuus, with the addition of stockings and brandy-distilleries. Randers has a grammar-school and good hospital.

AARON, the first high-priest of the Jews. He was the elder brother of Moses, and was, by the express appointment of Heaven, associated with that illustrious legislator in the enterprize of delivering their countrymen from Egyptian bondage, and conducting them to the promised land. Aaron, who was a ready and eloquent speaker, was the chief instrument employed in announcing the command of God to Pharaoh, and attesting it by the series of stupendous miracles recorded in the earlier chapters of the book of Exodus. After the passage of the Red Sea, and during the sojourn in the wilderness, he was far from manifesting the steady confidence and undaunted disregard of popular clamour which characterized the conduct of his brother; but, notwithstanding the timidity and weakness which he had shown in yielding to the demand of the impatient and superstitious multitude, that he would make them a golden calf to worship, he was, in conformity to the divine purpose, consecrated to the priesthood, of which the highest office was made hereditary in his family. Aaron, however, was not permitted to reach the promised land, any more than his brother Moses. Having ascended the summit of Mount Hor, in company with Moses and his eldest son Eleazar, he died there, after Moses, as commanded by God, had stripped him of his sacerdotal robes, and put them upon his son. This event happened when Aaron was in the hundred and twenty-third year of his age, forty years after the departure of the Israelites from Egypt, and, according to the commonly received chronology, in the year 1451 B.C., or 2553 from the creation of the world.—The history of Aaron is to be found in the book of Exodus, and the three following books of the Pentateuch.

AARON, the fifth caliph of the race of the Abbasides, born 765, died in 802.—[See ABBASIDES.]

AB, the fifth month of the ancient Hebrew year, but now the eleventh (or, in intercalary years, the twelfth), in consequence of the transfer of the new year from spring to autumn.

On the 1st day of Ab a fast is held in commemoration of the death of Aaron. On the 9th a very solemn fast is observed in remembrance of the destruction of the Holy Temple by Nebuchadnezzar in 588, B.C., and of the destruction of the second Temple by Titus, A.D. 70. This fast is considered the most mournful of the whole year: on this day, in the synagogues, the lamentations of Jeremiah are publicly read, with other portions of the Bible, expressive of sorrow and desolation. No recreation is allowed from the beginning of the month, nor may any man shave his beard the more serious Jews even abstain from all meat, except on the Sabbath-day. On the 18th, another fast is observed. All these fasts are postponed one day if they fall on the Saturday.

A little festival is celebrated on the 15th day of the month to commemorate an ancient custom, according to which, the young girls of each tribe came forth into the fields clothed in white, and exhibited themselves in dances before the marriageable young men, with the view of being selected by them in marriage. A fast is also said to fall on the 18th, in memory of the western lamp going out in the Temple in the time of Ahaz.

The month of Ab may begin in some years as early as the 10th July, in others as late as the 7th August. In 1855, it commences on the 16th July.

Ab is the name of the twelfth month of the Syrian year, coinciding with our August.

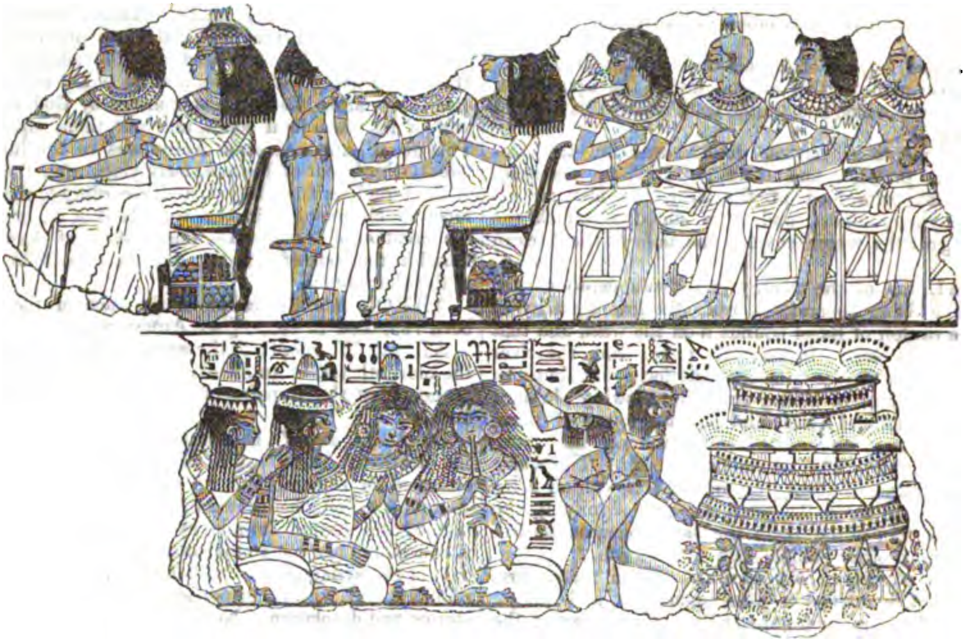
ABABDE, the name of several African tribes, which occupy the country between the Nile and the Red Sea, south of Kosseir, nearly as far as the latitude of Derr, 22°. 47′. The Bisharye inhabit the mountains from thence southwards. Many of the Ababde have settled in Upper Egypt, on the east bank of the Nile, from Kenneh to Assouan, and thence to Derr. According to Belzoni, some of them are spread as far as Suez. But the greater part still live like Bedouins, and act as guides to the Sennaar caravans which set out from Daraou, a place about ten hours' journey north of Assouan. The Ababde formerly guarded the caravans from Kenneh to Kosseir, on the Red Sea but they have been deprived of this branch of profit by the Maazu and Ataony Arabs, who live to the north, and farm the profits of this line of road from the Pasha.

The Ababde have considerable property, but a very bad character; they are described as faithless, and unworthy of the Bedouin origin of which they boast.

These people are known in Upper Egypt for their excellent camels, and particularly for their dromedaries. They trade principally in senna leaves, and charcoal made of acacia wood, which is sent as far as Cairo. The Ababde have few horses; they fight with other Arab tribes upon camels. Their arms are a target, lance, and sword. They are divided into three principal tribes, El Fokara, El Ashabat, and El Meleykab.

Those who encamp with the Bisharye speak the language of the latter. The female children of the Ababde and Jaafere Arabs, as Burckhardt calls them, who inhabit the west bank of the Nile, south of Thebes, as far as the first cataracts, as well as the female children of all the people south of Kenneh and Esne to the borders of Sennaar, undergo the operation of excision, which was an old Egyptian custom. [Compare Strabo., p. 824, Casaub.] The Ababde fight naked, except that they have a rag or napkin round their waists. A fight which Burckhardt saw commenced with a shower of stones, for the repelling of which missiles, their targets appeared very useful. The combatants on each side were about thirty; and the results were, three men slightly wounded, and one shield cleft in two.

This account is from Burckhardt's *Travels in Nubia* (London, 1819), who appears, from this and other passages, to consider the Ababde as of Arab stock; but if this be his meaning, it seems to be incorrect. Other writers say that the Ababde, who are of the same family as their southern neighbours, the Bisharye, differ in appearance, habits and language from the Arabs. The latter fact might readily be established by a comparison of an Arabic and Ababde vocabulary; but we have not been able to find one of the latter language. That the Ababde have, at different periods, mixed with the Arabs is certain, and we believe have got their religion, such as it is, from the same nation. Their form, which is not that of the negro, their dark colour, and their long hair besmeared with grease, and hanging in ringlets, which have been compared in shape to corkscrews, show them to be of Nubian stock, and probably the remnant of a race long settled in these regions. The kind of head-dress which they wear is often seen on the Egyptian monuments, and a pretty correct notion of it may be formed from the following Egyptian painting, now in the British Museum.



The fact of the Ababde being camel-breeders, and using them in battle, coincides singularly with the habits of the *Arabians*, as Herodotus calls them, who lived south of Egypt, and were in the army of Xerxes when he invaded Greece, B.C. 480.

It is conjectured by Ritter, that the Ababde, as well as the Bisharye, may be a remnant of that people, whom we hear of under the Roman Emperors by the name of Blemyes. We hear no more of the Blemyes after the Arab conquest of Egypt; but they appear under the general name of Bejas, as the great carriers between the Nile and Aidab on the Red Sea, and, in fact, as a commercial people. The Bisharye, the Ababde, Barabras, &c., may be considered as different branches of the Beja stock. [See Bejas.] What reasons Herodotus had for calling the camel-riding people south of Egypt by the name of Arabs, it is difficult to say; only we may observe, that Arabia, properly so called, was then very little known; and the word Arabs would be applied vaguely, and perhaps sometimes incorrectly, to many people, who lived a nomadic life. For many Ababde customs, see Belzoni's *Researches*, p. 309, 4to. [See Ritter's *Geography*, Africa.]

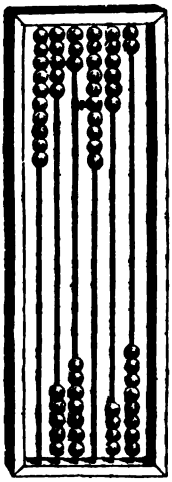
ABACISCUS, in architecture, is a diminution of the architectural term Abacus, and is principally applied, when used at all, which is not often, to the tiles or squares of a tessellated pavement.

A'BACUS, in architecture, is the level tablet, whether square or oblong, which is almost always formed on the moulded or otherwise enriched capital of a column, to support the horizontal entablature. [See the words Capital, Column, and Entablature.] The architectural application of the term Abacus, which in the original is applied to any rectangular tile-like figure, arises from a story which Vitruvius tells of the manner in which the foliated capital called the Corinthian originated.

A'BACUS, a game among the Romans; so called from its being played on a board, somewhat in the manner of chess.

A'BACUS, an instrument employed to facilitate arithmetical calculations. The name may be given with propriety to any machine for reckoning with counters, beads, &c., in which one line is made to stand for units, another for tens, and so on. We have here given the form of an abacus, such as we may recommend, for the purpose of teaching the first principles of arithmetic, the only use, as far as we know, to which such an instrument is put in this country. Its length should be about three times its breadth. It consists of a frame, traversed by stiff wires, on which beads or counters are strung so as to move easily. The beads on the first right hand row are units, those on the next tens, and so on. Thus, as it stands, the number 57048 is represented upon the lower part of it.

For a more detailed account of the method of using this instrument for the purposes of instruction, see Numeration. There is an instrument sold in the toy-shops with twelve wires, and twelve beads on each wire, for teaching the multiplication-table, which may be made of more use if applied according to the method which will be described in the article referred to.



The abacus can never be much used in this country, owing to our various division of weights and measures. We should need one abacus for pounds, shillings, and pence; another for avoirdupois weight; a third for troy weight, and so on. In China, however, where the whole system is decimal, that is, where every measure, weight, &c., is the tenth part of the next greater one, this instrument, called in Chinese Shwanpan, is very much used, and with most astonishing rapidity. It is said that while one man reads over rapidly a number of sums of money, another can add them so as to give the total as soon as the first has done reading. Their abacus differs from the one described above, in having only five beads on each wire, one of which is distinguished from the rest either in colour or size, and stands for five. There is one of these instruments in the East India Company's Museum. The Greeks and Romans used the same sort of abacus, at least in later times. The Russians are also much in the habit of performing calculations by strings of beads. It is probable that the word was originally applied to a board strewed with dust or sand, on which letters were marked in teaching children to read. The word *Abax* was the Greek term for this instrument. Some etymologists derive the name from the Phœnician *Abak*, which signifies dust. Lucas de Burgo, an old algebraical writer, says it is a contraction of Arabicus. It is most probable, however, that the first derivation is correct. A chequered board, such as we still sometimes see at the doors of public-houses, was formerly used in this country as an abacus [see EXCHEQUER], and a chess-board would now do very well for the purposes of instruction above-mentioned. The multiplication-table is sometimes called the Pythagorean abacus.

ABANDONMENT is a term used in marine insurance. Before a person, who insures a ship or goods, can demand from an insurer or underwriter the stipulated compensation for a total loss of such ship or goods, he must *abandon* or relinquish to the insurer all his interest in any part of the property which may be saved. [See INSURANCE.]

ABA'NO, PETER DE, a celebrated Italian physician and philosopher of the middle ages. He was born in 1250 at Abano, anciently Aponus, a village about five miles from Padua. Peter de Abano, or Apono as he is often called, having repaired to the University of Paris to complete his education, is said, while studying there, to have published the most famous of his works—his *Conciliator Differentiarum Philosophorum et Medicorum*, a performance from which he has derived the title of the *Conciliator*. He afterwards wrote various other works which are less known, and also translated into Latin some of the treatises of the Arabian physicians. Abano was undoubtedly one of the most accomplished scholars and men of science of his age; and he also seems to have been possessed of native powers and an inventive genius. As it was, he has been regarded as one of the principal restorers of true science in his native country. After he left the University of Paris, where he took the degree of Doctor both in Philosophy and in Medicine, he settled at Padua, where he practised as a physician for the remainder of his life. Abano was also a great proficient in mathematics and astronomy, so far as those sciences were known in that age. His reputed skill in this kind of learning caused him to be regarded, in his own day, as a magician; and, in his latter years, a process was actually commenced against him as such by the Inquisition. An inscription on a statue which the citizens of Padua erected to him after his death, asserts that he was suspected of magic and accused of heresy; but acquitted. Other authorities, however, assure us that he only escaped condemnation by his death, in 1315, at the age of sixty-six; and that the sentence, which would have been passed upon him if he had lived, was executed upon his effigy in straw. The imputation of being a practiser of magic long clung to the memory of Abano in the popular belief, and even in the minds of many of the learned. As one of the many distinguished cultivators of mathematical and physical science who have acquired this sort of celebrity, he occupies a conspicuous place in the curious work which the French physician, Gabriel Naudé, published in the early part of the seventeenth century, entitled *A Vindication of the Great Men who have been accused of Magic*. Abano, however, although no student of magic, shared the universal belief of that and several succeeding ages in the delusions of astrology, and had no doubt that the movements of the stars exercised the most important influence on human affairs. The calculation of these imaginary sympathies formed, indeed, the principal part of his astronomy. The mysterious and almost prophetic character which he and others thus professed to derive from their scientific skill, must no doubt have helped, in a considerable degree, to countenance and confirm the popular notion of their intercourse with the powers of darkness. [See *Bayle's Dictionary*—Abano.]

ABATEMENT. This word is derived from the old French word *abater*, which signified to beat down, prostrate, or destroy.

Before entering upon the explanation of the present meaning of this term, it will be well to observe, for the information of those who may not be acquainted with the history of our law, that by far the greater number of the terms of art (as they may be called) peculiar to it, are derived either from the Norman-French, or the Latin,—we shall therefore give a cursory view of the circumstances which led to their adoption. When William I., commonly styled the Conqueror, became King of England, he filled all the posts of profit and honour with subjects from his Norman dominions —the civil places chiefly with ecclesiastics. The foreign priests having obtained from their master all the seats of the judges and other officers of the superior courts of justice, it was found necessary to ordain that all proceedings in them should be carried on in the Norman tongue instead of the English, of which these new judges were for the most part altogether ignorant. This practice continued until Edward III. conquered the armies of the French in their own country, and abolished the use of their language in the courts of justice here. At the same time that all arguments and judgments of law were spoken in French, the written parts of the proceedings, such as the writs and records, were all in the Latin language, with which the priests of the Roman Church were necessarily more or less acquainted. The judicial *writings* continued to be in Latin long after Edward III. had expelled the French tongue from our courts; and they were not written in our own language until the reign of George II., when an Act of Parliament was passed for the purpose.

It will be evident that, under the circumstances described, the more ancient legal terms would, whenever that could conveniently be done, be translated into the French and Latin languages; and as, during the periods mentioned above, the laws of England experienced great alterations and received many additions, abundance of new terms were necessarily called for to express new notions, and were naturally drawn from the languages then in legal use. Many of the expressions thus translated, and those first invented, are employed at the present day with little or no alteration. Of this we have an example in the word which is the subject of this article.

The term *Abatement* is used by our law in three senses, viz. those of abating a nuisance, abating an action or indictment, and abating into a freehold.

The first of these, in which the word seems to be used in its primitive or literal sense, is that of abating or *beating down* a nuisance; an expression commonly used, and, therefore, well understood. Whatever unlawfully annoys, or does damage to another, is a nuisance, which he is at liberty to abate, that is beat down, and remove; provided in so doing he commits no breach of the peace, and does no more injury to the property than is absolutely necessary for effecting his purpose. If a new house or a wall be erected so near to an old house as to obstruct its ancient lights, this is a private nuisance, which it is competent to the person injured peaceably to abate: or, if a gate or other obstruction be erected or placed across a public road, this, which is a public nuisance, any of the king's subjects passing that way may beat down and remove.

The second signification of abatement is that of abating a civil action, or an indictment. Here it is taken figuratively, and signifies the beating down or overthrowing such action or indictment. This is effected in an action at law, either by showing, by way of plea, that something has occurred by which the proceeding is *ipso facto* determined, or by stating some matter which renders it imperative on the court to quash, or put an end to, the proceedings. Thus, in the first case, it may be alleged that the plaintiff has taken possession of the property which he seeks by his suit to recover from the defendant. In the second case, it may be shewn that the plaintiff in such proceedings is an alien, an outlaw, or an attainted or excommunicated person, and therefore incompetent by the law of England to maintain an action; or that the defendant is privileged from action, or has been misnamed in the suit; or that there are other persons still living who are equally liable with the defendant, and ought, therefore, to be joined with him in the demand; or that the plaintiff is disqualified from suing by some personal disability, or that the plaintiff or defendant is misnamed. In the former of these cases, the plea informs the court that the action is no longer pending—is already of itself abated by one of the parties, without the interposition of the court: in the latter it calls upon the court to pronounce a judgment which shall put a stop to the present proceedings, without deciding anything upon the main question in dispute between the parties. Where the defendant pleads any matter in abatement which lies peculiarly in his own knowledge, such as his own misnomer, or the non-joinder of other parties as defendants, it is, in general, necessary that the plea should be so framed as to give to the plaintiff that information which shall prevent his falling into a similar mistake, when commencing a new action for the same demand. This is technically called giving the plaintiff a better writ. It is an indispensable rule, where the action is only abateable by plea, that he who takes advantage of a flaw must, at the same time, show how it can be amended. This is, of course, not required where the action is actually abated, and where the plea, though in form a plea in abatement, is substantially a plea in bar, and shows, not that the particular proceeding is misconceived, but that the plaintiff has no *right* to recover by his action the thing which he has claimed.

In the early history of our law, as recorded in the Year Books, the most numerous subjects of discussion are questions arising upon pleas in abatement; and many important legal points were settled in considering whether a writ had or had not abated in fact, or was or was not abateable. Of late years a variety of causes, which cannot be explained without involving the consideration of matters scarcely intelligible to any but a professional reader, have conspired to render pleas in abatement in civil actions of much less frequent use than they formerly were. They are, in fact, discouraged by the Courts; and now, by the provisions of the 15 and 16 Vict. c. 76 (1852), commonly called the Common Law Procedure Act, the law on this subject is very much simplified and improved; facilities are given for amendment of pleadings, and much of the artificial technicality of the former system of procedure abolished. The law on the subject of abatement is very much the same in the Courts of Equity, the procedure of which has also of late been considerably simplified. The effect of *marriage*, however, as a ground of abatement, appears to be differently viewed in the legal and equitable jurisdictions. Thus, at Common Law, and under the regulations of the above Act, 15 and 16 Vict. c. 76, the marriage of a female plaintiff or defendant will not cause the action to abate; whereas, in Equity, it would appear that upon the marriage of a female *plaintiff* the suit abates; but not so of a female defendant, in which case it is merely necessary to name the husband as well as the wife in the subsequent proceedings.

The subjects of pleas in abatement, in criminal proceedings, are far more confined than in civil actions. In general, if an indictment assign to the defendant no Christian name or a wrong one, no surname or a wrong one, or no addition, or description of his calling and place of abode, or a wrong one, he may plead this matter in abatement. In modern times, however, misnomer is the only case in which a plea in abatement to an indictment has been at all usual in practice; and at the present day, such a plea would be of no avail to a defendant—a statute (7 Geo. IV. cap. 64, section 10) having been passed, which gives authority to criminal courts of justice to amend the indictment according to the truth upon such a plea being made, and then to call upon the party to plead to the substance of the charge.

The last species of abatement is that of an abatement into a freehold, wherein, as in the last case, the term abatement is used in a figurative sense, to denote that the rightful possession or freehold of the heir or devisee is overthrown by the rude intervention of a stranger. [Stephen's *Commentaries*, vol. iii. p. 475, and notes; and Blackstone's *Commentaries*, vol. iii. pp. 167–8.]

ABATIS, a military term, signifying a work composed of felled trees, with the softer branches cut off, laid side by side with the end from which the branches grow towards the enemy; thus forming an obstruction to his progress, and a breast-work for musketry to fire over. This species of defence is often used in fieldworks, where wood, not of too great size, is plentiful. Lines, flanked by bastions, are thus formed, either simply by laying down and fastening the trees, or, if when so placed they would be too high to fire over, by sinking them in a ditch whose section is an angle, with its longest slope towards the enemy. They are sometimes formed against the counterscarp of a rampart, sometimes in the covered way, and may generally be used wherever an obstruction is to be raised to the enemy's progress, provided they can be flanked by a fire sufficient to prevent his destroying them at his leisure.

ABATTOIR, the name given by the French to the public slaughter-houses, which were established in Paris, by a decree of Napoleon, in 1807, and finished in 1818. Paris, previous to the arrangement thus made for the public health and comfort, was, as London now is, subject to the nuisance of having cattle driven through a crowded city, to be slaughtered in yards and hovels of the closest streets. But that capital was not still further exposed, as our metropolis is, to the frightful annoyance of a great cattle-market, held in the very heart of the city: the cattle were bought and sold at the adjacent villages of Scéaux and Passy. Assuredly, the beast-market of Smithfield, and the slaughter-houses of Warwick-lane, and of many other thoroughfares, are evils which ought not to exist in a period of high civilization. The abattoirs of Paris are five in number; three being on the right bank of the Seine, and two on the left. These buildings, which are of very large dimensions, consist of slaughter-rooms, built of stone, with every arrangement for cleanliness, and with ample mechanical aids; and of ox and sheep pens. Each butcher has stalls set apart for his beasts, and conveniences for securing his own forage. A fixed price is paid for the accommodation of the building, and for the labour of the attendants; the rate for killing is 6 francs for an ox, 4 fr. for a cow, 2 fr. for a calf, and ½ fr. for a sheep. A charge is also made for melting tallow, preparing tripe, &c. In 1843, the revenue of the abbatoirs of Paris, derived from the above charges, amounted to 1,090,230 fr., or 43,610*l*. When it is considered that above two million head of sheep, oxen, calves, and hogs are annually slaughtered in London, the serious inconveniences arising from the old system must be evident. In 1851, an act of parliament was passed for the removal of Smithfield Market, but as yet without any practical effect. [*Dictionnaire de la Conversation.*]

ABAUZIT FIRMIN, born 1679, died 1767, aged 87. His family was descended from an Arabian physician who settled at Toulouse in the ninth century. He was born at Uzès in Languedoc, of Protestant parents in good circumstances, and lost his father when he was only two years of age. In 1685, after the revocation of the Edict of Nantz, he and his brother were seized by the authorities for the purpose of being educated in the Catholic faith. After some time, however, his mother was enabled to effect his escape, and send him to Geneva. For this she was imprisoned, until she also contrived to escape and follow her son. Abauzit applied himself closely to study, and attended to almost every branch of human knowledge. In 1698 he visited Germany, Holland, France, and England, and gained the esteem of many eminent men, among others of Bayle and

Newton. King William wished to retain him in England, but he decided to return to Geneva. There he took part in the translation of the New Testament, which appeared in 1726, and received the thanks of the clergy for his exertions. The Academy offered him a professor's chair in 1723, which he declined, preferring the situation of a supernumerary librarian, without salary. In 1727 the government of Geneva bestowed on him the rights of citizenship. He is one of the most remarkable instances on record of a combination of universality and depth of learning. Every man who talked with Abauzit on his own particular study, imagined that, whatever his general learning might be, his special attention had been reserved for that which they were discussing. Newton addressed himself to Abauzit as a proper person to decide between him and Leibnitz. Pococke, the Oriental traveller, thought he had passed his life in the east. Rousseau imagined that he had devoted himself to the study of ancient music. The latter speaks of him in terms of the highest admiration in his *Héloïse*, being the only instance in which he has thus distinguished a contemporary. In his temper he was so mild and enduring, that an anecdote which is preserved of him shows that those virtues had reached an excess which almost entitles them to the appellation of a disease of the mind. His friends bribed or encouraged his servant to try what lengths he might go with his master. The man, accordingly, neglected to make his bed, of which Abauzit reminded him without reproof. The same neglect, however, was allowed to occur several days running; on which Abauzit called the servant, and said, 'You appear not to like to make my bed; perhaps you think it too much trouble; it is, however, no great matter, as I begin to accustom myself to it.' For a man of his attainments we have not much remaining of Abauzit. With the exception of some antiquarian papers, in Spon's *Histoire de la Ville de Genève* and the *Journal Helvétique*, he printed nothing himself. Some theological works were published after his death, but the greater part of his manuscripts were burnt by his heirs, whose religious opinions differed from his own, which were Unitarian.—[Mostly abridged from the *Biographie Universelle*.]

ABBAS the Great, or, with his full name, Shah Abbas Bahadur Khan, was the fifth king of the Sufi dynasty which ascended the throne of Persia in the year 1501 of our era. During the latter part of the reign of Shah Mohammed Khodabende, his father, he filled the situation of governor in the province of Khorasan; and on the death of that prince in 1586, succeeded him in the government. Khorasan had just then been occupied by the Usbeks, and it was the first object of Shah Abbas to recover possession of it. But his efforts proved for a time ineffectual. Not being able to take Herat, the capital of Khorasan, from the Usbeks, he was obliged to content himself with leaving a garrison at Meshhed, and even this town, considered as sacred by the Shiites on account of the tomb of a celebrated Mohammedan saint, Imam Ali Reza, fell again into the hands of the enemy. About the same time the internal peace of Persia was interrupted by a revolt at Istakhar, which was, however, soon repressed, and terminated with the execution of the prime mover, Yakub Khan. The year 1590 was distinguished by victories in Gilan and Azerbijan over the Turks, who had collected a considerable force on the banks of the river Kur, and threatened Persia with an invasion. The Turks lost, through this campaign, their influence in Gilan, but retained for the present possession of the fortresses of Nuhavend, Tebriz, Tiflis, and almost the whole of Azerbijan and Georgia. During this time, one of the generals of Abbas conquered the province of Lar in the south, and the Bahrein islands in the Persian gulf, important on account of their pearl-fishery.

The Usbeks still remained masters of Khorasan, and, owing to their desultory mode of carrying on their attacks, many attempts at bringing them to a regular action had failed. At last, however, in the year 1597, they were totally defeated by the Persian troops, near Herat, and Khorasan was for a long time released from their predatory incursions.

Two English knights, Sir Anthony, and his brother Sir Robert Sherley, arrived about this time as private travellers in Persia. They were honourably received by Shah Abbas, whose confidence they soon gained to such a degree, that while Sir Robert Sherley remained in Persia, his brother Sir Anthony was sent as envoy from the Persian court to the Christian princes of Europe, to offer them the Shah's friendship, chiefly with a view to some future common undertaking against the Turks, who were then the terror of Europe.

Between Persia and Turkey hostilities were still carried on. Nuhavend, Tebriz, and Bagdad were taken; a Turkish army of 100,000 men was defeated by about half that number of Persians; Abbas recovered Azerbijan, Shirwan, part of Georgia, and Armenia, and subsequently also Kurdistan, Mosul, and Diarbekir; and the Turks were ever after this victory kept in check. They formed a league with the Tartars of Kaptchak, but the united forces of both were vanquished in a battle fought between Sultanieh and Tebriz, A. D. 1618, the last memorable battle that occurred during the reign of Shah Abbas. Negotiations were then commenced between Abbas and the Sultan at Constantinople; but insurrections and conflicts in the frontier provinces, fomented and secretly instigated by the Turkish government, still continued for some time.

Shah Abbas encouraged the trade of Europeans with Persia: he protected the factories which the English, the French and the Dutch had at Gombroon; but he looked with jealousy on the flourishing establishment of the Portuguese on the small island of Ormuz, situated near the entrance of the Persian Gulf, which had been in their possession ever since 1507, when Albuquerque occupied it, and had now become the emporium of an extensive commerce with India, Persia, Arabia, and Turkey. This settlement the Persians and the English East India Company agreed to attack with joint forces. The English furnished the naval, the Persians the military, forces; and the island was taken on the 22nd April, 1622. For this service the English received part of the plunder, and a grant of half the customs at the port of Gombroon; but their hopes of further advantages for their commerce in these parts were frustrated, and the mission of Sir Dodmore Cotton from England to the Persian court, in 1627, likewise failed in procuring them.

After a reign of upwards of forty years, Shah Abbas died at Kaswin, A. D. 1628. Like most of the monarchs of the Sufi dynasty, he was excessively cruel, and hasty in awarding capital punishment often on very slight grounds. All his sons fell victims to his suspicion and jealousy; only one grandson survived him, who succeeded him on the throne as Shah Sufi. Abbas was a zealous Shiite, and used to make frequent pilgrimages to the tomb of Imam Ali Reza, at Meshhed; but he showed great tolerance to those that professed other religions, and especially to Christians. His belief in astrology was so firm that he once even vacated the throne for a short period during which it had been predicted that danger menaced the life of the Shah. He made Isfahan the capital of the empire, and embellished that town by magnificent gardens and palaces. He favoured commerce, and rendered the communications in the interior easier by caravanserais and highways. As a means of securing the authority of the crown, he countenanced the conflict of political parties in the interior; with the same view he formed a new clan of his own, consisting of persons from all classes, and denominated the 'King's friends,' whom he distinguished and attached to his person by many particular favours.

ABBASIDES. The name of this family of sovereigns is derived from their ancestor, Abbas ben Abd-al-Motalleb, a paternal uncle of the Arabian prophet Mohammed. On account of their descent from so near a relation of the prophet, the Abbasides had, ever since the introduction of the Islam, been held in very high esteem among the Arabs, and had at an early period begun to excite the jealousy of the Ommaïade caliphs, who, after the defeat of Ali ben Ali Taleb, the son-in-law of Mohammed (A. D. 661), occupied the throne of the Arabian empire. The Abbasides had already for some time asserted their claims to the caliphat, in preference to the reigning family, when, in A.D. 746, they formed a strong party, and commenced open hostilities against the government of the Ommaïades in the province of Khorasan. Three years afterwards (A.D. 749) the Abbaside Abul-Abbas Abdallah ben Mohammed, surnamed Al-Saffah, or 'the bloodshedder,' was recognized as caliph at Kufa. A battle on the banks of the river Zab, not far from Mosul (in the same neighbourhood where, more than a thousand years before, the battle of Gaugamela had made Alexander master of the Persian empire), decided (Jan. 750 A. D.) the ruin of the Ommaïades. Merwan II., the last caliph of that lineage, fled before the advancing forces of Al-Saffah from Mosul to Emesa, thence to Damascus, and finally to Egypt, where he was overtaken and killed. So great was the hatred of the victorious party against the vanquished royal family, that not less than ninety Ommaïades were doomed to a cruel and ignominious death, while even the remains of those that were already dead, were taken out of their tombs, and publicly insulted. A survivor of the fallen dynasty, Abd-alrahman, a grandson of the caliph Hesham, escaped to Spain, the westernmost province of the Arabian empire. There his name procured him a favourable reception; he was saluted as king, and an Ommaïade lineage continued to reign for nearly three centuries (A.D. 756—1031) over the eight Mohammedan provinces of Spain.

Al-Saffah died in A.D. 753, and was succeeded in the caliphat by his brother Al-Mansur (A.D. 753—774), who removed the seat of government from Damascus to the new-built city of Bagdad. He was successful in wars with the Turcomans and with the Grecian empire in Asia Minor: but the internal tranquillity of his reign was often disturbed by insurrections in the distant provinces. In the reign of his son, Mohdi (A.D. 774—784), a Mohammedan army, under the command of the youthful Harun al Rashid, penetrated the Grecian provinces of Lesser Asia as far as the Hellespont. During the short reign of Mohdi's son, Hadi (784—786), an attempt at an overthrow of the Abbaside dominion was made at Medina, by Hossein, a descendant of Ali ben Abi Taleb.

Hadi was followed by the celebrated Harun al Rashid, a grandson of Al-Mansur, whose early military exploits have already been alluded to. When called to the throne, he soon displayed a love of justice and peace, and a zeal for literature and the arts, which corresponded to his valour as a military commander. He opened friendly communications with Charlemagne: the presents which he sent him (among others a curious sort of clock, a description of which is given by Eginhard), while they show the regard which he entertained for his great European contemporary, afford at the same time an illustration of the progress which the mechanical arts must at that time have made among the Arabs. In conducting the internal affairs of his empire, Harun was chiefly guided by his two ministers, Yahya and Jafar, of the ancient Persian family of the Barmekides, whose ancestors had, through many generations, previous to the introduction of the Islam, held the hereditary office of priests at the fire-temple of Balkh. But the high degree of popularity which the Barmekides enjoyed, aroused Harun's jealousy, and the rashness and cruelty with which he indulged himself in his suspicion by putting to death not only the two ministers, but almost all their relations, form an odious exception to the praise of mildness and equity with which his memory is honoured by Eastern chroniclers. The epoch of his reign has, in the remembrance of Mohammedan nations, become the golden age of their dominion. The wealth and the adopted luxury of the conquered nations had given to social life that refinement, and to the court of Bagdad that splendour, of which so lively pictures are exhibited in many of the tales of the *Arabian Nights*. Flourishing towns sprung up in every part of the empire. Traffic by land and by sea increased with the luxury of the wealthy classes; and Bagdad rivalled even Constantinople in magnificence.

To wage war against the Infidels was, with the Arabs, a matter of religion and of faith: as soon, therefore, as a conquered nation embraced the Mohammedan belief, it was no longer regarded as subject to the victors, but was raised to an equality with them, and formed an integral part of the same body. The different elements of the empire were thus held together by the tie of a common religion, and the language of the Koran (which the Mohammedans have always deemed it unlawful to profane by translations) became the medium of communication for the nations from the banks of the Indus to those of the Tagus and the Ebro. The supreme pontificate and the secular sovereignty, the two elements whose conflict forms the prominent feature in the history of the Christian world during the middle ages, were in the Mohammedan empire united in the person of the caliph, who, invested with the mantle, signet, and staff of the prophet, and bearing the title of Emir al Mumenin, *i.e.* Commander of the Faithful, wielded the supreme spiritual and temporal rule without any other restriction or control besides the ordinances of the established religion. The only formal recognition of the sovereignty of the caliphs (and, subsequently, of all other independent Mohammedan princes) was the prerogative of having the money of the state stamped with their name, and of having their name also introduced into the public prayers at the mosques. According to the ancient Persian plan, the several provinces of the empire were governed by delegates, with military and administrative powers. But this system soon proved fatal to the caliphat: for the lieutenants in the distant parts of the empire would often revolt, and aspire to independent authority. On an expedition to Khorasan, undertaken against such a disloyal satrap, Harun died at Tus, A.D. 808.

The throne was for some years contested between his two sons, Amin and Mamun: but, in A.D. 813, Mamun came to the sole and undisputed possession of it. His reign (A.D. 813—833) forms an important epoch in the history of science and literature, the cultivation of which was conspicuously patronized by that caliph. The Arabs were avowed borrowers in science: they were chiefly indebted to the Hindus and the Greeks; and even what they received from these nations seems often to have exceeded their comprehension. Their claims to originality of invention, and to the merit of having made real additions to the stock of knowledge, are not great; but they are entitled to *our* gratitude for having kept alive and diffused the light of letters, and for having preserved a sort of scientific tradition from classical antiquity, during an age when science and literature in Europe lay buried under ignorance and barbarism. Mamun founded colleges and libraries in the principal towns of his dominions, such as Bagdad, Bassora, Kufa, and Nishabur. Syrian physicians and Hindu mathematicians and astronomers lived at his court; and works on astronomy, mathematics, metaphysics, natural philosophy, and medicine were translated from the Sanscrit and Greek into Arabic. Mamun took personally a particular interest in astronomy. He built observatories, had accurate instruments constructed, improved by their means the astronomical tables, and caused a degree of the meridian to be measured in the sandy desert between Palmyra and Racca on the Euphrates. At his command, Mohammed ben Musa wrote an elementary treatise on algebra, the earliest systematic work extant on that branch of mathematics, for their knowledge of which, as well as for much of their astronomy, the Arabs seem to be chiefly indebted to the Hindus. The investigation of the structure of their own language, and the systematic development of the Mohammedan theology and jurisprudence, both founded chiefly on the Koran, afforded an opportunity of applying practically the principles of the Aristotelian philosophy.

The period of prosperity which the Arabic empire enjoyed under Harun al Rashid and Mamun was only of short duration. The chivalrous enthusiasm with which Mohammed had inspired his nation became soon extinguished under voluptuousness and love of enjoyment. Many provinces in the west (Spain, Fez, and Tunis) had already shaken off their allegiance to the caliphat, and the attachment of others in the east was likewise doubtful. From the north the empire was threatened by the Turks, some tribes of whom had been compelled to adopt the Mohammedan religion. Turkish youths were soon brought as mercenaries to Bagdad, and Motasem (833—842), the brother and successor of Mamun, formed of them a body-guard, which, under the reign of Vathek (842—846), Motawakkel (846—861), and Montaser (861, 862), became to the caliphat what the prætorian guards had been under the Roman emperors. Mostaïn (862—866) was obliged to concede to them the privilege of electing their own commander, and thus lost much of his authority at home, while the provinces of his empire were infested by invasions from the Greeks. Under his successor Motaz (866—868), a native of Sejestan, Yakub al Laith, surnamed Al-Soffar, *i.e.* the brazier, made himself master of Khorasan, Kerman, Persia proper, and Khuzistan, and united these provinces into an independent kingdom, with Nishabur for its capital, which continued in the possession of his family (the Soffarides) till 917.

The successors of Motaz were Mohtadi (868, 869), Motamed (869 — 892), Motadhed (892 — 902), Moktafi (902 — 907), Moktader (907 — 932), and Kahir (932 — 934). Under the reign of Radhi (934—940) the disorder of the empire had reached such a height, that the caliph, in order to restore public order and tranquillity, was obliged to call Mohammed ben Rayek, the governor of Wasith, to Bagdad, and to confide to him, with the title of Emir al Omara, or commander of the commanders, an almost unlimited authority in the government. From this time the caliphat became a mere nominal dignity; all the efficient power was in the hands of the mighty Emirs al Omara.

After the short reign of Mottaki (940—943), Mostakfi (943, 944) came to the caliphat; but he was soon dethroned by Moizzeddaula the Buide (properly Bawaihide), who, in concert with his two brothers, had rendered himself master of a great part of Persia and Irak. Moizzeddaula conferred the caliphat, now limited to the mere pontifical dignity and to the possession of the town of Bagdad, on Mothi Lillah (946—973), and reserved to himself the powerful office of Emir al Omara, which continued hereditary in his family during the caliphat of Tayi lillah (973—991), and Kadir billah (991—1031), till the year 1056, when, in the caliphat of Kaïm biamr illah (1031—1074), Bagdad was occupied by the Seljukes under Togrul Beg, whose family retained the authority of Emir al Omara till 1152, while the nominal sovereignty of the caliphat passed from Kaïm biamr illah successively into the hands of Moktadi (1074—1094), Mostajer (1094—1118), Mostarshed (1118—1134), Rashid (1134, 1135), and Moktafi (1135—1160). The sovereigns of those principalities into which the Arabian empire had now dissolved itself, either still recognized the caliph at Bagdad as Imam or supreme pontiff, and thus showed him a sort of spiritual allegiance, or they were Shiites, *i.e.* partizans of the cause of Ali ben Abi Taleb and his descendants, and as such execrated the dominion of the Abbasides. Of the first kind were the Tulunides and Ikshides in Egypt and Syria, and the Tahirides, Soffarides, Samanides, and Gasnevides in Persia and Khorasan; to the second description belonged the Assassines, and the Fatimides in Africa. Moktafi's son Mostanjed (1160—1170) was succeeded in the caliphat by Mostadhi (1170—1179), and Nasir (1179—1226), during whose reign the Tartars under Jingiskhan invaded Persia. Dahir occupied the caliphat only for a few months. His successor, Mostanser (1226—1242), offered for a time a vigorous resistance to the advance of the Tartar conquest; but his son Mostasem was defeated and killed by the Tartar Hulaku, who took Bagdad, and put an end to the government of the Abbasides.

Ahmed, a son of the caliph Dahir, fled to Egypt, where Sultan Bibars, the Mamluk (A. D. 1260), recognized him as caliph. But he soon met his death at Bagdad in an attempt to establish his right to the throne of his ancestors; and Bibars conferred the title of caliph on another Abbaside, Hakem bi-amillah, whose descendants, under the protection of the Mamluks, retained possession of the almost nominal caliphat in Egypt till 1517, when the Osman Turks conquered Egypt. Sultan Selim took the last Abbaside caliph, Motawakkel, to Constantinople, where he kept him for some time as a prisoner, but afterwards allowed him to return to Egypt, where he lived at Kairo till his death, in 1538.

ABBE' is the French term for Abbot, which will be explained in its place. In France, before the Revolution, Abbé was the denomination of a very numerous body of persons, who had little or no connexion with the church, except the apparent one, which they derived from this title. Many of them had not even received the tonsure, which is, in Roman Catholic countries, the first and indispensable mark of the clerical character. So far back as the end of the seventeenth century, we find Richelet, the lexicographer, complaining that there was scarcely a young man, tolerably well made, and who had acquired the air of an ecclesiastic, who did not, by an insufferable abuse, assume the style of Monsieur l'Abbé. 'People,' he adds, 'even stupidly honour with that respectable name any small scholar, who may have put on the short coat, the small neckband, and the little peruke.' Another author, Mercier, writing a century later, describes the same class of characters. 'They are persons,' he says, 'passing under the denomination of Abbé, without any clerical mark or ornament, in a smart coat with gilt buttons, a small opera hat, displaying a high style of frisure of the hair, and the most effeminate manners.' The coat, usually of brown or blue, with the neckband and wig, formed the well-known distinguishing costume of the Abbé. The band, descending under the chin, was originally the common dress of all classes: ecclesiastical persons only wore it shorter than others, in affectation of humility. As for the peruke, which was also of small dimensions, it is said to have been first worn by the Abbés about the year 1660; the Abbé Lariviere, a worthless character, who afterwards became Bishop of Langres, having set the example. This innovation greatly scandalized the more serious members of the ecclesiastical order; and several works were written in vehement condemnation of the abuse. One of these bears the odd title of *Clericus Deperrucatus*, which may be translated *The Church Unperiwigged* The abbés occupied a very conspicuous place in French society, and discharged a variety of functions. 'In many houses,' writes Mercier, 'we find an Abbé, on whom is bestowed the appellation of friend, and who is in reality but an honest upper servant, commanding the livery servants; he is the humble attendant on Madame, assisting at her toilet, taking charge of household matters in general, and directing the affairs of Monsieur without.' Many of the abbés, however, followed a more useful and creditable way of life. Some acted as private tutors in families, though these were seldom treated with much respect, and were consequently, in general, persons of very inferior qualifications. Others were professors of the university; and a great many employed themselves as men of letters,—in which capacity their labours have given to the title of Abbé an honourable celebrity, and redeemed it from the universal contempt to which swarms of frivolous and intriguing sycophants would otherwise have reduced it.

ABBE'S COMMENDATAIRES, were such abbés as held abbeys in commendam,—that is, with the right of administering their revenues, or a part of them. There were, before the Revolution, between 200 and 300 abbeys in France, which the king had the privilege of conferring in commendam; and it was the expectation of obtaining one of these benefices which induced so many persons to take the title of Abbé. Before obtaining such preferment they used to be called *Abbés de sainte esperance*, abbés of holy hope. After they were thus provided for, they were Abbés Commendataires. The papal bull, which ratified their appointment, commanded them in all cases to get themselves ordained priests within the year, or as soon as they should arrive at the canonical age (five-and-twenty), on pain of the benefice being declared vacant; but it was common to obtain dispensations for disregarding this condition, and most of them remained Secular Abbés, as they were designated; that is, not subjected to any monastic rule. The Abbé Commendataire received the third part of the revenues of his abbey, and also enjoyed certain dignities and privileges which it is unnecessary to specify; but the actual government of the house was committed to the hands of a resident superior, the *prieur claustral*, who was in almost all respects quite independent of the sinecurist, his colleague.

ABBESS, the superior of a nunnery, or other female religious community. An abbess, in the Roman Catholic Church, possesses, in general, the same dignity and authority as an abbot, except that she cannot exercise the spiritual functions appertaining to the priesthood. An abbess, for example,

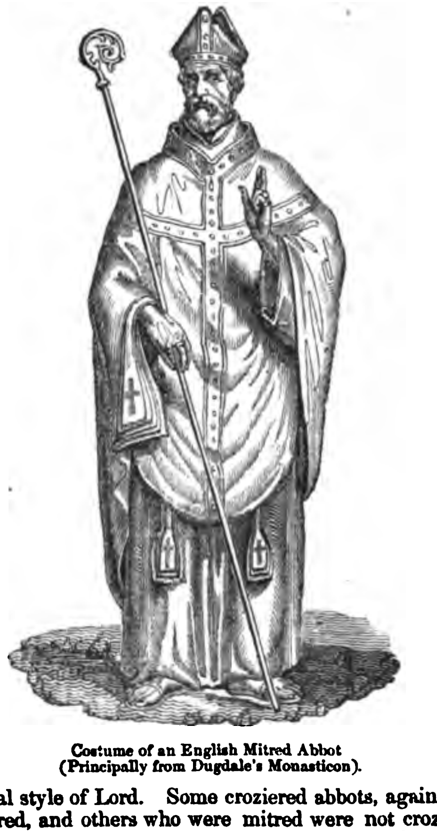
Costume of an English Abbess
(From Strutt's Ecclesiastical Antiquities).

cannot confess her nuns; although it appears that in ancient times she was allowed to do so; and that the practice was suppressed, according to the learned father Dom Martene, in his treatise on the *Rites of the Church*, in consequence of its having been found that there was no end to the questions which female curiosity would ask. According to a decree of the Council of Trent, an abbess, at the time of her election, ought to be at least forty years old, and to have made profession for eight years; and it is forbidden that any person be elected to the dignity who has not been professed for five years, or is under thirty years of age.

ABBEVILLE, a town in France, in the department of the Somme, and upon the river which gives name to the department. It is situated in a pleasant and fertile valley, and is a place of considerable trade. Its manufactures are various, and include woollen stuffs, such as serges, barracans, &c.; also bed-ticking and linings; rope and twine; and soap. There is also a woollen-cloth manufactory, the most extensive in France, established in 1665, by Van Robais, a Dutchman, who was patronized by the minister Colbert. The cloths are little inferior to those of our own country. Dyeing and bleaching are also carried on. The articles thus made, together with the produce of the neighbourhood, grain, flax, hemp, and oil, constitute the chief exports of the place, which trades with Brittany and with Bayonne. The town, from its situation on the Somme, which is here a wide river, is accessible for vessels of 150 tons. The population of the entire commune in 1851, was 19,158; of the municipal commune, 18,174. It is fortified, but is not to be regarded as in the first class of strong places. The houses are generally well built, and of brick. A few are of stone, and some few ancient ones of wood. There is no building in the town of any interest to the traveller, except the Church of St Wolfram, which has a splendid façade in the Flamboyant style. Abbeville is 25 miles N.W. of Amiens, the departmental capital, and 91 N. by W. of Paris. Lat. 50° 7′ N., and long. 1° 49′ E. of Greenwich.

ABBEY, a religious community presided over by an abbot or abbess. When the superior was denominated a Prior, the establishment was called a priory; but there was latterly no real distinction between a priory and an abbey. The priories appear to have been all originally off-shoots from certain abbeys, to which they continued for some time to be regarded as subordinate. The wealthiest abbeys, in former times, were in Germany; and of all such foundations in the world, the most splendid and powerful was that of Fulda, or Fulden, situated near the town of the same name in Franconia. This monastery, which belonged to the order of St. Benedict, was founded by St. Boniface, in the year 784. Every candidate for admission into the princely brotherhood was required to prove his nobility. The monks themselves elected their abbot from their own number; and that dignitary became, by right of his office, Arch-Chancellor to the Empress, and Prince-Bishop of the diocese of Fulda. He claimed precedence over all the other abbots both of Germany and of France. One of the first effects of the Reformation, both in England and in Germany, was the destruction of the religious houses; although, even in the Protestant parts of the latter country, a few male and female monastic communities still subsist. In England their extinction was sweeping and complete. The preface to Bishop Tanner's *Notitia Monastica* may be consulted for the most accurate and comprehensive account that has been given of the number and revenues of the English monasteries at the time of the dissolution. From this statement, it appears that, by the Act of Parliament passed in 1535 for the suppression of all the establishments of this kind having a less revenue than 200*l.* a-year, about 380 houses were dissolved; from whose possessions the crown derived a revenue of 32,000*l.*, besides plate and jewels to the value of about 100,000*l.* By a subsequent act passed in 1539, all the remaining monasteries were suppressed, to the number of 186; the revenues of these amounted to 100,000*l.* per annum. Besides the monasteries, forty-eight houses of the knight's hospitallers of St. John were also confiscated to the crown. Other authorities make the wealth of the monastic establishments much greater than it would appear to have been from this account; and it is probable that the revenues of many of them, at the period of the dissolution, had been considerably diminished by the precautions which the abbots were led to take in anticipation of that event. Camden states the whole number of the religious houses that were suppressed at 645. In the early times of the French monarchy, the term abbey was applied to a duchy or earldom, as well as to a religious establishment; and the dukes and counts called themselves abbots, although remaining, in all respects, secular persons. They took this title in consequence of the possessions of certain abbeys having been conferred upon them by the crown.

ABBOT, the title of the superior of certain establishments of religious persons of the male sex, thence called Abbeys. The word *Abbot*, or *Abbat*, as it has been sometimes written, comes from *Abbatis*, the genitive of *Abbas*, which is the Greek and Latin form of the Syriac *Abba*, of which the original is the Hebrew *Ab*, father. It is, therefore, merely an epithet of respect and reverence, and appears to have been at first applied to any member of the clerical order, just as the French Père and the English Father, having the same signification, still are in the Catholic Church. In the earliest age of monastic institutions, however, the monks were not even priests; they were merely holy persons who retired from the world to live in common, and the abbot was that one of their number whom they chose to preside over the association. In regard to general ecclesiastical discipline, all these communities were, at this time, subject to the bishop of the diocese, and even to the pastor of the parochial district, within the bounds of which they were established. At length it began to be usual for the Abbot, or, as he was called in the Greek Church, the Archimandrite (that is the Chief Monk), or the Hegumenos (that is the Leader), to be in orders; and since the sixth century monks generally have been priests. In point of dignity an abbot is considered to stand next to a bishop; but there have been many abbots in different countries who have claimed almost an equality in rank with the episcopal order. A minute and learned account of the different descriptions of abbots may be found in Du Cange's Glossary, and in Carpentier's Supplement to that work. In England, according to Coke, there used to be twenty-six abbots (Fuller says twenty-seven), and two priors, who were Lords of Parliament, and sat in the House of Peers. These, sometimes designated Sovereigns, or General Abbots, wore the mitre (though not exactly the same in fashion with that of the bishops), carried the crozier (but in their right hands, while the bishops carried their's in their left), and assumed the episcopal style of Lord. Some croziered abbots, again, were not mitred, and others who were mitred were not croziered. Abbots, who presided over establishments that had sent out several branches, were styled Cardinal-Abbots. There were


Costume of an English Mitred Abbot
(Principally from Dugdale's Monasticon).

likewise, in Germany, Prince-Abbots, as well as Prince-Bishops. In early times we read of Field-Abbots (in Latin, *Abbates Milites*) and Abbot-Counts (*Abba-Comites*, or *Abbi-Comites*). These were secular persons, upon whom the sovereign had bestowed certain abbeys, for which they were obliged to render military service as for common fiefs. A remnant of this practice appears to have subsisted in our own country long after it had been discontinued on the continent. Thus, in Scotland, James Stuart, the natural son of James V., more celebrated as the Regent Murray, was, at the time of the Reformation, Prior of St. Andrew's, although a secular person. And the secularization of some of the German ecclesiastic dignities has since occasioned something like a renewal of the ancient usage. We have in our day seen a prince of the House of Brunswick (the late Duke of York) at the same time Commander-in-Chief of the British army and Bishop of Osnaburg. The efforts of the abbots to throw off the authority of their diocesans long disturbed the church, and called forth severe denunciations from several of the early councils. Some abbeys, however, obtained special charters recognizing their independence; a boon which, although acquired at first with the consent of the bishop, was usually defended against his successors with the most jealous punctiliousness. Many of the abbots lived in the enjoyment of great power and state. In ancient times they possessed nearly absolute authority in their monasteries. 'Before the time of Charlemagne,' says Gibbon, 'the abbots indulged themselves in mutilating their monks, or putting out their eyes; a punishment much less cruel than the tremendous *vade in pace* (the subterraneous dungeon, or sepulchre), which was afterwards invented.' The picture which this writer draws of what he calls 'the abject slavery of the monastic discipline' is very striking. 'The actions of a monk, his words, and even his thoughts, were determined by an inflexible rule, or a capricious superior: the slightest offences were corrected by disgrace or confinement, extraordinary fasts, or bloody flagellation; and disobedience, murmur, or delay, were ranked in the catalogue of the most heinous sins.' The external pomp and splendour with which an abbot was in many cases surrounded, corresponded to the extensive authority which he enjoyed within his abbey, and throughout its domains. St. Bernard is thought to refer to the celebrated Luger, Abbot of St. Denis, in the beginning of the twelfth century, when he speaks, in one of his writings, of having seen an abbot at the head of more than 600 horsemen, who served him as a cortege. 'By the pomp which these dignitaries exhibit,' adds the Saint, 'you would take them, not for superiors of monasteries, but for the lords of castles,—not for the directors of consciences, but for the governors of provinces.' This illustrates a remark which Gibbon makes in one of his notes:—'I have somewhere heard or read the frank confession of a Benedictine Abbot, "My vow of poverty has given me 100,000 crowns a-year, my vow of obedience has raised me to the rank of a sovereign prince."' Even in the unreformed parts of the continent, however, and long before the French Revolution, the powers of the heads of monasteries, as well as those of other ecclesiastical persons, had been reduced to comparatively narrow limits; and the sovereignty both of abbots and bishops had been subjected in all material points to the authority of the civil magistrate. The former became merely guardians of the rule of their order, and superintendents of the internal discipline which it prescribed. In France this salutary change was greatly facilitated by the concordat made by Francis I. with Pope Leo X., in 1516, which gave to the king the right of nominating the abbots of nearly every monastery in his dominions. The only exceptions were some of the principal and most ancient houses, which retained the privilege of electing their superiors. The title of Abbot has also been borne by the civil authorities in some places, especially among the Genoese, one of whose chief magistrates used to be called the Abbot of the People. Nor must we forget another application of the term which was once famous in our own and other countries. In many of the French towns there used, of old, to be annually elected from among the burgesses, by the magistrates, an Abbé de Liesse (in Latin, Abbas Lætitiæ), that is, an Abbot of Joy, who acted for the year as a sort of master of the revels, presiding over and directing all their public shows. Among the retainers of some great families in England was an officer of a similar description, styled the Abbot of Misrule; and in Scotland the Abbot of Unreason was, before the Reformation, a personage who acted a principal part in the diversions of the populace, and one of those whom the zeal of the reforming divines was most eager in proscribing.

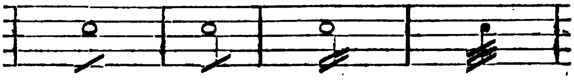
ABBOT, GEORGE, an English prelate of the seventeenth century, more remarkable for the circumstances of his personal history than on any other account. He was born in 1562, at Guilford, in Surrey, where his father was a poor clothworker. Aubrey, the antiquary, in the curious little volume which he published in 1696, under the title of *Miscellanies*, tells a marvellous story of a dream which the mother of George Abbot had, that he would become a great man. In spite of the dream the boy might have remained a clothworker, like his father, had there not been in those days many admirable public institutions for the education of the children of the humbler classes. George Abbot and his elder brother, Robert, were put to the grammar-school of their native town, and in due time proceeded to Baliol College, Oxford. George entered the University in 1578, and in 1597 obtained his first preferment by being elected Master of University College. After this he was also three times appointed Vice-Chancellor of the University. These academic honours seem to show that his reputation and influence at Oxford must have been considerable; but the high standing which he enjoyed has been attributed as much to the zeal with which he opposed Popery and Arminianism as to his superior ability or learning. There had already commenced between him and Laud that violent opposition of theological sentiment, which, involving them eventually in political hostility and in a contest of personal ambition, made them rivals and enemies for life. The Master of University College, however, must have been in considerable esteem for his erudition as well as for his orthodoxy, seeing that we find him in 1604 appointed one of the persons charged with the new translation of the Bible. He was one of eight to whom the whole of the New Testament, with the exception of the Epistles, was entrusted. In 1608 he was appointed chaplain in the establishment of the Earl of Dunbar, at this time the king's chief favourite. This connexion proved of the most important consequence to Abbot's future fortunes. Soon after it was formed, the earl was despatched to Scotland by the king, in order to commence that attempt to bring about a uniformity between the two national churches, their persevering prosecution of which so greatly contributed to the disastrous fate of the line of Stuart. Abbot accompanied him on this mission, and gave himself to its object with so much zeal as to secure the highest approbation and favour both from the earl and the monarch. His course of professional promotion, hitherto so slow, now proceeded with almost unexampled rapidity. He had in 1609 obtained the Deanery of Gloucester, and in December of that same year he was made Bishop of Lichfield and Coventry. In the February following he was transferred to the See of London; and, finally, in little more than a month afterwards, elevated to the Archbishopric of Canterbury. It is probable that Abbot was indebted for his elevation principally to his being the object at the moment of that capricious favoritism for which James was so remarkable throughout his reign. Abbot at this time did not disdain to court his royal master with the most profuse expenditure of that flattery which he loved so well to receive from others, and not unfrequently used to bestow on himself. Both Fuller and Clarendon have expressed a belief that, had the system of severity begun by Archbishops Whitgift and Bancroft not been interrupted by the intervention of the opposite politics of Abbot, Calvinism and dissent would have been extirpated from England, and the political convulsions which arose in the next reign, from the effervescence of these elements, would have been prevented. We do not think that this result would have followed; but, if it had, it is quite certain that the utter extinction of English liberty would have been its accompaniment. Abbot, however, although his theology was of a different complexion from that of his predecessor Bancroft, soon showed himself scarcely less inclined to stretch to their utmost extent all the powers and prerogatives of his office. In the Court of High Commission his conduct was as arbitrary and oppressive towards certain descriptions of delinquents as that of any one who had ever presided over that ecclesiastical tribunal; and he manifested the most marked disposition to set up its authority as superior to that of both the statute and the common law. It is also an accusation brought against him that, never having held a parochial charge himself, he was apt to be inattentive and overbearing towards the inferior or working clergy. In other respects, Archbishop Abbot, though a stern and rigid ruler of the establishment, was active and zealous in the performance of all the duties of his high station. After having reached the summit of professional advancement, he seems, like some other ambitious characters, Coke, for example, and Shaftesbury, to have exchanged the servility by which he rose for an opposite demeanour, and from the supple and cringing courtier to have sprung up into the bold advocate of popular rights and popular politics. Before obtaining the archiepiscopal dignity, Abbot had professed the doctrines of divine right and passive obedience in their most comprehensive and slavish form. Now, however, when circumstances placed him in opposition to the rising influence of his old adversary, Laud, he soon came to adopt and act upon principles in politics, as well as in religion, removed as far as possible from those of that headlong zealot of arbitrary power.

The bright fortunes of Abbot were, however, clouded by an occurrence of which his enemies took signal advantage. On the 24th of July, 1622, the Archbishop (prelates then did not think it unbecoming their office to engage in secular sports) was occupied in a stag hunt in Lord Zoucn's park at Harringworth, in Hampshire, where he was so unfortunate as to discharge, while he sat on horseback, a barbed arrow from his cross-bow, which struck one of the park-keepers, Peter Hawkins, in the fleshy part of the left arm, and occasioned the man's death in less than an hour. The party in the church and state to whom Abbot was opposed, employed every effort to turn this accident to his disadvantage, both with the public and with the king; and although James very sensibly remarked that 'an angel might have miscarried in this sort,' he found it necessary to yield so far to the clamour that was raised, as to appoint a commission to consider the case of the archbishop, and to determine whether he had not, by this act of chancemedley, incapacited himself, as Laud and his partizans asserted, for discharging the duties of his office. The adjudication of the commissioners was, that nothing more than an irregularity had been committed, but that it would be necessary for the archbishop to receive the king's pardon, and also a dispensation, before he could resume the exercise of his functions. These forms were accordingly gone through; but the affair, although thus far satisfactorily terminated, gave great vexation and distress to Abbot, both from the scandal to which it subjected him, and from the feelings with which he naturally and unavoidably contemplated the lamentable event of which he had been, though unintentionally, the cause. It is said that, throughout the remainder of his life, he observed a monthly fast on the day of the week which had thus stained his hand with blood; and he also settled a pension of twenty pounds for life on Hawkins's widow. After this he withdrew for some time from his attendance at the Council Board, and took no part in public affairs. The following year, however, on hearing it reported that the king intended to proclaim a toleration to the Papists, he wrote a letter to his Majesty, dissuading him from that measure. He also, soon after this, strenuously opposed in Parliament the projected match between the Prince of Wales and the Infanta of Spain. On the 2nd of February, 1626, Abbot crowned Charles I. in Westminster Abbey, Laud officiating as Dean of Westminster. The new reign confirmed the ascendancy of this latter personage and his confederate Buckingham, and left the Archbishop and his politics less influence at Court than ever. In these circumstances he selected and steadily persevered in that independent path in which alone he was now to find either honour or safety. In 1627, when Dr. Manwaring was brought to the bar of the House of Lords, and sentenced to be fined, admonished, suspended, and imprisoned, for a sermon in which he asserted that 'the king is not bound to observe the laws of the realm concerning the subjects' rights and liberties, but that his royal will and command in imposing loans and taxes, without common consent in Parliament, doth oblige the subjects' conscience upon pain of eternal damnation,' Abbot, in reprimanding the culprit, by order of the House, expressed in energetic terms his abhorrence of so audacious a doctrine. He also refused to license another discourse of a similar description, which had been preached at Northampton by Dr. Sibthorp, and for this he was suspended from his archiepiscopal functions, and ordered into confinement in one of his country houses. This most arbitrary and oppressive treatment was mainly the work of his vindictive enemy Laud, whose character, accordingly, the archbishop has delineated with a pen dipped in gall, in a narrative of the affair which he drew up in his own vindication, and which Rushworth has printed. It was found necessary, however, soon after, to restore him to favour, and he received his summons as usual to the Parliament which assembled in March, 1628. During the rest of his life he continued the same course of opposition to the arbitrary and oppressive measures of the Court; and by the resistance which he offered, as far as lay in his power, to the insane counsels of Laud, may be said to have established a claim to be regarded as a patriot in the termination of his career. He died at his palace of Croydon on Sunday, the 4th of August, 1633, and was buried in the church of his native town of Guilford, where a sumptuous monument is erected to his memory. He was the founder of a well-endowed hospital, which still exists in that town; and other instances are recorded of his charity and munificence. He was succeeded in the primacy by Laud, who soon brought matters to such a pass as overthrew both himself and the church.

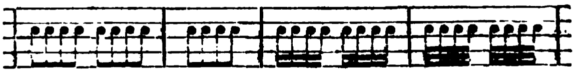
Archbishop Abbot is the author of several literary productions, among which is *A Brief Description of the whole World*, published in 1636. His brother Robert was raised to the see of Salisbury in 1615, but died on the 2nd of March, 1618. The archbishop's youngest brother, Maurice Abbot, was an eminent London merchant, and was, in the course of his life, one of the first Directors of the East India Company, Lord Mayor, and representative of the City in Parliament. He died in 1640. The sons of the poor clothworker were thus singularly lucky in their worldly advancement.—[See *Biographia Britannica*—*Wood's Athenæ Oxonienses*, by Bliss—*Fuller's English Worthies*—*Bayle's Dictionnaire Critique*—*Rushworth's Collection*—*Southey's Book of the Church*.]

ABBREVIATION, a mathematical term, given to the process by which a fraction is reduced to lower terms. Thus the division of the numerator and denominator of $\frac{24}{32}$ by 8, which reduces it to $\frac{3}{4}$, *abbreviates* the fraction.

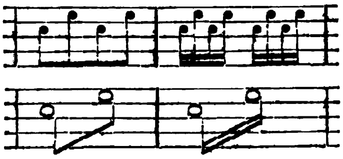
ABBREVIATION (*in Music*) is a kind of stenography, or short-hand, which much diminishes the labour of the composer and copyist, and ought to be well understood by every performer. It not only frequently happens that the same note is reiterated, but the same passage is repeated, and the necessity of writing at length such repetitions is avoided by the use of certain well-contrived, simple abbreviations. Those most commonly employed are:—I. One dash, or more, through the stem of a minim or crotchet, or under a semibreve, by which such note is converted into as many quavers, semiquavers, &c., as it is equal to in time. Ex.



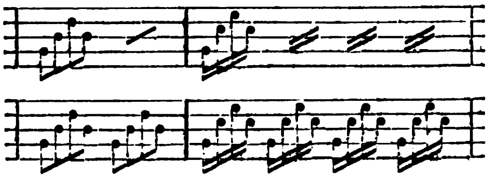
are to be played thus,—



II. Two alternate notes frequently repeated, are commonly abridged in the following manner,—



III. Arpeggios are thus contracted, the dash alone denoting repetition;—



IV. The word *simili* (*the same*) signifies that the group of notes is to be repeated. *Bis* (*twice*) written over a bar, or a passage, denotes repetition. The abbreviations of Italian or other terms used in music, will be found under the respective words.

ABBREVIATIONS, the shortening of a word or phrase, made either by omitting some letters or words, or by substituting some arbitrary mark.

Abbreviations are of two kinds; first, those which are used in familiar speech, by which two words are made one, as can't for can not, won't for will not, &c., and those which are employed in writing only; our business is with the latter.

Before the invention of printing, every expedient to abridge the enormous labour of copying would be naturally adopted, and the principle, once introduced, was followed where the necessity which led to its first employment no longer existed. Latin inscriptions are not unfrequently quite unintelligible to the best scholar who has not given the subject his particular attention, and many are ambiguous even to the most skilful. The most usual Latin abbreviation is the initial letter instead of the whole word; whether a name, as M. for Marcus, P. for Publius; or a relation, as F. for filius, a son; or an officer, as C. for consul, Qu. for quæstor, &c.

The Rabbins carried this practice to a great extent; and although, in copying the Bible, they carefully abstained from abbreviations, their other writings are filled with them. They even carried their abbreviations into their common tongue, and when they had contracted a name or sentence, by taking the initials only, they made words of the unconnected letters by the interposition of vowels. Thus, for Rabbi Levi ben Gerson, they took the first letters, R.L.B.G.; and, by the interposition of vowels, made the word Ralbag.

In the middle ages the practice of abbreviating increased; and even in printing, where the employment of contractions was much less necessary, the old mode was by no means abandoned. Many writings became unintelligible; and in matters of law and government the difficulties thus created demanded the interposition of Government. An Act of Parliament was passed in the fourth year of George II., by which the use of abbreviations was altogether forbidden in legal documents; and although this was so far modified by another Act, within a year or two, allowing the use of those of common occurrence, the old practice was never completely revived. A few only are still employed, chiefly in titles, coins, and commercial transactions; the most important of which follow,—

TITLES. . .

A.M. Master of Arts.
Abp. Archbishop.
Bp. Bishop.
Bt. Baronet.
B.A. Bachelor of Arts.
B.C.L. Bachelor of Civil Law.
B.D. Bachelor of Divinity.
Clk. Clerk, a Clergyman.
C.B. Companion of the Bath.
Dr. Doctor.
D.C.L. Doctor of Civil Law
D.D. Doctor of Divinity.
Mus. D. Doctor of Music.
Esq. Esquire.
F.G.S. Fellow of the Geological Society.
F.L.S. Fellow of the Linnæan Society.
F.R.S. Fellow of the Royal Society.
F.S.A. Fellow of the Society of Antiquaries.
G.C.B. Grand Cross of the Bath.
G.C.H. Grand Cross of Hanover.
J.V.D. Of Canon and Civil Law.
Kt. Knight.
K.B. Knight of the Bath.
K.C.B. Knight Commander of the Bath.
K.C.H. Knight Commander of Hanover.
K.G. Knight of the Garter.
K.G.H. Knight of Guelph of Hanover.
K.M. Knight of Malta.
K.P. Knight of St. Patrick.
K.T. Knight of the Thistle.
Lp. Lordship.
LL.D. Doctor of Law.
Mr. Mister.
Mrs. Mistress.
Messrs. Gentlemen.
M.A. Master of Arts.
M.D. Doctor of Physic.
M.P. Member of Parliament.
M.R.I.A. Member of the Royal Irish Academy.
R.A. Royal Academician.
Rt. Hon. Right Honorable.
R.E. Royal Engineers.
R.M. Royal Marines.
R.N. Royal Navy.
S.T.P. Doctor of Divinity.
U.E.I.C. United East India Company.
W.S. Writer to the Signet.

ON ENGLISH COINS.

A.C. Arch-Chancellor.
A.D. Arch-Duke.
A.T. Arch-Treasurer.
B. et L.D. Duke of Brunswick and Lunenberg.
D.G. By the Grace of God.
F.D. Defender of the Faith.
S.R.I. Holy Roman Empire.
M.B.F. et H. Great Britain, France, and Ireland.
R. King.

COMMERCIAL.

Cr. Creditor.
Dr. Debtor.
Do. or ditto, the same.
No. Number.
Fo. Folio.
4to. Quarto.
8vo. Octavo.
Ro. Right-hand page.
Vo. Left-hand page.
L.S.D. Pounds, Shillings, and Pence.
A.R.P. Acres, Roods, and Poles.
Cwt. Qr. Lb. Oz. Hundredweights, Quarters, Pounds, and Ounces.

MISCELLANEOUS.

A.D. the year of our Lord.
A.H. the year of the Hegira.
A.M. the year of the world.
A.M. before noon.
A.U.C. the year of the building of Rome
B.C. Before Christ.
I.e. that is to say.
Ib. in the same place.
Id. the same.
H.M.S. His Majesty's ship
the place of the Seal.
Manuscript.
N.B. Observe.
N.S. New Style (after the year 1752).
O.S. Old Style (before 1752).
Nem. con. without contradiction.
Nem. dis. unanimously.
P.M. Afternoon
P.S. Postscript.
ss. a half
ult. the last month.
viz. namely.
U.S. United State
Xmas. Christmas
Xtian. Christian.

ABDALLATIF, or, with his full name, **Mowaffik-eddin Abu Mohammed Allatif ben Yussuf ben Mohammed ben Ali ben Abi Said**, a distinguished Arabic writer, whose name has become familiar to us chiefly through an excellent description of Egypt, of which he is the author. The Baron Silvestre de Sacy has appended to his French translation of this treatise a notice of the life of Abdallatif, taken from the bibliographical work of Ebn Abi Osaibia, who knew Abdallatif personally, and to a great extent quotes an account of his life written by himself.

We learn from this notice that Abdallatif was born at Bagdad in A.H. 557 (A.D. 1161). From his earliest years he received a lettered education. Agreeably to the prevailing fashion of his age and country, which considered a thorough familiarity with the copious and classical Arabic language as the indispensable groundwork for every liberal acquirement, he was led to commit to memory the Koran, the much-admired Makamat, or novels of Hariri, and other compositions distinguished for the purity and elegance of their diction, besides several works professedly treating on style or grammar. Next to these philological studies, he had already bestowed some attention on Mussulman jurisprudence, when the arrival at Bagdad of Ebn al Tateli, a naturalist from the western provinces of the Arabian empire, attracted his curiosity towards natural philosophy and alchemy, of the illusory nature of which latter pursuit he seems not till late, and after much waste of time and labour, to have convinced himself.

Damascus, the residence of Saladin, had about this time, through the liberality of that celebrated sultan, become a rallying point for learned men from all parts of the Mohammedan dominions. It is here that we find Abdallatif commencing his literary career by the publication of several works, mostly on Arabic philology. But the celebrity of several scholars then residing in Egypt, among others the Rabbi Moses Maimonides, drew him to that country to seek their personal acquaintance. A letter from Fadhel, the vizir of Saladin, introduced him at Kairo, and he was delivering lectures there while Saladin was engaged with the crusaders at Acca (St. Jean d'Acre). Soon, however, the news of Saladin's truce with the Franks (A. D. 1192) induced Abdallatif to return to Syria, and he obtained from Saladin a lucrative appointment at the principal mosque of Damascus. After the death of Saladin, which took place in the next year, we find Abdallatif going back to Kairo, where he lectured on medicine and other sciences, supported for a time by Al-Aziz, the son and successor of Saladin. It was during this residence at Kairo that Abdallatif wrote his work on Egypt. But the troubles of which Egypt now became the scene, induced Abdallatif to retire to Syria, and subsequently to Asia Minor, where he seems to have lived for a long time quietly at the court of a petty prince, Alaeddin Daud, of Arzenjan. After the death of that prince (A.D. 1227) he went to Aleppo, to lecture there partly on Arabic grammar, and partly on medicine and on the traditions, an important branch of Mohammedan theology and jurisprudence. Four years after this, Abdallatif set out on a pilgrimage to Mecca, and took his route through Bagdad, to present some of his works to the then reigning caliph Mostanser, when he died there, A.D. 1231.

Ebn Abi Osaibia has given a list of the works composed by Abdallatif, which, in the Arabic appendix to Baron de Sacy's translation, fills three closely-printed quarto pages. The description of Egypt, through which his name has become so familiar to all friends of antiquarian research in Europe, and in which he displays an accuracy of inquiry, and an unpretending simplicity of description almost approaching to the character of Herodotus, is dedicated to the caliph Nasir ledin-illah. It is divided into two books: the first treats, in six chapters, on Egypt generally, on its plants, its animals, its ancient monuments, peculiarities in the structure of Egyptian boats or vessels, and on the kind of food used by the inhabitants; the second book gives an account of the Nile, the causes of its rise, &c., and concludes with a history of Egypt during the dreadful famines of the years 1200 and 1201.

The only MS. copy of this work, of the existence of which we are aware, is preserved in the Bodleian Library at Oxford. From this MS. the Arabic text was edited for the first time at Tübingen, in 1787, by Paulus, and again, with a Latin translation, by the late Professor White, at Oxford, 1800, 4to. The French translation published by Baron de Sacy, under the title *Relation de l'Egypte, &c.* (Paris, 1810, 4to.)

beside its greater fidelity, has, through the copious notes added to it, become one of the most important works that the scholar can consult on the geography, the history, or the antiquities of Egypt.

ABDE'RA, a Greek town situated near the mouth of the Nestus (now the *Mesto*, or *Kara-sou*, i.e. *black-water*), in Thrace. It was originally founded by some Greeks of Clazomenæ, but owed its importance to a colony of Ionian Greeks from Teos, who left their native city (B.C. 541) when Cyrus had conquered Crœsus, king of Lydia, and was attacking the cities of Ionia. Xerxes passed through Abdera (B.C. 480) on his unsuccessful expedition against Greece. The people of Abdera had some of the Thracian tribes for their neighbours, who, we may conjecture, often rendered their situation uncomfortable and dangerous by their predatory incursions and insecure alliance. On one occasion they were rescued by Chabrias, the Athenian general, from the attacks of the Triballi.

Under the Romans, Abdera was a free city (Plin. iv. 11), which title marks a place of importance at that period. The epicure may be interested in learning that mullets were plentiful and good at Abdera. Its literary fame rests on the two names of Democritus and Protagoras.

Some geographers place Abdera east of the Nestus, but this is directly contrary to the testimony of Herodotus, who says that the river ran through the town. The exact site of this place is, we believe, unknown.

ABDICATION (from *Abdicatio*), in general is the act of renouncing and giving up an office by the voluntary act of the party who holds it. Though the expressions are frequently confounded, the word abdication differs from resignation in this, that the former signifies a total and unconditional renunciation of an office; whereas by the latter term is meant a relinquishing in favour of another. As to the cases in which an abdication will be presumed, from actions inconsistent with and subversive of the essential nature and object of the office held, see Blackstone's *Commentaries*, vol. i. p. 210-212, and iv. p. 78, where mention is made of the resolution of the legislature, in 1688, that King James II. had, by acts subversive of the constitution of the kingdom, by breaking the original contract between king and people, virtually renounced the authority which he claimed by that very constitution, and that, therefore, the throne had become vacant. It appears, by the parliamentary debates at that period, that in the conference between the two Houses of Parliament, previous to the passing of the statute which settled the crown upon William III., it was disputed whether the word 'abdicated,' or 'deserted,' should be the term used, to denote in the Journals the conduct of James II. in quitting the country. It was then resolved that the word 'abdicate' should be used, as including in it the mal-administration of his government.

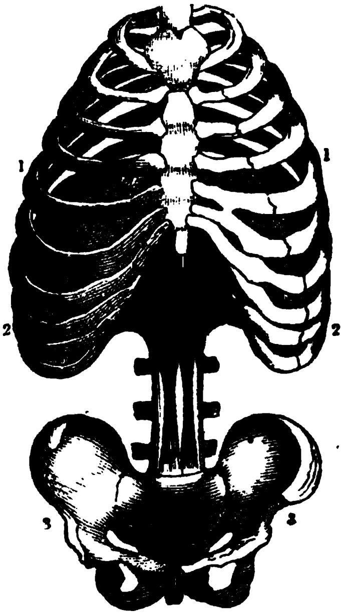
ABDO'MEN; the BELLY, from *Abdo*, to hide, because it conceals or hides its contents. The last syllable is only a termination. The *lower belly*, IMUS VENTER, ALVUS, GASTER, &c. &c., are synonymous.

The human body is divided by anatomists into three portions, the head, the trunk, and the extremities. The head and trunk enclose cavities which contain the organs or the instruments by which the most important functions of the living body are performed. The trunk forms two cavities, the superior of which is termed the Thorax or Chest, and the lower constitutes the Abdomen.

In the artificial skeleton nothing is shown, because nothing remains, except the mere framework of the body or the bones; but in the natural state, when the soft parts remain as well as the bones, there is a complete partition between the cavity of the chest and that of the abdomen (*fig*. I. 1, 2.) This partition is effected by means of an organ which is termed the Diaphragm (*fig*. I. 1, 2.), a name derived from a Greek word signifying to divide. The Diaphragm is composed partly of membrane, but chiefly of muscle. It is placed transversely across the trunk at about its middle portion, dividing it into two pretty nearly equal halves (*fig*. I. 1, 2.). But the Diaphragm is a moveable body; it is in fact one of the main organs of respiration; its chief function consists in alternately increasing and diminishing the capacity of the thorax and abdomen; for a purpose in the animal economy which will be fully explained hereafter. [See RESPIRATION.] But since the very partition which separates these two cavities from each other is perpetually changing its relative position, now encroaching upon the one, and now upon the other, it is obvious that their actual capacity must be constantly varying.

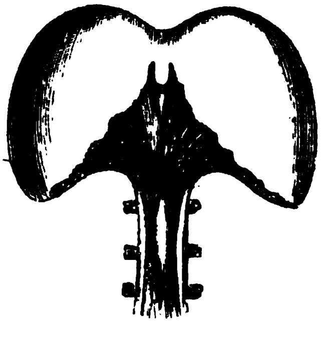
The cavity of the Abdomen is bounded above by the Diaphragm (*fig*. I. 2), below by the bones of the Pelvis or Basin (*fig*. I. 3, 3), which may be considered as ribs that have become very much altered in form, before and at the sides by the abdominal muscles, behind partly by the muscles of the loins, and partly by the bone of the spine. The spine, as will be shown hereafter, (See SPINAL COLUMN,) is composed of a number of separate bones, each of which is termed a vertebra. The vertebræ are firmly united together, and by their union form what is commonly called the back-bone, termed by anatomists the spinal or the vertebral column.

Fig. I.



The cavity of the abdomen is lined throughout by a thin, but dense, firm, and strong membrane, termed the PERITONEUM, from a Greek word signifying to extend around. (See PERITONEUM.)

Fig. II.



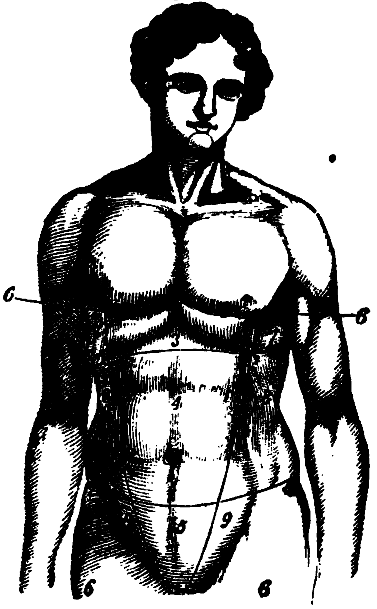
Diaphragm removed from its natural situation between the Chest and Abdomen.

We have spoken of the abdomen as a cavity, but without explanation, this mode of expression may occasion misconception. During the state of life there is no cavity. The abdomen is always completely full. It has been stated that the diaphragm alternately enlarges and diminishes the space proper to the abdomen; but the abdominal and lumbar muscles which form so large a part of the boundaries of the abdomen in front, at the sides and behind, in like manner alternately contract and relax. The consequence is, that a firm and uniform pressure is at all times maintained upon the whole contents of the abdomen, so that there is always the most exact adaptation of the containing to the contained parts, and of the viscera one to the other, not the slightest space or cavity ever intervening either between the walls of the abdomen and its viscera, or between one viscus and another. By the cavity of the abdomen, therefore, is not meant what the expression might at first view seem to denote, namely, a void or empty space; but the term is merely employed to mark the extent of the boundary within which the abdominal viscera are enclosed.

When the number, the diversity, the proximity, the relation, and the importance of the organs contained within the abdomen is considered, it will be obvious that it must be a matter of absolute necessity to the anatomist, the physiologist, the physician, and the surgeon, to mark with accuracy the situation of each. An effectual expedient for the accomplishment of this object is now in universal use. It consists in dividing the whole extent of the abdomen into certain parts or regions. It must be borne in mind that this division is altogether arbitrary, and is adopted not because there is any such division in nature, but solely because it is convenient for the purposes of science. The abdomen, then, is artificially mapped out into the following regions.

Two imaginary lines are drawn across the abdomen, one of which is supposed to extend from about the seventh rib on one side to the same point on the opposite side (*fig.* III. 1. 1.). The second line is supposed to extend from the fore part of the large bone of the pelvis to the same projecting point on the other side (2. 2.). These lines mark out three large and distinct spaces (3, 4, 5.). The space above the upper line is termed the Epigastric Region (3.). The space below the lower line is termed the Hypogastric Region (5.). The space included between the two lines is termed the Umbilical Region (4.).

Fig. III.



Two lines are next supposed to extend vertically, one on each side from between the seventh rib to the prominence formed by the large bone of the pelvis (*fig.* III. 6. 6.). By these vertical lines the three first regions are still further subdivided in the following manner:—The right and left parts of the Epigastric region form two distinct regions (7, 7.); these are termed the right and left Hypochondriac (7, 7.), while the central part retains the name of the Epigastric (3.). In like manner the right and left parts of the umbilical region form two distinct regions (8, 8.), which are termed the Lumbar Regions (8, 8.), while the central part retains the name of the Umbilical (4.). Moreover, the right and left parts of the hypogastric regions are at the same time each divided into two, which are termed the Iliac Regions (9, 9.), while the central part is termed the Region of the Pubis (5.).

This arrangement being once understood, it is easy to speak with precision of the situation of any of the abdominal viscera. He who has made himself thoroughly acquainted with these regions, and with the organs situated in each, can tell what viscera would be wounded supposing a sharp instrument were to pass from the fore to the back part of the body, entering at any given point of the abdomen. He who can tell this has acquired, in a practical point of view, an invaluable piece of information. He who cannot tell this is in danger, in the practice either of medicine or surgery, of committing perpetual and fatal mistakes; and, therefore, until he can tell this, no student of medicine who has a clea. conception of the duties of his profession, and who wishes to perform these duties conscientiously, can be at rest.

Knowledge of structure is necessary to the knowledge of function; knowledge of natural function is necessary to the knowledge of diseased function; knowledge of the nature of disease is necessary to the cure of disease. The natural situation and relation of organs, the healthy structure of organs, the sound action of organs, must therefore form the subject of the daily study of the physician and surgeon, since this knowledge is the basis of the science of the one and the art of the other. Now, among the means of acquiring this knowledge, one of the most direct and certain is the examination of the external parts of the body. There are organs, indeed, placed beyond the reach of any external examination. The disordered states of such organs can be ascertained only by symptoms. The diseases of such organs do not alter the external appearance of the body; they afford no outward sign by which the inward state can be distinguished. But whenever the situation of organs is such as to place them within the reach of external examination, this mode of investigating their diseased affections is the simplest, the readiest, and the surest; and there is no part of the human body so well adapted for this kind of examination as the abdomen. Its walls are soft and yielding; some of its most important organs lie immediately beneath the surface; though they cannot be seen they can be felt; and several of their morbid conditions can therefore be ascertained with clearness and certainty.

Not only are some of the diseases of the abdominal viscera visible to the naked eye, but they are even strikingly expressed; for they either cause a permanent change in the configuration of the abdomen, or they produce a temporary alteration of its natural movements, or they occasion both effects. And as the abdomen affords the greatest facility for the external examination of its contents, so the varied and extended functions performed by its organs render this examination of paramount importance. There is no other part of the body in which so many different organs are crowded together; in which they lie so close to one another; in which they are so much intermixed; in which they are so liable, by the operation of internal morbid causes, to be removed from their natural situation; in which the diseases of one influence by sympathy to so great an extent the state of others; in which the symptoms or signs of disease are so numerous, so complex, so deceptive; in which disease is so apt to extinguish or embitter life, and the oversight, or the misconception of which proves so certainly injurious, and so often fatal.

Both in the male and in the female it often happens that diseases not to be ascertained, or at any rate exceedingly apt to be overlooked, or mistaken, if the region of the part affected be covered with its ordinary clothing, become manifest the moment the part in question is uncovered; or if not, are rendered obvious by other modes of inspection to which the removal of the clothing is indispensable. As an example of this, it may be worth while to give some illustration of the extent and value of the information to be derived from an external examination of the abdomen, when carefully and accurately performed, were it only to remove the obstacles sometimes opposed to this examination on the part of the patient from false delicacy, and to exhibit the mischiefs that may result from the neglect of it, on the part of the practitioner, whether from ignorance or from indolence.

The external examination of the Abdomen, or the Exploration of it, as it is technically termed, is comprised in simple inspection, manual examination, and percussion.

1. The simple inspection of the abdomen often affords valuable information. The mere alteration of its form is sometimes of itself sufficient to determine the seat and the nature of the disease. In each case of diseased organs the change is different; in each it is peculiar, and even characteristic. The abdomen may be affected with spasm, as in the disease called colic, or with inflammation, as in the disease called enteritis. Life may depend on the promptitude with which the true nature of the affection is detected. One set of remedies is required for one of these diseases, and a totally different set for the other. Remedies essential to the preservation of life, if the disease be inflammation, may be destructive of life, if the disease be merely spasm; and if, under the notion that the disease is spasm, the remedies proper for inflammation be not employed, death may be the consequence of the error in less than twenty-four, or even

twelve, hours. In both affections the pain may be the same; and several other symptoms may be similar, but the form of the abdomen may be alone sufficient to determine the true nature of the malady; for, if it be inflammation, the abdomen will be rounded, enlarged, and distended; while, if it be spasm, it will be drawn in and contracted. There are affections which place life in the most imminent danger, especially in children, in which it is difficult, if not impossible, to determine, from the symptoms alone, whether the seat of the disease be in the brain, or in the inner coat of the intestines. Suppose it be in the brain; one set of remedies are required, which must be applied to the head. Suppose it be in the intestines, a different sort of remedies is required, which must be applied to the belly. An index is sometimes afforded to the real seat of the disease, by the mere form of the abdomen; while its size, combined with its form, oftener affords a still more certain guide; and so does any deviation from its natural movements.

2. Manual examination affords still more correct and complete information relative to the condition of the abdominal organs. The size, the tension, the temperature, the sensibility of the abdomen, the presence or absence of unnatural tumours, or morbid growths within its cavity, the presence or absence of fluids, the nature and extent of the contents of the intestinal canal, may be ascertained with considerable precision by touch combined with pressure. Increase of temperature on the surface of the body is a most important sign of internal disease. Increase of temperature arises from a preternatural increase in the action of the arteries, and denotes inflammation of the part affected. All acutely inflamed organs are hotter than in their natural state, and if the inflammation be intense, the neighbourhood of the inflamed part gives to the hand of the examiner the sensation of pungent heat, which is always a sign not only of disease, but of exceedingly severe disease.

Diminished temperature, which arises from diminished action in the arteries, and an overloaded state of the veins, is no less important as a sign of disease. It always denotes a most dangerous condition of the system, the danger being in proportion to the coldness. It is the concomitant of the worst forms of fever which are ever witnessed in this country; fever with a cold skin being incomparably more alarming than fever with even a pungently hot skin. In that fatal disease, termed Asiatic cholera, which has only been known since the year 1817, the first, the most sure, and the most alarming sign of the invasion of the malady, is a coldness of the system, and especially of the abdomen, the main seat of the malady; and it is invariably found that there is no sign which can afford a better criterion of the extent of the danger, in any case, than the degree of coldness of the system in general, and of the abdomen in particular.

The physician may often form a judgment as to the seat, the nature, and the extent of abdominal disease, from the degree of sensibility of the abdomen to pressure with the hand; and, by practice, he may acquire such delicacy of touch as to be able to detect, by its means alone, morbid changes, even in deep-seated organs, to an extent, and with a degree of precision and certainty, far beyond what is commonly believed by practitioners.

3. That mode of external examination of the body termed percussion—namely, the mode of eliciting sounds from the surface, the nature of the sound produced affording a knowledge of the condition of the parts beneath, has opened to the modern practitioner a new source of information, the careful and skilful employment of which has afforded practical results of far greater precision and importance than could possibly have been anticipated. This mode of examination is usually applied to diseases of the chest, but application of it has since been made to the detection of abdominal disease. M. Piorry, a Parisian physician, has attained a world-wide celebrity for his practical application of the discovery of Anenbrugger; but the published results of his inquiries are much obscured by technicalities, and it may be affirmed that very few of his followers have been able to verify his remarkable statements in respect of the detection of abdominal disease.

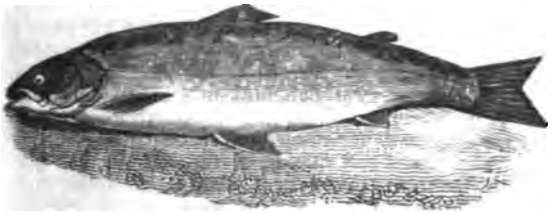
Our limits will not permit us to pursue this subject further. Our object has been rather to awaken than to satisfy curiosity; rather to indicate the nature and extent of the information to be acquired, than to supply it. Enough has been said to show that there is reason to congratulate both the medical profession and the public on the renewed attention which is now paid to the external or the physical signs of internal disease. The external examination of the body can never supersede other modes of investigation; but it may often afford essential aid to whatever other mode is adopted; and sometimes it is absolutely indispensable to the success of any other. With all the aids that can be applied to the task, the detection of internal disease is often difficult and very often uncertain, and the enlightened practitioner will gladly avail himself of every resource which is open to him, and will endeavour to derive from each the utmost information it can be made to afford.

The Father of Physic long ago said, 'Certain it is that he who examines the abdomen as well as the pulse, is much less likely to be deceived than he who does not.' And a distinguished author, Baglivi, has confirmed this observation of Hippocrates in the following words:—'If physicians were always to examine the abdomen, upon first visiting the patient, more particularly in acute diseases, they would assuredly commit much fewer mistakes than they do at present, neglecting this method of exploration. The knowledge of the condition of the upper parts of the abdomen improves vastly both our treatment and our prognosis.'

ABDOMEN, in insects, has a somewhat different signification from the same term when applied to other animals, being used for the whole portion of the body of an insect behind the corselet (*thorax*), and including the back as well as the belly. It consists, in most cases, of a number of rings without any jointed members for locomotion, and uniformly incloses a portion of the intestines, though sometimes but a very small one. These rings, or very short hollow cylinders, are severally united with each other by a joint, by a membrane, or sometimes by an intimate junction, the exact line of which is not very apparent. The rings in some cases, as in the grub of the chameleon fly, slide into one another like the tubes of an opera-glass. Each ring is technically termed a segment (*segmentum*), virtually composed of two principal pieces, which, when distinct, are termed arches; the upper the arch of the back, the under the arch of the belly. In some cases these two portions are not distinct, but, when they are so, the two borders usually come into contact. When they do not, but remain free, one usually, more or less, overlaps the other as in bees. In caterpillars, grubs, and wingless insects, such as the flea, where the joining of the corselet with the abdomen is not apparent, the abdomen may always be known by the legs never being jointed with it; and in caterpillars it usually consists of all the body behind the six fore legs, which are always on the corselet.

ABDOMINALES, in Zoology, the name of a group of fishes, to which different naturalists have attached a more or less extensive signification, according to the particular principles of their several systems. The system of ichthyology (the knowledge of fishes) of Linnæus is founded upon the presence and position of the ventral fins (those of the belly) in relation to the pectoral (those of the breast); and these he justly enough regards as analogous to the fore and hind members of quadrupeds, and to the wings and feet of birds. Linnæus includes, in his order Abdominales, all those species which have the ventral fins placed behind the pectoral, or upon the abdomen, the cartilaginous fishes alone excepted; which, after the example of Ray, Willoughby, and Artedi, he very properly considers as forming an order apart. But this arrangement, though at first sight plausible, and apparently founded upon the modifications of important organs, is, in reality, extremely defective, and of little assistance in studying the natural affinities of fishes. The different nature of the medium in which these animals move, necessarily induces corresponding modifications in their organs of locomotion; and thus it happens, that the important function of progression which in the case of birds and mammals is performed entirely by the extremities, is in fishes evidently executed by the tail; whilst the fin of the fish and the tail of the bird have analogous uses in balancing the animals. The fins, again, be it observed, have but a very slight influence upon the nature of fishes, compared with that which the extremities exercise upon land-animals; and hence it is that the Linnæan system of ichthyology, founded upon these modifications, fails altogether in arranging the different genera and species of this class of animals according to these natural affinities.

M. Cuvier, perceiving the deficiency of the Linnæan system in this respect, revives the more correct and natural arrangement of Artedi; and after, first of all, dividing the class of fishes into the three great orders—Chondropterygii, Acanthopterygii, and Malacopterygii, according to the cartilaginous or osseous nature of their skeletons and fins, afterwards applies the principles of Linnæus, or the relative position of the pectoral and ventral fins, to subdivide the last of these orders into families. In its present acceptation, therefore, the term abdominales denotes a family, or subdivision of malacopterygious, or soft-finned fishes, only; and, in this restricted sense, includes the greater number of the fresh-water species, as well as those which, like the salmon, periodically migrate from the ocean to deposit their spawn in fresh-water lakes and rivers. M. Cuvier subdivides this family into five subordinate groups, all of which he has defined by appropriate and unequivocal characters. He denominates these subfamilies, cyprinoïdes, siluroïdes, salmonoïdes, clupeoïdes, and lucioïdes respectively, from the carps, silures, salmons, herrings, and pikes, the typical genera from which their characters are severally taken.



Salmon, given as a specimen of the family of Abdominales.

ABDUCTION (from *ab*, from or off, and *duco*, to lead) is an unlawful taking away of the person of another, whether of child, wife, ward, heiress, or women generally.

Abduction *of child*.—(See Kidnapping).

Abduction *of wife* may be either by open violence, or by fraud and persuasion, though the law in both cases supposes force and constraint. The remedy given to the husband in such a case is an action, by which he may recover, not the possession of his wife, but damages for taking her away; and also, by statute of 3 Edward I., c. 13, the offender shall be imprisoned for two years, and fined at the pleasure of the king. The husband is also entitled to recover damages against such as persuade and entice the wife to live separate from him without sufficient cause.

Abduction *of ward*. A guardian is entitled to an action if his ward be taken from him, but for the damages recovered in such action he must account to his ward when the ward comes of age. This action is now nearly superseded by a more speedy and summary method of redressing all complaints relative to guardians and wards,—namely, by application to the Court of Chancery, which is the supreme guardian of all persons under age in the kingdom.

Abduction *of heiress*. By a late statute, passed in the 9th year of George IV., the abduction of any woman against her will, who may have property either in possession or expectation, is declared to be a felony, and punishable by transportation for life or a shorter period, or to be imprisoned for any period not exceeding four years with or without hard labour. In addition to this punishment of the offender, the marriage, when obtained by means of force, may be set aside on that ground. In this case, as in many others, the law will construe *fraud* into force; and, consequently, in one case, where both the abduction and marriage were voluntary in fact, they were held in law to be forcible, the consent to both having been obtained by fraud.

Abduction *of women generally*. The forcible abduction and marriage of women is a felony. Here, and in the case of stealing an heiress, the usual rule that a wife shall not give evidence for or against her husband is departed from, for in such case the woman can with no propriety be reckoned a wife where a main ingredient, *i. e.* her consent, was wanting to the contract of marriage; besides which there is another rule of law, that 'a man shall not take advantage of his own wrong,' which would obviously be done here, if he who carries off a woman could, by forcibly marrying her, prevent her from being evidence against him, when she was perhaps the only witness to the fact.

ABEL, the second son of Adam. Some interpreters have maintained that he was the twin brother of Cain, but apparently without any authority from the language of Scripture. His history is contained in the fourth chapter of Genesis, where, we are informed, that he being a keeper of sheep, while Cain was a tiller of the ground, the two brothers offered sacrifices together to the Lord; the former bringing of the fruit of the ground for that purpose, and the latter of the firstlings of his flock. The offering of Abel alone was accepted; and the preference thus shown so excited the envy and anger of Cain, that, as they were together in the field, he rose up against his brother and slew him; thus for the first time staining the earth with human blood. There does not seem to be any reason for supposing that God was pleased with Abel's sacrifice, and offended with that of Cain, on account of the difference that there was between the offerings of which they were severally composed. It would rather appear that it was the opposite characters of the two brothers which made the sacrifice of the one acceptable, and that of the other the reverse. This view seems to be confirmed by the epithet which our Saviour applies to Abel in the twenty-third chapter of Matthew, *righteous* Abel; and also by the reason expressly assigned for Cain's enmity to his brother, in the third chapter of the First Epistle of John, where we are told that he slew him, 'because his own works were evil, and his brother's righteous.'

ABEL (CHARLES FREDERICK), a native of Germany, and a pupil of Sebastian Bach, was much distinguished as a composer and performer in the middle and towards the end of the last century. He served for some years in the celebrated band of the Electoral King of Poland, at Dresden; but, his talents being very inadequately rewarded, he quitted that service, in 1758, with only three dollars in his pocket, and reached England the following year, where he soon met with encouragement that did not end in empty praise. When the queen of George III. had her establishment fixed, Abel was appointed chamber-musician on it, at a salary of 200*l.* per annum; and shortly after he united with J. Christian Bach in forming a weekly subscription concert, which for many years continued to be highly patronised and liberally supported. His chief instrument was the *viol da gamba*, a small violoncello with six strings, now fallen into disuse. With this he produced an effect on his auditors which scarcely any one since has been able to achieve on bowed instruments, and principally by means of his *adagios*, or slow movements. 'His compositions,' Dr. Burney tells us, 'were easy and elegantly simple; for he used to say, "I do not choose to be always struggling with difficulties, and playing with all my might." In nothing was he so superior to all other musicians,' the historian of Music adds, 'as in writing and playing an *adagio;* in which the most pleasing yet learned modulation, the richest harmony, and the most elegant and polished melody, were all expressed with such feeling, taste, and science, that no musical production or performance with which I was then acquainted seemed to approach nearer perfection.' (*Hist. of Music*, vol. iv.) The critic, however, of the present day, who has compositions of the same kind by Haydn, Mozart, Beethoven, Clementi, Dussek, and Cramer, &c., fresh in his memory, will not deny the vast superiority of these later productions. Abel—judging him by his remains—possessed more taste than imagination—more knowledge of his art, and elegance in his manner of performance, than vigour of conception. Even Dr. Burney admits that 'his later productions, compared with those of younger composers, appeared somewhat languid and monotonous.' But we suspect the fact to be, that they were more accurately estimated when compared with the productions of a more advanced age. Abel was intemperate in the use of fermented liquors, and brought his life to a hasty close in the year 1787.

ABEL (NIELS-HENRI), born 1802; died 1829; aged twenty-six years and a-half. If we cannot place him in the first rank of analysts, it is because his early death prevented his competing with the great names of the age in that department in the *quantity* of his labours. But his first essays, compared with those of the best mathematicians, sufficiently indicate a talent which would have placed its possessor high in the ranks of science. He was born in the province of Christiansand in Norway, where his father was a poor clergyman. He commenced his studies at the cathedral school of Christiania, and at the age of sixteen showed a decided turn for scientific pursuits. In 1821 he entered the university, and soon afterwards published his first essay. In 1824 the government gave him an allowance of 600 dollars, to enable him to travel. He went, accordingly, through France, Germany, and Austria, and formed an acquaintance with M. Crelle, in whose journal, and in the *Astronomische*

Nachrichten of Professor Schumacher, most of his works are published. On his return, after two years of absence, he was appointed Professor in the University, which post he held till his death, which was brought on by over-exertion in his public duties.

Abel has linked his name to a remarkable discovery. It is well known that no *general* solution has ever been discovered of any class of equations above the fourth degree,—that is, no problem has hitherto been solved, in which the quantity sought has been multiplied by itself more than three times, in the conditions of the question. Some particular cases only have been fully investigated, and though all can be solved with more than sufficient nearness for practical purposes, yet a general and exact solution has never been found. Abel showed that such a solution never could be found, that the roots of an equation of the fifth degree and upwards did not admit of any general algebraical expression.

While the researches of Abel on elliptic functions excite the attention of all mathematicians, the elementary student may judge of the elegance of his analytical style, from a paper on the convergence of series in Crelle's Journal, in which some results, hitherto unnoticed, seem to lie on the very threshold of the subject. M. Crelle calls him, with justice, one of those geniuses who appear but once in a century.

His works, written in French, have been edited by Professor Holmboe, his teacher. (2 vols. Christiania, 1839.)

ABELARD, one of the most celebrated teachers of the twelfth century, both for his extraordinary talents and his misfortunes, was born at Palais, a little town in the neighbourhood of Nantes, in the year 1079. His father, a gentleman of fortune, and of considerable merit, spared no expense for the education of his son. Learning, having begun to revive a second time in the preceding century, had made considerable progress in France towards the end of the eleventh; and Brittany was not behind the general improvement. The far-famed Roscelin was from that country, though he was not the master of Abelard, as many writers have asserted.

But Brittany, fruitful as she was in celebrated teachers, was soon too narrow a field for Abelard, who had already learnt Hebrew, Greek, and Latin; and accordingly he went to Paris, whose University was the resort of crowds of students from all parts of Europe. Guillaume de Champeaux, the most skilful dialectician of the age, numbered Abelard among his pupils. But the pupil soon surpassed his master, and in the dialectic struggles of the day, he often challenged him to public disputations, so common in the twelfth century, in which the youthful pupil frequently vanquished his more tried and experienced antagonist. After this success, he became so puffed up with vanity, that he made enemies of all around him. His tutors, and many of his fellow pupils, became disgusted with him, and Abelard retired to Melun. But even here the anger of his exasperated master brought him into many troubles; in spite of which, however, a great number of pupils left De Champeaux to attend the lessons of the rival professor at Melun. This success induced Abelard to change his residence, and to remove nearer Paris, as the storm was now somewhat abated. But his arduous labours had so much injured his health, although he was then scarcely twenty-two years of age, that he was obliged, for some time, to discontinue his public lessons, and to seek, by repose, and breathing his native air, to restore his declining constitution. After the lapse of some years, he came back to Paris, where he found that his powerful antagonist had ceded his chair to a man of very inferior talents, who was all at once deserted by his pupils on the re-appearance of Abelard. This unforeseen circumstance forced De Champeaux to enter again into the arena, there to dispute with this scholastic Achilles, by whom he was again conquered, and compelled for ever to leave the field. Family affairs obliged Abelard to withdraw from the scene of his triumphs; and his conquered rival was at the same time appointed to the see of Châlons-sur-Marne. In consequence of this event, Abelard, at his return, did not resume his dialectic lessons: he went to Laon, in order to study divinity there, under the direction of Anselme; but his pride and his vanity having led him to commit the same faults there which he had committed at Paris, he suffered nearly the same severe consequences. The disciple of Anselme put himself forward as the master: taught divinity to the pupils, and, still more, taught them to despise Anselme, who, indeed, was unfit for his station, and altogether inferior to Abelard. The latter compared him to a tree of promising appearance at a distance, on account of its thick foliage, but whose nearer view disappoints us, when we find it bears no fruit. [*Abel., Epist. prima.*] However, Anselme had power enough to have him expelled from Laon, which he soon effected. Abelard now re-appeared in Paris, but as professor of divinity, and in a few days he was better attended by pupils than when previously most successful. He saw himself surrounded by the most eminent scholars of his age: Gui du Châtel, who became Pope Celestin II.; the still more famed St. Bernard; and above all, the illustrious John of Salisbury. Enriched by this extraordinary success, and intoxicated by his fortune, he now gave way to passions of a different kind. He cast his eyes on the fair Heloise, niece of Fulbert, a canon in the cathedral of Paris, and from that moment he thought of nothing but seducing her. In order the more readily to accomplish his ends, he proposed to the unsuspecting uncle to receive him into his house as a boarder, and he promised to give, in exchange, all the instruction which he might consider his niece to require. The canon, who was anxious that Heloise should be a star amongst the learned of the age, and who was rather parsimonious, was delighted to see his ardent wish likely to be accomplished, and that, too, without expense. It was exactly as if, according to Abelard's own words, the 'shepherd himself had introduced the wolf into the fold.' Amongst the things taught by Abelard to his ardent pupil, the art of love was the chief; and very soon the fair disciple surpassed her master. Their love was published all over Paris, before the good canon suspected anything wrong; but the negligence of Abelard in attending to his scholastic duties, excited so generally the satirical clamours of the students, and became so universally the topic of conversation at Paris, that at last the eyes of the uncle were opened to the consequences of his indiscretion. His niece, whose shame could no longer be concealed, fled to Brittany, and hid herself under the roof of Abelard's sister, where she gave birth to a boy, who was called Astrolabus; but the child died. Fulbert, enraged at this discovery, demanded the marriage of Heloise. Abelard, although ordained, yielded to his threats, as did Heloise herself, but with a great deal more reluctance. She seems to have been not so much actuated by any improper motives (as so many romantic writers, who have disfigured history, under the pretext of embellishing it, have been pleased to repeat), as because she thought that this union, being made public, would infallibly ruin the fortune of Abelard, and destroy that which was above all things dear to her—the present and future glory of her illustrious lover. She wrote a letter to Abelard, to dissuade him from the marriage, which is full of the most eloquent expressions. At last it was agreed that the marriage should be performed at Paris, and kept secret. But Fulbert, who was impatient that the honour of his family should no longer be the subject of public scandal, lost no time in making the marriage as public as possible. Heloise, convinced that the glory of her husband was endangered by their marriage being known, denied it in the strongest manner. Her uncle, enraged at her obstinacy, in which he thought her encouraged by Abelard, swore to revenge himself at least on his niece, who was at that time residing with him. Abelard, being informed how cruelly Heloise was treated by Fulbert, took her away, and placed her in the convent of Argenteuil, near Paris. Fulbert, believing that Abelard wanted to make a nun of his wife, in order to get rid of a mistress, vowed a cruel vengeance, which he was soon enabled to execute. He bribed the valet of Abelard to admit two wretches into the bed-room of his master at midnight, who mutilated him in the most atrocious manner. The miscreants were punished after the cruel fashion of the age; and the canon was condemned to lose all his fortune, and was banished from Paris. Heloise took the veil at Argenteuil, and Abelard went to bury his grief and his shame under the monastic garment in the Abbey of St. Denis. But he did not there find the repose which he sought. The monks of that convent soon hated him, on account of the freedom with which he reproached them for their dissolute habits, and for his having had the temerity to assert, and to prove, that their great patron, St. Dionysius, or St. Denis, was not the Areopagite, who was then as generally believed to be the patron of that church, as the reverse is now universally known to be the fact. But this opinion of his, well-founded as it was, shocked the prejudices of the monks, being contrary to the legends and miracles of the abbey, and, as such, was considered as subversive of the privileges of the order. The infatuated monks, enraged at the pretended heresy of his work on the Trinity, which was publicly burnt in council at Soissons, in 1121, and still more at his 'treacherous' assertions about St. Denis, accused him to the king of high treason.

To escape from the impending danger, the unfortunate Abelard fled, and took refuge near Troyes, placing himself under the protection of the Count of Champagne, that country being then independent of the crown (*Du Cange*), as to judicial power. Here he built the celebrated Oratory of Paraclet, where a number of pupils came again to him in his solitude, and prevailed on him to resume his lectures. Amongst these pupils came two furious fanatics, whom his enemies had incited against him, and who soon discovered fresh theological errors; this provoked his enraged calumniators to still further persecution of Abelard, till, about this time, the monks of the Abbey of Bruis, near Vannes, in Brittany, elected him their superior. But here again, as at St. Denis, his endeavours to establish order, and to suppress the licentiousness which prevailed in that monastery, drew on him the implacable hatred of the monks, who, having first tried to ruin his character by calumny, afterwards even attempted his life by poison. Heloise also was not without her share of troubles; for she was expelled, with the rest of the nuns, from the convent of Argenteuil, on account of the scandalous disorders which prevailed there, although, notwithstanding the calumnies which were circulated against her, she had conducted herself with the strictest propriety.

In this destitute condition, Abelard gave her the Oratory of Paraclet; and after eleven years of separation, saw her there at the consecration of the community. Her exemplary conduct procured her general admiration, and particularly that of the bishop; while Abelard himself governed the convent by his occasional visits, by his advice, and by his letters, which are still preserved, and which very curiously prove that he encouraged the nuns not only to acquire a thorough knowledge of Scripture, but also to study the Hebrew, Greek, and Latin languages, in which Heloise had the reputation of being a proficient. Heloise's love being, as was suspected, by no means extinguished, notwithstanding her having taken the veil, the visits of Abelard to the Paraclet gave rise to some scandal. Being still accused of heresy by his inveterate enemies, at the head of whom was St. Bernard, he resolved to defend himself in full council, which he accordingly did at Sens. The king, Louis VII., was desirous of being present, to hear the defence of so distinguished a man. Notwithstanding his eloquence, he was condemned in 1140, as he had been before in 1121. Persecuted, it may be said, rather for his boldness and freedom of thought, than for his errors in theology, he desired to appeal to the pope, and on his way to the pontiff, was stopped at Cluni, near Maçon, by Peter the Venerable, who tried to soothe his grief, and to appease his enemies. Shortly afterwards he became reconciled to St. Bernard; and consigning himself, for the rest of his life, to the closest retirement, he died two years after, in 1142, at the Priory of St. Marcel, having, by his sincere repentance, his resignation, and good conduct, excited the admiration of the monks and the clergy of France. He was buried at Paraclet, and the remains of Heloise were interred in the same tomb, twenty-one years after. Since 1817, the remains of both have reposed in Père la Chaise, under a beautiful Gothic tomb, originally erected by the sculptor Lenoir in the garden of his own museum.

In Abelard's time, scholastic instruction was divided into two courses: the one, the 'trivium,' containing grammar, rhetoric, and dialectics or philosophy; the other, the 'quadrivium,' comprising arithmetic, music, geometry, and astronomy. Abelard understood all these sciences in the greatest perfection, for his time, and thereby obtained from his contemporaries the title of the all-accomplished master. He was considered to be the only person who understood the writings of Aristotle, which had been unknown in France until the preceding century, when they were communicated through the learned Jerbert, who, travelling in Spain, had learnt them from the Arabians. Notwithstanding all that has been said of Abelard's perfect knowledge of the writings of Aristotle, it is now well ascertained that the Greek text did not exist at that period in France, and that there were only partial Latin translations from the Arabic. All the quotations of Abelard from Aristotle, in every part of his works, are invariably in Latin, as well in the printed edition of Abelard as in the three different MS. copies which we have seen of his works in the British Museum.

In estimating Abelard's acquirements we must judge of them by the age in which he lived. Scholastic philosophy and theology were then the highest branches of learning, and it was Abelard's praise to have surpassed in these all his contemporaries. If we are to judge of this renowned disputant by what remains of him, we fear our judgment would be rather unfavourable. Among the Lansdowne MSS. of the British Museum the reader may see a copy of two of Abelard's dialogues, one between a Christian and a Jew, the other between a Christian and a philosopher. Words are wanting to express the utter insipidity and absence of all taste, energy, or life, which these spiritless compositions display; nor can we concede to them the praise of being written in Latin which will bear the test of strict examination. The crime of Abelard, for such we must call it, and his misfortunes, have given to his name a celebrity, to which we conceive most men would prefer an honourable obscurity. Pope's well-known epistle of Heloïse to Abelard, which is animated with the glowing fervor of the unfortunate lovers, while it is tainted with the impure imagination of the poet, has made the name of Abelard familiar to those who are, perhaps, only imperfectly acquainted with his true history.

The real historic interest of Abelard's life turns on the state of knowledge during the age in which he acquired his reputation. The works of Abelard were once thought worthy to be put in the Index by the Inquisition of Madrid, which is almost the only thing we know in their favour. As to the question whether Abelard himself knew Greek, we are inclined to think that he did to a certain extent, but whether he was well acquainted with any Greek authors, except perhaps the New Testament, seems to us doubtful. That he knew some parts of Aristotle and Plato, both of them probably through translations, is pretty certain. In the printed edition of Abelard's works (1616) a few Greek words occur here and there(pp. 241, 244, 247, 831), which, taken in connexion with the remarks upon them, undoubtedly prove, if these passages really were in his MSS., as we believe they were, that he must have had some knowledge of the Greek language. It appears that Greek was always studied in France during the ninth, tenth, eleventh, and twelfth centuries; though it was very imperfectly known, and confined to a few schools. Hebrew and Arabic, at that time, were both better known than Greek. The occasional visits of Greek priests into Western Europe served to keep alive a certain degree of knowledge of this language.

The most complete edition of Abelard, is *Petri Abælardi et Heloisæ Conjugis ejus Opera, nunc primum edita ex MSS. codd. Francisci Amboesii*. Paris, 1616, in 4to.

The edition in the British Museum, though it is in fact that of Amboise, bears the title of *Andreæ Quercetani* (Andrè Duchesne), as do several other copies. Andrè Duchesne is the author of the Notes and Commentaries at the end. There is a number of other editions, amongst which is that of the Letters published by Bastion, 2 vols. 12mo, Paris, 1782, with the text and translation; that of Fournier, 1796, with a Life of Abelard, by M. Delaunay, 3 vols. 4to., that of Richard Rawlinson, London, 1714, 8vo.; that of Oxford, 1728. Brunet, in his Manual, gives an incomplete list of them.

The principal sources from which we have drawn this article are, first, the *Literary History of France*, from page 20 to 225, vol. ix.; *Bayle's Critical Dictionary* (Amsterdam edit.), 1740, 4 vols. folio; the *Universal Biography*; and the *Works of Abelard*, complete, Paris, 1616, 4to.

ABELE TREE, in Botany, the English name of the Populus alba.—(See POPULUS.)

ABELMOSCHUS, in Botany, a genus of the Mallow tribe, usually referred to *Hibiscus*, which see. It consists of plants having showy white, rose-coloured, or yellow flowers, with a rich deep purple or brown centre. The name is an alteration of the Arabic *habb ĕl misk*, or musk-seed, according to Forskahl.

ABENCERAGES, is the name given by Spanish chroniclers and romance writers to a noble family in the Arabic kingdom of Granada, several members of which distinguished themselves during the period immediately preceding the fall of the Mohammedan empire in Spain. The history of the Abencerages is intimately connected with that of the then reigning dynasty of Grenada. In the year 1423 of our era died Yussuf III., a wise and valiant prince. He was succeeded by his son Mohammed VII., surnamed Al-Haizari, or the Left handed, who followed the example and advice of his father in maintaining friendly relations with the Christian court of Castille, and with the Arab princes on the northern coast of Africa, but lost the affection of his subjects by his pride and tyranny. The discontent which soon manifested itself against the youthful monarch, was for a time kept in check by the watchfulness of his principal chamberlain Yussuf ben Zerragh, then the chief of the noble family, which probably derived from him the common designation of the Abencerages. But, in 1427, an open revolt broke out, which had been incited by one of the king's cousins, Mohammed al Zaghir. The royal palace, called the Alhambra, was invested by the conspirators. Mohammed VII., disguised as a fisherman, escaped to Africa, where the King of Fez, Mulei ben Fariz, kindly received him, while Mohammed al Zaghir ascended the throne of Grenada. Yussuf ben Zerragh, with most of the Abencerages, fled from his persecutions to Castille; and some members of the family who had remained at Grenada were put to death. John II., then King of Castille, yielding to the representations and entreaties of Yussuf ben Zerragh, negociated through him a treaty with the King of Tunis, to replace Mohammed VII. on the throne of Grenada. This plan succeeded. Mohammed VII., supported by his two allies, recovered his paternal dominions, and Al Zaghir suffered death for his treason. But the friendly relations between Grenada and Castille were soon interrupted, in consequence of the refusal of Mohammed VII. to fulfil certain engagements which he had entered into with John II. Hostilities broke out, and John declared himself in favour of Yussuf ben Alhamar, an aspirant to the throne, who had formed a strong party in the kingdom of Grenada. Yussuf ben Zerragh led the troops of Mohammed VII. to encounter the united forces of his opponents. But he fell in a decisive battle, which he lost, and Yussuf ben Alhamar occupied Grenada, while Mohammed VII. fled to Malaga. This second interruption of Mohammed's reign was, however, only of short duration. He regained his throne a second time after the death of Yussuf ben Alhamar, which took place within six months. Fresh hostilities with Castille soon commenced. The frontier provinces of Grenada were much infested by the incursions of the Castilian commander Cazorla. A son of Yussuf ben Zerragh, at the head of a select band of valiant knights, drew out his troops against Cazorla, and fell in a battle (1438), in which the Castilians sustained much loss. New disturbances soon broke out in the interior of Grenada. Mohammed VII. was (in 1444) once more dethroned by one of his nephews, Osmin al Ahnaf. But the claims of the latter to the throne were contested by another aspirant, Mohammed ben Ismail, who was supported by John II.; and, finally, in 1453, prevailed over his opponent. Soon after this, John II. was succeeded in the government of Castille by Henry IV., who was adverse to Mohammed ben Ismail, and renewed the hostilities which, from this time, took a turn decidedly unfavourable to the kingdom of Grenada. The Spanish historians mention that, about this time, an attempt at a revolution was made in Grenada by the Abencerages, which had for its object to confer the crown on one of their own family, Mohammed ben Zerragh, and that the Castilian commander, Medina Sidonia, took advantage of these disturbances to occupy the fortress of Gibraltar. The Arabic chronicles say nothing of such an event, and the whole story appears doubtful. If there be any truth in the report, it may be, that the Abencerages made another effort to place Mohammed VII. once more upon the throne, which, from their steady attachment to the cause of that unfortunate prince, seems not improbable.

Of the feuds of the Abencerages with the Zegries, another noble Arabian family in the kingdom of Grenada, who traced their descent from the Mohammedan kings of Cordova, of the massacre of thirty-six Abencerages, caused through the perfidy of their opponents, and how the survivors of the family ultimately embraced the Christian religion, and entered the service of Ferdinand of Castille, a highly interesting story is told in the *Guerras civiles de Granada*, by Gines Perez de Hyta, a work which professes to be a translation from an Arabic manuscript. Of the authenticity of this there seems, however, good reason to doubt. The work properly consists of two volumes, but in most editions only the first is reprinted, and copies of the second are said to be now extremely rare even in Spain. An English translation of the first part, by Thomas Rodd, appeared under the title of *The Civil Wars of Granada*, &c. London. 1803. 8vo. [See *Conde's Historia de la Dominacion de los Arabes en España*, vol. iii.]

ABEN ESRA, sometimes called Ebenare, or Evenare, by the scholastic writers, or with his complete name Abraham ben Meïr ben Esra, was a celebrated Jewish scholar, who lived during the twelfth century. The year of his birth, as well as that of his death, is unknown. He was born at Toledo, probably in A.D. 1093, and died, it is believed, about 1168, at an age of seventy-five years, or upwards. Of the history of his life, few details are known. The Rabbi Japhet Hallevi is mentioned as having been one of his early teachers. A considerable portion of his life was spent in travelling. He visited Mantua in 1145, and the island of Rhodes in 1156; in 1159 he was in England, and in 1167 we find him at Rome. His celebrity, even among his contemporaries, as a scholar, and as an accomplished writer of the Hebrew language, was very great. Moses Maimonides recommended his son to study the writings of Aben Esra in preference to all others; and the well-known grammarian, David Kimchi, and the traveller, Benjamin of Tudela, praise his vast erudition; while Juda ben Alcharizi, the successful Hebrew translator and imitator of Hariri, acknowledges his merits as a poet. Among ourselves Aben Esra has become known chiefly through his great commentary on the Old Testament, which, it seems, he wrote at different periods, between the years 1140 and 1167. It has been printed in the great Rabbinical editions of the Bible, which have appeared at Venice, Bâle, and Amsterdam, and there have been besides many separate editions of single parts of it. But, from the great number of his other writings, which are still extant, it is evident that Aben Esra must have bestowed as much attention upon mathematics, astronomy, philosophy, and medicine, as on philology; and his treatise in verse on the game of chess (edited by Thomas Hyde, Oxford, 1694) affords us a specimen of his success in poetic composition. For an enumeration of the works of Aben Esra, which are still preserved in MS. in several of the libraries of Europe, see the article 'Aben Esra,' by Hartmann, in *Ersch und Gruber's Encyclopædie*, vol. i.

ABER. This word, which is prefixed to the names of many places in Great Britain, is a Celtic term, and means, generally, the mouth or entrance of a river. It is sometimes defined as 'the fall of a small water into a greater,' which, of course, *includes* the terms 'mouth of a river,' and 'port or harbour.' Thus, the town of Aberbrothwick, in Scotland, is at the mouth of the river Brothick, and New Aberdeen is near the mouth of the Dee. In Wales, we have Abergavenny, at the confluence of the Usk and Gavenny; and Aberystwith at the outlet of the river Istwith.

ABERBROTHWICK, or more commonly **ARBROATH**, a town in Scotland, in the county of Forfar, at the mouth of the rivulet Brothic, from which its name comes. It is a royal burgh, having been created so by charter, granted in 1186, and renewed in 1589; and, in conjunction with Aberdeen, Montrose, Bervie, and Brechin, formerly sent one member to parliament. Aberbrothwick is now united with Bervie, Brechin, Forfar, and Montrose in sending a member. It is irregularly built, except in the parts of modern erection. The town-house contains several public offices, as well as a library and reading-room. The chief manufactures are sail-cloth, thread, and leather, which are exported, together with paving-stones and grain. Among the imports are flax, hemp, linseed, and tallow. A small but secure harbour (defended from the sea by a breakwater, and protected by a battery of twelve guns) enables the town to carry on this trade. There are two parish churches, and some dissenting places of worship. The population amounted in 1851 to 8302. There are the ruins of an abbey, founded in honour of St. Thomas-à-Becket, which was destroyed by the reformers in 1560. The last abbot was the celebrated Cardinal Beaton. Aberbrothwick is fifty-eight miles north-north-east of Edinburgh. Lat. 56° 32′ north, long. 2° 34′ west.

ABERCROMBY (SIR RALPH), a British general, distinguished for many gallant and important services. He was the son of George Abercromby, Esq., of Tullibodie, in Clackmannanshire, where he was born in 1738. After receiving a liberal education, he entered the army in March 1756, as a cornet in the 3d regiment of Dragoon Guards. By the year 1787 he had reached the rank of major-general. When the war with France broke out, in 1793, Abercromby was sent to Holland, with the local rank of lieutenant-general, in the expedition commanded by the Duke of York. His bravery during the prosperous commencement of this attempt was not more conspicuous than the humanity with which he exerted his best energies in the disastrous sequel to alleviate, as far as possible, the miseries of the sick and wounded troops, whom he was charged to conduct in their retreat.

Soon after his return to England, in April, 1795, he was made a Knight of the Bath; and in August of the same year, he was sent out to the West Indies, as Commander-in-Chief of the forces there. In this quarter he took from the enemy, in succession, Grenada, Demerara, Essequibo, St. Lucia, St. Vincent, and Trinidad. The last of these colonies fell into his hands in February, 1797. He then returned to Europe, having been previously raised to the rank of lieutenant-general; and on reaching England, he was rewarded for his valuable services by receiving the command of the Scots Greys, and the appointment of lieutenant-governor of the Isle of Wight. In the following year, on the breaking out of the rebellion in Ireland, Sir Ralph proceeded thither, as commander-in-chief; but after he had held that office for a short time, it is understood that his unconcealed aversion to the service in which he was engaged, and some differences of opinion with his superiors as to certain operations, led to a new arrangement, by which he was transferred to the chief military command in Scotland, and the governorship of Fort Augustus and Fort George. He was soon, however, called again to active service abroad, on occasion of the second expedition sent against the French in Holland, in August, 1799, with the conduct of which he was entrusted, before the arrival of the Duke of York. It proved, as is well known, equally unfortunate with the former; but it did not the less afford many opportunities to General Abercromby of displaying his activity, intrepidity, and high military talent. In 1801, he was employed to command the English forces despatched for the relief of Egypt; and, in spite of the utmost exertions of the French to prevent his design, he effected the landing of his troops, on the 8th of March, at Aboukir, though not without the loss of 2000 men. A few days after, the enemy made a general attack upon the invading forces, as they lay encamped near Alexandria, but were speedily repulsed. On the 21st, was fought, on the same ground, the more obstinate and bloody engagement, usually designated the battle of Alexandria, in which the French were again driven back at all points. But the victory of our countrymen was purchased at the cost of the life of their gallant commander, who was unhorsed and severely wounded at an early period of the action, by one of the enemy, whom, notwithstanding, he disarmed, delivering his sword to Sir Sidney Smith, whom he soon after met. Then remounting his horse, 'he concealed his situation,' says the despatch of Lord Hutchinson, 'from those about him, and continued in the field giving his orders with that coolness and perspicuity which had ever marked his character, till long after the action was over, when he fainted through weakness and loss of blood.' The injuries which he had received, and which he thus nobly bore in silence, were past the skill of surgery: he was immediately conveyed to the ship of the Admiral, Lord Keith, and there lingered till the 28th, when he expired. His body was interred in the burial-ground of the Commandery of the Grand Master, under the walls of the Castle of St. Elmo, near the town of La Valetta, in Malta. A monument has since been erected to his memory, by order of the House of Commons, in St. Paul's Cathedral. Sir Ralph Abercromby, whose private character was as excellent as his public merits were great, left four sons, of whom the late Lord Abercromby was the eldest. On his death, his widow was created Baroness Abercromby, with remainder to her issue male by her late husband. A pension of 2000*l* a year was also settled upon Lady Abercromby and the three succeeding inheritors of the title.

ABERDEEN, called, when distinguished from the other town of the same name, NEW ABERDEEN, a city, parliamentary burgh, and chief town of Aberdeenshire, is situated on the river Dee, at its mouth. N. lat. 57° 9′; W. long. 2° 5′. Pop. of mun. bor. (1851), 53,808.

It is built for the most part of granite, and the more recently constructed streets have a fine appearance.

A chief point of interest lies in its Universities—Marischal College, in New Aberdeen—named from George Keith, Earl Marischal, who founded it 1594—and King's College, in Old Aberdeen, founded by James IV., 1494. Attempts have long been made to unite them, without success; but hopes are entertained of the success of a new proposal for that purpose. The average attendance at King's College is 300; at Marischal College, 250. Both colleges are well endowed with bursaries, which are obtained by competition, and thus give a powerful impetus to study.

Aberdeen has flourishing manufactories of cotton, linen, and woollen goods, rope, paper, soap, sail-cloth, &c., with iron-foundries, also extensive shipping. Its clippers and large ships have a high character for swift sailing. Sailing vessels registered Dec. 31, 1851, 264; tonnage, 48,118.

OLD ABERDEEN—originally Aberdon, *i.e.* on the Don—is an ecclesiastical town, of a thoroughly ancient appearance. It consists mainly of one long street. It possesses, besides the building of King's College, the remains of an old cathedral, which is used as the parish church.

ABERDEENSHIRE is a large county, occupying the north-east corner of Scotland. Greatest length from north-east to south-west, 88 miles; greatest breadth from Dee mouth to near Banff, 38 miles; area, 1970 sq. miles; in size, the fifth of Scottish counties. Pop. (1851), 212,032.

The coast-line of Aberdeenshire is pretty regular, mostly convex to the sea. From the border of Kincardineshire to the Ythan, the coast is low and shelving; from the mouth of the Ythan, it becomes bolder, with rocks rising considerably above the level of the sea. North of the Ugie, the coast presents a line of clay hills, covered with an accumulation of drift sand, which is continued round the coast, interrupted occasionally by ridges of rocks.

The county is generally hilly; in the south-west part, it is mountainous. Branches of the Grampians form the southern and western boundaries to a certain extent. The highest mountain in the former range is Loch-na-Gar (3777 ft.); in the latter, Ben Muicdhui (4296 ft.)

The principal rivers of the county are the Dee, the Don, the Ythan, the Ugie, and the Deveron, Dovern, or Doveran, which fall into the sea in the order named, from south to north and west, from Kincardineshire to Banffshire.

The Dee rises in the south-west of the county, in the mountains separating it from Inverness-shire, on the side of the mountain Breriach, at an altitude of 4000 ft. In the upper part of the Dee are several falls or 'linns;' the chief, from its turbulence, is the Linn of Dee, where the river forces its way through a very narrow passage. It receives, in its course, besides mountain streams, the Geauley, Gairn, Muick, and the Dye, which joins it from Kincardineshire. Its whole course is 96 miles, 10 miles of which is through Kincardineshire, from 24 to 14 miles above its mouth. It is a rapid river, and by inundations sweeps away much soil. Its salmon-fishery is valuable. On Deeside, 60 miles from Aberdeen, is Balmoral, the property of the Queen.

The Don rises on the western border of the county, in the parish of Strathdon, at an elevation of 1640 ft. It has a very winding course of about 78 miles. In its upper part, it receives several mountain streams, and is very shallow, rapid, and subject to inundations. Its chief tributary is the Urie, which it receives at Inverury. It falls into the sea two miles north of the Dee. The Ythan rises in the parish of Forgue, near the north-west border, and flows tortuously past Fyvie, Methlick, Ellon, and enters the sea at Newburgh—course 30 miles. It is a slow river, has a considerable body of water, and is navigable by vessels of 90 tons to Newburgh, one mile from its mouth. Formerly, it had a rather valuable pearl-fishery. The Ugie, formed by the junction of two streams, falls into the sea near Peterhead. The Deveron rises in Aberdeenshire, and flows partly in that county, partly in Banff, and partly forms the boundary between the two; its whole course is 51 miles. It receives the Bogie, near Huntly. It is rapid, and subject to great floods.

The only canal is the Aberdeenshire Canal, opened 1807; the length of which is 18 miles, from Aberdeen harbour to near Inverury, through Don valley, along its right bank. It is now superseded by the North of Scotland Railway.

Geology and Soil.—The mountains in the south-west of the county, forming the Braemar district, are mostly composed of granite. The greater part have broad summits, and their sides present, in many places, almost perpendicular precipices, sometimes 1000 feet high. By far the greater part of this district is uncultivated, the arable soil being confined to narrow strips in the valleys. There is a considerable extent of wood on the lower parts of the mountains, but the upper parts are often too sterile to afford even pasture for sheep or deer. The district round the city of Aberdeen is also granitic; and large quantities of building and paving stones are annually shipped from the port. There are extensive works in Aberdeen for polishing this gray granite, as well as the red variety, found near Peterhead. The predominant rock in other parts of the county is mica slate. A few patches of Old Red Sandstone occur—one on the coast, in the bay of Aberdour.

The soil of Aberdeenshire is, upon the whole, rather poor; but spirited and skilful farming have done much to overcome natural disadvantages. The county is distinguished for the cultivation of turnips and the feeding of cattle, of which large numbers are weekly shipped from the port.

The county contains the city of Aberdeen; the royal and parliamentary burghs of Inverury, Kintore, and Peterhead; the burghs of barony of Charlestown, Fraserburgh, Huntly, Old Meldrum, Rosehearty, and Turriff. Inverury, consisting of one long straggling street, is about 16 miles N.W. of Aberdeen, on the Don. It unites with Banff, Cullen, Elgin, Kintore, and Peterhead, to return a member to parliament. Its population in 1851 was 2084. Kintore is 12 miles N.W. from Aberdeen, on the canal. It is a very ancient burgh. Pop. in 1851, 476. Peterhead is in the district of Buchan, on the east coast, 32 miles N.N.E. of Aberdeen; stands on a peninsula, has two harbours, a considerable trade, and an extensive herring-fishery. It is regularly and well built, chiefly of granite. Pop. in 1851, 4819. Charlestown is a small town on the Dee, 27 miles W. of Aberdeen. Fraserburgh, in the Buchan district, 42 miles N. of Aberdeen, is neatly built; has an excellent harbour; and large herring-fisheries. The pop. of the parish in 1851 was 4447. Huntly, in Strathbogie, is 38 miles N.W. of Aberdeen, on the Inverness road. Pop. in 1851, 3131. Old Meldrum, in the Garioch district, is 16 miles N.W. of Aberdeen. The pop. of the parish in 1851, 2002. Rosehearty, about 4 miles from Fraserburgh, is a fishing-village. Pop. in 1851, 844. Turriff, 9 miles S. of Banff; has a bleach-field, with a pop. of 1693 in 1851

ABERDEVINE (*Carduelis spinus*, Cuvier; *Fringilla ligurina*, Ranzani), sometimes called the siskin, a well-known song-bird, which has some resemblance to the green variety of the canary-bird, but there is considerable difference in individual birds with respect to the brightness of colouring. Fleming's specific description, therefore, 'the head above, black; the neck, breast, and rump, lemon yellow,' though it applies to individual male birds, will not apply to others, and not at all to the female; as we have seen male birds, at least two years old, with the head grey rather than black; and others with neck, breast, and rump as bright yellow as the marks on the wings of the goldfinch. In the latter instances the head was jet black.

There is no reason to suppose, as has been conjectured, that the siskin is a variety of the common canary-bird. It is indigenous in Russia, Norway, Sweden, and, according to Temminck, inhabits also Asia and the islands of Japan; but the canary, which possesses characters distinct from the aberdevine, is, in its wild state, an inhabitant of the Fortunate Islands, off the west coast of Africa. [See Canary.]

Sepp has delineated the nest of the aberdevine in the cleft of an oak, built with dry bent, mixed with leaves, and profusely lined with feathers; the base neatly rounded, and the feathers projecting above the rim, and concealing the eggs, which are bluish-white speckled with purplish red, like those of the goldfinch. Temminck, again, says it builds in the highest branches of the pine.

It breeds in the north of Europe, and only visits Britain, Germany, and France in the autumn and winter. It is represented in some books as very irregular in its migrations, particularly to this country; but we suspect that this opinion has perhaps arisen from the irregularity of observations, for, since our attention has been directed to the subject, we have remarked its arrival about Lee, in Kent, to be almost as regular as the departure of the swallows, which takes place about the same time. During its winter stay with us, the aberdevine feeds chiefly on the seeds of the birch and alder.

As a cage-bird it is frequently paired with the canary, to produce what are termed mule-birds; but it is, besides, a lively and persevering songster. Numerous instances are now on record of the siskin breeding in this country; such examples are quoted by Macgillivray, Meyer, Yarrell, and others. The Rev. Mr. Morris, in his beautiful work on *British Birds*, now publishing, states that 'the 'incubation of the siskin lasts fourteen days,' and that the young are 'able to leave the nest at the end of the third week.'

ABERGAVENNY, a town in the county of Monmouth, at the confluence of the Usk and Gavenny, situated in a range of meadows, surrounded by several hills. There is a fine old bridge, of fifteen arches, over the Usk; also an ancient and spacious church, as well as the remains of a castle, and of a Benedictine priory founded soon after the Conquest. The town is long and straggling, the streets narrow, and the houses irregularly built; but considerable improvements have been made by enlarging the market-place and removing projections. There are several Dissenting meeting-houses, a Catholic chapel, a grammar-school, a Lancasterian, and several Sunday schools. The principal trade is in wool, of which a considerable quantity is sold in the market in the months of June and July. The supply of coal and iron afforded by the neighbouring mountains has given rise to several iron-works in the surrounding district. The population in 1851 was 4797. The Monmouthshire and Brecon canal passes near the town, and gives facilities for its trade and that of the neighbourhood. Abergavenny is supposed to have been the Roman station of Gobannium, so called from the river Gobannius (Gavenny), and once possessed a charter of incorporation, which was forfeited in the reign of William III. It is 14 miles W. by N. of Monmouth, and 143 W. by N. of London; lat. 51° 59′ N., long. 2° 58′ W.

ABERNETHY (JOHN), a distinguished surgeon, was born in 1765, in London, where his father, a merchant, had settled shortly before his birth. His father, grandfather, and great-grandfather, were all called John; the two last were Presbyterian clergymen in the north of Ireland, and one of them, the grandfather, a man of eminence. Abernethy died at Enfield, after a protracted illness, on the 18th of April 1831. He received the elements of grammatical and classical instruction at a day-school in Lothbury, but it does not appear that he enjoyed the advantage of any higher education than that afforded by the ordinary day-school of that period. At the usual age he was apprenticed to Sir Charles Blick, surgeon to St. Bartholomew's Hospital, under whom, and especially in the wards of this hospital, he had ample opportunities of acquiring a thorough knowledge of his profession, of which he availed himself with diligence. Competent judges, who observed at this early period the qualities of his mind and his habits of study, predicted that he would one day acquire fame if not fortune. Though he appeared before the public early as an author, and though his very first works stamped him as a man of genius, endowed with a philosophical and original mind, yet he did not rise into reputation nor acquire practice with rapidity. In 1786 he succeeded Mr. Pott as assistant-surgeon to St. Bartholomew's Hospital, and shortly afterwards took the place of that gentleman as lecturer on anatomy and surgery. For a considerable time he had but few pupils, and he was at first by no means a good lecturer, his delivery being attended with a more than ordinary degree of hesitation. On the death of Sir Charles Blick, his former master, he was elected surgeon in his room; and, subsequently, St. Bartholomew's Hospital obtained under him a reputation which it had never before acquired.

Abernethy was a pupil of John Hunter, and the earnestness and delight with which, at an early age, he received the lessons of this his great master, were indications of the soundness of his own judgment. It was from this profound and original thinker, who exercised an extraordinary influence over the understanding, tastes, and pursuits of his young pupil, that Abernethy derived that ardent love of physiology, by the application of which to surgery, he was destined to convert a rude art into a beautiful science. He made himself thoroughly acquainted with anatomy, but it was that he might be admitted into the *then* new world of physiology; he studied structure, but it was that he might understand function: and the moment he had obtained a clear insight into these two sciences, he saw the applications of which they were capable to the treatment of disease. From that moment he looked with contempt on the empiricism then almost universal in surgery; he ridiculed its jargon; he exposed the narrowness of its principles, if it be at all allowable to designate by such a term the ignorant dogmas which alone regulated the practice of the surgeon. But he did not content himself with deriding what truly deserved contempt; he laid the foundation of, and mainly contributed to build up, a new edifice. By the diligent study of nature, and by continual reflection on what he saw, and, as he himself expressed it, the concatenation of what he saw, he reduced to order what he found a chaos. Hitherto the surgeon had looked upon the class of diseases which it was his part to treat, diseases which almost always have a local seat, as diseases which have also a local origin, and consequently as diseases which are to be cured by local applications. To Abernethy belongs the great merit of first perceiving, in its full extent, the utter incompatibility of this notion with the true phenomena of disease, and the inertness, or, when it ceased to be inert, the mischievousness of the treatment that grew out of it. In a work abounding with acute and original observation, and exhibiting comprehensive and philosophical views, entitled, *The Constitutional Origin and Treatment of Local Diseases*, he lays down and establishes this great principle:—that local diseases are symptoms of a disordered constitution, not primary and independent maladies; and that they are to be cured by remedies calculated to make a salutary impression on the general frame, not by topical dressing, nor any mere manipulations of surgery. This single principle changed the aspect of the entire field of surgery, and elevated it from a manual art into the rank of a science. And to this first principle he added a second, the range of which is perhaps somewhat less extensive, but the practical importance of which is scarcely inferior to that of the first—namely, that this disordered state of the constitution either originates from, or is rigorously allied with, derangements of the stomach and bowels, and that it can only be reached by remedies which first exercise a curative influence upon these organs. The benefit daily and hourly conferred upon mankind by the elucidation and establishment of these two principles, both by the prevention and the mitigation of disease and suffering, it were vain to attempt to estimate, and it is not easy to pay to their author the debt of gratitude which is his due.

Further, the same philosophical view of the structure and functions of the human frame, which enabled this acute physiologist so greatly to improve the theory and practice of surgery, suggested, and at the same time armed him with the courage to perform, two operations in surgery bolder than any that had ever before been achieved, and the repetition of which has since been attended with splendid success—namely, the tying the carotid and the external iliac arteries. The announcement of the performance of these capital operations, at once established his reputation as a surgeon, and increased the credit of the English school throughout Europe.

Great, however, as was the reputation which this distinguished man acquired as an anatomist, physiologist, and surgeon, it is probable that he owed his celebrity chiefly to his success as a teacher. Gifted with the genius to master and extend his science, he was endowed with the still rarer capacity of communicating to others in a clear, succinct, impressive, and fascinating manner, whatever he himself knew. Easy and fluent, yet not inelegant—abounding with illustration and anecdote, yet methodical—logical, yet often witty, and occasionally humorous almost to coarseness—seldom impassioned, yet always impressive, and never allowing the attention of his audience to flag for a single moment,—it was rare, indeed, that he failed to convince whoever heard him, and as rare that he failed to make whoever was convinced a decided partizan. Nevertheless, a highly competent witness, speaking apparently from a careful and mature examination of the impression made upon his own mind by the prelections of his master, gives the following account, which, if true, is decidedly unfavourable as to the ultimate result of the mode and spirit of his lecturing. 'He so eloquently expounded some of the highest truths,' says Dr. Latham; 'he so nicely disentangled the perplexities of many abstruse subjects; he made that so easy which was before so difficult,—that every man who heard him feels perhaps to this day, that for some important portion of his knowledge he is indebted to Mr. Abernethy. But he reserved all his enthusiasm for his peculiar doctrine; he so reasoned it, so acted it, and so dramatised it (those who have heard him will know what I mean); and then in his own droll way he so disparaged the more laborious searchers after truth, calling them contemptuously "the Doctors," and so disported himself with ridicule of every system but his own, that we accepted the doctrine in all its fulness. We should have been ashamed to do otherwise. We accepted it with acclamation, and voted ourselves by acclamation the profoundest of medical philosophers, at the easy rate of one half-hour's instruction. The great Lord Chatham, it is said, had such power of inspiring self-complacency into the minds of other men, that no man was ever a quarter of an hour in his company without believing that Lord Chatham was the first man in the world, and himself the second; and so it was with us poor pupils and Mr. Abernethy. We never left his lecture-room without thinking him the prince of pathologists, and ourselves only just one degree below him.'

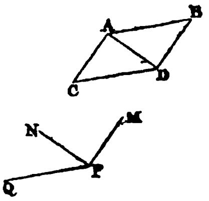
If this were, indeed, the ordinary result, then it must be admitted that the excellence of Mr. Abernethy, as a teacher, was, after all, but of a secondary order. *He* only teaches well who sends his pupil away thirsting after truth, determined to search for it, feeling that he has a clear conception of the manner in which he is to get at it, and, at all events, in no mood to be satisfied with anything but the entire truth.

The private character of Mr. Abernethy was blameless. He was highly honourable in all his transactions, and incapable of duplicity, meanness, artifice, or servility. His manners in the domestic circle were gentle, and even playful; he gave to those about him a large portion of what his heart really abounded with—tenderness and affection; and on his part he was tenderly beloved by his children and by all the members of his family. In public, and more especially to his patients, his manners were coarse, capricious, churlish, and sometimes even brutal. It would not be difficult to account for this anomaly were there any use in pursuing the investigation: his conduct in this respect merits unqualified censure. If but one-half of the stories that are told of him be true, the feelings they should excite are disgust and indignation. Without doubt it is the interest of every patient to state his case to his medical adviser in as few and plain words as possible, and then to listen without interruption to the counsel that is given him; but no one knew better than Mr. Abernethy how utterly ignorant even the educated classes are of the structure and functions of the animal economy, and how completely they have been excluded from the means of obtaining any information on these subjects. No one knew better than he that in the cases in which he was consulted there was often real suffering, though there might be exaggerated statement and unreasonable complaint; that suffering is not the less suffering because it is self-inflicted, and that it is bitter indeed when the very person from whom solace is sought treats it with derision and reproach. To listen to the interminable details of a bewildered and possibly a selfish hypochondriac may, indeed, be a 'trial of temper;' but the deportment of the medical practitioner, even towards such an hypochondriac who applies to him for guidance and aid, ought to be under the control of principle, rather than of feeling. Whatever be the folly of a patient, it can never forfeit his claim to humanity,—of which the physician, from the knowledge which his profession gives him of the weakness, infirmity, and suffering of human nature, ought to be more observant than any other human being.—[For a list of the various Tracts published by Mr. Abernethy, see Watt's *Bibliotheca Britannica*. A collected edition of his surgical works appeared in 1815, in 2 vols. 8vo.]

ABERRATION (of Light), an astronomical phenomenon, being an apparent alteration in the place of a star, arising from the combined motion of the spectator, and of the light which brings the impression of the star to his eye. We should, however, premise, in order that the reader may not form too large a notion of aberration, that it is never so much as 21″, that is, the apparent place of the star differs from its real place less than the *ninetieth* part of the apparent diameter of the sun. It is no wonder, therefore, that practical astronomy was considerably advanced before this discovery was made. If our sense of vision were perfect, or if light moved no faster than a rain-drop, we should have *terrestrial aberration*, that is, objects would change their relative places when we began to move, and if we went as fast as a ray of light moved, the utmost confusion would be the consequence. When we ride in a carriage, into which the rain is beating, we mistake the direction of the rain: for the cause of which phenomenon, see Apparent Motion. But as light moves with a velocity which imagination cannot conceive, about 200,000 miles in a second, its motion is so great compared with any we can give ourselves, that its passage from any one terrestrial object to another may be considered as instantaneous. The motion of a spectator on the earth which goes round the sun at the average rate of about eighteen miles in one second, though less than the ten thousandth part of that of light, is nevertheless sufficient to cause a small variation in the place of the star, perceptible by good astronomical instruments.

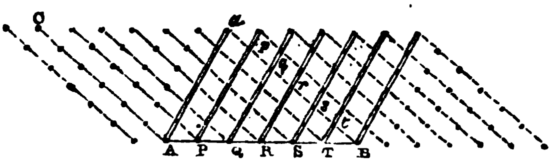
We know (see Apparent Motion) that if a body A be struck in two different directions at the same instant, with impulses which would separately carry it through AB and AC in one second of time, the result of the combined impulses is, that it moves in one second through AD, the diagonal of the parallelogram, whose sides are AB and AC. Again, if the spectator and the object at which he is looking are both in motion, the appearances presented by the motion will be preserved, if we render the spectator stationary, provided we give to the object a velocity equal and contrary to that which the spectator *had*, in addition to its own. Hence, if the spectator move from P to Q in one second, while in the same time the object moves from A to C, and if AB be equal to PQ, the spectator, who does not perceive his own motion, will imagine that the object moves through AD in one second, he himself remaining at P. Hence, if rays of light move parallel to AC, and he can distinguish them, they will appear to him to move parallel to AD. Though he cannot see the light itself, he will mistake the direction of the object from which it comes; and if asked to point it out, will place his finger in the direction PN instead of PM. The following illustration will place this in a clearer light.

Fig. 1.



Let us suppose the rays to move so slowly, that a spectator can be furnished with a tube long enough for light to take some perceptible time in passing from one end of it to the other. This will do for our purpose, since, though by such a supposition the aberration will be very much increased, yet the effect, and the reason of it, will be of the same kind as if light were supposed to have its real velocity. The star being at an immense distance, the rays which reach the spectator in different parts of the second may be called parallel, without sensible error. Thus, while in one second the spectator moves from A to B, he receives rays of light in the direction indicated by the dotted lines. The question now is, in what direction must he hold the tube, so as to see the star through it? If he were at rest, that direction would evidently be AC.

Fig. 2.



Let AB be the line described by the spectator in one second, during which time let a ray of light move from a to B, or from C to A. Join Aa, and let Aa be the length and direction of the tube. Divide the second into any number of equal parts, say six, and carry the tube into the various positions which it will successively occupy. Consider a ray of light as a succession of little particles moving one after another in a straight line. Then when the eye has come to P, the particle a will have come to p; when the eye is at Q, the particle will be at q, and so on. We have then so placed the tube, that its motion will not interfere with that of the ray, which moves as freely in the moving tube as it would do if there were no tube. To the spectator, who does not perceive his own motion, the tube is stationary, and the ray of light appears to come down it; therefore Aa will be the direction in which he sees the star, instead of AC. The angle CAa, contained between the real and apparent directions, is what is called the *aberration*. Here aA is the diagonal of the parallelogram BaCA, in which aC is equal and opposite to AB, as before noticed. To apply this, we must remark,—

1. That the above figure is much distorted, since AB is not the ten thousandth of aB; whence the aberration will be very small.

2. That the aberration is in the plane passing through AB, the line of the earth's course for the moment, and through the real direction AC of the star; whence, as the earth changes the direction of its motion in going round the sun, the direction of the aberration will also change.

3. That we have committed an error in supposing the lines AC and Ba to be parallel, since they meet at the star; which error, on account of the star's enormous distance, will be imperceptible.

4. That AB is not properly the spectator's motion round the sun only, but compounded of that and his motion round the earth's axis; the latter, however, being at most not one-third of a mile in a second, while the former is eighteen miles per second, does not produce any sensible aberration.

5. The real direction AC of the light may be considered as the same at every part of the earth's orbit, on account of the distance of the star.

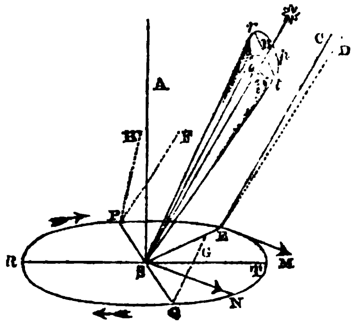
6. The aberration always throws the star apparently nearer to the earth's course, that is, Aa is always within the angle CAB.

7. The aberration is greater or less according as the angle CAB is nearer to, or further from, a right angle, and is greatest when CAB is a right angle. This result may readily be proved by those who understand trigonometry, if they recollect that AB and aA are given, being the velocity of the earth and the *apparent* velocity of light, and that

$$\sin \mathrm{A}a\mathrm{B}, \text{ or } \sin \mathrm{CA}a = \frac{\mathrm{AB}}{a\mathrm{A}} \sin a\mathrm{BA} = \frac{\mathrm{AB}}{a\mathrm{A}} \sin \mathrm{CAB}.$$

Let us suppose, which will be exact enough for our purpose, that the earth moves in a circle (the ecliptic), of which the sun is in the centre. The line SA, perpendicular to the plane of the ecliptic, looks towards the *pole* of the ecliptic. Let SB be the direction of a star, PSQ perpendicular in the plane of the ecliptic to SB, and RST perpendicular to PSQ in the same plane. When the earth is at E, it is moving in the direction EM perpendicular to SE, and the star, from its great distance, is in the direction EC parallel to SB.

Fig. 3.



Hence the aberration takes place in the plane CEM, that is, the star is a little lowered towards EM, and appears in the direction ED. Let the needle SN move round the circle with the earth, so as always to indicate the direction in which the earth is moving, that is, SN is always parallel to EM, and perpendicular to SE. The plane BSN being parallel to the plane CEM, is the plane in which aberration would appear to take place if the spectator were at S, and S was moving; but as the spectator does not perceive his own motion, let us suppose him placed at S, and the same aberration to take place in the plane BSN, which really does take place in CEM. By what has been said, the aberration is greatest when the needle points to Q or P, that is, when the earth is at T or R; and least, when the needle points to T or R, that is, when the earth is at P or Q; because the angle BSN is a right angle when N is at P or Q, and differs most from a right angle when N is at T or R. Hence the aberration increases as the earth moves from P to T, diminishes from T to Q, increases from Q to R, and decreases again from R to P. The line in which the star appears, moves round SB in the course of a year, and describes a cone, while the star appears to describe a small oval or ellipse about B, the greater axis of which is parallel to PQ, and the lesser to RT; such as *prqt*, in which *p* is the apparent place when the earth is at P, and so on. This deviation is completed in the course of a year.

When the star itself is in the pole of the ecliptic, or is seen in the direction SA, the angle ASN is always a right angle, the aberration is always of the same magnitude, and the apparent path of the star is a circle. As we take stars in which SB is more inclined to the ecliptic, the oval becomes flattened in proportion to its length, so that when the star is in the ecliptic, it appears to vibrate backwards and forwards in a straight line, going and returning once in each year.

If the star be on the solsticial colure, the points P and Q will be the equinoxes, and R and M the solstices. The aberration will consequently be greatest at the solstices, and least at the equinoxes. We shall refer to this case presently.

The stars appear to us to lie on a large sphere, of which we are at the centre. [See APPARENT MOTION, SPHERE.] We may represent the phenomenon on a common globe by drawing a small ellipse or oval round the star, the major axis of which is parallel to the ecliptic, and the figure of which is more or less flattened as the star is nearer to, or further from, the ecliptic. The major axis will always be an arc of 41″, and the minor axis will be 41″ multiplied by the *sine* of BSM or the star's latitude.

Previously to entering upon the quantity of aberration, we shall give some account of the discovery, which is one of the most remarkable in the history of science. The arguments for the motion of the earth, though tolerably conclusive, were yet principally derived from the great simplicity of this hypothesis in comparison with others, since all the phenomena then observed could be equally well explained upon the supposition, that the other planets moved round the sun, at the same time that the sun moved round the earth. It remained, therefore, to find some *experimentum crucis*, some phenomenon, which admitted of no *other* explanation except what could be derived from the earth's motion. The first idea which suggested itself to astronomers was, that if the earth really moved, the stars would appear to change their places; though they did not count much upon this, since they knew that the distance of the stars might be so great, that the whole diameter of the earth's orbit would be too small a change of position to cause any perceptible change of place. [See PARALLAX.] To illustrate this, suppose that when the earth is at Q, we look at the star in the direction QG, and when it is at P, in the direction PF. Draw PH parallel to QG. The spectator, who imagines himself at rest, will, if he observes the star at these two epochs, see a difference of position corresponding to the angle HPF, at least if the distance of the star be not so great as to render that angle imperceptible to his instruments. This, however, will take place in the plane passing through the star and PQ, whereas the effect of aberration takes place in a plane perpendicular to that plane. Picard, Hook, and Flamsteed had all observed slight changes in the position of the stars; but seeing that they were in a direction different from that which would have been caused by the earth's motion only, they do not appear to have advanced any other explanation. In 1725, Bradley, Savilian Professor of Astronomy at Oxford, and afterwards Astronomer Royal, and Molyneux, the son of Locke's well-known friend of that name, set about this question conjointly. The most correct instrument for measuring very small angles was, at that time, the zenith sector [see ZENITH SECTOR], and a very large one, having a telescope twenty-four feet long, made by Graham, one of the most celebrated artists this country has produced, was erected at Kew, under the directions of Molyneux. A zenith sector measures the angular distance from the zenith, at which a star passes the meridian, the zenith being determined by a plumb line. The instrument having a very small range, the star must not be far from the zenith, and the one chosen on this occasion was γ Draconis, which happens to be within about 16° of the pole of the ecliptic, and passes very near the zenith of London. This star will, from the preceding account of aberration, appear to describe nearly a small circle about the place it would have if the earth had no motion, which is called its *mean place*. In the maps of the stars, published by the Society, the little circle, which represents γ Draconis, will do well enough to give an idea of the path which it describes every year. By measuring the star's zenith distance when on the meridian, its *polar* distance was also measured, since the zenith and pole are both points of the meridian, distant from one another by the *colatitude* of the place. [See COMPLEMENT.] That is, by adding the difference between 90° and the latitude of Kew to the meridional zenith distance of the star at that place, we obtain its polar distance. In *fig.* 4, S represents the mean place of the star, and *vsaw* the small ellipse, nearly a circle, described by the star in one year. The reader must imagine this circle placed in the heavens, and the line PS bent over his head, so that Z is his zenith and P the pole. We must now show how to find the points of the ellipse *vsaw*, answering to the four principal periods of the year—namely, the solstices and equinoxes. Referring back to *fig.* 3, in which we finally placed the spectator at S, the sun will appear to describe the circle which the earth really describes; that is, as the earth moves from Q to R, the sun will appear to move from P to T. Hence, when the earth is at Q, the aberration, throwing the apparent place of the star towards SR, 90° *before* the earth, throws it also towards a line 90° *behind* the sun's *apparent* place. Let E, *fig.* 5, be the earth, W V S A the apparent course of the sun or the ecliptic, EP the axis of the earth, A M V N the equator; whence, if the sun move in the direction indicated by the arrows, V is the vernal equinox, S the summer solstice, A the autumnal equinox, and W the winter solstice. The circle which bounds the whole figure is the *solsticial colure*, and as the star γ Draconis is very nearly on that colure, we will suppose it to be at S. Let Z be the spectator's zenith, that is, let him be on such a part of the earth that the plumb line falls in the direction ZE, the point Z will, by the motion of the earth, be carried round the dotted circle. The meridian is the moving circle passing through P and Z, and as the figure stands, the real star and the pole of the ecliptic are on the meridian. First, let the time be the vernal equinox, or let the sun appear at V; then the point W being 90° behind V, the star will appear to be thrown towards W, and its apparent place is *v*. Similarly, *s*, *a*, and *w* are the apparent places corresponding to S, A, and W, the dotted part of the ellipse being supposed to be bent over on the other side of the sphere. *Fig.* 4 is taken from *fig.* 5, and is the course of the star, as it will appear to the spectator at E, SQP being bent, so that Z is over his head, and P behind him. Let us now suppose him in the situation of Bradley, with an instrument capable only of measuring changes in the polar distance, the time being the winter solstice. As the star appears to move from *w* to *v*, which takes place between this and the vernal equinox, the polar distance will increase from day to day: after the vernal equinox it will decrease, and continue to do so until the autumnal equinox; after which, it will increase again till the winter solstice. This is precisely the phenomenon observed by Bradley, who at first suspected that it arose from some irregularity in the instrument, or deviation of the plumb line, and afterwards from some *nutation*, or conical motion of the earth's axis. These, however, he found would not account for the phenomenon. After setting up another instrument, and trying several other stars, it struck him, by what steps he has not told us, that the motion of light,

Fig. 4.

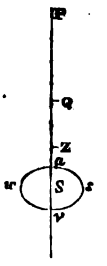
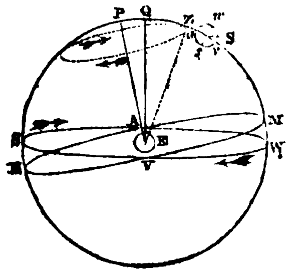


Fig. 5.

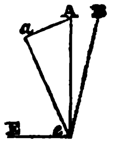


which had been previously discovered by observation of Jupiter's satellites, must, when combined with that of the earth, produce some variation in the apparent place of a star. Following up this idea, he found that it was fully sufficient to account for the deviation he had observed. We have previously explained why the idea of a parallax or change of place in a star, arising from the earth's change of place, did not withdraw his attention for a moment, though the hope of proving the sensible existence of such an irregularity was the primary motive of his observations.

The greatest aberration, as we have observed, is parallel to the ecliptic, and is the greatest semidiameter of the apparent annual ellipse of a star. This ought to be the same for all stars, if the rays which come from them move with the same velocity. Hitherto it has not been discovered that the greatest aberrations of different stars differ by more than may reasonably be imputed to instrumental errors; we must therefore conclude that, as far as we know, the light of every star moves with the same velocity. Bradley made the greatest aberration 20″; others have deduced different values, varying from $20\frac{1}{4}''$ to $20\frac{7}{18}''$, but the result which appears most entitled to confidence, is that deduced by Mr. Richardson, Assistant Observer at the Royal Observatory, Greenwich, from more than four thousand observations, for which he received the gold medal of the Astronomical Society. He makes the aberration to be extremely near to $20\frac{1}{2}''$; which result is the more entitled to confidence, as it does not differ more than one-tenth of a second from the mean of all the results previously obtained.

It is well known that solar light is composed of several colours, which admit of separation from one another. The light of the stars is also compounded of several colours; for though different tinges predominate in different stars, no one gives a perfectly pure colour. The phenomenon of aberration proves that these different lights move with the same velocity; for two lights, moving with different velocities from the same star, would give different quantities of aberration; that is, would make differently coloured images of the star in different places, that image being nearest to the real place of the star, the colour of which moves with the greatest velocity. But as no indication of such an appearance is observable in the very best telescopes, we are, therefore, bound to conclude, that all the different coloured light of which white light is composed, moves with the same velocity. For the determination of the velocity of light from the aberration, see the article LIGHT.

We have hitherto considered only the case of a star which has no motion of its own; let us now take that of a planet, comet, or the moon, which moves while the earth moves. Let the planet move from A to *a*, and the earth from E to *e*, in the time which it takes the light to move from the planet to the earth. Then, by what has been said, the earth at *e* receives the ray A*e*, which is imagined to be in the direction B*e*; and if the planet had remained fixed at A, A*e*B would have been the aberration, or the angle contained between its true and its apparent direction. But in the meanwhile the planet has moved to *a*, and if light were transmitted instantaneously, would appear in the direction *ea*. Hence *ae*B is the aberration: that is, to the former angle, the planet's motion round *e*, during the passage of the light, must be added or subtracted, according as the earth and planet move in the contrary or same directions. The greatest aberration of Mercury is nearly one minute; that of the moon only two-thirds of a second. To the sun, which has no motion of its own, the rule for a star in the ecliptic may be applied; recollecting, however, that as a line drawn from the sun to the earth is always at right angles, or very nearly so, to the direction of the earth's motion, the aberration is always at its greatest value, or nearly so, and is nearly $20\frac{1}{2}''$.



In the preceding account we have omitted two circumstances, which would only have perplexed the reader: firstly, every star changes its place on account of the precession of the equinoxes. [See PRECESSION.] This was known to Bradley, who was, therefore, obliged to allow for this change, before he could pretend to assign that arising from any other phenomenon; secondly, the motion of the earth not being perfectly circular, but slightly elliptical, the quantity of aberration must be a little modified on that account. The effect of this will be seen in the article REDUCTION.

ABERRATION, in Optics. The most perfect mirror, or lens, which could be made, would be one in which all the rays which come from one point should be reflected or refracted to another point. Owing to the practical difficulties in the way of forming such a mirror or lens, the spherical form is adopted, of which it can only be said, that instead of returning to a point all the rays coming from a point, it condenses so many of them near a particular point, that an apparent image is formed at that point. The point near which most rays are collected is called the focus, and the distance at which a ray cuts any line passing through the focus is called its aberration with respect to that line. For a discussion of this subject, see LENS. Again, when light is refracted through any transparent medium, its different colours have different foci; for the cause and phenomena of which see ACHROMATIC. The aberrations arising from these two causes are generally known by the names of *spherical aberration* and *chromatic aberration*.

ABERYSTWITH, a town on the coast of Cardiganshire, in South Wales, near the outlet of the joint streams of the Ystwith and Rheidiol, over the latter of which rivers, above their junction, is a neat stone bridge. It was formerly defended by walls and by a castle, but these are now in ruins. The streets are narrow and steep, and the houses covered with the black slate of the country. It is a busy place; and in addition to its commerce, and its fisheries of cod, whiting, herring, and mackarel, some woollen manufactures are carried on, and small vessels built. Its exports are woollen goods, calamine, lead ore, and pig lead; its imports, coal, iron, and the articles of ordinary consumption. It has also become a place of great resort for sea-bathing. The harbour has been much improved, and admits vessels of 500 tons burden. In 1829, 120 vessels belonged to the port, with an aggregate tonnage of 6423; the amount is now doubled. Charles I. established a mint here for coining silver, chiefly for the payment of the neighbouring miners: the money was stamped on both sides with the feathers, to show that it was coined in Wales. It has a national school. Population in 1851, 5231. Aberystwith, in conjunction with Cardigan, Lampeter, and Adpar, returns one member to Parliament. Aberystwith is 39 miles N. E. of Cardigan, and 208 W.N.W. of London. Lat. 52° 24′ N., long. 4° 5′ W.

ABETTOR. The etymology of this word is somewhat uncertain; it may be derived from the Saxon *betan*, to push forward, or incite. An abettor is an instigator or setter on—one that procures another to commit a crime. If an abettor, or, as he is then usually termed, aider and abettor, be present at the time of committing the crime, he is treated as a principal; if absent, he becomes an accessary before the fact. [See ACCESSARIES.] It is to be observed, that the presence spoken of is not necessarily an actual presence within sight or hearing of the fact, for there are circumstances of connexion with the principal actor which the law will construe into a presence, although, in fact, the party may have been absent, as in the case where one man commits a robbery or murder, while another keeps watch or guard at some convenient distance. Here the keeping watch is such a direct assistance in the commission of the crime as will amount to a *constructive* presence.

Aiders and abettors are distinguished from the absolute perpetrators of a crime by being denominated principals in the second degree, whilst the latter are called principals in the first degree. Formerly, the punishment of principals in the two degrees was, in most cases, different; but now, by the statute 7 and 8 George IV., cap. 29, principals in the first and second degrees, and accessaries before the fact, are all made liable to the same punishment.

ABEYANCE is a legal term derived from the French *bayer*, to expect. It is used with reference to a freehold or an inheritance; and the expression that the freehold or inheritance is in abeyance, imports that such freehold or inheritance is not vested in any one, but is in expectation and suspense, ready to descend upon, and vest in the parties (if any such there be), who shall first fill the character required by the particular quality of the estate. This suspense of the freehold or inheritance, especially of the former, is so repugnant to the general principles of the laws which regulate the tenure of land in England, that it is not allowed except where it is unavoidable. By the old law of this country, it was always necessary that some person should be in existence, as the representative of the fee or freehold for the discharge of the feudal duties, and to answer the actions which might be brought for the fief; and by this means the maxim arose that the freehold of lands could never be in abeyance, as to this day it is the rule of the Scotch law that the fee must be *full*. Still, in the case of glebe lands belonging to parsons, and of lands held by bishops and other corporations sole, the *inheritance* is, and must always be, in abeyance, as no one can, under any circumstances, be entitled to more than an estate for life in these lands; and during a vacancy of the church, the freehold is in abeyance; for no parson being actually appointed, it cannot possibly reside in any one, nor can the freehold be in the patron, who, though he possesses a right to present to the benefice, has no direct interest in the land annexed to it.

In this case, the law acknowledges a necessity that the freehold or inheritance should for a time be in suspense or in abeyance, but such an abeyance is always discouraged as much as possible, and is never permitted by the law to be *created* by the voluntary acts of parties. Therefore if a man grant land in such a manner that the *freehold* would, if the deed were allowed to operate, be in abeyance, the law comes forward and declares the deed granting such an estate to be void; and if the grant be so framed that the *inheritance* would be in abeyance, the law declares that the inheritance shall remain in the person making the conveyance. The object of this rule of law is to prevent the possibility of the freehold subsisting for a time without an owner, an evil which it guards against with the greatest vigilance; and therefore, if, as in the case last put, land is so granted that by possibility upon the death of one person there may be no one otherwise entitled to take immediate possession, the law appoints the grantor to supply the gap, if any should occur; and though he had, as he considered and intended, parted with all his interest, another rule of law, which will be more fully considered in treating of *contingent remainders*, then steps in and gives him the land for ever. Titles of Honour are also sometimes said to be in abeyance, as where the persons next in inheritance, to the last possessor, are several females, or co-parceners. In this case the title is not extinct but is in abeyance; and may be revived at any time at the nomination of the king, who by his prerogative is said to be the fountain of honours and dignities. Several instances of the exercise of this prerogative are on record both in ancient and modern times. [See 'Coke upon Littleton' 165, *a* notes 16, 17.]

ABIB, the first month of the Hebrew year, now more generally known by the Chaldee name Nisan. This month is first mentioned by name in Exodus xiii. 4. 'This day came ye out in the month of Abib;' and in the second verse of the preceding chapter it is appointed to be the beginning of the year.

On the 14th of this month, in the evening, the great festival of the Passover commences, according to the precept in Exodus xii. 18. 'In the first month, on the fourteenth day of the month, at even, ye shall eat unleavened bread,' &c. At sunset the paschal lamb is killed, the use of unleavened bread begins, and all servile labour ceases. A sheaf of barley was gathered on the evening of the 15th, and offered up on the 16th as the first fruits of the harvest. The reaping commences the next day. The eating of unleavened bread finishes on the 21st.

In the calendar of the modern Jews, Abib is no longer the beginning of the year, its place being usurped by Tisri, which was anciently the seventh month. Abib contains thirty days, and must not begin on Monday, Wednesday, or Friday. In those cases where the beginning would fall regularly on one of those days, the occurrence is obviated by adding or taking away a day of the preceding year.

The fast of the death of Joshua is celebrated on the 26th day of the month, unless it should happen to be Sabbath. when the fast is postponed to the day following, or Sunday.

This month begins on the first appearance of the new moon nearest the vernal equinox, or the 21st of March. The 1st of Abib, in 1854, fell on the 30th of March, the change of the moon occurring on Tuesday the 28th.

The word Abib signifies 'an ear of corn;' and the month, without doubt, received its name from the season in which it occurred, as the corn was then in ear in Egypt and Palestine.

Abib is the name given by the modern Coptic Christians to their month which begins on the 25th of June. The Coptic name is Epip.

ABIES (from the Latin, *abies*, a fir-tree), a genus of coniferous or cone-bearing trees, well known for the valuable timber they produce. It was formerly considered a part of the genus Pinus itself; but modern botanists have followed the popular practice, and have distinguished it. The origin of the English appellation is the Saxon *furh-wudu*, firwood.

GENERIC CHARACTER.

Flowers monœcious.[*]

MALES. *Catkins* simple, solitary, terminal, or axillary. *Stamens* obtuse, and often callous at the apex, terminated by a jagged membrane.

FEMALES. *Catkins* somewhat cylindrical; their *scales* two-flowered, imbricated, and having frequently at their base externally a *bractea*, which is either very short or lengthened beyond the scales themselves, and terminated by a taper point.

CONES more or less cylindrical; the *scales* imbricated and woody, but not thickened at the extremity; *seeds* ending in a membranous wing.

Embryo about the length of the seed, with several closely-packed cotyledons.

Trees of various sizes, usually with a straight, conical, undivided trunk, from which proceed spreading, horizontal, or drooping branches, arranged in a pyramidal manner. *Leaves* either solitary, or collected in little fascicles, deciduous or evergreen.

From Pinus, or the pine-tree, the fir is obviously distinguished by its more pyramidal form, and by its leaves arising singly from around the stem, not by twos, or threes, or a greater number, from out of a membranous shrivelling sheath, as well as by the characters in the fructification above described. Its species form four very natural tribes, of the first of which, the silver fir may be taken as the representative; of the second, the Norway spruce; of the third, the larch; and of the fourth, the cedar of Lebanon. As most of these are interesting either for the excellence of their wood or as objects of ornament, we shall briefly notice all that are at present known. Those who wish for further information should consult *Mr. Lambert's Monograph of the Genus Pinus*—*L. C. Richard's Mémoire sur les Conifères*—*Michaux's Histoire des Arbres Forestiers de l'Amérique Septentrionale, &c.*

SECT. I. Leaves growing singly round the branches, and all turned towards one side.—SILVERS.

[Silver Fir.]

No. 1. *Abies Picea*, the Silver Fir (Abies pectinata, *De Candolle Fl. Franç.*, ii. 275; Pinus Picea, *Linnæus Sp. pl.* 1420; *Lambert*, t. 40). Leaves arranged like the teeth of a comb somewhat emarginate, of a whitish colour underneath. Cones erect, with very blunt closely-pressed scales, which are much shorter than the taper-pointed inflexed bracteæ. A native of the mountains of the middle and south of Europe, in stony, dry, exposed situations. Its favourite district seems to be on the Pollino and in the forest of Rubia, in the kingdom of Naples, where it is found in all its grandeur, often growing from 130 to 150 feet in height, and richly meriting the name *pulcherrima* (most beautiful), applied to it by Virgil. This tree is readily known by its leaves having their points all turned towards the sky, and being mealy underneath, as well as by its long, erect, stalkless cones, of a greenish-purple colour, bristling with reflexed taper points of the bracteæ that subtend the scales. It is the *sapin* of the French. Planks of indifferent quality, on account of their softness, are sawn from its trunk, which also yields Burgundy pitch and Strasburgh turpentine. For its successful cultivation in this country it requires strong land, such as will suit the oak, and a sheltered situation; it will then become a very large tree. From a communication to Mr. Lambert, it appears that trees have been felled which, at 100 years of age, contained six loads, or 240 cubic feet, of timber. It is said by some to grow slowly for the first fifteen years, but afterwards with great rapidity. A plant in Woburn Park is recorded to have grown for 110 years at the rate of one foot in height and nearly three and a half cubic feet per annum. Its trunk sometimes arrives at 150 feet in height, and six feet in diameter.

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[*] In the article ABIES, and in subsequent articles of a similar description, it will be necessary to use some technical words which may present a difficulty to the reader who is unacquainted with the terms of Botany. As few of such words as possible will be employed; and a complete Glossary of them will be given under the article BOTANY.

Antiquarians, not considering that this plant is the real *abies pulcherrima* of Virgil, and of the Roman authors, have erred in attempting to reconcile the declaration of Cæsar (*De Bel. Gal.* v. 12), that he found in Britain all the trees of Gaul, except the beech and abies, with the well-known fact that fir-wood is abundant in our ancient mosses, and has been met with even beneath the foundations of Roman roads. What Cæsar meant was, no doubt, that he did not meet with the silver fir in Britain; of the pine he says nothing, and therefore it is to be presumed that he found it.

No. 2. *Abies Sibirica*, the Siberian Silver Fir (Pinus Sibirica *and* Pinus Pichta *of the gardens*). Scarcely anything certain has been published of this tree, which, according to Linnæus, Mr. Lambert, and others, is the same as the Abies picea, our No. 1, but which Russian botanists distinguish as a particular species. Gmelin describes it as a native of all parts of Siberia as far as 58° N. lat. in mountainous regions, especially in the upper country lying between the Irtisch and the Ob, where it forms dense woods. The Russians call it *pichta*, or *fir*.

No. 3. *Abies grandis*, Great Californian Fir (Pinus grandis, *Douglas* and *Lambert*). Leaves long, narrow, very blunt, whitish beneath, all turned one way. Cones oblong, erect, rather curved, with very broad, uneven, downy scales, which are longer than the bracteæ.—Found, by Mr. Douglas, in low, moist valleys in northern California, where it attains the height of 200 feet. The wood is soft, white, and of inferior quality. Cones from three to four inches long; bracteæ very short, jagged, two-lobed, with a short intermediate point.

No. 4. *Abies Balsamea*, the Balm of Gilead Fir (Abies Balsamifera, *Michaux*, *Hist.*, vol. i. p. 145, tab. 14; Pinus Balsamea, *Lambert*, t. 41). Leaves flat, silvery-white beneath, either emarginate or entire at the point, all curved towards the upper side. Cones cylindrical, oblong, erect, purple, with rounded, even, undivided scales.—Found, along with *Abies nigra* and *alba*, in the coldest parts of North America, but always in detached individuals, never in large masses. It extends also along the ridge of the Alleghanies as far as the crests of the mountains of North Carolina. It forms a small slender tree, rarely more than forty feet high, with a diameter of from twelve to fifteen inches. The cones are four or five inches long, and about an inch in diameter. Its wood is light, of a pale yellow colour, and but slightly resinous; it is of little value, and is chiefly split up into staves for fish-barrels, for which, however, it is less fit than the Weymouth pine and the red variety of the black spruce fir. The English name has been given in consequence of a resemblance between the clear, transparent greenish-yellow turpentine, which is obtained from numerous cysts in its bark, and the Balm of Gilead of the shops; it is commonly known under the name of *Canadian balsam*. In England this is a small tree of very ornamental appearance, when young, on the skirts of plantations, but it rarely acquires any considerable size. It was introduced into this country in the year 1696.

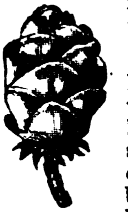
No. 5. *Abies nobilis*, Large-bracted Fir (Pinus nobilis, *Douglas* and *Lambert*). Leaves very numerous, falcate, all turned one way, of nearly the same colour on both sides. Cones oblong, erect, with rounded broad scales concealed by the long wedge-shaped two-lobed jagged scales, which are bent back, and terminate abruptly in a rigid elongated point. A majestic tree, forming vast forests upon the mountains of northern California, where it was found by Mr. Douglas. The timber is said to be of excellent quality. The cones are about six inches long.

No. 6. *Abies Frazeri*, the Double Balsam Fir (Pinus Frazeri, *Pursh*, *Flor. Amer. Sept.*, 2639; *Lamb.*, vol. i., t. 42). 'Leaves linear, emarginate, silvery-white beneath. Cones oblong, squarrose. Bracteæ somewhat leafy, inversely cordate, mucronate, reflexed.' *Lambert*.—A native of the mountains of Carolina and Pennsylvania. Pursh is the only botanist who appears to have seen this species in its native situations. According to Mr. Lambert it is little more than a shrub, seldom exceeding ten feet, and more frequently, at least in this country, much under that height. That botanist considers it well suited for lawns and pleasure grounds in situations where it is wanted to break particular lines, but not to interrupt the view. A fine specimen exists in the nursery of Mr. Lee, at Hammersmith.

No. 7. *Abies Webbiana*, Webb's Fir (Pinus Webbiana, *Wallich. Cat.*; *Lambert*, t. 44; Pinus spectabilis, *Lambert*). Leaves linear, solitary, flat, all-spreading, and turned one way, silvery-white beneath, with a deep notch at the extremity. Cones oblong, erect, obtuse, with very broad, rounded, even scales. According to the account of Captain Webb, who first discovered it, this remarkable species attains the height of eighty or ninety feet, with a diameter near the ground of three or four feet. Its wood seems to be valuable; in India it is used by plane-makers. From what has been reported of its general appearance, it is probably one of the most interesting species that has yet been discovered. Inhabiting the colder regions of northern India, and found among a flora that is more Siberian in its character than Indian, there can be no reasonable doubt of its being well able to withstand the rigor of the winters of this country. Plants that have been introduced into England have in several instances produced cones, and these are of a purple colour; but the trees are not so hardy as the common silver fir (*Abies picea*). They are, however, like the Norway spruce, and many others, not adapted to bear frost after they have once begun to grow. High and dry stations, where the late frosts of spring are little felt, would, it is to be presumed, be the most eligible for experiments upon its naturalization. The natives call it *oumur*, and extract an indigo or purple pigment from the cones, which are represented in Indian drawings as strikingly beautiful.

No. 8. *Abies Canadensis*, the Hemlock Spruce Fir (*Michaux*, *Histoire*, vol. i., p. 137, t. 13; Pinus Canadensis, *Lambert*, t. 45). Leaves flat, arranged irregularly in two rows; when young, downy as well as the young slender branches. Cones very small, ovate, sharp pointed, with rather acute, even, entire scales: seeds very small.—The most northerly situation in which this tree is found is about Hudson's Bay, in lat. 51°. Near Quebec it forms extensive forests; in Nova Scotia, New Brunswick, Vermont, and the upper part of New Hampshire, it is extremely common; but in the middle and southern states it is confined to the Alleghanies and their dependent ridges, where it inhabits the sides of torrents and the bleakest situations. It is a noble species, rising to the height of seventy or eighty feet, and measuring from two to three feet in diameter. It appears to be of slow growth, not arriving at its full dimensions in less than 200 years. When from twenty-five to thirty feet high its form is exceedingly elegant, but when old its huge limbs are apt to be rent and broken by winds and snow; and their naked stumps sticking out beyond the young and verdant foliage, give the trees an air of decrepitude and decay. The wood is of little value, being neither sound nor durable: it is chiefly employed for the manufacture of laths and for coarse in-door work. The bark is exceedingly valuable for tanning; mixed with oak-bark, it is said to be much better than oak-bark alone. It bears clipping well, and is therefore adapted, like the yew, to the construction of live-fences. A great deal of the essence of spruce is extracted from its shoots.

No. 9. *Abies Brunoniana*, the Deciduous Silver Fir (Pinus Brunoniana, *Wallich. Plant. As. rarior.* vol. iii. p. 24, tab. 247; P. dumosa, *Lambert*, t. 46). Leaves flat, all turned one way, serrulate towards the points, covered beneath with a milk-white bloom. Cones terminal, erect, ovate, blunt, very small, with lax, ovate, very blunt scales.—Found in the northern parts of India in the provinces of Nepal, Butan, and Gossain Than, where it is known by the names *tangshing* and *changathasi-dhup*. A tree seventy or eighty feet high, with a clear trunk of from fifteen to twenty feet, and a spreading, very branchy head. Leaves about an inch long, falling off at a very early period, and so exceedingly deciduous, that the slightest shake of the branch is sufficient to detach them; very bright green, and shining. Cone not above an inch long, pale brown, nearly smooth, with several minute scales at its base; the scales ovate and very obtuse, subtended by a short kidney-shaped bractea. Seeds very small. The wood is of bad quality, being liable to warp, on which account it is not employed.



No. 10. *Abies religiosa*, the Sacred Mexican Fir (*Schlecthend. in Linnæa*, v. 77; Pinus religiosa, *Humboldt* and *Kunth*, *Nov. gen. et sp. pl.*, vol. ii. p. 5; *Lambert*, t. 43). Young branches quite smooth. Leaves arranged in two rows, sharp pointed, covered beneath with a glaucous bloom.—Found by Humboldt on the lower hills of Mexico, between Masatla and Chilpantzingo, at an elevation of 4000 feet. Deppe and Schiede found it upon the cold mountains of Orizaba, at the highest limit of arborescent vegetation. It is described as a lofty tree, resembling Abies picea and balsamea, from which it is distinguished by its sharp-pointed leaves. The flowers are unknown. The branches are used for adorning the churches in Mexico. According to Mr. Lambert, the cones are like those of the cedar of Lebanon, but smaller, and almost black. The Mexicans call it *oyamel*. From specimens brought by Mr. Graham from Mexico, we should suppose this to be a very beautiful tree; the leaves are longer, and the branches more slender than those of any other of the Silver tribe.

No. 11. *Abies hirtella*, the Hairy Fir (Pinus hirtella, *Humboldt* and *Kunth*, *Nov. gen. et sp.* pl. ii. p. 5). Young branches covered with hairs. Leaves arranged in two rows, flat, acute, covered with glaucous bloom beneath.—Known only from the incomplete account of Humboldt, who found it on the mountains of Mexico near El Guarda, between Guchilaque and the city of Mexico, growing at an elevation of between 8000 and 9000 feet. He describes it as a small tree, three or four times as high as a man. Its cones and flowers are wholly unknown. The leaves are about an inch and a quarter long.

No. 12. *Abies Smithiana*, the Indian Silver Fir (Pinus Smithiana, *Wallich*. *Plant. As. rarior.*, vol. iii. p. 24, t. 246). Leaves slender, four-cornered, whitish beneath, a little turned towards one side. Cones erect, ovate-oblong, with obovate, rounded, even scales.—A native of the mountains next the Himalayeh, where it is called by the natives *raga*. A tree of enormous size, with nearly opposite branches, covered with short down, and so arranged as to form generally two rows. Leaves dark green, from an inch to an inch and a half in length. Cones from four to six inches long, brown, very even, and covered with a glaucous bloom. Seeds small. This plant is now considered synonymous with the *Pinus khutrow* of Dr. Royle.

[Cone of the Indian Silver Fir.]

SECT. II. Leaves growing singly round the branches, and all spreading equally.—SPRUCES.

No. 1. *Abies excelsa*, the Norway Spruce Fir (*DeCand. Fl. Franç.*, 3.275; Pinus abies, *Linn. sp. pl.* 1421). Leaves scattered, somewhat four-cornered, mucronate. Cones cylindrical, pendulous, with blunt, wavy, slightly-toothed scales.—Native of the mountainous parts of the north of Europe, where it sometimes constitutes, as in Norway, the principal timber. It is found all over Siberia as high as 70° N. lat.; in that region it is considered by the wandering tribes a certain sign of the presence of springs of fresh water, for it is only seen in moist and springy places. On dry soils, it invariably becomes stunted, and produces a great number of cones at an early stage of its growth, then shrivels up and dies. When growing singly in rich soil, separate from other trees, this forms one of the most beautiful objects that can be imagined, with its long, drooping branches touching the very ground, and its regularly pyramidal figure; but in other situations, in plantations where the trees are crowded and deprived of their lower branches by want of light and air, it becomes, after nine or ten years, an inelegant plant of little value, except to be cut for poles. When in perfection, and occasionally it arrives at its greatest perfection in this country, it acquires a stature of 150 feet; its wood is of a white colour, of a fine even grain, and very durable: in the market it is known under the name of white or Christiania deal. In Norway it arrives at maturity in seventy or eighty years. Trees of such an age are what are usually cut down for exportation, and each yields on an average three pieces of timber, eleven or twelve feet long. The spruce is readily known by its leaves of one uniform dull green colour, spread equally round the branches, and by its long pendant cones.

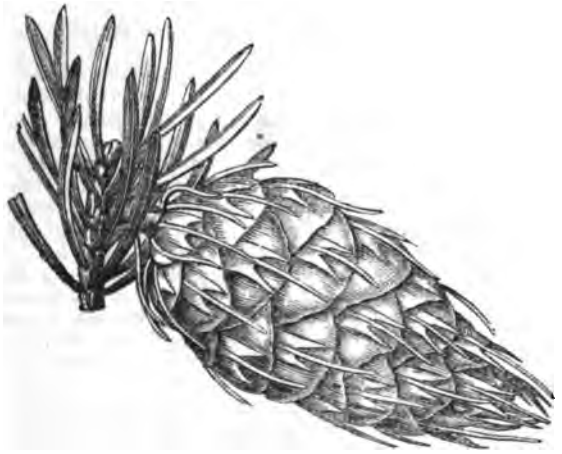
[Norway Spruce Fir.]

No. 2. *Abies orientalis*, the Oriental Fir (Pinus orientalis, *Linn. sp. pl.* 1421; *Lambert*, t. 39). Leaves very short, uniformly imbricated, quadrangular, with a callous point. Cones ovate, cylindrical, pendulous, their scales somewhat rhomboid. To botanists this is known chiefly by a figure published by Mr. Lambert after a drawing by Aubriet, the celebrated draughtsman, who accompanied Tournefort in his journey to the Levant. It was found by that traveller in the mountains south-east of Trebisond, above the convent of St. John. It was subsequently met with by Sir Gore Ouseley in the neighbourhood of Teflis. It is a tall tree, and is now known to be very abundant in the Caucasus, Imeretia, and Upper Mingrelia, constituting whole forests between Guriel and the Ashdar Mountains. Plants have been raised from seeds sent to this country.

No. 3. *Abies alba*, the White Spruce Fir (*Michaux*, *Hist.*, vol. i. p. 136, t. 12; Pinus alba, *Lambert*, t. 36). Leaves rather glaucous, spreading equally round the branches, four-cornered, somewhat pungent. Cones narrow, oval, tapering towards the point, with even, undivided scales. Found along with *Abies nigra* in the colder regions of North America; according to Michaux it does not advance so far to the northward as that species, from which it is known not only by its smaller size, the trunks rarely exceeding forty or fifty feet in height, but also by the bluish cast which characterizes the foliage, and which gives it a much lighter appearance than the sombre *abies nigra:* Dr. Richardson, however, states that it was the most northerly tree observed in Franklin's Polar journey. The timber is of inferior quality. From the fibres of the root, macerated in water, the Canadians prepare the thread with which they sew together the birch-bark that forms their canoes. Its resin is also used to render the seams water-tight. Mr. Lambert appears to have been misinformed as to the essence of spruce being prepared from the branches of this species, which appears on the contrary from the statements of Michaux to be carefully rejected, because its leaves are thought to impart an unpleasant flavour. The bark is said to be occasionally used for tanning. Like all the American spruces introduced into England, it is a short-lived and stunted tree at best, seldom lasting thirty years, or attaining the height of the same number of feet. Several varieties have been described.

No. 4. *Abies nigra*, the Black, or Red, Spruce Fir (*Michaux*, *Hist.*, vol. i. p. 125, t. 11; Pinus nigra *and* rubra, *Lambert Monogr.*, t. 37 and 38). Leaves spreading equally round the stem, short, four-cornered. Cones ovate-oblong, obtuse with ragged rounded scales.—Native of the most inclement regions of North America, especially in swampy situations and in the valleys between ridges of low hills, where the soil is deep black and humid. In such situations are found the finest forests of this species, and there, although the trees are so crowded together as often not to be more than four or five feet apart, the timber arrives at the height of seventy or eighty feet, with a diameter of from fifteen to twenty inches. The firs in the landscapes of northern scenery illustrating Captain Franklin's *Polar Expedition* are of this species, which, however, Dr. Richardson did not observe higher than 65° N. lat. The trunk is remarkable for the perfect regularity with which it diminishes from the base upwards. The head is of a regularly pyramidal figure, the branches spreading almost horizontally, and not inclining towards the earth, as in the Norway spruce. The timber is of great value on account of its strength, lightness, and elasticity. It is employed for the yards of ships; and in America, in districts where the oak is scarce, also for their knees: floors are occasionally laid with it, but it is not well adapted for this usage, as the planks are apt to split. From its young branches is extracted the *essence of spruce*, so well known as a useful antiscorbutic in long voyages; and not from those of the Abies alba, according to Michaux. By some it has been thought that North America produces a red as well as a black spruce, the former being of better quality than the latter; but the researches of Michaux show that what differences exist are due exclusively to the influence of soil, and have no dependence upon specific peculiarities. Michaux's view is still thought incorrect.

According to Mr. Lambert, the curious dwarf spruce, called *Pinus clanbrasiliana*, is probably a variety of abies nigra. It produces no blossoms.



[Cone of Douglas Fir.]

No. 5. *Abies Douglasii*, the Douglas Fir (Pinus taxifolia *Lambert Monogr.*, No. 43; Pinus Douglasii, *Id.* t. 47 and 48). Leaves spreading equally, deep green, whitish beneath, obtuse. Cones cernuous, ovate-oblong, with rather uneven cartilaginous scales, much shorter than the bracteæ, which are three-toothed, the lateral teeth being membranous, with the intermediate ones much longer and more rigid.—According to Mr. Douglas, the discoverer of this gigantic species, it is found in immense forests in North-West America from 43° to 52° N. lat. The trunks vary from two to ten feet in diameter, and from 100 to 180 feet in height. Occasionally it arrives at still greater dimensions; there still exists, near Fort George, on the Colombia River, a stump which, without the bark, and at three feet from the ground, measures forty-eight feet in circumference. An evergreen tree, with an erect, taper trunk, which when old is covered with a rough, rugged bark from six to nine inches thick, abounding in a clear yellow resin, and making excellent fuel. The young branches have their bark filled with receptacles of resin, as in the balm of Gilead. The timber is heavy, firm, of as deep a colour as yew, with very few knots, and not in the least liable to warp. We have a plank now before us, which, after standing some years in a hot room, is as straight, and its grain as compact, as the first day it was planed. The growth is exceedingly rapid; we have seen a branch three inches in diameter which was not more than eight years old. The aspect of the young branches is so deep a green, that they seem as if they were more nearly of the nature of a yew than of a spruce. In the autumn their buds are very prominent and bright brown. The cones are remarkable for the long tridentate bractæ which stick out far beyond the scales themselves.

A considerable number of plants of this important species are now scattered among the parks and woods of this country, some hundreds having been raised and distributed by the Horticultural Society. It appears to suit this climate perfectly, and to be likely to prove more valuable than even the larch itself, being evergreen, and fully as hardy.

No. 6. *Abies Menziesii*, the Menzies Fir (Pinus Menziesii, *Douglas*, *Lambert*). Leaves very short, rigid, rather sharp-pointed, whitish beneath, spreading regularly round the stem, very deciduous. Cones oblong, composed of very lax, ragged retuse, ovate, thin scales, much longer than the narrow, serrated, concealed bracteæ. Buds ovate, acute, covered with resin.—A native of Northern California, where it was found by Mr. Douglas, who describes the wood as being of excellent quality. The cones, which are about three inches long, are extremely different from those of any other species. The branches, deprived of their leaves, are covered with thin, hard, projecting bases, which give them a singularly tuberculated appearance.

Sect. III. Leaves growing in clusters; deciduous.—Larches.

By some botanists this section is considered essentially different from Abies; but the want of any clear, distinctive characters, either in the mode of growth or the organs of fructification, induces us to concur with Linnæus, Jussieu, and Richard, in considering the larch the same genus as the spruce. The leaves of the former are clustered or fasciculated, merely in consequence of the universal non-development of lateral branches; so that the leaves themselves make their appearance without a perceptible central axis. This is proved not only in the cedar of Lebanon, but even in the larch itself, by numerous cases where the branches being less abortive than usual, lengthen enough to display their real nature.

No. 1. *Abies Larix*, the Common Larch Fir (*Rich. Monogr. Conif.* 164, t. 13; Pinus Larix, *Linn. sp. pl.* 1427; Larix Europæa, *De Cand. Fl. Franç.*, 3.277). Leaves clustered, deciduous. Cones ovate-oblong, blunt.—A native of the mountains of the middle of Europe, of Russia, and of Siberia. In the latter country it is the commonest of all trees, delighting in dry, elevated situations, where it forms vast forests, sparingly intermixed with pines. Its trunk grows very erect, with graceful drooping branches, gradually diminishing from the base to the apex, and giving it a regularly pyramidal form. In the spring, when its young leaves have just burst into life, it has a peculiar bright yellowish-green tint, which is possessed by no other tree of our forests. The larch has been now, for many years, extensively cultivated upon barren, exposed land, both in England and Scotland, and it has been found one of the most profitable of all trees to the planter, provided the land be well drained; but it will not succeed in swampy situations. It grows with great rapidity, is subject to very few accidents, transplants with but little risk, and produces timber of great

excellence and value, not only for domestic but for naval purposes. In mountainous districts in Scotland the Duke of Athol has planted it in immense quantities; and it appears, from a report of that nobleman to the Horticultural Society, that in situations 1500 to 1600 feet above the level of the sea, he has felled trees, eighty years old, that have each yielded six loads of the finest timber. Three varieties are mentioned by botanical writers; of these the first is remarkable for the young cones being pale green instead of crimson; the second has a weeping habit: both these are natives of the Tyrol. The third sort is of a slow, stunted growth, and an inelegant appearance, leafing early, and very subject to injury from spring frosts; it was raised by the Duke of Athol from Archangel seeds.

[The Larch.]

From the boiled inner bark, mixed with rye-flour, and afterwards buried for a few hours in the snow, the hardy Siberian hunters prepare a sort of leaven, with which they supply the place of common leaven when the latter is destroyed, as it frequently is, by the intense cold to which hunters are exposed in the pursuit of game.

The bark of the larch is nearly as valuable to the tanner as oak-bark; it also produces the substance called Venice turpentine, which flows in abundance when the lower part of the trunk of old trees is wounded. A sort of manna, called Briançon manna, is exuded from its leaves in the form of a white flocculent substance, which finally becomes concreted into small lumps.

It is believed that this species was the πίτυς of the ancient Greeks. The origin of the more modern word *larix* is uncertain. By some it is derived from the Celtic *lar*, fat, in allusion to its unctuous, inflammable resin; by others from the Welsh *llär*, wide-spreading: it is, however, more likely to have been in some way connected with the word *l'aris*, which appears, from a very curious paper by Mr. Drummond Hay, read many years since to the Horticultural Society, to be the Berber name of a large coniferous tree found in Rif, or Er rif, and in all the higher sierras of Marocco.

No. 2. *Abies microcarpa*, the Red Larch Fir (Pinus microcarpa, *Lambert*, t. 50). Leaves clustered, deciduous. Cones oblong, small; their scales erect, close-pressed, the upper ones much smaller than the lower.—A graceful tree, with much of the habit of the common larch, from which its very small cones, of a bright purple in the summer, readily distinguish it.—A native of North America. This is by no means so well adapted to the planters' purposes as the common larch, growing very much smaller. According to the Duke of Athol, who cultivated this in his arch-plantations in Scotland, trees, when fifty years old, do not contain one-third as many cubic feet as the common larch. The wood is so heavy that it will scarcely swim in water.

No. 3. *Abies pendula*, the **Black Larch Fir (Pinus pendula**, *Lambert*, t. 49). Leaves clustered, deciduous. Cones oblong, with numerous spreading scales, which gradually diminish from the base to the apex of the cones. Branches weak and drooping.—A native of North America, where it is found growing in a rich clay soil, mixed with sand, in cold mountainous districts. When cultivated in this country it is an elegant tree, having a good deal of resemblance to the common larch, but being of a brighter green colour, and much more graceful. The leading shoot will often begin to droop at the height of fifteen or twenty feet from the ground, and, after gradually acquiring a horizontal direction, will bend towards the earth so as to form a natural arch of great beauty. The wood is less valuable than that of the common larch.

SECT. IV. Leaves growing in clusters; evergreen.—CEDARS.

No. 1. *Abies Cedrus*, the Cedar of Lebanon Fir (Pinus Cedrus, *Linnæus*, *Lambert*, t. 51). Leaves clustered, evergreen. Cones oblong, very obtuse, erect, with broad closely-packed scales, which are a little thickened at the margin.—Mount Lebanon and the range of Taurus are the native spots of this most stately and magnificent tree, which compensates for its want of height by its huge wide-spreading arms, each of which is almost a tree in itself. According to Labillardière, a French traveller in Syria, the largest of those now remaining on Lebanon is, at least, nine feet in diameter; the trees are held in great veneration, and a holiday is set apart for the *feast of cedars*. Its growth is far from being so slow as some imagine; on the contrary, the observations of those who have cultivated it with care prove that it will vie in rapidity of growth with almost any forest tree. It appears from Mr. Lysons' inquiries that there was a tree at Highclere, the seat of the Earl of Caernarvon, which, when fifty-eight years old, measured ten feet one inch in circumference at three feet from the ground. Cedar wood has the reputation of being indestructible: instances have been named of its having been taken from buildings uninjured after a lapse of two thousand years. Mr. Lambert, however, remarks, with justice, that 'in relation to these properties, there is much vulgar error and confusion, the cedar of Lebanon being often confounded with trees of different genera.' Mr. Lambert conjectures that the Cedrus of the Greeks was the wood of *Cupressus horizontalis;* Sprengel refers it to the *Juniperus oxycedrus;* but it appears highly probable, from some interesting observations made at Tangier by Mr. Drummond Hay, that the indestructible cedar wood was the beautiful, hard, deep-brown timber of Thuja articulata, the Sandarac tree (see THUJA). The wood of Abies cedrus produces deal of very indifferent quality.

[The Cedar of Lebanon.]

No. 2. *Abies Deodara*, the Sacred Indian Fir (Pinus Deodara, *Lambert*, t. 52). Leaves evergreen, in clusters, acute, triangular, stiff. Cones growing in pairs, stalked, oval, obtuse, erect; the scales closely packed, very broad, and nearly even at the margin.—A native of the mountains of India near the town of Rohilcund, on the alps of Nepal and Thibet, at a height of 10,000 or 12,000 feet, and also in the woods of Almorah. A large tree, with a trunk about four feet in diameter, resembling the cedar of Lebanon, from which it differs in having its cones upon stalks and its leaves longer and more distinctly three-sided, and also in the quality of its timber. According to Mr. Moorcroft, from whose notes, in Mr. Lambert's monograph of the genus, we borrow much of our information, the Hindoos call it the Devadara, or God tree, and hold it in a sort of veneration. Its wood is extremely durable, and so resinous that laths made of it are used for candles. Spars of it have been taken out of Indian temples, known to have been erected from 200 to 400 years, uninjured except in those parts which originally were sapwood. Mr. Moorcroft procured specimens from the starlings of the Zein ool Kuddul bridge, in Ladakh, where it had been exposed to the water for nearly 400 years. Mr. Lambert says that its wood takes an excellent polish, being very close-grained, and perhaps the most valuable of the genus. A few plants are now growing in the gardens of Great Britain, having been reared from seeds brought from India by the Hon. Mr. Melville: they are too young for us to judge of their suitableness to this climate, but there is every reason to believe that they will be as hardy as the now common cedar of Lebanon.

Two varieties, or perhaps nearly-related species, called the *Shinlik* and *Christa rooroo*, are mentioned by Moorcroft as natives of the forests of Ladakh.

To the species now enumerated, the following almost unknown kinds have to be added:—

No. 3. *Abies Kæmpferi* (Pinus Kæmpferi, *Lambert. Monogr.*, Preface, p. vii.; Pinus Larix, *Thunberg. Fl. Japon.*, p. 275). A native of Japan, found wild upon the mountains of Fako; called by the natives *Leosi*, or *Kara maats Nomi*, according to Kæmpfer.

No. 4. *Abies Thunbergii* (Pinus Thunbergii, *Lambert. Monogr.*, Preface, p. vii.; Pinus Abies, *Thunb. Fl. Japon.*, p. 275). A scarce plant in Japan, where it is found even in the city of Jeddo, according to Thunberg.

No. 5. *Abies Momi*, (Siebold in verhand. Bataav. genootsch. xii., p. 12.) Found in Japan, as well as the two following. Its wood is, according to Siebold, in great estimation on account of its whiteness and fine grain.

No. 6. *Abies Torano*. Id.

No. 7. *Abies Araragi*. Id. Wood brown; used for various domestic purposes.

The genus of resinous plants called Abies, which we have thus described, comprehend many forest trees of great importance; and it will be, therefore, proper to add a few remarks on their cultivation. Some of them, such as the larch, the Norway spruce, the silver fir, and the balm of Gilead, are raised in the nurseries annually in the open ground, in large quantities, for the supply of our plantations; others, such as the cedar of Lebanon and the Douglas fir, are procured in much less abundance, and are treated with more care, being usually kept in pots until they are finally committed to the earth in the situation they may be subsequently destined to occupy.

All the species are increased by seeds; they may also be propagated both by inarching and by cuttings; but it is found that plants so obtained are either very shortlived or stunted, unhealthy, and incapable of becoming vigorous trees. In some of the species, such as the balm of Gilead and the silver fir, the scales of the cones readily separate from their axis, so as to render the extraction of the seeds a simple and easy operation; but in others, such as the larch and the spruce, the scales will neither separate nor open: in such cases it is necessary to dry the cones as much as possible, then to split them by means of an instrument passed up their axis, and afterwards to thresh the portions so separated till the seeds can be sifted out.

Like other resinous seeds, these are perishable unless sown within a few months after the cones have been gathered; they will, however, keep much longer in the cone than if separated; wherefore, they should always be imported in that state.

It is usual in the nurseries to sow them in the spring in beds of light soil, in which no recent manure has been mixed: they are buried at various depths, according to the force of the vital energy of the species. This has been found by experience, as it is said, to be one inch for the silver fir; half an inch for the spruce, balm of Gilead, and cedar of Lebanon; a quarter of an inch for the larch; and less for the American spruce: it is, however, probable that these depths are of very little importance. In order to protect the surface of the beds from being dried while the young seeds are sprouting, it is generally overspread with a thin layer of long straw, which is removed as soon as the crop begins generally to appear. During the first season the seedlings remain undisturbed; the only attention they receive being to keep them free from weeds. In the following spring the young plants are taken up carefully, and their roots, being a little shortened, are imbedded in rows about six inches apart, where they remain for one or two years. After this they are transplanted into quarters, in rows a foot or nine inches apart, the plants being about six inches from each other. Having remained in this situation for a year, they are fit to be transferred to the plantation, or they may stand two years in the quarters, and then be taken up and replaced in a situation of the same kind, if circumstances should render such a proceeding desirable. On no account, however, should they be allowed to remain in the nursery quarters more than two years at a time without being taken out of the ground, because they are apt to form long and strong roots, which are destroyed in the process of transplantation, so that the life of many must be either materially injured or wholly sacrificed.

None of the firs should be transplanted at a height exceeding three feet, for the reason last mentioned; and the larch is the only kind that will remove advantageously even at this size. The spruce and its allied species may be removed more successfully when from a foot and a half to two feet high. To this there is no other exception than that of plants that have been constantly reared in pots, as the cedar of Lebanon; these may be safely removed at any size, if the transplantation is carefully attended to, because their roots are uninjured in the operation. It should, however, be remembered, in finally planting out large firs which have been always kept in pots, that it is absolutely necessary that their roots should be spread out among the earth as much as may be practicable without straining or breaking them; because, while in pots, they necessarily acquire a spiral direction, which they will not afterwards lose unless it is destroyed at the period of final transplantation; and, if they do not lose it, they are apt to be blown over by high winds, on account of their roots not having penetrated into the earth far enough in a horizontal direction to form the requisite stay to support the trunk and head.

Where great importance is attached to the raising the seeds of rare species of fir, it has been found a very beneficial practice to place them between two turfs placed root to root, the one upon the other, and to watch them till the seeds begin to sprout; they are then to be sown in the usual way, when every seed will usually succeed.

No trees are more impatient of pruning than these. They exude, when wounded, so large a quantity of their resinous sap as to become weakened even by a few incisions; and, if they have suffered many, they are long before they recover from the effects. So great is their symmetry, and so uniformly will their branches form under favourable circumstances, that it will rarely happen that a necessity for the use of the pruning-knife can arise. The great rule to be observed in their management is to allow them ample room for the extension of their branches; if this is attended to, their beauty is not only ensured, but the rate at which they will form their timber will be an ample recompense for the space they may occupy.

ABIETINÆ, in Botany, a section of Coniferæ, comprehending, according to Lindley, the following genera:—Pinus, *Linneus;* Abies, *Tournefort;* Cunninghamia, *R. Brown;* Arthrotaxis, *Don.;* Microcachrys, *Hooker, jun.;* Sciadopitys, *Luccarini;* Araucaria, *Jussieu;* Eutassa, *Salisbury;* and Dammara, *Rumphius*. These genera are separated from the group of conifers termed Cupressinæ, on account of a difference in the position of the ovules, which are inverted in the former, and erect in the latter. [See Coniferæ.]

ABINGDON, one of the principal towns in Berkshire, and a place of great antiquity. Some have carried back its origin to the time of the Britons. It received its name of Abban dun, or Abben don, the town of the abbey, from the removal hither of a monastery previously fixed at Bagley

Wood in the neighbourhood. It was a place of considerable importance in the period of the Saxon Heptarchy; and Offa, King of Mercia, had a palace here. The abbey, which was founded in the twelfth century, flourished under the favour of successive princes; and its revenues, at the dissolution of religious houses, amounted to nearly 2000*l.* per annum. Henry I. was educated in it. The town is pleasantly situated at the junction of the Ock and the Thames, just above where the Wilts and Berks canal joins the latter. The streets are spacious, diverging from the market-place, and are well paved and lighted; the supply of water is also good. The market-house is an elegant structure of freestone, and in it is a spacious hall for transacting public business. The July and October sessions and the summer assizes are held here. Abingdon returns one member to Parliament. It has a separate jurisdiction, having obtained a charter of incorporation in the reign of Philip and Mary, A.D. 1557. There are two handsome churches, those of St. Helen and St. Nicholas; and meeting-houses for the Baptists, Independents, Quakers, and Wesleyan Methodists. There is a free grammar-school well endowed, a national and a British school, and some other foundations for the purposes of education. There are also many alms-houses, in the chief of which (Christ's Hospital) thirty-two poor women are supported. The trade of Abingdon consists of malting, hemp-dressing, and sack and sail cloth making; in the latter branch of manufacture there has been a considerable decline since the peace. The corn-market is large. Capacious wharfs and warehouses have been erected at the entry of the Wilts and Berks canal into the Thames. The population of the town was, in 1851, 5954. It is 26 miles N.W. by N. of Reading, and 56 W.N.W. of London, and 3 miles distant from the Gr. W. Railway.

ABIPONIANS, an aboriginal tribe of South America, who formerly occupied part of the province of Chaco, a country about 300 leagues long and 100 broad, lying about the centre of Paraguay, near the parallel of 28° south. The Mokoby, a powerful tribe, whose relationship to the Abiponians is proved by the resemblance of their language (see ADELUNG'S MITHRIDATES), still inhabit the interior of the province of Chaco, on the banks of the Vermejo and Ypita rivers, which are tributaries to the great Paraguay. The Abiponians, about the beginning of the last century, being defeated by the Mokoby, who were more numerous, placed themselves under the protection of the Spaniards; and finally, to escape from their vindictive enemies, the greater part of them went eastward in 1770, and crossing the Parana river, established the colony of Las Garzas. Here they have retained nearly all their original usages. There are three divisions of the Abipones: the Naquegtgaguehee, the Ruecahee, and the Jaconaiga. When Dobrizhoffer was acquainted with the Abiponians, they were chiefly in Chaco; he describes them as a well-made, tall, handsome race of men, with faces of the European form, and a complexion rather light coloured. Their bodies are robust, capable of enduring fatigue and all the changes of temperature. According to the Jesuit missionary Dobrizhoffer, our chief authority, they are the most wonderful people in the world. An Abiponian, almost a hundred years old, will leap on his horse as nimbly as a boy, and sit there for hours. His teeth and sight are unimpaired at this advanced age; a man who dies at eighty is considered to have come to an untimely end. However, the good missionary remarks that *all* the inhabitants of Paraguay are not quite so wonderful as the Abiponians, for the pedestrian nations are less long lived than the equestrian. One curious feature in the character of the Abiponians is their skill in horsemanship. The horse, as is well known, was introduced into South America by the Spaniards, and from them the Abiponians stole them. They soon became so expert in the management of this animal, that, issuing from their distant retreats, they crossed dry deserts, or extensive swamps, with equal ease and daring, and, after a journey of surprising rapidity, would fall on the Spaniards, when least expected, and massacre all before them. [See *Martin Dobrizhoffer's Account of the Abiponians*, London translation, 1822; Latin original, Vienna, 1784: also in German, 3 vols. 8vo.]

Dobrizhoffer went to South America in 1749, and stayed there eighteen years. His account of the Abiponians is exceedingly minute, and even tedious; and though it no doubt contains many curious and interesting facts, it is not possible to read it without a considerable portion of scepticism; indeed, we do not hesitate to say, that we disbelieve altogether many of the accounts which the good missionary gives: we need only refer to men one hundred years old jumping on horses. Compare Azara's short notice (vol. ii. p. 165) of the Abiponians of Las Garzas.

ABJURATION (*of the Realm*), in law, signifies a sworn banishment, or the taking of an oath to renounce and depart from the realm for ever. By the ancient common law of England, if a person guilty of any felony, excepting sacrilege, fled to a parish church, or churchyard, for sanctuary, he might, within forty days afterwards, go clothed in sackcloth before the coroner, confess the full particulars of his guilt, and take an oath to abjure the kingdom for ever, and not to return without the king's licence. Upon making his confession and taking this oath, he became *ipso facto* attainted of the felony; he had forty days from the day of his appearance before the coroner to prepare for his departure, and the coroner assigned him such port as he chose for his embarkation, to which he was bound to repair immediately with a cross in his hand, and to embark with all convenient speed. If he did not go immediately out of the kingdom, or if he afterwards returned into England without licence, he was condemned to be hanged, unless he happened to be a clerk, in which case he was allowed the benefit of clergy. This practice, which has obvious marks of a religious origin, was, by several regulations in the reign of Henry VIII., in a great measure discontinued, and at length by the statute 21 James I., c. 28., all privilege of sanctuary and abjuration consequent upon it were entirely abolished, and the opposing of any process in pretended privileged places made penal by the statutes 8 and 9 Will. III. c. 27; 9 Geo. I. c. 28; 11 Geo. I. c. 22; 1 Geo. IV. c. 116. In the reign of Queen Elizabeth, however, amongst other severities then enacted against Roman Catholics and Protestant Dissenters convicted of having refused to attend the divine service of the Church of England, they were by statute (35 Eliz. c. 1), required to *abjure the realm* in open court; and if they refused to swear, or returned into England without licence after their departure, they were to be adjudged felons, and to suffer death without benefit of clergy. Protestant Dissenters are expressly exempted from this severe enactment by the Toleration Act; but Popish recusants convict were liable to be called upon to abjure the realm for their recusancy, until a statute, passed in the 31 Geo. III. (1791), relieved them from that and many other penal restrictions upon their taking the Oaths of Allegiance and Abjuration. These oaths, however, in the case of Roman Catholics, are now dispensed with, and in lieu thereof they take an oath prescribed by the 10 Geo. IV. c. 7.

ABJURATION (*Oath of*). This is an oath asserting the title of the present royal family to the crown of England. It is imposed by 13 Will. III. c. 6; 1 Geo. I. c. 13; and 6 Geo. III. c. 53: and expressly disclaims any right thereto by the descendants of the Pretender. This is one of the three oaths required of all persons being Protestants before admission to any public office.

ABLANCOURT (PERROT NICOLAS D'), one of the most esteemed translators of the classic authors, in the seventeenth century, was born at Châlons sur Marne, in Champagne, (now in the department of the Marne,) in 1606, and died of the stone at Ablancourt in November, 1664; but not of voluntary starvation, on account of the pains of his disorder, as is said in the *Menagiana*. His family was honourable, and greatly esteemed at the bar. His father bestowed the most anxious care on his education, with the view of uniting the advantages of public and private education; and in this he succeeded, for his son advanced most rapidly in his classical studies. Ablancourt commenced his career at the bar but quitted it almost immediately for literary pursuits; and at the same time abandoned the Protestant creed, in which he had been brought up, to the great delight of the Catholic members of his family. He returned, however, to his first belief; for six years afterwards, his conscience not being quite at rest, he studied with the deepest attention under the learned Stuart for three years, at the end of which time he abjured the Roman faith, and immediately after retired into Holland, to be near the learned Saumaise, and enjoy the society of that famous scholar; perhaps, also, to let the scandal of his second abjuration die away. It is only fair to state, that on neither occasion was he influenced by any worldly consideration whatever. From Holland he repaired to England, and from thence to Paris, where he became intimately acquainted with Patru, one of the most celebrated writers and distinguished lawyers of that day, and also with other eminent literary characters. In 1637, (the *Biograph. Univ.* says, by mistake, 1627, the Académie Françoise having been established only in 1634-35,) he was received a Member of the French Academy, and gave his whole attention to the translation of the works of Tacitus; but being soon obliged to quit Paris on account of the war which broke out, he went to reside at his seat at Ablancourt, in Champagne, for the remainder of his life, with the exception of the time he spent in Paris during the printing of his works. Ablancourt had so lively an imagination, that his friends wondered at his being only a translator; but his reason for being so was, according to his own account, that there were already too many modern works deficient in truth and novelty, in which princes could not learn their duties so well as in the ancient writers. D'Ablancourt might have quoted Mezerai and several others as exceptions to that remark. Of his numerous translations those most known are, the whole of Tacitus, of which there have been ten editions; four orations of Cicero; Cæsar; and the Wars of Alexander by Arrian, the most esteemed of his translations as regards the style only; Thucydides; the Anabasis of Xenophon; and an imitation, rather than a translation, of Lucian. As to the accuracy of the translations of Ablancourt, when compared with those of the last century, and still more with those of the present, they are decidedly inferior to both; and even during the life of the author, admired as he was, and destined to immortality according to the opinion of his friends and the public at large, they were denominated *belles infidèles*. They were intended for what is called the 'fashionable world;' and it was then the notion of that class that everything ought to be Gallicised; which is, in truth, the great fault of many branches of French literature in the seventeenth century.

D'Ablancourt entered so well into the taste of his readers that everything, even in geography, is modernised in his translations; as, for instance, Germany becomes Allemagne; Caledonia, Scotland; Britannia, England; the Batavians, Hollanders: and, in the Life of Agricola, the description of *Britain* is introduced in this manner—'*England* is the largest of the islands which are known by us; it has *Allemagne* to the orient, and to the occident *Spain*, and *France* to the south.'

Though this notice is not very long, we may perhaps have extended it beyond what this author deserves, considering his degree of merit; but Ablancourt, during his lifetime, was held in high estimation, which still prevails to a certain degree in France, and perhaps in England also. His life has been written by his friend, Patru. In 1662, Colbert proposed him to Louis XIV., as the historian of his reign, but Louis would not have a Protestant to commemorate the events of his reign. However, he did not deprive him of his pension of 120*l.* per annum, which had been granted to him as historiographer. The revocation of the Edict of Nantes had not yet been proclaimed.

ABLATIVE CASE, a term borrowed from the grammatical system of the Latin language, and occasionally employed in teaching our own. In the English language there are many little words, such as *with, in, to, at,* &c., which are called *prepositions*, because they are *preposed* or prefixed to the words with which they are connected. The name, however, is an unfortunate one, as they are sometimes found *postponed* or placed after such words, especially in the older specimens of our language. We say *with which* or *wherewith, in which* or *wherein, from which* or *wherefrom*. So, in the Latin language, a certain set of little words, with the force of prepositions, were tacked on to the end of their nouns: thus, while the three letters, *reg*, meant *king* (whence our word *reg-al*), *reg-is* meant *of* or *from a king*—*reg-i, with, in,* or *near a king*—*reg-em, to a king*. Thus the three little words, *is, i, em,* were equivalent to prepositions. It pleased the grammarians, however, who are fond of multiplying names, to call these words *reg-is, reg-i*, &c., by the name of *cases*. The meaning of the endings of these words was not always definite enough. Thus with the case in *i*, for instance, it was found necessary to mark the relation of place more precisely by the addition of other words, as *in, in—pro, before—cum, with*. Thus they would have, *in regi, in the king; pro regi, before the king; cum regi, with the king*. Now, as *in, pro, cum,* were much more definite than the termination *i*, it became unnecessary to make the *i* distinctly heard. It was no longer necessary to the meaning, and might, therefore, be slurred over: hence the pronunciation was reduced to *in rege* (the last *e* very faintly pronounced), *pro rege, cum rege*. It would seem as if the termination *is*, signifying *of*, or *from*, was treated in the same unceremonious manner, for we find *ex rege, out of the king; ab rege, from the king; de rege, down from the king;* where we might have expected *ex reg-is, ab regis, de regis*. But, as we said above, *ex, ab,* and *de*, being more precise in meaning than the little appendage *is*, the distinct pronunciation of the former rendered that of *is* superfluous, and consequently the little *is* dropped into a weak *e*, as before. Now this termination *e*, affixed to the Latin nouns, received from the grammarians the name of *ablative case*, i.e. the *case* of *removal;* which applies, indeed, well enough to *ex rege, out of the king; ab rege, from the king*, &c.; but is not well suited to the ideas, *cum rege, with the king; in rege, in the king*, &c. But the grammarians who invented these hard names seldom saw more than half of the question before them. For fear, lastly, that any of the learned should find fault with our Latin, we will observe that even the little *e* which marks the ablative case, which *e* itself is but a remnant of a longer termination, was often absorbed by a preceding vowel in the Latin word to which it was attached. Thus, to take *regina, a queen*, they did not say *in reginae, cum reginae, ex reginae*, &c., but *in regina, cum regina, ex regina*, &c. When the term 'ablative case' is used in English grammar, it is only an awkward name for the preposition *from*.

ABLUTION, literally *a washing away*—a religious ceremony, consisting in bathing the body, or a part of it, in water, which has been practised more or less extensively by the disciples of almost every form of faith. In the earlier and ruder states of society especially, there is a strong tendency to endeavour to invest the spiritualities of religion with what we may call a visible and substantial form, so that they may be apprehended not only by the reason, but also by the senses. Of this disposition the master minds who have founded and reared the various systems of superstition that have held sway in different countries and ages of the world, have usually taken advantage, as a chief instrument whereby to work upon the gross natures to which they had to address themselves, and to intwine the desired belief at once with their affections and with their habits. Among such outward types, none can be conceived more natural or appropriate than that of washing the body with water as a sign or attempted representation of mental purity. The custom, particularly in the warm climates where it was first introduced, had also the further advantage of being highly conducive to health; and this circumstance no doubt contributed powerfully to recommend it to the authors of many of the religions by which it was sanctioned and enjoined. Ablutions, or lustrations, as they are more commonly called, even constituted a part of the Mosaic ceremonial, and were practised among the Jews on various occasions both by the priests and by the people. They occupy an important place in the Brahminical and other religions of India, where the waters of the Ganges are considered as having so purifying a power, that even if a votary, who cannot go to that river, shall call upon it to cleanse him, in prayer, while bathing in another stream, he will be freed from any sin or pollution he may have contracted. But the religion by which ablutions have been enjoined most punctiliously, and in the greatest number, is the Mohammedan. According to the precepts of the most rigid doctors of that faith, it may almost be said that scarcely the most ordinary or trifling action can be rightly performed without being either preceded or followed by an entire or partial lustration. The rules laid down upon the subject by these writers are minute and tedious, to a degree scarcely to be believed. The simple ceremony of the Christian baptism may be regarded as an adoption of this natural type by the Author of our faith. Although, however, that is the only instance in which dipping in or sprinkling with water has been enjoined under the dispensation of the New Testament, the early Christians appear to have been also in the habit of undergoing ablution with water, before partaking of the communion. The sprinkling with holy water, in use in the Catholic church, may be considered as a species of ablution; and that term is also applied both to the water in which the priest, who consecrates the host, washes his hands, and to a drop of wine and water which used anciently to be swallowed immediately after the holy wafer.

ABO, in N. lat. 60° 27′, E. long. 22° 19′, near the angle formed by the gulfs of Bothnia and Finland, is a town of the great principality of Finland, now part of the Russian empire. Abo is in that part of Finland which once belonged to Sweden, and it then was the chief city of all Finland. It stands on the Aurajoki river, and is surrounded by hills and mountains. In its neighbourhood is a mineral spring. The number of inhabitants is 13,050. The manufactures of Abo are tobacco, sugar, sail-cloth; and it trades in provisions and deals. There are also dockyards here. The fort of Abohus protects the entrance of the river, which does not admit vessels of large size to go up as far as the town. In the year 1827, seven hundred and eighty houses were destroyed by fire, together with the University buildings, the library, and all the valuable collections. Since this accident, the University has been removed to Helsingfors. (See HELSINGFORS.) Gustavus Adolphus, in the year 1628, founded this University, or rather instituted an Academy, which Christina, in 1640, elevated to the rank of a University. Alexander I. of Russia added to the endowments. (*Cannabich's Geography, German.*)

Many of the treaties between the great European powers are distinguished by the names of the places at which they were concluded. Thus, the *Peace of Abo* is often referred to in history, as the treaty by which the relations of Sweden and Russia were determined during the latter part of the last century.

A congress was opened at Abo in March, 1743, by the plenipotentiaries of Sweden and Russia, to confer on conditions of peace between those powers. The war, which it was the object of this conference to put an end to, had been commenced in 1741 by Sweden, who, still smarting from the concessions she had been compelled to make to Peter the Great by the treaty of Nystadt in 1721, took advantage of the war between Russia and Turkey to conclude an alliance with the latter power against Russia. The war was most disastrous to Sweden: the hopes she had conceived of assistance from Turkey were frustrated by the peace of Belgrade between Russia and the Porte, her best soldiers were defeated, and her armies in Finland destroyed in the first campaign.

The revolution in Russia, by which Ivan was dethroned, and the daughter of Peter set upon the throne, occasioned a suspension of arms, but in 1742 hostilities began again; Sweden was again defeated, and all Finland abandoned to the Russian arms.

The Swedish Diet met, and deliberated on offering the succession of the throne of Sweden to the Prince Royal of Denmark. Russia, fearing the union of the crowns, offered peace, and restitution of her conquests, on condition of the Diet's choosing Adolphus Frederic of Holstein Gottorp as the successor of the reigning king, Frederick, who was childless. The condition was accepted, and the election took place on the 4th of July, 1743.

By the stipulations of the treaty, which was signed on the 18th of August, N.S., Sweden renewed her cession of Ingria, Livonia, and Esthonia, which had been given up by the treaty of Nystadt, and was also compelled to yield the eastern portion of Finland, making the river Kymmene the boundary of the two nations. Russia restored the rest of the Grand Duchy, which she had gained in the war, including Abo, Biorneborg, and East Bothnia. It may be necessary to mention that the whole of Finland was ceded to Russia by a peace concluded between the two powers, on the 17th of September, 1809.

ABOMA, a large species of serpent, which inhabits the fens and morasses of South America. (See BOA.)

ABORI'GINES, a term by which we denote the primitive inhabitants of a country. Thus, to take one of the most striking instances, when the continent and islands of America were discovered, they were found to be inhabited by various races of people, of whose immigration into those regions we have no historical accounts. All the tribes, then, of North America may, for the present, be considered as aborigines. We can, indeed, since the discovery of America, trace the movements of various tribes from one part of the continent to another; and, in this point of view, when we compare the tribes *one with another*, we cannot call a tribe which has changed its place of abode, aboriginal, with reference to the new country which it has occupied. The North American tribes that have moved from the east side of the Mississippi to the west of that river are not *aborigines* in their new territories. But the *whole mass* of American Indians must, for the present, be considered as *aboriginal* with respect to the rest of the world. The English, French, Germans, &c., who have settled in America, are, of course, not *aborigines* with reference to that continent, but settlers, or colonists.

If there is no reason to suppose that we can discover traces of any people who inhabited England prior to and different from those whom Julius Cæsar found here, then the Britons of Cæsar's time are the aborigines of this island.

The term aborigines first occurs in the Greek and Roman writers who treated of the earlier periods of Roman history, and, though interpreted by Dionysius of Halicarnassus to mean *ancestors*, it is more probable that it corresponds to the Greek word *autochthones*. This latter designation, indeed, expresses the most remote possible origin of a nation, for it signifies 'people coeval with the land which they inhabit.' The word *aborigines*, though perhaps not derived, as some suppose, from the Latin words *ab* and *origo*, still has the appearance of being a *general* term analogous to *autochthones*, and not the name of any people really known to history. The *aborigines* of the ancient legends, interwoven with the history of Rome, were the inhabitants of part of the country south of the Tiber, called by the Romans Latium, and now the Maremma of the Campagna di Roma; but we are, in truth, unable to say to what people this term may be properly applied. [See *Niebuhr's Roman History*.]

ABOU-HANNES (*Numenius Ibis*, Cuvier; *Tantalus Æthiopicus*, Latham), an African bird, which has occasioned much discussion among the learned as to its identity with the ancient Ibis. The attention of Bruce was attracted, during his stay in Upper Egypt, by some birds called by the natives Abou-Hannes, whose forms reminded him of the ibis, as represented on Egyptian monuments, and repeated observation confirmed him in the opinion of their identity with the ibis of the ancients. This identity was subsequently corroborated by the distinguished naturalists, Geoffroy and Savigny, who accompanied the French expedition into Egypt, and procured a number of specimens. M. Savigny published his observations in a small work (*L'Histoire Nat. et Mythol. de l'Ibis*), now very scarce, and Baron Cuvier also gave a memoir on the Egyptian ibis in the *Annales du Muséum* for 1804, in which he has clearly proved, from the comparison of a mummy ibis with a stuffed specimen, that the true ibis is not the *Tantalus ibis* of Linnæus, that being a much larger bird, but is really a species of curlew. This bird appears to be also a native of regions very remote from Egypt. After just getting round Cape Guardafui (sailing from the south), Salt saw, near the coast, a lagoon abounding in wild fowl,—'on the borders of it stood birds of a species called by the Arabs, Abou-Hannes, which is the true Ibis of the Egyptians, as described by Herodotus; a fact strongly marked by the head and neck being bare, and of a deep black colour. It may be worthy of remark that Strabo mentions this bird as frequenting the coast to the east of the Straits of Babelmandeb.' (Salt, p. 97.) He adds, in a note, 'a tolerably good specimen of the bird is to be seen in Mr. Bullock's valuable Museum.'

[True White Ibis.]

Herodotus attributes the veneration of the Egyptians for the ibis, to supposed services rendered them by the bird in freeing their country from winged serpents. That the ibis, however, could not feed upon serpents appears nearly certain from anatomical inspection. The bill, for example, being long, slender, considerably curved, blunt on the edges, and expanded, and roundish at the point, could neither divide nor pierce serpents; and indicates rather an aptitude to dabble in marshy and moist grounds.

On the other hand, Baron Cuvier found, in the mummy of the ibis, remains of the skin and scales of serpents, and hence it has been inferred that the birds might have been serpent-eaters (*Ophiophagæ*). This inference, however, is at variance with the observations made in Egypt by M. Savigny on a great number of individuals, in the crops of which he uniformly found land and fresh-water shells (*Cyclostomata, Ampullariæ, Planorbæ, &c.*), and these shells were always entire when their inhabitants had not been previously digested.

It does not appear that the ibis breeds in Egypt; but, on the testimony of the inhabitants, it arrives as soon as the waters of the Nile begin to rise, augmenting in numbers as the waters increase, and diminishing as they subside, and disappearing when the inundation terminates. These birds, on their arrival, repair to the low lands, which are first covered with water; but when the waters become deeper and spread wider, the birds betake themselves to the higher lands. They afterwards approach the river, where they establish themselves by the sides of the canals and on the small dykes, with which the greater part of the cultivated grounds are surrounded.

The bird in question sometimes lives solitary, sometimes in small troops of from eight to ten. Its flight is lofty and powerful, and it utters at intervals hoarse cries. When it alights on a fresh piece of land, it remains for hours together occupied in tapping the mud with its bill, in search of worms, &c. It walks leisurely step by step, and has not been observed to run, like our curlew (*Numenius arquata*, Latham), to which it otherwise bears some resemblance.

The Egyptians call the bird *Abou-menzel*, which literally means 'Father sickle-bill;' the bill being curved like a sickle. The Æthiopian name, *Abou-Hannes*, means 'Father-John,' because, as M. Dumont supposes, the birds arrive about St. John's day.

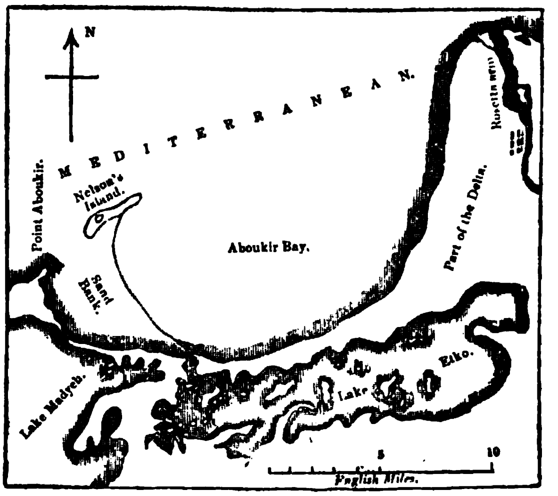
The following is the earliest account that we have of the ibis, from an eye-witness (Herodotus ii. 76):—'The ibis is all over very black: it has the legs of a crane, and a beak considerably curved: its size is about that of a *crex*. Such is the appearance of the black ibis, which fights against the serpents. But the other ibis, which is more of a domestic bird (for there are two kinds), has the head and all the neck bare of feathers: it is of a white colour, except the head, neck, and the extremities of the wings and tail, all which parts are very black. As to its legs and beak, it resembles the other kind of ibis.' The black ibis, according to Herodotus, devoured the winged serpents which yearly attempted to make their entry into Egypt from Arabia. It is needless to add that these winged serpents are a fable. Strabo, who himself was some time in Egypt, gives the following account:—'The ibis is the tamest bird of all: in form and size it is like the stork. But there are two varieties of colour, one of which is that of the stork, and the other is all black. Every street in Alexandria is filled with them, partly to the benefit of the citizens, and partly not. The bird is useful so far as it devours all kinds of vermin, with the garbage of the shambles, and the refuse of the eating-houses, &c.' Here Strabo makes no distinction between the two, except in colour, and he describes both species as living on all kinds of garbage. We believe, however, he has confounded the real ibis and the stork, as Hasselquist, a Danish traveller, confounded the real ibis and the heron. [See IBIS.]

ABOU-HARB, in Arabic, the name of the Leucoryx antelope.

ABOU-HOSSEIN, according to Rüppel, the German traveller in Egypt and Nubia, the Arabic name of the *canis pallidus*, a small species of fox, found in Dar-Foor and Kordofan.

ABOUKIR. The castle of Aboukir (N. lat. 31° 19′, E. long. 30° 6′, and about thirteen miles N.E. of the town of Alexandria) is on the extreme north-eastern point of the low barrier of limestone rocks that form the breastwork of the coast of Alexandria. It marks, in fact, the extreme eastern limit, along the northern coast, of the rocks of the African continent, being immediately followed by the old Canopic mouth and the alluvium of the Delta. It is not unlikely that Aboukir castle is near the site of an ancient city, but whether this city was Canopus or not, we think it is impossible to decide, as the coast has undergone very great changes. Canopus, however, could not be more than a few miles distant from Aboukir, probably on the east side.

The small island which lies near Aboukir point contains traces of old buildings, and also evident marks of having once been larger than it is at present. This little spot is now commonly called Nelson's island, in commemoration of the victory which the English admiral obtained over the French fleet, under Brueys, in Aboukir bay, August 1, 1798 (see NELSON). Aboukir bay may be considered as bounded by Aboukir point on the south-west, and by the neck of land at the outlet of the Rosetta arm on the north-east.



ABOUSAMBUL, IPSAMBUL, or EBSAMBUL, a place remarkable for containing two of the most perfect specimens of Egyptian rock-cut temples. These excavations are in Nubia, on the west side of the Nile, N. lat. 22° 22′, about twenty-six geographical miles north of the cataracts of Wady Halfa. Near Abousambul the river flows from south-west to north-east, through sandstone hills; on the west bank a valley opens and displays two faces or walls of rock, each of which has been fashioned into the front of a temple. The excavations are made in the solid mass of the mountain.

The smaller temple was first described by Burckhardt, who gave it the name of the Temple of Isis. It stands 20 feet above the present level of the river, is free from all incumbrance of dust or rubbish, and in a state almost as perfect as when it was just completed.

The façade of this excavation is the exact prototype of those masses of Egyptian architecture, called *propyla*: the face slopes outwards towards the base, thus preserving one chief characteristic of the pyramidal style of building. On each side of the door-way are three standing colossal figures, about 30 feet high, cut out of the rock, and deep sunk in niches; to the back part of which they are attached by a portion of the rock that has been allowed to remain. The figures have, as usual with Egyptian statues in a standing position, one foot advanced; they look towards the river. On each side of the larger figures stand smaller ones, from 4 to 6 feet high: we believe this is the case with all of them, though the print in Gau's splendid work on Nubia does not exhibit any smaller figures attached to the central one on each side, which is a female, and probably the representative of Isis. These smaller figures, however, appear in Gau's geometrical elevation. (pl. 54.) The two male figures, on the right side of the doorway, are probably Osiris: that nearest to the door, on the left hand, is the same; while the other male figure on this side has a different head-dress and expression of countenance, and is also an Osiris. He has horns on his head, supporting a disk. The whole façade is ornamented with hieroglyphics; among which we perceive several elliptical rings, which, it is now ascertained, contain the names and titles of kings. The rings on this temple present, with several variations, the name of Ramses, one of the several ancient monarchs of Egypt, who bore that name. If we consider the name to be that of Ramses the Great, the date of this excavation will be about B.C. 1500, provided we admit the inscription to be contemporary with the excavation—an hypothesis, however, that wants confirmation. It is not at all unlikely that the original excavation is of much higher antiquity than the sculptures of the outside, and the painted bas-reliefs of the interior.

The width of the front of this temple is about 90 feet: the depth measured from the centre of the door-way to the extremity of the adytum is 76 feet. From the door a passage leads to a room 35 feet by 36½, supported by six square pillars, three on each side, with Isis-headed capitals, similar to those of Denderah. From this apartment we pass into a narrow kind of vestibule, the direction of whose length is at right-angles to the axis of the excavation; and thence into the adytum or recess, which contains the remains of a sitting statue cut in the rock. There are two other small chambers besides those enumerated, one at each end of the vestibule just alluded to. The interior of this excavation is richly adorned with painted bas-reliefs, representing offerings of palm-branches and the lotus to Osiris, with other subjects usually found in the Egyptian sculptures. The figures are painted yellow with black hair; the head-dress of Isis is painted in black and white stripes; the ceiling is blue, which is a favourite colour for ceilings in the ancient buildings of Egypt.

But this excavation, magnificent as it is, sinks into insignificance when compared with another rock-cut temple, which is found a few hundred feet distant in the opposite side of the valley. The front of this temple was almost covered with sand, except the head and shoulders of one of the four colossi which decorate the façade, and the frieze and head of an enormous hawk. Belzoni, in the year 1817, with the assistance of Captains Irby and Mangles, and the aid of the miserable natives, succeeded in finding the entrance; but he had to remove 31 feet of sand before he came to the top of the door.

This excavation is about 100 feet above the level of the river, and faces south-east by east. The width of the front is 117 feet (127 according to Colonel Stratton), and 86 high: the height from the top of the door to the top of the cornice is 66 feet 6 inches; the height of the door is 20 feet. There are four enormous sitting colossi in front, which are the largest in all Egypt or Nubia.

[One of the Colossi of Abousambul.]

The following are some of the dimensions of this enormous figure: 25 feet 4 inches across the shoulders, the face 7 feet long, the nose 2 feet 8 inches, the beard 5 feet 6 inches; the whole height, as it sits, is about 50 feet, besides the cap, which is 14 feet high. Only two of these monsters are in sight; a third is buried in the sand, and the fourth has partly fallen down from the rock to which he was attached by the back, and is also covered. From some traces of colour on these figures, it seems probable that they were once painted, according to the Egyptian fashion. Over the door there is a figure in relief of Osiris, 20 feet high, in a niche, and with two colossal figures, one on each side looking towards it. The highest part of the façade is formed by a cornice, ornamented with hieroglyphics, and a moulding and frieze below it. Above the cornice is a row of twenty-two monkeys seated, about 8 feet high, and 6 across the shoulders.

The depth of the temple is about 170 feet. It contains in all fourteen apartments; but its several arrangements may be best understood, in the absence of a plan, by considering it as containing four principal chambers behind one another, with a number of attached apartments. To form anything like an adequate notion of this enormous excavation, it is necessary to consult the special descriptions to which we refer at the end of this article; but the following description of the Pronaos, or first great chamber, may serve to give some idea of the colossal dimensions of the whole. The first chamber is 57 feet long, and 52 wide, and is supported by two rows of square pillars, four in each row; each side of the pillars measures, according to some accounts, 5 feet, according to others 8 feet. Their height, according to Belzoni's account, is 30 feet. To each pillar is attached by his back a standing colossus, which, reaching the roof with its high cap, appears to support the incumbent mass. These figures are described as bold in their execution, and as producing an agreeable effect. Their arms are crossed on the breast; in one hand they bear the key of the Nile, and in the other the scourge. These statues are entirely covered with a kind of stucco, which is richly painted with various colours.

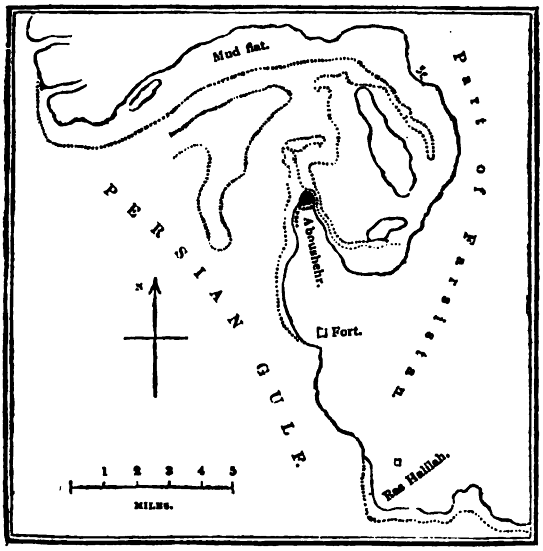
The painted walls, which represent a hero of colossal size gaining a victory over his enemies, triumphing, &c., are well worth a careful study, not only as works of art which possess merit in their way, but from the resemblance, in many respects, of the events here depicted to the battle-scenes represented on the walls of Thebes. They appear to be the records of great achievements, such as tradition assigns to Sesostris, who is now generally considered to be identical with Ramses the Great. The name and title of the latter monarch are found in many parts of the temple; and if he was not the original excavator, he may, perhaps, be considered, at least, as the completer of this great design.

In the adytum, or last chamber of the four above-mentioned, which is 23½ feet long, and 12 wide, there are four colossal painted figures seated at the extremity: in the centre of this room is a pedestal. Heeren conjectures that a sarcophagus once stood on this pedestal, and that we ought to consider this huge excavation not a temple, but a tomb.

The name Abousambul is variously written at the present day, and the origin of it is somewhat obscure. It seems most probable that it contains the syllable *Psam* (the name of a deity), which we observe in several Egyptian names, such as Psammis and Psammetichus. [See *Gau's Monuments of Nubia—Belzoni's Operations in Egypt and Nubia — Ritter's Africa—Col. Stratton, Edin. Phil. Journal—Egyptian Antiquities of this Society*.]

ABOU-SCHOM, the Arabic name of a species of fox (*canis variegatus*) [Rüpp. *Zool. Atl.*, p. 31], discovered by Rüppel in Nubia and Upper Egypt. It does not burrow under ground, like the generality of foxes; but, like the jackall, resides among the rocks and deserts, and feeds upon lizards and small quadrupeds.

ABOUSHEHR, generally called **BUSHIRE**, is a town on the east side of the Persian gulf (N. lat. 28° 57′, E. long. 50° 52′), and now the principal sea-port in these waters. It stands on the northern extremity of a sandy peninsula, which is washed by the sea on the west side, and on the north and north-east bounded by an indentation of the sea, forming a deep bay. The country all around Bushire is parched and barren, showing nothing but grey clay, brown sand, and rock, without any kind of vegetation. Though the town looks pretty well from the sea, like most Persian towns the interior disappoints expectation, as the place does not contain more than half a dozen decent houses, which are built of sun-dried bricks. Since the decline of Bunder Abbas, or Gombroon, Bushire has become the great Persian emporium for the Indian trade, and its commerce is now considerable. Bullion and raw silk are the principal articles of export. Vessels of 300 tons cannot approach nearer the town than six miles. The population is probably as much as 10,000. [See *Kinneir's Memoir on Persia.*]



From Bushire to Shiraz in the interior, through which place a great part of the trade of Bushire passes, is a distance of about 152 miles following the road through Kazeroon, which, in many parts, is exceedingly steep and rugged.

ABOUSIR, a place in the Egyptian Delta on the site of the ancient Busiris (N. lat. 30° 55′), near the left bank of the Damietta branch of the Nile. Like most of the sites of ancient cities in the Delta, it has preserved its name almost unchanged, and enough still remains to show that a temple once existed here, as we know from Herodotus, though its traces are insignificant when compared with those of San, Tel Basta, and Heliopolis.

ABRAHAM (originally ABRAM), the great ancestor and founder of the Jewish nation, and the first depositary of the divine promises in favour of the chosen people. He was the eldest son of Terah, the eighth in descent from Shem, the eldest son of Noah, and was born, probably, at Ur, a town of Chaldæa, about 2000 years before the Christian era. His history occupies about a fourth part of the book of Genesis—namely, from the 11th to the 25th chapters inclusive. Having married Sarah (originally Sarai), his sister by the father's side, he accompanied his father and his nephew Lot to Haran, where Terah died: and then, at the command of God, still taking his wife and Lot along with him, he left Haran, and proceeded towards the south, till he reached the plain of Moreh, in Canaan. The epoch of the commencement of this journey, which happened when he was seventy-five years old, is called by chronologists the Call of Abraham. Soon after, a famine forced the patriarch to make a journey into Egypt; from which country, when he had returned to the place of his abode in Canaan, he found that the increase of his own flocks, and those of his nephew, made it necessary that they should choose separate settlements; and, accordingly, by mutual consent, Lot withdrew towards the east, and established himself among the cities in the plain of Jordan, while Abraham removed to the plain of Mamre in Hebron. He had reached his ninety-ninth year, and his wife, who had been hitherto barren, her eighty-ninth, when God appeared to him, and declared that there should yet spring from them a great nation: a promise which was confirmed, to the almost incredulous mother, by the birth of Isaac the following year. The severe trial of Abraham's faith, in the command given him to sacrifice this beloved son, so beautifully related in the 22nd chapter of Genesis, is familiar to every reader. Some time before this, we may remark, he had given another striking proof of his submission to the divine will, and his implicit reliance on the promises of God, in his dismissal of his son Ishmael, whom he had by Hagar, the Egyptian bondwoman, on the assurance of his heavenly father, that of him, too, would he make a nation, because he was the patriarch's seed. Although Sarah's determination, that the bondwoman and her offspring should no longer remain in the house, 'was,' we are told, 'very grievous in Abraham's sight, because of his son,' he had no sooner received the above intimation from on High, than he 'rose up early in the morning, and took bread, and a bottle of water, and gave it unto Hagar, putting it on her shoulder, and the child, and sent her away.' The Arabs claim to have sprung from Ishmael, as did the Hebrews from Isaac. After the death of Sarah, at the age of 127, Abraham married Keturah, and by her had other six sons. The venerable patriarch died at the age of 175, and was buried, by Isaac and Ishmael, in the same tomb which contained his first wife in Mamre. Abraham is mentioned by the epitomist Justin, who, on the authority of his original *Trogus Pompeius*, inaccurately says of the Jews, that they derive their origin from Damascus, a famous city of Syria, and that their kings were Abraham and Israel.

ABRAHAM MEN. 'To sham Abraham' is a well known cant expression, which has reference to the practices of a large class of vagabonds and cheats who were once common in this country. An Abraham Man was an impostor who personated a 'Tom of Bedlam,'—an unhappy being who was turned out of a lunatic hospital to subsist upon casual alms, incurable but harmless, without a home, but still maintained by public sympathy. This class of persons was so numerous at a period when there was very insufficient provision for the cure or mitigation of the greatest of human calamities, that the charity of the kind-hearted inhabitants of the small towns and villages was largely taxed for their support; and the appeal thus made to the feelings by a poor creature, fantastically clothed in tawdry rags, and singing snatches of old songs, was so irresistible, that it became a profitable trade to imitate such an unfortunate being. In Decker's *English Villanies*, written more than two centuries ago, there are many curious particulars of the habits of this class of impostors; these details, in great part, agree with the rich description which Shakspeare has given in his *Lear* (Act ii. scene 3.) of a pretended 'Poor Tom,' who has put on

> 'The basest and most poorest shape,
> That ever penury, in contempt of man,
> Brought near to beast.'

[See D'Israeli's *Curiosities of Literature*, vol. iii.]

ABRANTES, a fortified town of Portugal, in the province of Estremadura, on a hill near the Tagus (N. lat. 39° 27′, W. long. 8° 11′), 74 miles north-east of Lisbon. It has about 5000 inhabitants. The eminence on which the town stands is covered with olive-yards and gardens; and, indeed, the whole country along the Tagus, as far as Lisbon, is exceedingly fertile. Abrantes has several churches and convents; but its value, as a military position, constitutes its chief importance. Abrantes gave the title of Duke to Marshal Junot, one of Buonaparte's generals.

ABRUZZO is the name given to three of the fifteen divisions of the kingdom of Naples in Italy, which, from their relative positions with regard to the capital, Naples, are distinguished by the names: Abruzzo Ultra, or Further Abruzzo I. and II., and Abruzzo Citra, or Nearer Abruzzo. These three divisions together contain an area of about 5000 square miles, and have a population of about 800,000.

The inhabitants of Abruzzo Ultra I. are a manufacturing people, and amongst the most industrious in the kingdom of Naples. The capital is Teramo, an episcopal city, which has a royal college, and 10,000 inhabitants. This district contains the considerable towns of Atri, with 6000 inhabitants, and Civita di Penna with 9000; also the fortress of Civitella, near the Roman frontier.

The chief town of Abruzzo Ultra II. is Aquila, which stands on a hill on the banks of the Aterno. It is a fortified episcopal city, having a castle, manufactures of paper, stockings, and leather, a lyceum, and a high court of appeals. Its population is about 10,000. Sulmona, the ancient Sulmo, and the birthplace of Ovid, and Celano, about 4 miles from the lake of the same name, belong to this province.

The inhabitants of Abruzzo Citra, like those of the other divisions, possess considerable manufacturing industry. Chieti or Teti, the ancient Teate, the chief town, near the Pescara, is a fortified archiepiscopal city, with a population of 15,000. The Theatine order of monks, founded in 1524, take their name from this place. The fortress of Pescara, and the towns of Ortona on the sea, and Lanciano on the Foltrino, belong to this division. The latter town is considered the chief commercial place in the Abruzzi. It has a population of 13,000.

The origin of the name Abruzzo is uncertain. The word appears in the oldest Italian writers as Bruzio, the a in the beginning of the modern name being no efficient part of it.

The provinces of the Abruzzi present to the Adriatic a coast about eighty miles in length, with hardly an indention or projection that deserves notice, except the point called Penna, and not a single harbour for moderate-sized vessels. The northern boundary, between the States of the Church and the Abruzzi, commences at the mouth of the Tronto. Running irregularly westward, and then south, it strikes the river Velino near Rieti; from this point its general direction, which is south-east, follows a high mountain range, which, however, must not be considered as the dividing line of the waters that fall into the Adriatic and the opposite or Tuscan sea. The southern boundary of the Abruzzi commences near the mouth of the Trigno, half way between the towns of Vasto and Termoli on the Adriatic coast, and, after a short deviation from the course of this stream, follows it upwards for some distance. It then runs, irregularly, westward and northward, nearly parallel to the course of the Sangro, and keeping along the summit of the high central ridge that divides the waters of this river from those of the Voltorno, it then descends into the valley of the Liris, which river it crosses above Sora, where we may consider it as uniting with the line just described running south-east from Rieti. A traveller going from Arpino (Arpinum), the birth-place of Cicero, to the Lake Celano, must cross the Liris, and the first village in the Abruzzi that he will come to, is a little place called Balzerano. Around this place the mountains are lofty and well wooded, containing oaks of a larger size than usual in Italy; some of the mountains on the 6th of May, according to Colt Hoare, were capped with snow. From Balzerano the road runs along the mountain sides, through rocks and oak forests, and over the high eminence of Morrea, to the still greater elevation of Antino, a place remarkable for remains of its original walls, built without cement, and for many Roman inscriptions, which prove the Roman name of the town to have been Antinum. From Antino to Capistrello, the valley of the river becomes so narrow, as to admit only a passage for the water, and a road along the brink. The traveller, ascending along this wild and picturesque track, perceives that he is approaching the sources of the Liris, and the basin of the lake Celano. This lake, the Fucinus of the Romans, is only a short distance from Capistrello: its greatest length is about fifteen miles, with a breadth averaging about five or six. It is subject to rises and falls, which are difficult to explain, and, indeed, without more information on the subject than can be found in books of ordinary access, there is no use in hazarding any opinion. It is said to contain many fish. The Emperor Claudius undertook a great work for the purpose of draining the lake, or, at least, preventing it from doing damage by overflowing. Suetonius says of it, 'he undertook the Fucine lake, no less from the hope of speedily completing the task, than from the love of glory. Some private individuals had already offered to construct the necessary drain, on condition of having the lands that were recovered. Claudius made a canal three miles long, partly by perforating and partly by cutting down a mountain. It was finished in eleven years, thirty thousand men having been constantly employed thereon. 'The emissary,' says Sir R. C. Hoare, 'commences in a plain near the lake, traverses a mountain of solid rock, and pursues its course through the Campi Palentini to Capistrello, where it discharges itself into the Liris. The present emissary is far advanced into the lake, and considerably below the ordinary surface of the water.' The emissary has been lately restored by the government. In 1852, a company was formed, under the sanction of the present king, for draining the lake, and recovering the valuable land which has for so many ages been lying unproductive. All the land which may be recovered was conceded in perpetuity to Messrs D'Argout and Devas of Naples. It is calculated that nearly 35,000 acres will be recovered, and that the sale of the land will return 1,120,000*l.* equal to four times the capital of the company. A little to the north of the lake is the deserted village of Albi, on an eminence, probably the Alba Fucinensis of the Romans. From Avezzano, which is near the lake, the traveller may proceed northwards, through the valley of Cesolino to Tagliacozzo, built on the right side of a deep ravine. 'On ascending the hill,' says Sir R. C. Hoare, 'May 17, a dreary extent of rocky mountain expanded itself to my view, and the trees had not yet laid aside their wintry garb, but were just pushing forth their leaves.'

The mountains of the Abruzzi, though forming an essential part of the Apennine chain, and therefore running, generally, from north-west to south-east, are extremely irregular. They send out smaller branches towards the coast of the Adriatic, forming beds for the numerous streams which flow into that gulf. In the centre they form several high ridges, sometimes diverging from, and sometimes parallel to, each other; the valley of Aquila lies between Monte Corno and Monte Velino, and between the latter and a more southern ridge lies the basin of Celano. The valleys of the Abruzzi, to the west of the Lake Celano, are watered by the Liris, the Turano, and the Salto, which two last join the Velino. The real back-bone of the Apennines, by which we mean the line which divides the waters that flow eastward from those which run westward or southward, may be traced between the sources of the latter river and those of the Tronto, which flows into the Adriatic. Following it to the south, we find the sources of the Pescara, which also runs into the Adriatic; and we trace the main chain farther south, on the east side of the basin, which contains the Lake of Celano. The direction then winds round the south part of the lake, and afterwards runs to the head-waters of the Sangro, which flows in the same direction as the other two rivers. It then strikes direct east, separating Abruzzo from Campania and the province of Molise, and passing between Castel di Sangro and Isernia, joins Mounts Biferno and Matese south-east of the latter. The central Apennines, to the north and east of Lake Celano, contain the highest points in the whole range. Monte Velino is seen from the eminence of Albi to the north, raising its lofty head 8397 feet. Farther north, Monte Corno, the highest point of the Apennines, sometimes called the great rock of Italy (*il gran sasso d' Italia*), rises to the height of 9521 feet, and its summit is covered with snow, sometimes perhaps through the whole year. Vegetation, however, ceases only 600 feet below its highest point. Another lofty mountain, called Monte Majella, projects out of the main ridge between the valley of the Pescara and that of the Sangro, to the north-east of Sulmona, its highest summit being 8500 feet. This is an extinct volcano. The mountains of Abruzzo are among the finest in the whole Apennine range. They are less naked than those farther north, and they present groups of a bolder and more romantic appearance. Spreading over a vast extent of country, 50 or 60 miles in breadth, they enclose delightful valleys, towns, and a numerous population within their various ridges: the whole province of Aquila is, in fact, encircled by them. These mountains are calcareous, like the great mass of the Apennines. M. Orsini, a naturalist from Ascoli, observed on the sides of Monte Corno, masses of gneiss laid bare by the waters which had carried off the crust of alpine lime, of which the external cliffs are formed. A party of botanists from Naples visited these mountains in the summer of 1829, they ascended Mounts Velino, Corno, Majella, and other high pinnacles. M. Tenora, one of the party, published an account of their observations. They found Mount Velino rich in rare plants, and the view from its summit magnificent. They suffered much from thirst, as they met with no springs on this mountain.

The brief description of Antinori, an Italian writer, is, on the whole, correct:—'There are, in many places, rough and inaccessible mountains always covered with snow, wild forests, pleasant woods, agreeable pastures, clear fountains, deep lakes, and many rivers of every size, which run from the one, or the other side, to seek the one or the other sea of Italy.'

The natives of the highlands of Abruzzo are chiefly employed in the rearing and tending of sheep, numerous flocks of which, after feeding on the mountain pastures during summer, migrate to the plains of Puglia at the approach of winter. The shepherds are generally accompanied by their wives and children in these yearly migrations to and from the mountains, and by their large white dogs, which are very fierce to strangers. The sheep's milk is used to make cheese, the wool is an important article of trade, and the skins are exported in great quantities to the Levant. The shepherds also are clothed in them, and wear sandals of untanned leather, fastened with small cords, round the leg: they are a quiet, frugal, and honest race. The breed of merino sheep has lately been introduced into the Abruzzi near Sulmona and Valloscura, wool being now in great demand for the fast-increasing manufactures of the kingdom. The labourers and farmers in the Abruzzi are mostly poor, few of the latter being proprietors; and although the feudal duties have been long since abolished, yet the land-tax is very oppressive, amounting in many instances to 30 per cent. on the estimated income of the land. Improvements in agriculture, and especially in the method of manuring the land, are little known. Numerous herds of swine are fed in the extensive oak forests that cover the mountain sides; and the hams and sausages of Abruzzo are in great request. Lamb and mutton are also of excellent quality.

The woods of the Abruzzi have been sadly laid waste during the last thirty years: fine timber trees, oaks and beeches, have been wantonly cut down; and the mountains having thus been laid bare, the rain and melted snow, meeting with no obstacle, have washed off the soil, and carried devastation into the fields below. A want of fuel has been felt in many places, which is a serious evil in the high regions that are exposed to eight months' winter; but to remedy this inconvenience, the government has now relieved the new plantations from taxation. The mountain fastnesses are inhabited by bears, wolves, and wild boars. These provinces are but little frequented by travellers. Sir R. C. Hoare, who visited the Lake Celano, says of this country :—'The province of Abruzzo, unfrequented by the generality of travellers, and unknown even to the inhabitants of the neighbouring districts, like Sicily, has been represented as a country uncivilized with regard to society, infested by robbers, inaccessible from mountains, and fitter for the residence of wild beasts than of rational beings. But I must here repeat, with gratitude, that, in these romantic, unfrequented tracts, we met with that genuine and cordial hospitality which is too seldom to be found in more favoured and more populous countries.'

The natives of Abruzzo are generally tall, robust, and healthy; their countenances are mild, and their manner quiet and civil; they are intelligent, industrious, and brave, and furnish the best soldiers in the Neapolitan service. They are hospitable; even the poor peasant will cheerfully receive the stranger into his cabin, and offer him a share of his scanty pittance. Their cabins, however, are often miserable, smoky, and filthy; the pig and the donkey share them with the family. The chief article of food consists of Indian corn flour boiled in water or skimmed milk; wheaten bread is a luxury; wine, however, is drank generally, being imported from the neighbouring districts. The women work in the fields as hard as the men. Thousands of peasants leave their mountains in the autumn, to go and work in the vast farms of the Roman lowlands, and return in the beginning of summer; whilst others proceed at that period to reap the harvest in the unwholesome plains, and to brave the malaria fever, which makes great havoc among them. Many of the Abruzzi shepherds may be seen in December perambulating the streets of Naples and of Rome, with their bagpipes, with which they go playing from house to house, in honour of the approaching Christmas festivities. Others come to live altogether at Naples, where they employ themselves as porters, grooms, and in other hard service; and they bear a general reputation for honesty above the natives of the other provinces of the kingdom. Indeed, a traveller may ramble over the wild mountains and glens of Abruzzo in greater safety than through the fertile plains of Campania. The natives of Abruzzo speak better Italian than those of the other provinces of the kingdom; in fact, they cannot be said to speak a dialect; their language, especially at Aquila, and round the Lake of Celano, resembles that of their neighbours of the Roman States. The young men, who can afford it, repair to Rome and Naples to follow their studies, and generally distinguish themselves by their assiduity and regularity.

The lower parts of the Abruzzi have a productive soil, and export a considerable amount of grain, oil, and almonds: they also produce some cotton. In some parts of the Abruzzi we find the system of terrace husbandry, which has converted the arid hills of Tuscany into productive gardens. Of the three provinces that of Aquila is the most mountainous and the poorest; the city of Aquila, however, is considered as one of the principal provincial towns in the kingdom, and contains many wealthy families. Its territory produces excellent saffron. The province of Teramo is fruitful in rice and corn. That of Chieti is the most fertile of all, and its wines are much esteemed. The olive grows in both the latter provinces. The city of Chieti, the finest in all Abruzzo, is well built, in a delightful situation, ten miles from the sea, has manufactures of silks and woollens, a lyceum, a theatre, several literary societies, and is a place of considerable wealth and luxury. Abruzzo is, upon the whole, a very important as well as very interesting division of the Neapolitan States, of which it constitutes the chief defence on the land side. During the numerous invasions and civil wars of that kingdom, it has been often the scene of protracted contests. It was at Tagliacozzo that the unfortunate Corradino was defeated by Charles of Anjou. It was likewise in the Abruzzi that Alfonso of Aragon recruited his party and maintained himself for years, until at last he was enabled to drive away René, the last of the Anjou kings, from the throne of Naples. The possession of the Abruzzi has always tended materially to decide the fate of Naples. In 1799 the mountaineers strenuously opposed the French troops, and assisted in the recovery of the kingdom.

Albanian and Greek colonies are found scattered about the Abruzzi, as well as in the other eastern provinces of the kingdom of Naples. They occupy whole villages with the districts around them, and form so many distinct populations in the midst of the indigenous inhabitants, preserving the manners, the language, and partially the dress, of their ancestors. These colonies date from different periods: the Albanian or Epirote emigration took place in the fifteenth century, in the time of Scanderbeg and his son John Castriot. The town of Ururi, on the borders of the nearer Abruzzo and Puglia, is an Albanian colony. The Greek emigrants from the Morea came away when that peninsula was lost to the Venetians in the last century; the town of Villa Badessa, in the farther Abruzzo, was peopled by them. These people associate but little with the surrounding population, who look upon them as semi-barbarous strangers; they are, however, acknowledged to be industrious, brave, tenacious of their lands and privileges, honest, jealous of the honour of their women, and strongly united among themselves. The whole number of their villages or colonies throughout the kingdom is about fifty, and their whole population is estimated at 52,000.

Three roads lead into the Abruzzi from the Roman States, one, which is a post-road, on the Adriatic side, proceeds from Ascoli to Teramo, and thence to Penna and Sulmona, where it joins the high-road to Naples. The second is a mountain-road, leading from Rieti to Civita Ducale, and by the pass of Antrodoco to Aquila. The third, also a mountain pass, leads direct from Rome by Tivoli and Vicovaro to Tagliacozzo, and the banks of the Lake of Celano. The only carriage-road from Naples to Abruzzo leads by Venafro to Isernia, in the province of Molise, the ancient Samnium; thence over the central Apennines to Castel di Sangro, which is the first town in Abruzzo, and further over a high wild mountainous region to Sulmona and Popoli on the Pescara, where the road divides, one branch to the left leading to Aquila, and the other to Chieti.—[*Zannoni's Map of the Kingdom of Naples*—*Balbi's Geography*—*Tenore, viaggio in Abruzzo*, Naples, 1830—*Classical Tour by Sir R. C. Hoare*, 4to. 1819.]

ABSCESS, (from a Latin word, *Abscedo*, implying separation,) is so called, because parts which were in contact have become separated. An abscess consists of a collection of the matter termed pus, in some tissue, or organ of the body. This pus, or purulent matter, is made up of a thin watery fluid, in which numerous round cell-like particles, or corpuscles, as they are named, are suspended; and it is a curious fact, the importance of which is not yet thoroughly understood, that these pus corpuscles bear a very close resemblance to, if not a perfect identity with, a set of similar bodies, known as the white or colourless corpuscles of the blood. The formation of pus is never a healthy action, but is usually consequent on an inflammation, and is technically termed the process of Suppuration, of which we shall speak further under the article INFLAMMATION.

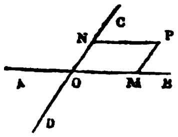
The purulent matter constituting an abscess, properly so called, is always confined within a definite space: the means by which it is confined vary. Sometimes the purulent matter is effused into the substance of an organ; in this case some portion of that part of the blood which is called *fibrin*, or coagulable lymph, is effused with it; this fibrin coagulates into a firm solid, encloses the pus, and so prevents its diffusion. Sometimes the effused fibrin, or coagulable lymph, becomes organized; in this case it forms a new membrane, which is called an *adventitious* membrane, and the pus is completely enclosed in this new membrane as in a bag, or shut sac or *cyst:* an abscess of this kind is called an *encysted* abscess, and the internal surface of this cyst is always endowed with the properties both of absorption and of secretion; for large collections of matter, enclosed in bags of this kind, occasionally disappear without any external opening; and on the other hand, when such a bag has been completely emptied of its contents, it is sometimes rapidly refilled with pus. When an opening is formed in an abscess, and purulent matter continues to be discharged from it, it loses the name of abscess, and takes that of ulcer.

Purulent matter is poured out from the blood in other modes, and forms other collections of pus; but these latter collections are never called abscesses. Sometimes, for example, the pus, as it is secreted from the blood, is diffused through the substance of the inflamed organ. This is the case especially with the lung during the progress of inflammation. This diffusion of purulent matter through the substance of an inflamed organ is termed Infiltration; and, instead of containing an abscess, the organ is said to have pus infiltrated through it.

Again, collections of purulent matter are often formed in natural cavities. The cavity of the thorax, for example, is lined with a serous membrane called the Pleura, and the cavity of the abdomen with a serous membrane called the Peritoneum. In consequence of the inflammation of these membranes, pus is often poured out on their surface, and accordingly large quantities of it are found accumulated in those cavities: but in this case it is merely said that pus is contained in the cavity of the thorax or in that of the abdomen; we never say that those cavities form abscesses.

There are few tissues of the body, and still fewer organs, in which abscesses may not form. They are found in the brain, the lungs, the heart, the liver, the spleen, the uterus, the ovaria, the cellular membrane, and the joints. In some of these organs the disease is highly dangerous, in others certainly fatal, in others comparatively unimportant. In whatever organ an abscess may have its seat, the affection will give rise to a peculiar and definite train of symptoms dependant on the peculiar structure and function of the organ affected; but the symptoms which attend the formation of abscesses, and the phenomena which accompany and denote the successive stages of their progress, the different modes in which they terminate, their diagnostic or distinctive signs, and their treatment, all these topics belong properly to the subject of suppuration, and will be treated of under the article Inflammation.

ABSCISSA, or Linea Abscissa, a line cut off, is a mathematical term, used as follows: If any two right lines AB, CD, be given, meeting in O, the position of any point, P, in the plane of those lines, is known when we know (I.) within which of the four angles, BOC, COA, AOD, DOB, it lies, and (II.) what is its distance from each line, measured on a line parallel to the other; or, in other words, what are the sides of the parallelogram OMPN. Either of these sides being called the *abscissa*, the other is called the *ordinate*; both are called *co-ordinates*; the straight lines, AB and CD, are called the *axes*, and O is called the *origin*. It is customary to denote the lengths of the abscissa and ordinates by the letters x and y respectively. Thus, OM being the abscissa of the point P, PM is its ordinate. All points in the line PM have the same abscissa; all those in PN the same ordinate.—See Equation, Curve, Positive, Negative.



ABSENTEE. This is a term applied, generally by way of reproach, to that class of capitalists who, deriving their income from one country, reside in another country, in which they expend their property. The name has been adopted in political economy; and it is with reference to the principles of that science that we here propose to state some of the more material points in a controverted question of great interest,—namely, whether the consumption of absentees is really an evil to the particular country from which they derive their revenues. It is of the more importance that a right judgment should be formed upon this matter, as there is a decided tendency in the progress of social intercourse to loosen the ties which formerly bound an individual or a family to one particular spot. From the improvement of roads, and the rapidity and certainty of steam navigation, Dublin is now as near, in point of time, to London, as Bath was half a century ago; and the distance between England and every part of the continent is in the same way daily diminishing. With the conviction, therefore, that the inducements to absenteeism, whether from Ireland to England, or from England to the Continent, are constantly increasing, it would be satisfactory to find that a theory which asserts that absenteeism is not wholly an evil, has some foundation in reason and experience.

The expenditure of a landed proprietor resident upon his estate, calls, or appears to call, into action, the industry of a number of labourers, domestics, artisans, and tradesmen. If the landlord remove to another part of the same country, the labourers remain; the domestic servants probably remove with him; but the artisans and tradesmen whom he formerly employed lose that encouragement which they once derived in the exchange of their skill or commodities for a portion of the landlord's capital. It never occurs to those who observe, and perhaps deplore these changes, that the landlord ought to be prevented spending his money in what part of his own country he pleases. They conclude, reasonably enough, that there is only a fresh distribution of the landlord's revenues; and that new tradesmen and mechanics have obtained the custom which the old ones, through uncontrollable circumstances, have lost. But let the same landlord go to reside in a foreign country—let the Englishman go to France or Italy, or the Irishman to England,—and it is immediately asserted that the amount of revenue which he spends in the foreign country is so much clear loss to the country from which he derives his property, and so much encouragement withdrawn from its industry; and that he ought, therefore, to be compelled to stay at home, instead of draining his native land for the support of foreign rivals. Some of the more eminent of our political economists maintain that this is a popular delusion, and that, in point of fact, the revenue spent by the landlord in a foreign country has precisely the same effect upon the industry of his own country, as if his consumption took place at home, for that, in either case, it is unproductive consumption. We will endeavour to state their arguments as briefly as we can.

Let us suppose a landowner deriving an income of 1000*l.* a-year from an estate in one of our agricultural counties. We will leave out of the consideration whether he resides or not upon that estate;—whether he lives in the hall of his fathers, employing the moral influences of property for the amelioration of the lot of his poorer neighbours, or lets that hall, as well as his paternal acres, to one or more farmers. The landowner resides himself in London, or Brighton, or Cheltenham, or any other place congenial to his taste. With his rents he probably purchases many articles of foreign production, which have been exchanged for the productions of our own country. No one questions his right to purchase these foreign productions; for there are few people now who do not understand that if we did not take from foreigners the goods which they can produce cheaper and better than we can, we should not send to foreigners the goods which we can produce cheaper and better than they can. If we did not take wines from the continental nations, for instance, we should not send to the continental nations our cottons and hardware; and the same principle applies to all the countries of the earth with which we have commercial intercourse. The landlord, therefore, by consuming the foreign wines encourages our own manufactures of cotton and hardware, as much as if, drinking no foreign wine at all, he applied the money so saved to the direct purchases of cotton and hardware at home. But he even bestows a greater encouragement upon native industry, by consuming wine which has been exchanged for cotton and hardware, than if he abstained from drinking the wine: for he doubtless himself uses as much cotton and hardware as he wants, as well as the wine; and by using the wine he enables other people in Europe to use the cotton and hardware, who would otherwise have gone without it. For all that he consumes of foreign produce, some English produce has been sent in exchange. Whatever may be the difference between the government accounts of exports and imports (than which nothing can be more fallacious), there is a real balance between the goods we send away and the goods we receive; and thus the intrinsic value of all foreign trade is this,—that it opens a larger store of commodities to the consumers, whilst it developes a wider field of industry for the producers. (See Exports.) There used to be a notion, which, for many years, governed the decisions of our legislators, that unless we sent away to foreigners a great many more goods than we received from them, or, in other words, unless our exports were much greater than our imports, the balance of trade was against us. (See Balance of Trade.) This notion was founded upon the belief, that if we sent away a greater amount of goods than those we received in exchange, we should be paid the difference in bullion; and that the nation would be rich, not in the proportion in which it was industrious at home, and in which its industry obtained foreign products in exchange for native products, but as it got a surplus of gold, year by year, through its foreign trade. Now, in point of fact, no such surplus ever did accrue, or ever could have accrued; for the commercial transactions between one country and another are nothing but a series of exchanges or barter, and gold is only the standard by which those exchanges are regulated. (See BULLION.) We shall see how these considerations bear upon the relations of the English landlord to his native country when he becomes an absentee.

When the landlord, whose case we have supposed, resided upon his estate, he probably received his rental direct from his tenants. That rental was, in truth, the landlord's share of as many quarters of corn, as many head of oxen and sheep, as many fleeces of wool, as many fowls, as many pounds of butter, and so forth, as the estate produced. Three or four centuries ago the landlord's share was paid in kind: for the convenience of all parties, it is now paid in money, or, in other words, the tenant sells the landlord's share, as well as his own share, and pays over the amount of his share to the landlord, in a money-rent, instead of in produce. When the landlord removes to a distant part of the country, this arrangement of modern times becomes doubly convenient. The rental is then collected by a steward, and is probably paid into the hands of a country banker, who draws a bill of exchange in favour of the landlord. By this process, the produce of the land may be most advantageously sold; and the landlord receives the amount of his share at his own door, without even the risk of sending money from one part of the kingdom to another. If it were not so, the servants of a great landed proprietor residing in London might announce to their master,—

'A hundred oxen at your levee roar.'

If the landlord becomes an absentee, the process of remitting his rental assumes a more complicated shape. We will suppose that his inclination leads him to settle in the Netherlands. His means of living there depend upon the punctual transmission of the value of his share of the corn, cattle, and other produce growing upon his estate in England. To make the remittance in bullion would not only be expensive, but unsafe: and, indeed, remittances in bullion can never be made to any considerable extent (such as the demands of absentees would require) from one country to another; for these large remittances would produce a scarcity of money at home, and then the bullion being raised in value, its remittance would necessarily cease. (See COURSE of EXCHANGE.) Although the expenses of our armies in the Peninsula, in 1812-13, amounted to nearly 32,000,000*l.*, the remittances in coin were little more than 3,000,000*l.* Nearly all foreign remittances are carried on by bills of exchange. The operation of a bill of exchange, in connexion with our absentee landlord, would be this. He is a consumer now, in great part, of foreign produce; he probably requires many articles of English produce, through the effect of habit; but whether or no, there must be an export of English goods to the amount of the foreign goods he consumes, otherwise his remittances could not be made to him. He draws a bill upon England, which he pays, through a banker, to a merchant at Antwerp. This bill represents his share of the corn and cattle upon his farm; but the merchant at Antwerp, who does not want corn and cattle, transmits it to a merchant at London, in payment for cotton goods and hardware, which he does want. Or there may be another process. The agent, in England, of the absentee landlord, may procure a bill upon the merchant at Antwerp, which he transmits to the English landlord; and the merchant at Antwerp, recognising in that bill the representation of a debt which he has incurred to England, hands over the proceeds to the bearer of the bill. In either case the bill represents the value of English commodities exported to foreigners. We thus perceive how the consumption of an English resident in a foreign state, out of a capital derived from England, produces, in principle, the same indirect effects upon English industry, as his partial or entire consumption of foreign goods in England. His consumption of foreign goods abroad is equivalent to an importation of foreign goods into England; and that consumption produces a correspondent exportation of English goods to the foreigner. Let it not be said that England sends out a thousand pounds' worth of her exports in consequence of the absentee's residence abroad, and gets nothing in return. She would have had to pay a thousand pounds to the landlord wherever he resided; and the only question is, whether she pays the amount less advantageously for the national welfare to the absentee, than to the resident at home. The political economists, whose opinions we have endeavoured to exhibit, maintain that she does not. It is probable that a good deal of the difficulty which this question presents, has arisen from the circumstance, that the subtraction of a particular amount of expenditure from a particular district, is felt in the immediate locality as an evil; while the benefit which still remains to the whole country is not perceived, because it is universally diffused.

It is right, however, to state, that a number of political economists dissent from the views above exhibited. In fact, the advantages arising from the presence of the landlord in a moral point of view are admitted on all hands. Even those who maintain that absenteeism has no effect on the *wealth* of the country from which the absentee derives his income, allow that the absence of the principal landholders of such a country as Ireland must, morally considered, be a very serious evil. When a country possesses ample means of public instruction, a wholesome and widely-spread literature, and ready and cheap communication, the moral influences of a benevolent resident landlord may be little more felt than the example of any other wise and good man. But in a country far short of this high state of civilisation, the possessors of property have duties to discharge which cannot easily be deputed, and certainly not safely neglected.

But even as a point of pure economy, the opinion of those who maintain that absenteeism is no loss to the country of the absentee admits of question. They allow, that if the absentee landlord, who had been accustomed to expend a certain portion of his income in the improvement of his estate in England, were to suspend those improvements, and invest his surplus capital in undertakings in a foreign country, the question would be widely different, the distinction between consumption and accumulation being fundamental. It is indifferent, they argue, where the proprietor's mere consumption is made, provided his accumulations be invested at home.

Now, there is a fallacy in this assumption. The income which a landlord spends upon his butcher and baker, his tailor, upholsterer, and other artisans, may be all *consumed* so far as he is concerned, but not so far as the country is concerned in which the expenditure takes place. Those who supply such wants do not give the articles at the naked cost of production. Such transactions imply more or less profit on the part of the supplier. When, therefore, we are told by the defenders of absenteeism that the only difference it makes is, 'that the landlord eats them and wears them (the commodities bought with his income) in London or Paris, and not in Dublin or his house in Ireland,' the 'difference,' even on their own principles, is not to be despised. The absentee landlord enables a Paris or Brussels butcher, baker, &c., to accumulate profits; and these accumulations are added to the capital wealth of France or Belgium, instead of to that of Ireland.

We have only to suppose the principle of absenteeism carried to an extreme, to be convinced that there must be fallacy in any argument which pretends to prove it altogether harmless to the resources of a country. If all who have it in their power were to leave Britain, and take up their residence on the continent, although they might still continue to invest their own savings in home undertakings, the sources of profit to numerous classes that remained would be affected in a way not to be mistaken, and the accumulation of capital by those classes palpably diminished. To take an instance: One of the increments of the national wealth takes the form of deposits in the savings-banks, and of these the accumulated earnings of domestic servants make a considerable part. It can hardly be seriously maintained that, on the supposition we have made, this source of accumulation would not be greatly dried up.

Besides, the fundamental proposition of the economists who justify absenteeism—namely, that the consumption of foreign goods by an Englishman abroad produces a correspondent exportation of English goods to the foreigner—is at least not satisfactorily proven. It is far from being a self-evident axiom, as Mr. M'Culloch put it in his evidence before a parliamentary committee, that 'the bill of exchange (by which an absentee Irish landlord receives his rents abroad) is a draft drawn for equivalent commodities, *which must be sent from Ireland.*'

[See M'Culloch's Evidence before the Select Committee on the State of Ireland, 1825, Fourth Report, pp. 813-14-15; also his Evidence before the Select Committee on the State of the Poor in Ireland, 1830, p. 592, &c.—Leslie Foster's *Essay upon Commercial Exchange*, 1804, quoted in the last-mentioned Report, p. 597—Say, *Cours Complet d'Economie Politique*, tom. v. chap. 6—Chalmers on *Political Economy*, p. 200, 1832—*Quarterly Review*, vol. xxxiii. p. 459, for an hostile examination of Mr. M'Culloch's opinions.]

ABSOLUTION, a religious ceremony in use in different Christian communities, by which the priest declares an individual, on repentance and submission to the requisite penance, to be absolved either from his sin, or from the ecclesiastical punishment or deprivation to which it had rendered him liable. It is contended by many theological writers, that down to the twelfth century the priest in this act only used the words 'May God, or may Christ, absolve thee;' thus refraining from claiming any authority to remit the sin himself. Since then, however, the formula used in the Roman Catholic church has been *Ego te absolvo a peccatis tuis* (I absolve thee from thy sins), accompanied with the sign of the cross. The Council of Trent has expressly condemned the doctrine that the priest has not power of himself to absolve from the guilt of sin. (Session xiv. Canon 4.) The Church of England also holds, as may be seen in the Order for the Visitation of the Sick, that power has been left to the church to absolve repentant sinners; and the words which the minister uses in performing the ceremony are nearly the same with those employed in the Catholic communion, 'I absolve thee from all thy sins.' It has, however, been maintained by some that the absolution thus bestowed is only declaratory, while that pronounced by the Catholic priest is professed to be absolute, and to proceed solely from himself. In the Greek church the formula is merely declaratory; that is to say, it is of the nature of a prayer to heaven that the sins of the penitent person may not be visited with their due punishment. It is so also in the Protestant Church of Scotland; and there the term absolution is commonly used to denote simply the declaration of the Kirk-Session or other judicatory, expressed by the mouth of its president, that the party is released from the ecclesiastical interdict to which his delinquency had subjected him.

ABSORPTION, from *absorbeo*, to suck up. The function of absorption is one of the most curious and important of the animal economy. The matter of which the living body is composed is in a state of continual change: old particles are every moment taken from their situation and carried out of the system; new particles are every moment conveyed to the place occupied by the old and deposited in their room. The constituent matter of the living body is, therefore, never exactly the same in two successive moments. This change of the constituent matter of the living body is effected by the process termed absorption, and the agents by which this process is carried on are the absorbent vessels. The absorbent vessels possess a peculiar structure essentially different from that of arteries, veins, or any other vessels of the body, and their action likewise is altogether peculiar. The absorbent vessels consist of two distinct sets. The first arise from the alimentary canal, and more especially from the small intestines. They absorb the digested aliment, and are the instruments by which the new particles of matter, which are necessary to supply the loss occasioned by the removal of the old, are carried into the system. This new matter, which is termed Chyle, is of a white colour, very much resembling milk; and these vessels, when full of it, have the appearance of minute tubes distended with a milky fluid; hence they are called Lacteal Vessels, (that is, milk-vessels.) The other set arise from every part of the body,—from the whole of its external surface,—from the whole of its internal surface,—from every one of its tissues,—from every one of its organs,—so that the point of the finest needle can touch no part of the body without coming into contact with a branch of this system of vessels. At every point of the body these vessels are always at work, taking up and carrying away the old and worn-out particles. But, further, those which are spread out on the external skin, and those, also, which are spread out on the internal skin, on the membrane which lines the air passages, for example, and on that which lines the passage to the stomach, are capable of taking up many foreign substances which may come into contact with them, and often powerfully affect the system by introducing into it these foreign bodies. Whatever be the nature of the substance contained in this second set of vessels, and from whatever source it be derived, it is always without colour when received into the vessel, and perfectly transparent and pellucid; on this account it is termed *Lymph*, and these vessels are, therefore, called Lymphatics. The Lacteals then contain new matter derived from the digested aliment: the Lymphatics contain the old and worn-out particles of the system, together with whatever substances may have been taken into it from the surfaces of the body. The structure and the course of these vessels, and the agencies by which they receive and circulate their contents, will be treated of under the terms Lacteal and Lymphatic Vessels.

Of the real existence and the active operation of the function of absorption there is indubitable proof.

1. In the first place, in certain states of the system, there is a wasting of the flesh, a dissipation of the solids, a diminution of the weight of the body; under other circumstances, while the general system remains unaffected, particular parts of the body diminish in size, or even disappear altogether. These phenomena are not dependent on any external influence, and cannot be referred to the action of any physical agent. They can be accounted for only on the supposition that processes are constantly going on within the body, which remove from the system both the solid and the fluid parts of which it is composed.

2. In the second place, if fluids be injected from without into the internal cavities, or if they be effused in the progress of disease, these fluids disappear sometimes spontaneously, and still more often under the influence of particular medicinal substances. An opening was made into the cavity of the abdomen of a living animal; three quarts of water were injected and secured; in six hours after this operation the animal was killed, and the state of the abdomen was examined; not more than four ounces of the water remained. Oftentimes, after digitalis or fox-glove has been taken some days in succession, large collections of water in the different cavities of the body disappear in the course of a few hours.

3. In the third place, various substances, when placed in contact with a living surface, produce the same effects upon the system as when received into the stomach, or injected into the veins. Arsenic, when applied to an external wound, will sometimes affect the system as rapidly and as powerfully as when introduced into the stomach. A strong infusion of tobacco, when applied to the pit of the stomach, will occasion vomiting, when injected into the rectum will produce almost immediate fainting, and unless care be taken this fainting will end in death. These phenomena can be accounted for only by supposing that the substances in question are really conveyed into the system.

Many facts testify the action of cutaneous or external absorption. It is proved by direct experiment, that the human hand is capable of imbibing, in a quarter of an hour, an ounce and a half of warm water, which, for the whole body, is at the rate of six or seven pounds per hour. An interesting narrative is on record of a ship's crew who were exposed at sea for several days in an open boat; they had consumed all their water; they had no fluid of any kind which they could drink; they soon began to suffer from thirst; the feeling at length became intolerable, and the drinking of sea-water was found only to increase its intensity. When nearly exhausted, they were exposed, during several hours, to a heavy shower of rain. As soon as their clothes became thoroughly wet their thirst began to abate, and before the rain had ceased their thirst was gone. They did not fail to profit by this experience. From this time each man, as soon as he began to feel thirsty, dipped his shirt in the sea-water and wore it next his skin, which had invariably the effect of removing his thirst, the absorbents taking up the particles of water, but rejecting the saline matter dissolved in it.

The function of absorption explains many phenomena connected with health, with disease, and with the action of remedies. The agents which produce disease, and especially the widely-extended and powerful causes of fever,—namely, animal and vegetable matter in a state of decomposition; these, together with the effluvia of marshes, exhalations from the animal body itself, and perhaps other noxious gases diffused in the atmosphere, afford striking illustrations of its operation. An exposure but for a few minutes to an atmosphere loaded with marsh effluvia, of an intensely noxious nature, may produce a protracted ague, or even instantaneous death. Even a few inspirations of an atmosphere, rendered foul by exhalations from the human body, may produce, in a person previously healthy, immediate nausea and vomiting, followed by severe and pernicious fever. A person labouring under small-pox may contaminate the air of a room to such a degree that a healthy person, breathing this air but for a short space of time, may become affected with the disease, although the infected may never have come into actual contact with the infecting person. In all these cases a poison is diffused through the atmosphere, which comes into contact with the surfaces of the body, and so affects the system through the medium of absorption. The free dilution of this poison with pure air will destroy, or render innoxious, these malignant agents; hence, persons who are under the necessity of remaining constantly in the chambers of the sick may remain there with perfect impunity, if these chambers are frequently and thoroughly ventilated; while, if ventilation be neglected, or imperfectly performed, not only is the disease of the patient aggravated, and perhaps by this cause alone rendered mortal, but his nurse also is sure to suffer; hence the value of this further fact, which cannot be too constantly borne in mind, that these noxious agents always affect the system exactly in proportion to its want of energy. Exposure to a powerful noxious agent,—when the stomach is empty,—when the body is exhausted by fatigue,—when the mind is depressed and desponding,—will occasion a mortal disease; exposure to this very same agent, when the body is well nourished,—when the functions are carried on with vigor,—when the mind is cheerful and confident,—will be attended with no appreciable effect. There is no kind or degree of sickness with which a family or an individual can be affected, in the management of which the knowledge of facts of this kind may not afford useful suggestions; but this knowledge is of paramount importance when malignant and mortal epidemics attack a village, a city, a district, or a nation.

Nor is there less practical utility in attending to the action of absorption in relation to noxious agents which are generated within the body itself. When secretion is vitiated, and the morbid matter is absorbed by the lymphatics,—when digestion is imperfect, and unwholesome chyle is absorbed by the lacteals,—when the excretory portion of the alimentary canal is torpid, and the fæcal matter which ought to be carried out of the system is retained there and in part absorbed,—in such cases, the sensible qualities of the perspiration, the odour of the breath, the foul state of the skin, the loss of strength, the irritable and feverish condition of body and mind sufficiently declare the disorder of the system. Considerations such as these show the value of pure air, simple and easily digested food, moderate and regular exercise, purgative medicines, and remedies of the class termed alterative. By alterative remedies we mean medicinal substances that are absorbed from the surface of the alimentary canal, that enter the current of the circulation, that are conveyed by this channel to secreting organs, and that, by their influence over the actions of these organs, effect a salutary change in the general functions of the body.

ABSTINENCE, from *abstineo*, to abstain. The term abstinence signifies a total, or an excessive privation of food. It has been shown (see ABSORPTION) that the constituent matter of the body is in a state of continual change,—that old particles are constantly taken up and carried out of the system, while new particles are as regularly deposited in their room to repair the loss. The source of these new particles is the aliment or food; but a second office is performed by the aliment scarcely less important than that of furnishing new matter for the renovation of the system. All the organs of the body are excited to the performance of their functions by certain external agents, which are called stimulants; such as air, water, heat, and so on; but of these stimulants the aliment is among the most indispensable and the most powerful. Upon the quantity and quality of the aliment depend the quantity and quality of the blood, and upon the quantity and quality of the blood depends in a great measure the energy of all the functions of all the organs. Any material change in the diet must necessarily produce a powerful impression on the system. Life can be maintained but for a short period under the total privation of food, while the excessive privation of it produces effects upon the system which have not been often observed with accuracy, but which are remarkably uniform, and highly curious and instructive. Opportunities occasionally occur of noting those effects with correctness and completeness, when, for example, the passage to the stomach is closed up by disease; or when, owing to an unsound state of mind, the individual refuses to take nourishment.

During the first two or three days after the total abstinence from food, in a person previously in sound health, the suffering from hunger is generally severe. The thirst is also at times distressing, but thirst is not constantly attendant. The pulse during this period remains natural, and so does the temperature of the body. All the evacuations are scanty, and take place at distant intervals. After the first two or three days the wasting of the body becomes visible, the fresh colour characteristic of health disappears, and the features and the limbs, instead of being plump and round, are sunk and collapsed. The loss of weight, which increases rapidly, is appreciable, and the progress of the emaciation is striking. The physical debility increases in exact proportion with the emaciation: and the mind becomes weak, confused, wandering, irritable, and at length almost deprived of reason. All this time there is little or no pain from hunger or thirst, or these uneasy sensations return only at intervals, and are seldom acute and never lasting. The pulse at this stage may be a little quickened; it is certainly easily excited; and in like manner the heat, which seldom sinks below the natural standard, is readily parted with,—so that a slight change of the temperature of a room is felt acutely, and produces very uneasy sensations, a fact which demonstrates to the physician the feebleness with which the functions are carried on, no less clearly than the physical debility itself. The most remarkable and curious phenomena which next supervene are those connected with the intellectual faculties. The loss of power to perceive accurately, and to connect the trains of thought, is followed by decided delirium, which is at first of a low muttering character, similar to that which takes place in the last stage of typhus fever; but this sometimes passes rapidly into furious and even maniacal delirium, requiring coercion just as a violent paroxysm of madness itself. Generally the delirium is preceded by a state of painful watchfulness and restlessness, it being impossible to procure sleep or quiet; and, finally, the skin becomes intensely hot, the pulse extremely rapid, the emaciation frightful, the debility so great that scarcely the slightest movement can be performed, and at length the individual sinks exhausted, commonly into a state of stupor amounting to that complete and profound insensibility which is technically called Coma.

This history of the progressive changes which take place in the system on the total abstraction of food, is illustrated in the most perfect manner, by two cases which fell under the notice of physicians capable of accurately observing and duly appreciating each successive event. Many wonderful stories are on record, of the truth of which there is no sufficient evidence; but the cases to which we refer were observed and recorded by men whose veracity is beyond question, and who were endowed with more than ordinary discrimination and judgment. The record on this account is invaluable, while in itself it is highly curious and instructive.

For the first case we are indebted to Dr. Currie, of Liverpool, the author of an admirable work on the application of cold as a remedy in certain cases of fever. In August, 1795, a gentleman of Yorkshire, aged sixty-six, applied to this physician for his assistance, on account of an obstruction in his swallowing food, with which he had been afflicted for ten or twelve months. At first the complaint was slight; it occurred only when he attempted to swallow dry and hard substances; it afterwards extended to solids of every kind; and, at the time he was first seen by his physician, although he was still able to pass down liquids, the quantity he could swallow was not sufficient for his nutrition, and he was considerably reduced. On the introduction of a bougie into the gullet, it passed about two inches easily, but then met with an obstruction which, by a moderate pressure, was overcome. It then passed easily seven or eight inches more, but, at the lower part of the tube towards its termination in the cardia, it met with a firm resistance, which no patience or skill could surmount. This obstruction proceeded from a schirrous tumour, which, gradually increasing at first, diminished the passage, and at length closed it wholly.

On the evening of the 17th of October a sudden increase of the obstruction came on, and from this time he was able to swallow only a table-spoonful of liquid at a time, and at long intervals. It was with difficulty that he got down seven or eight spoonsful of strong soup in the day, and this quantity gradually diminished. On the thirteenth day from this sudden increase of the obstruction, the passage appeared to be wholly closed.

The patient himself, to the last, was far from despairing of his recovery; and the affectionate friends around him, though they could not but see the issue of the case, yet desired that his life might be prolonged to the uttermost. The following plan was, therefore, adopted with this view. Every morning a clyster was administered, consisting of eight ounces of strong broth, made chiefly of the membranous parts of beef, these being considered the most nutritious, into which were rubbed two yolks of egg, and to which were added forty drops of laudanum. This was repeated in the afternoon, and again in the evening, previously to which, in the evening, he was placed up to the neck in a tepid bath, of which one-fourth was milk, and the rest water; the whole quantity amounting to twenty-four gallons. The temperature was fixed at 96°, to accommodate his sensations, and the time of immersion was gradually prolonged from forty-five minutes to an hour.

After a few days it was found that the retention of the rectum improved, so that the clysters were enlarged to ten ounces of broth, and three yolks of eggs each; to which were added eight ounces of white wine, and the laudanum, which was added to the evening clyster, was gradually increased from sixty to two hundred and fifty drops. Thus the whole of his nutriment for twenty-four hours consisted of thirty ounces of broth, twenty-four ounces of wine, nine yolks of eggs, and from 250 to 380 drops of laudanum, and administered by clyster; with what liquid might be supposed to be taken up in the bath by the absorbents of the surface of the body.

When in tolerable health at the commencement of his complaint, this gentleman, who was a tall man and naturally corpulent, weighed 240 lbs. Before the obstruction had become complete, imperfect nutrition had reduced him to the weight of 179 lbs. In twenty days, from the period of the sudden increase of the obstruction, he was reduced to 154 lbs.; on the twenty-fourth day he had lost 5 lbs. more; and at the period when his delirium commenced, that is on the thirty-second day from the night that he ceased to swallow, he weighed 138 lbs., having lost upwards of 100 lbs. of his original weight. He lived four days longer, that is, thirty-six days from the period when the obstruction was supposed to be complete; but, during these last four days, no nutriment, in any form or of any kind, was administered; for the rectum no longer retained the clysters, and the administration of the bath appeared, under these circumstances, to be wholly useless.

For a month after the total obstruction of the passage, the temperature and the pulse were natural; but on the thirty-second day the pulse became small and frequent; on the following day the eyes lost their common direction, the axis of each being turned towards the nose; he complained that he sometimes saw double, but the sensibility of the retina was increased rather than impaired; for, on the admission of the light of the window, he screamed out, though he had before been accustomed to this light. On the next day there was considerable incoherence of mind; this incoherence passed rapidly into delirium, during the prevalence of which there was a perpetual and indistinct muttering, with great restlessness and agitation; the skin and the extremities were sometimes of a burning heat, and sometimes clammy and cold; the pulse became feeble and irregular; the respiration, which hitherto had been singularly undisturbed, became laborious; and in ninety-six hours after the clysters and all other means of nutrition had been abandoned he ceased to breathe.

During the whole of this melancholy progress to inevitable death, this unfortunate gentleman complained very little of hunger: occasionally he expressed a wish that he could swallow, but not often nor anxiously; and, when questioned on the subject of his appetite, he always declared that he had no hunger which occasioned any uneasiness. The clysters evidently relieved the sense of hunger, and the opium they contained seemed to have a powerful share in producing this relief. It occasioned quiet and rest after each clyster, and allayed every kind of desire or appetite. Neither was he much disturbed with thirst. This sensation was, indeed, troublesome during the first days of his abstinence; but it abated, and, as he declared, was always removed by the tepid bath, in which he had the most grateful sensations. His spirits were uncommonly even, and his intellect perfectly sound. He occupied himself a good deal in his private concerns; and, as usual, interested himself in public affairs. In order to husband his strength he was confined a good deal to bed; but, till the last few days of his life, he dressed and undressed himself daily, and walked not only about his room, but through the house. His nights were quiet; his sleep sound, and apparently refreshing. Just before his delirium set in he had very lively dreams, which were all of a pleasant nature; and, in the last conversation he had with his physician, he told him he had had a very gay evening with two Yorkshire baronets whom he named; that they had pushed the bottle about freely; that many jokes had passed, at the recollection of which he laughed heartily, a thing uncommon with him; but it was observable that he was unable, longer than a moment or two, to distinguish this scene which had passed in sleep from a real occurrence; and this state of mind lapsed into delirium from which he never recovered. At this period he was so weak as to be scarcely able to turn himself in bed, to which he had been entirely confined several days, previously to his death.

The second case, which is no less interesting, occurred to Dr. Willan. A young man of a studious and melancholic turn of mind was affected with symptoms of indigestion, particularly with sharp pains in the stomach and a constant sensation of internal heat, for the relief of which he thought proper to begin a severe course of abstinence, hoping by this means, as he said, to remove his disagreeable complaints; but there was reason to believe that some mistaken notions on the subject of religion principally induced him to form this resolution. Having taken his purpose, he suddenly withdrew from business and the society of his friends, took lodgings in an obscure street, and entered upon his plan, which was to abstain from all solid food, and only to moisten his mouth from time to time with water slightly flavoured with the juice of an orange. After three days of abstinence the craving or desire for food, which was at first very troublesome, left him entirely; he then pursued his studies and meditations without further inconvenience; he used no manner of exercise; he slept very little, spending most of the night in writing; he consumed from half a pint to a pint of water daily, into which he squeezed the juice of the orange to give it an agreeable flavour. He persisted in this plan with firmness fifty-one days. During the succeeding ten days his strength failed rapidly; he was no longer able to rise from his bed: hitherto he had flattered himself that his support was preternatural, and indulged his imagination with the prospect of some great event which he expected would follow this extraordinary abstinence, but now that he found himself sinking to the grave his delusion vanished. About this time his friends discovered his retreat, and he was prevailed upon to assent to any plan that might be conducive to his recovery. He was seen by Dr. Willan on the sixty-first day of his fast: at that time he was emaciated to a most astonishing degree; the muscles of his face were entirely shrunk; his cheek bones stood prominent and distinct, affording a most ghastly appearance; the abdomen was concave, from the collapsed state of the intestines; the limbs were reduced to the greatest possible degree of tenuity, and the processes of their bones were easily distinguishable. His whole appearance suggested the idea of a skeleton prepared by drying the muscles upon it in their natural situations. His mind had become imbecile. He had undertaken during his confinement to copy the Bible in short-hand, and this work he had executed very neatly as far as the second book of Kings, with short arguments prefixed to each chapter. He showed his physician several improvements he had made in that kind of writing, particularly in the abbreviations. He had also, with great diligence, put together parallel passages, and traced particular subjects through the whole Scriptures, noting their application in different instances, and adding observations of his own. He appears at first to have proceeded in this undertaking with considerable ingenuity and judgment; but afterwards he became obscure, and seemed to be lost in endless confusion.

Unfortunately the treatment adopted was injudicious, the quantity of food allowed him being much too large; yet, for the first few days, he appeared to improve, regaining flesh and strength, and acquiring firmness and even cheerfulness of mind; but on the night of the fifth day he was sleepless and restless; on the morning of the sixth he began to lose his recollection, and before midnight he was quite frantic and unmanageable; at the same time his pulse was increased in frequency, with considerable heat of the skin, and tremors. During the following day he continued raving, and talking very incoherently, as he had done during the preceding night. He remained nearly in the same state, scarcely ever sleeping, and taking very little nourishment, his pulse becoming daily smaller and feebler, and beating at length 120 strokes in a minute, and his emaciation still increasing, until the eleventh day from the period that he began to take food and medicine, and the seventy-second from the commencement of his abstinence, on which day he died, quite exhausted.

There is no authentic case on record in which the duration of the abstinence was as long as this, and both these cases taken together afford an excellent history of the disorder of the functions, and the exhaustion of the powers of life on the total and continued abstraction of food. The mind in the first case was naturally firm and strong; in the second it was supported by an enthusiasm amounting to insanity. When the mind is feeble, and especially when it is under the influence of fear, anxiety, despondency, or any other depressing cause, the duration of life is greatly abridged. It is instructive to observe the absence of severe suffering from hunger and thirst; the absence of all acrimony of the fluids; the absence of all violence and turbulence of mind until delirium set in, the precursor of death.

From the powerful influence of abstinence on the system, it is obviously capable of becoming a most energetic remedy in various diseases. When the mass of the fluids and solids of the body is too abundant, abstinence is capable of reducing them to almost any extent that can be required; and if the abstinence be judiciously commenced and conducted, not only is it unattended with any diminution of the strength or injury to the health, but it contributes to the improvement of both. Numerous instances are on record which place this fact beyond question. The case of Cornaro the Venetian nobleman, and that of the Essex miller, which afford evidence of this more complete than it would be easy to invent, are universally known. The body, whatever be its bulk or weight, provided the health be in other respects sound, may be reduced to almost any degree of thinness, and kept at that point by an appropriate regulation of diet and exercise. The physician, at his pleasure, can make no one fat, but he can make any one as thin as he chooses, frequently improving at the same time the health and vigour both of body and mind. Seldom is he called upon to put this art into practice, and seldomer than he ought does he insist upon carrying it into practice; but it is something to know that the resources of his art place this in his power.

In all acute diseases, such as the various forms of fever and inflammation, abstinence is a most powerful remedy, not only because the abstraction of nutriment diminishes the mass of the fluids and solids, (since the process of absorption goes on though the supply of new matter is stopped,) but also because it withdraws one of the main stimulants of the system, and consequently subdues the increased actions which accompany, and which for the most part constitute, acute diseases.

In some chronic maladies, especially in that large class which depend on what is termed plethora, that is, too great a quantity of solids and fluids, particularly in the plethoric state of the blood-vessels of the brain predisposing to and producing apoplexy, in some morbid affections of the stomach itself, in some derangements of the liver, and in several diseases of the heart, abstinence is an invaluable remedy. In other chronic diseases it is injurious, as in diseases of debility, in diseases which depend on irritation in contradistinction to those which depend on inflammation, and in various nervous maladies.

Abstinence is not equally well borne by all persons, nor at all times by the same person. By the corpulent and plethoric it may be endured longer, and carried farther, than by the thin and the spare: in the middle or mature age, it is less injurious than in infancy, youth, or extreme old age. A degree and duration of it, which are highly beneficial in a fever or an inflammation, would be fatal in the state of health.

It is curious, and it is highly important to bear in mind, that abstinence and excess produce symptoms so nearly alike, that it often requires the utmost care and sagacity on the part of the physician to distinguish the one case from the other; and as the one requires opposite remedies from the other, a mistake may be fatal, and must be injurious. A man, addicted to drunkenness, was cast into prison for theft, and reduced, at once, to a diet of bread and water. After the first week, a disorder of the intellectual faculties took place; his countenance became pale and expressive of languor, his flesh wasted, and his strength declined; his nights were sleepless; shortly afterwards there was delirium, which was mild at first, but subsequently furious. These symptoms might have been easily mistaken for those which denote inflammation of the brain; but the true nature of the affection was discriminated, and brandy was administered. Immediately the affection of the brain disappeared, and the flesh and strength returned.

Many years ago, an alarming epidemic broke out in the Milbank Penitentiary, London. The prisoners confined in this prison were suddenly put upon a diet, from which animal food was almost entirely excluded. An ox's head, the meat of which weighs eight pounds, was made into soup for one hundred people, which allows one ounce and a quarter of meat to each person. The prisoners were at the same time subjected to a low degree of temperature, to considerable exertion, and were confined within the walls of a prison, situated in the midst of a marsh, which is below the level of the adjoining river. The consequences were, first, loss of colour, of flesh, and of strength; next, this simple debility of constitution was succeeded by various forms of disease—scurvy, dysentery, diarrhœa, low fever; and, lastly, affections of the brain and nervous system—namely, headache, vertigo, delirium, convulsions, apoplexy, and even mania. When bleeding was tried, the patients fainted after losing five, four, or even fewer ounces of blood. Abstinence will sometimes produce a train of symptoms exactly similar to those of the disease which it is employed to remove. Persistance in the abstinence will aggravate the malady, which will baffle every mode of treatment as long as the abstinence is persevered in; but which will disappear with surprising rapidity on the administration of a generous diet. This is especially the case with those affections of simple irritation which assume the appearance of inflammation, and which are attended with headache, noise in the ears, giddiness, restlessness, sleeplessness, and delirium. A professional man was seized with fever; rigid abstinence was enforced, not only during the continuance of the fever, but also during the stage of convalescence. Delirium, which had been present in the height of the fever, recurred in the convalescence. A physician of eminence in maniacal cases was consulted, who recommended him to be removed to a private asylum. Before this advice was carried into effect, another physician saw him: a different treatment and regimen, with a gradual increase of nourishment, were adopted; the patient was well in a few days, and within a fortnight returned to his professional avocations.

It is the common belief that abstinence is conducive to longevity, and many stories are on record which are conceived to establish the truth of this opinion. It is stated, for example, that the primitive Christians of the east, who retired from persecution into the deserts of Arabia and Egypt, lived healthfully and cheerfully on twelve ounces of bread per day, with mere water; that, with this diet, St. Anthony lived 105 years; James the Hermit, 104; Arsenius, tutor of the Emperor Arcadius, 120; St. Epiphanius, 115; Simeon the Stylite, 112; and Romauld, 120: to which are added many others. But we should remark that the evidence for these instances of longevity may not be quite satisfactory.

The quantity of food absolutely necessary to support the functions of life in vigor, is not known with any degree of exactness. Probably it varies with every constitution, and with every situation and circumstance that modify constitution. Provision is made in the economy for carrying out of the system superfluous nourishment, so that, within certain limits, more than is absolutely requisite is not injurious. Excess, without doubt, is always pernicious, and its direct tendency is to produce disease and to shorten life. For one person, however, who abridges the term of his life by excess, a hundred die prematurely from the want of a sufficient quantity of nutritious food. Persons who live in the bad air of a city require a larger quantity of food, and that of a more nutritious quality, than those who breathe the pure air of the country; and those who labour, physically or mentally, need a corresponding augmentation of food, in order to compensate the expenditure of the system. Persons in sound health, with a good constitution, having a tranquil mind, leading a quiet, contemplative life, without physical or mental labour, in a pure air, and taking regularly a good portion of sleep, may subsist a long time on very little food. And such seems to have been the condition of the Eastern Christian ascetics, whose abstinence and longevity have been so much celebrated. But, even under such circumstances, the processes of life are attended with a certain amount of expenditure, for the compensation of which a certain quantity of food is requisite, and without a supply of which the duration of life must be inevitably abridged. Both the physical and the mental states here supposed are precisely those, however, in which too large a quantity of food would prove more injurious than too small a quantity. In a word, in a state of health, abstinence is always pernicious, and temperance always beneficial; while, in a state of disease, abstinence is often beneficial, and temperance itself injurious, because what is temperance in health is excess in sickness.

Nothing can remedy the morbid condition induced by long continued abstinence, but food; yet nothing will more certainly or more rapidly extinguish life, than the administration of food, unless it be given with the utmost caution. If a person, after having been long exposed to severe cold, be placed close to a large fire, or be brought at once into a warm room, he will sustain grievous injury, and perhaps die; and, in like manner, if a large quantity of nutritious food be poured into the stomach of a person who has been exhausted by long abstinence, the feeble spark of life that may remain will certainly be extinguished. In Dr. Willan's case, three pints of food,—a pint of milk for breakfast, a pint of mutton-broth boiled with barley for dinner, and as much rice-milk for supper,—were allowed on the third day after an abstinence of sixty days! No wonder that all the symptoms were immediately aggravated, and that the condition of the patient soon became hopeless. One-third of this quantity would have been far too much. To have allowed milk at all was bad, because milk becomes solid in the stomach, and is then more difficult of digestion than other solids, from being unmasticated. In cases like this, a little thickened broth should be given every three or four hours, and the quantity very gradually increased; subsequently, animal food may be allowed; warmth should be promoted by every expedient; frictions are useful auxiliaries, and the bowels should be aided by the occasional use of mild clysters. Internal stimulants are seldom needed; when given at all, the best are ammonia, camphor, the vegetable bitters, and tonics, with small quantities of some anodyne.

ABSTRACTION is an act of the mind, by which it considers a certain attribute of an object, or several objects, by itself, and without regarding any other attributes which the object or objects may happen to possess. Thus, if we see ink, pitch, ebony, and a negro, we see that these objects have in common the attribute of blackness; and this quality we can in thought *draw off* or *abstract* from the various other attributes which they respectively possess; and consider it separately and independently of anything else. In like manner we can consider any attribute of a single object, such as of the sun or moon, without attending to its other attributes; thus we may contemplate the magnitude of the sun without attending to its heat, light, &c.: so we may contemplate the light of the moon, without attending to its magnitude, the inequalities of its surface, &c. All names of classes, inasmuch as the individual members can never be identical, are formed by a process of abstraction. Thus, when we think of a ship or a house, we pay no attention to the materials, colour, shape, size, construction, convenience, or beauty of the ship or house, but we give the one name to any dwelling of man built by regular artificers, and the other to any vessel with a deck and masts made to sail on the sea. Any object which possesses these attributes we call a ship or a house; though there cannot be any ship or house which possesses *only* those attributes, and is not also of a certain colour, size, shape, &c.: but these incidental qualities we leave out of our consideration in referring any object to the class of houses or ships.

From these remarks it is evident that abstraction, being a merely arbitrary act of the mind, by which a certain attribute is considered apart from any other attributes with which it may happen to be associated, does not represent to us images or notions to which there is anything corresponding in the nature of things: there is nowhere an abstract man or tree which has no colour, dimensions, or other incidents not entering into the abstract notion signified by those general terms. Whenever we recognize in any object those peculiarities which we consider as characteristic of a certain class, we refer it to that class, without taking any heed of the *other* attributes with which they may happen to be combined. Thus, if in some unexplored part of the world there should be discovered a race of animals resembling some known variety of the human race in every particular except the colour of the skin or the hair, they would be doubtless called men, although there is no such thing as an abstract man whose skin or hair is devoid of colour.

The circumstance of there not being any sensible object, or any conception of our mind, which we can image to ourselves without its attributes, has given rise to considerable perplexity on the subject of abstraction. For instance, when we think of a horse, we represent to ourselves an animal of certain colour, shape, and size; though we should equally give the name of horse to an animal of different colour, shape, and size. So, when we think of a plane triangle, although a triangle is any plane figure bounded by three straight lines, yet we cannot help representing to ourselves a triangle which is either right-angled, or acute-angled, or obtuse-angled, or equilateral or scalene. The truth is, that the process by which the mind abstracts is, that it conceives or represents to itself the object of thought as an individual of its class, together with certain particular attributes which must belong to all individuals; and it considers apart from the rest only that attribute which is required for the matter in hand. Thus, if it is a question whether a newly-discovered skeleton is that of an animal belonging to the class of elephants or of deer, the comparative anatomist calls to his mind an elephant or deer, such as actually exists, but *considers* only the structure of his bones; and, if there is a close agreement in this respect, he pronounces the skeleton to have belonged to one of those classes. So, likewise, when a mathematician, by means of a figure described on paper, proves that the square of the hypotenuse equals the sum of the squares of the other sides of a right-angled triangle, although the image in his mind is that of a triangle of a definite size, yet he considers only the relation of the sides and angles, without paying any attention to the length of the lines.

This process, by which the mind *generalizes* a particular notion, by considering only a part of it, might be illustrated by many examples of changes in the meaning of words. Thus, there stood formerly on the bank of the Thames in London, a palace called Bridewell; this, in the reign of Elizabeth, was converted into a penitentiary, or prison for hard labour: whence the term *bridewell* has been extended, and is now sometimes used as a general name for such penitentiaries. So the name *palace* has been extended to all sumptuous houses, having originally been confined to that on the *Palatine* hill, at Rome. It has been remarked that, although brute animals have, like men, the faculty of reasoning or drawing conclusions from premises, yet they have not, like men, the faculty of abstraction. Nevertheless, it is plain that some animals go through a process of which the effects exactly correspond with that of abstraction in men: for example, they can count, and are aware of the recurrence of certain numbers; and a dog who has once been beaten with a stick, or pelted with a stone, will run away from all sticks or stones, of whatsoever size, shape, or colour. That they cannot found, on abstraction, the admirable gift of language, the most important distinction between men and beasts, is owing apparently not to the absence of the power of forming general notions, nor yet to the inability of making articulate sounds, as we may perceive in the instance of the parrot.—See NOMINALISTS and REALISTS.

ABSURDUM, REDUCTIO AD, is that species of argument which proves not the thing asserted, but the absurdity of everything which contradicts it. It is much used in Geometry, in order to demonstrate the converse (see CONVERSE) of a proposition already proved. One of two things must be true; either the proposition asserted, or something which contradicts it. If the opposing party denies the proposition, he must affirm that which is contradictory. Let his counter-proposition be taken for granted: then, if, by the legitimate use of it, some absurdity can be deduced, it is evident that his contradiction is wrong, and the original proposition right. As an instance of this method of proceeding, let us suppose it has been proved, and is not denied, that whenever A is B, then C is D. We may then affirm that when C is not D, A is not B. For if A were B, C would be D; but C is not D, therefore A is not B. The strict form of the *reductio ad absurdum*, in this case, is as follows:—You grant that if A were B, C would be D; but you refuse to admit the consequence that, when C is not D, A is not B; that is, you say that C may not be D, and yet A may be B. Let this, then, be as you say, that is, let C not be D, and yet let A be B.

But in supposing that A is B, the admitted proposition obliges you to say that C is D. But you have supposed that C is not D, you therefore say at the same time that C is D, and that C is not D, which is absurd. Consequently, if it be true that, whenever A is B, then C is D, it follows that, when C is not D, A is not B.

The *reductio ad absurdum* has been objected to as not equally conclusive with direct demonstration. For this there is no foundation; though it must be admitted that direct demonstrations are more pleasing and more elegant. But it is obvious that, if everything which contradicts a proposition be false, the proposition itself must be true. The student of logic must distinguish between that which is only *contradictory*, and that which is *contrary* to a proposition. Thus, to the proposition that 'all squares are equal,' it is contradictory that '*some* squares are not equal,' and contrary, that '*no* squares are equal.' The contrary is the most complete contradictory, and affirms that the proposition is true in no one instance. It is not correct to say that, if a proposition be false, its contrary is true; for example, it is false that all squares are equal, and equally false that no squares are equal. But of a proposition and its contradictory one must be true; thus, either all squares are equal or some squares are not equal. Hence, whatever disproves a proposition proves something contradictory, and whatever disproves everything contradictory proves the proposition. The *reductio ad absurdum* is, therefore, as conclusive as direct demonstration.

ABU BEKR, properly called Abdallah Atik ben Abi Kohafah, but better known under the name of Abu Bekr (*i.e.* 'Father of the Maiden,' in allusion to his daughter Ayeshah, whom the Arabian prophet married very young), was the first caliph or successor of Mohammed in the government of the new empire founded by him. Mohammed died in A.D. 632, without leaving male issue. The succession to the sovereignty was at first contested between his father-in-law, Abu Bekr, and Ali ben Abi Taleb, his cousin-german, who was also, through marriage with the prophet's daughter Fatima, his son-in-law. Between the two rivals themselves the dispute was settled without an appeal to arms. Abu Bekr prevailed, and Ali, though disappointed, submitted to the authority of his successful opponent. But among the Mohammedans the respective claims of the two competitors became a point of perpetual controversy, and gave rise to the great division of the whole Mohammedan community into Sunnites and Shiites; the former asserting the right of Abu Bekr and his two successors, Omar and Othman, while the Shiites condemn these three caliphs as unlawful intruders, and maintain the exclusive right of Ali ben Abi Taleb and his lineal descendants to the commandership over the Faithful.—[See article Ali ben Abi Taleb.]

After the death of Mohammed, several of the Arabian tribes, who had become converts to the religion promulgated by him, shook off their allegiance to his successor. Only the three important towns of Mecca, Medinah, and Tayef declared themselves for Abu Bekr. It was the first and principal object of the newly appointed sovereign to establish his authority in the other parts of Arabia, especially in the countries of Yemen, Tehama, Oman, and Bahrain. In reducing to obedience these refractory provinces, Abu Bekr was powerfully supported by Omar, afterwards his successor, and especially by Khaled ben Walid, a military commander of extraordinary courage and presence of mind. Besides this rebellion of some of its members, the Mohammedan state had to encounter other difficulties from several new pretenders to prophetship, who came forward in different parts of Arabia, and some of whom soon gathered numerous adherents around them. Among these the names of Osud al Abbasi, Tolaihah ben Khowaised, and Mosailamah deserve to be mentioned. Whatever disturbance these new pretenders might cause among the faithful Moslems, the firmness of their belief in the mission of Mohammed could not be shaken, since he himself had prepared them for the appearance of such impostors. Mosailamah seems to have been the most formidable of these enemies of the Islam. He was however defeated by Khaled, and killed in a battle near Akrabah. This conflict is memorable also on another account. The precepts promulgated at different times by Mohammed had, till then, never been collected in a volume; they were handed about in fragments written on palm-leaves or pieces of parchment, and in a great measure preserved by oral tradition. Many of the personal associates of Mohammed, who were from memory familiar with his doctrine, fell in the war with Mosailamah; and Abu Bekr, in order to obviate any future uncertainty about the genuine text of the ordinances, caused all the fragments to be collected, the passages remembered by heart to be written out, and the whole to be embodied in the volume known under the title of the Koran—a work which, from the importance of its contents, as well as the force and purity of its language, is the sacred and classical book of the Mohammedans.

When the authority of the caliphat was fully established in Arabia, Abu Bekr was anxious to increase the Mohammedan dominions by foreign conquest. Khaled was dispatched into Irak, and subdued several of the frontier provinces along the Euphrates, which belonged to the then declining empire of Persia; while two other commanders, Yezid ben Abi Sofyan and Abu Obeidah, with an army gathered from all parts of Arabia, entered Syria and defeated the troops of the Grecian emperor Heraclius. They also got possession of the town of Bostra, favoured, it is said, by the treason of its governor Romanus. But the siege and capture of Damascus by the united forces of Abu Obeidah and Khaled, which event was preceded by a decisive victory over a Greek army of 70,000 men near Ajnadain, forms the principal feature of this expedition, as it established the dominion of the Arabs over Syria, and in fact over the whole country between the Euphrates and the Mediterranean.

On the day of the capture of Damascus (23rd August, A.D. 634) Abu Bekr died, at the age of sixty-three years. Not one of his three sons, Abdallah, Abd-al-rahman, and Mohammed, survived him; and in his will he appointed Omar as his successor. Eastern writers praise the almost austere simplicity of his habits and manners, and his entire disregard of wealth, and the luxuries or even comforts of life. So determined was he not to be enriched by his elevation to the supreme command, that every Friday he distributed all the surplus of his income among such persons as he thought deserving of it. His short reign, of little more than two years, forms an eventful epoch in the history of Mohammedism; and Oriental authors have vied with one another in recording details about the early conquests of the armies of the Faithful. The volume of the great Arabic chronicle of Tabari, lately edited and translated by Kosegarten (Greifswald, 1831. 4to.), is entirely occupied with only the earlier part of Abu Bekr's reign; the latter part, or the history of the conquests of Irak and Syria, still remains unpublished. A highly interesting account of the siege and capture of Damascus, derived chiefly from the Arabic chronicle of Wakedi, may be found in Ockley's *History of the Saracens*.

ABULFARA'GIUS, properly Mar Gregorius Abulfaraj, also called Gregorius Barhebræus, was an Oriental writer of much celebrity, who lived in the thirteenth century of our era. He was born in A.D. 1226, at Malatia or Melite, a town situated near the western bank of the Euphrates in Lesser Asia, where his father, Aaron, followed the profession of a physician. Though the offspring of a Jewish family, he embraced the Christian belief, to which he continued faithful till his death. It is, indeed, surmised that shortly before his death he renounced Christianity; but this unauthenticated report is sufficiently counterbalanced by the unqualified praise with which his name is mentioned by Christian writers, who would not have allowed such a fact to remain unnoticed. Abulfaraj studied theology, philosophy, and medicine. He spent the greater part of his life in Syria. At the early age of twenty years he was appointed Bishop of Guba, and subsequently of Aleppo. In 1266 he was elected Primate of all the Jacobite Christians in the East. He died at Meragha in Azerbijan, A.D. 1286.

Abulfaraj was the author of a great number of Arabic and Syriac works, but the composition through which his name has become best known among us is a universal history, originally written in Syriac, but subsequently translated by the author himself into Arabic, to which he has given the title of *History of the Dynasties*. It is divided into ten sections; the first of which gives some account of the patriarchs; the second of the Jewish commonwealth under the judges; and the third of the Jews under the kings; the fourth contains the history of the Chaldæans; the fifth of the Persians; the sixth of the Greeks; the seventh of the Romans; the eighth of the Christian Grecian empire; the ninth of the Mohammedan Arabs; and the tenth of the Mogols. In the early part of the work many errors are observable into which the author has fallen through his ignorance of the classical languages and literature. The section treating of the Mohammedan history is written with greater accuracy; and in his account of the Mogol dynasty, towards the conclusion of the work, Abulfaraj speaks from his own knowledge and experience as an eye-witness. Though written by a Christian, this work is held in high esteem even among Jews and Mohammedans in the East. To us its chief interest consists in the curious details which it contains concerning the history of science among the Arabs, particularly under the three Abbaside caliphs, Mansur, Harun al Rashid, and Mamun. An edition of the Arabic text of the *Dynasties*, accompanied with a Latin translation, was published by Edward Pococke, at Oxford, in 1663, 4to.; the Syriac text, likewise with a Latin version, was edited by Bruns and Kirsch, at Leipzig, in 1789, 4to.

ABUL FAZL, son of Sheikh Mobarik, was the vizir of the celebrated Mogol emperor Akbar, who reigned from A.D. 1555 to 1605. Of the history of his life few details are known to us. In 1602, when returning from an expedition to the Deckan, he was murdered in the district of Nurwar by banditti, and, it was suspected, by the contrivance of Akbar's son Selim, who afterwards succeeded his father on the throne, under the name of Jehangir. The extensive and valuable works, which, notwithstanding the duties of his high office, Abul Fazl found leisure to write, have ensured him a conspicuous place among the best authors, as well as among the most enlightened statesmen, of the East. His principal work is the *Akbar-Nameh*, which exists as yet only in MS., and contains a history of the reign of the sovereign whom he served, and to whom he was most devotedly attached; this history Abul Fazl carried down till very near the time of his own death, and it was afterwards continued by Sheikh Enaiet-ullah in a supplement, entitled *Takmileh-i-Akbar-Nameh*. But the work which has most contributed to make his name familiar to us, is the *Ayin-i-Akbari*, or *Institutes of Akbar*, a statistical and political description of the Mogol empire, and of the several branches of its administration, some account of which will be given hereafter. [See AYIN-I-AKBARI.] Abul Fazl was a friend to the oppressed Hindus. It appears that the exertions which he made for their protection, and the zeal with which, assisted by his brother Feizi, he endeavoured to derive a precise notion of the nature of their political and religious institutions from their own ancient codes, prejudiced many narrow-minded Mohammedans against him. In his Persian prose translation of the great Sanskrit heroic poem, the *Mahabharata*, Abul Fazl has left us a curious and valuable monument of the persevering diligence which a Mohammedan statesman deemed it worth his while to bestow on the literature of the conquered nation, in the government of which he was called to assist by his counsels. Another of his works, less interesting to us, though much admired in the East on account of its refined and florid style, is the *Ayar-i-Danish*, or *Touchstone of Intellect*, a Persian translation from the Arabic of the well-known fables of Bidpaï, or Pilpay.

ABU'LFEDA, or, with his full name, EMAD-EDDIN ABULFEDA ISMAÏL BEN ALI, was the descendant of a collateral branch of the Ayubite dynasty, which Saladin, in A.D. 1182, appointed to the sovereignty of the three towns Hamah, Maarrah, and Barin, in Syria, and which continued to hold that dignity even after the Bahrite Mamluks, under Azz-eddin Ibek, had, in A.D. 1254, put an end to the Ayubite dominion over Syria and Egypt. Abulfeda was born in A.D. 1273, at Damascus, whither his family had fled before the Mogols, who then threatened Syria with an invasion, but were successfully repelled by the Bahrite Sultan Bibars. Mohammed ben Basel, once sent as ambassador to the German Emperor, Frederic II., is mentioned as having been one of his teachers. He began at an early age to display a warlike disposition, and to join in the expeditions against the remains of the Christian kingdom founded in Syria by the Crusaders. In 1285 he was present at the siege of Markab,—in 1289 at that of Tripoli,—and in 1291 at the taking of Akka (St. Jean d'Acre); at a later period (A.D. 1298), he accompanied his cousin Modhaffar, then the reigning prince of Hamah, on an expedition against the Mogols. After the death of Modhaffar, in 1299, the Bahrite Sultan Nasir declared the fief which the Ayubites held under him to have become extinct, and assigned a small pension for their maintenance. When, however, ten years afterwards, Sultan Nasir became personally acquainted with Abulfeda, he not only restored to him (1310) the former dignity of his family, but soon after, as an acknowledgment for his services, raised him to the rank of *malik*, or king. In 1316, Abulfeda was obliged to give up the town of Maarrah and its territory to the Arab Emir Mohammed ben Isa, who demanded this boon as a reward for his defection from the Mogols; but he retained Barin and Hamah, and, with his troops, often rendered military services to Sultan Nasir. Already in 1315 he had assisted him in an expedition against the town of Malatia or Melite, which had shown itself favourable to the cause of the European Christians, and to the Moguls. He continued on the most friendly terms with Nasir, till he died in 1331. The numerous works which he has left behind attest the extent and variety of his information. Among them we find mentioned works on medicine, Mohammedan jurisprudence, mathematics, and philosophy; those most commonly known are a treatise on geography, entitled *Takwim al-boldan*, or 'Disposition of the Countries,' and an historical work called *Mukhtasar fi akhbar al-bashar*, i. e., 'A Compendium of the History of Mankind.' The geographical treatise consists of an introduction and twenty-eight sections on particular countries, each containing, first, a table, showing the latitudes and longitudes of the most remarkable places, and afterwards detailed statistical and topographical notices respecting them. Besides his native country, Abulfeda had seen Arabia, whither he went twice on a pilgrimage to Mecca, and also Egypt, which he visited frequently when he took the customary annual presents of homage to the court of the Sultan. In the description of such places as he had not seen himself, he takes care to name the authorities from whom he draws his information. A uniform edition and translation of the entire geographical work of Abulfeda is still a desideratum in oriental literature; the descriptions of single countries have been edited by Gravius, Reiske, Rommel, Kœhler, Michaelis, and others. The historical work is a chronicle after the usual comprehensive plan of Oriental works of this kind. It commences with a brief and very imperfect sketch of the ancient history of the Jews, Persians, Egyptians, Greeks, Romans, &c.; then gives some information about the history of the Arabs before the time of Mohammed, and thus passes over to its main object, the history of the Prophet, and of the Arabian empire, which it carries down as far as the year 1328. The earlier centuries of the Mohammedan power are but briefly treated, and many important events—for example, the conquest of Spain by the Arabs—are entirely passed over. Farther on the narrative becomes fuller and richer in interesting details. For the history of the Crusades it is one of the most important Oriental sources which we possess. The latter part of the work, or the history of Mohammedanism, was translated by Reiske, and edited with the Arabic text by Adler, at Copenhagen, in five vols. 4to. 1789-94; an edition and translation of the ante-Islamitic part has been published by Fleischer, Leipzig, 1831, 4to.

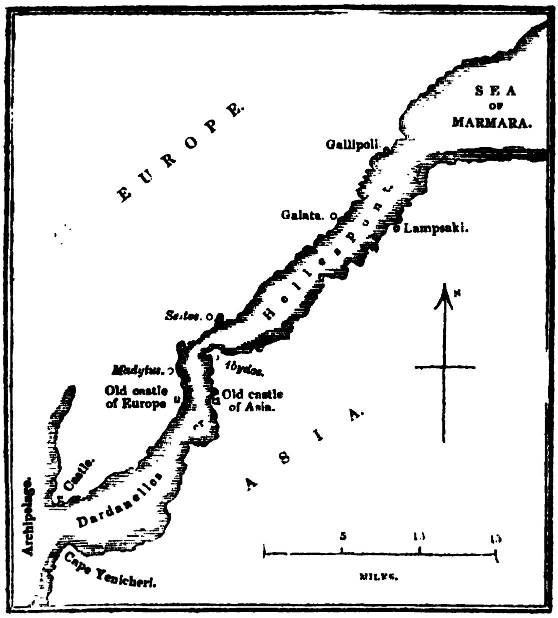
ABURY, see AVEBURY.

ABUTMENT, in building, or the practice of civil architecture, that which receives the end of, and gives support to, anything having a tendency to spread or thrust outwards, or in a horizontal direction. The piers or mounds on, or against, which an arch that is less than a semi-circle, or a series of such arches, rests, are abutments; while the supports of a semi circular or semi-elliptical arch, or of an arch of any other figure, which springs at right angles to the horizon, are imposts. The arches of the Southwark and Vauxhall bridges, over the Thames at London, are small segments of circles, even less than quadrants, and all their piers are abutments or abutment-piers; the arches of the London, Blackfriars, Waterloo, and Westminster bridges are all semi-ellipses, and their piers are imposts, or impost piers, and not abutments. Nevertheless, the piers at the extremities of a bridge, of whatever form its arch or arches may be, are always termed its abutments; that is, abutments of the bridge itself; for the road-way of most bridges forms the arc of a circle, and may be considered an outer arch, whose abutments are the land-piers. Level bridges, such as Waterloo-bridge, cannot, indeed, be said to have abutments, in the technical and more restricted sense of the term; but in its more general acceptation, as mounds or props which receive the ends of the series of arches of which the bridge is composed, and tend to prevent the possibility of their spreading, the land-piers of a level bridge also are abutments.—[See BUTTRESS and IMPOST.]

ABUTTALS (from the French ABUTTER, to limit or bound) are the buttings and boundings of lands to the east, west, north, and south, showing by what other lands, highways, hedges, rivers, &c., such lands are in those several directions bounded.

The boundaries and abuttals of corporation and church lands, and of parishes, are usually preserved by an annual procession.

ABY'DOS, an ancient Greek town on the Asiatic shore of the Hellespont, now the Dardanelles, and nearly opposite Sestos on the European shore. It is said by Strabo to have been founded by the Milesians; but the date of its foundation, like that of many other Greek towns, is not accurately known. Abydos was burnt by Darius the Persian, after his Scythian expedition; and somewhat later (B.C. 480) the people of Abydos witnessed the immense army of Xerxes cross the stream on a bridge of boats.—(See *Outline of General History*, chap. viii.)—This bridge did not extend from Abydos to Sestos, which was a distance of more than three English miles, but it was formed at a narrower part, where the distance is somewhat less than one mile. It commenced on the Asiatic side, a little higher up the stream than Abydos; its termination, on the opposite coast, was at the projecting point opposite to Abydos, and between Madytus and Sestos. The practice of crossing large streams by means of boats lashed together, and covered with planks, was common among the Persians; nor were they used only for temporary occasions, but existed in the time of Herodotus and Xenophon over the great rivers of Western Asia, as they do now over the Tigris at Bagdad, the Euphrates, at Hillah near the ruins of Babylon, and elsewhere. When Darius, the father of Xerxes, crossed the channel of Constantinople, on his Scythian expedition, the bridge of boats was constructed by a Greek of Samos, who endeavoured to perpetuate his glory by causing a painting of the passage of the army to be put up in the great temple of Juno at Samos. A description of the bridge of Xerxes is given by Herodotus (vii. 36), who was on the spot probably much less than half a century after the event.



[The ancient names are in italics.]

The passage of Abydos has obtained a poetical celebrity from the story of Leander, who used to swim across the stormy waters of the Hellespont to visit his mistress Hero, whose name was commemorated even as late as the beginning of the Christian æra by a building called the Tower of Hero. There is extant a Greek poem by Musæus, who perhaps lived about the fourth century, descriptive of the love and tragical fate of Leander. In our own days Lord Byron has given a new interest to these localities by his poem of the *Bride of Abydos*.

ABY'DOS, an ancient city of Upper Egypt, the remains of which are found near two villages, El Kherbeh and Harabat, about six miles from the west bank of the Nile (N. lat. 26° 12'). The chief building, which still remains, is nearly covered with sand, but the interior is in good preservation. Contrary to what we observe generally in Egyptian buildings, this edifice is constructed of both limestone and sandstone. In the interior it is said that constructed arches are found, similar to those of brick which Belzoni describes at Thebes. The numerous apartments in this building, and the style of decoration, show that Abydos was once a place of importance, and possibly a royal residence. When Strabo was in Egypt (about the commencement of the Christian æra) Abydos was a mere village, but he learned that the great building was called a Memnoneion, or palace of Memnon, and that tradition assigned to Abydos a rank in ancient time next to Thebes. 'There is,' says the geographer, 'a canal leading to the place from the river:' but, besides this communication with the main stream, Abydos had the advantage of standing on the great canal which runs northwards, and is best known by the name of the Bahr Youssuf, though the *name* commences much farther north, at a place called Tarut es Sheriff.

In the year 1818, Mr. W. Bankes discovered on an interior wall of a building at Abydos, not belonging to the great edifice, a kind of tablet or genealogy of the early kings of Egypt, which is now generally called the Table of Abydos. Mr. Bankes made a copy of this, and others have been since made by Caillaud, Mr. Wilkinson, Burton, and others. The copy which we have before us is one by Mr. Burton, which is more complete and correct than that in Salt's Essay, which was made by Mr. W. Bankes. This tablet consists of three compartments lying horizontally one above another, and each compartment has been divided into twenty-six rectangles, so that the whole has once contained seventy-eight rectangles. No one compartment is perfectly entire, but enough remains of the lowest to enable us to determine the original dimensions of the whole table, and the number of compartments. Each of these rectangles contains an elliptical ring, or cartouche as it is sometimes called, such as may be seen on the Egyptain monuments in the British Museum; and each cartouche contains those various figures which are now generally admitted to indicate the names or titles of sovereigns. The lowest of the three compartments contains in the nineteen rectangles, which are complete, the title and name of Ramses the Great, perhaps the Greek Sesostris; the same prænomen or title, and name, having each probably been repeated thirteen times in the whole twenty-six rectangles, of which seven, as we have just stated, are erased. Deducting these twenty-six, we have remaining in the other two compartments fifty-two rectangles: the fifty-first and fifty-second contain the title and name of a Ramses, who may be a predecessor of Ramses the Great. The cartouches preceding these are probably the titles of kings; for example, the forty-seventh is the same as that on the great colossal statue at Thebes, and on the entire colossal statue in the British Museum, which is Amenophis II. (in Manethon's Catalogue), or the Greek Memnon. Whether the forty-six cartouches that precede this of Memnon belong to kings, his lineal predecessors, we cannot undertake to assert or deny.—[See article in the *Westminster Review*, No. xxviii. p. 405; vol. ii.]

ABYSSINIA. The name of Abyssinia became known in Europe from the Portuguese missionaries who penetrated there in the sixteenth century. Tellez (*History of Ethiopia*) says, the name of the people is Abexins. The Portuguese wrote the names of the country and people in Latinised forms—namely, Abassia and Abassinos, whence comes our term Abyssinia. Habesh, according to Ludolf, an Arabic term, signifying a mixed people, is the native name of the country. The people, whether generally or not we cannot say, speak of themselves by the name of Ityopayawan, or Ethiopians.

The political boundaries of the country to which we give the name of Abyssinia, have varied since the Portuguese first made us acquainted with it, as we may see from Tellez' *History of Ethiopia*; but to trace all these revolutions would not be a very easy or a profitable labour. Though the term Abyssinia strictly belongs to a particular political division of Africa, it is often used in a vague sense as referring to an extensive country, remarkable for the physical conformation of its surface. Viewed in this sense, Abyssinia is an elevated table-land, with a uniform slope from east to west, of which the greater part is drained by branches of the Nile, lying between 8° 30' and 15° 40' N. lat., and between 35° and 42° E. long. The north-eastern edge of the table-land faces the Red Sea, between Massówa and Cape Rackmah, and is from 30 to 60 miles from its shores. The southern boundary of the table-land is formed by the valley of the Hawash River, from the mountains of Bulga, westward to its sources. From these mountains, the edge of the table-land runs northwards to Lake Haik, and forms the boundary of an elevated region, which, lying between the Hawash and the Abai, forms the water-shed of these rivers. The Bahr-el-Azrek, or Blue Nile, forms the boundary of the table-land towards the west. It is probable that the slope from the elevated country to the basin of the river is very gentle, as the latter in this quarter is not 1500 feet above the sea-level. It will be observed that we have not given a continuous outline of the edge of the table-land of Abyssinia—only those portions of it which are known have been mentioned.

The accounts of the Portuguese may still be considered as authority for many facts relating to Abyssinia, and the reader may see in the learned work of Job Ludolf how much information that industrious scholar was able to extract from them. Ludolf had also the advantage of personal acquaintance with Gregory, an Abyssinian, then in Germany. Lewis Poncet, a French physician, who visited Gondar in 1699, to cure the king of some complaint, published an account of his journey. Next, Mr. Bruce, in 1770, entered the country, and published an elaborate account of it sixteen years after his return. It was long the fashion to disparage the merits of this traveller, but the most recent accounts of the regions through which he passed serve to show that he possessed both honesty and a power of accurate observation, qualities which have very generally been denied him. The work of Salt on Abyssinia, however, contributed more than all that preceded it to a correct knowledge of that country. In consequence of a civil war between the Ras, or governor, of Tigré and the governor of Gojam, he was unfortunately not able to proceed to Gondar, so that his observations were confined to the kingdom of Tigré. Within the last twenty years, Abyssinia has been visited by many travellers, and from their accounts much additional topographical information regarding that country may be obtained.

Abyssinia is divided into three distinct and independent states, which division is partly founded on natural boundaries, and has been partly caused by the incursions of the barbarous Galla tribes. These three great divisions are Tigré, Amhara, and the province of Shoa. Tigré is bounded on the north by the Bekla, Boja, Takué, and some wild Shangalla tribes; by the Danákil, Doba, and Galla on the east and south. It is separated on the west from Amhara by a great branch of the Nile called the Tacazzé, running first north and then north-west. Along the west bank of the Tacazzé is the bold mountain-range of Samen, extending from the south part of Lasta northwards to the district of Waldubha. The Tacazzé and the Samen thus form a natural barrier between Tigré and Amhara; and though one province has been frequently conquered by the other, this natural boundary, joined to the difference of language between Amhara and Tigré, and other causes, has always made a real, effective, and permanent union impracticable. Tigré lies between 11° 20′ and 15° 40′ N. lat., and 39° and 42° E. long. But though the name Tigré is applied to all the country included within these limits, as forming one kingdom, it properly belongs only to one of the provinces of which that kingdom consists.

1. *Tigré*.—Upon the edge of the table-land facing the Red Sea, there rises a ridge of hills to a height of from 500 to 1000 feet above the table-land itself. Thus they have an elevation above the level of the sea of about 9000 feet, as at the village of Halai, at the top of the Taranta Pass, on the road from Massówa to Axum, the table-land is 8628 feet high. To the west of these hills, the country gradually descends, as is indicated by the course of the streams. It is supposed that these terminate in a swampy level country called Maleb, which, having no channel for the discharge of its waters, is unhealthy and uninhabited. The district watered by these streams is called Hamasien, which is the furthest north and narrowest part of Tigré. Advancing southwards from Hamasien to 15° N. lat., we find that there the hills begin to expand, so as to have a much greater width, and divide themselves into two ranges, enclosing a valley which runs parallel to their length. Of these ranges, the western is called Haramat, on a pinnacle of which is built the monastery called Debra Damo. This range attains a general elevation of 500 feet above its eastern base; a few summits are twice that height. The streams which drain the valley run through gorges in the eastern range, and descend into the low country of the Danakil, on the border of the Red Sea. This valley is not much under cultivation; its general elevation is towards 8000 feet above the sea-level. Ategerat, which is near its southern extremity, is 8181 feet high.

Proceeding to the south, we come next to the Plain of Antalo. This plain is bounded on the north by a range of hills which runs east and west, in about 14° N. lat., across the country, from the eastern edge of the table-land to the vicinity of the Tacazzé. On the south, it is bounded by the river Zamra, a tributary of the Tzelari. This plain is 40 miles broad from north to south, and above 80 miles long from east to west. In it stands the town of Antalo, the capital of Tigré, as also of the province of Enderta, situated on the declivity of a range of hills. Not far distant from Antalo is Chelicut, the usual residence of the Ras. The part of the plain around the town is considered the richest district in the whole country. It has a black soil 12 feet deep, which yields rich crops of grain. The superiority of the soil arises from its resting on a basis of basalt. In the hilly tract which bounds the plain on the north, is a volcanic hill called Alegna, 1000 feet above Ategerat, or 9000 feet above the sea. The western portion of the plain is not at all so fertile.

West of the Haramat Mountains, and north of the Plain of Antalo, there is another plain of great extent, called the Plain of Tembien. It is much less elevated than the Plain of Antalo, as is shown by the long and steep descent called the Pass of Atbara, by which Tembien is entered from the south.

This plain extends from the Haramat Mountains to the Tacazzé, from N.E. to S.W., above 60 miles, and runs along the northern bank of the river for 30 miles more. It widens as it proceeds towards the river. Its average breadth is about 30 miles. This large plain is in general not fertile. At a place called Ber Agowe, near the most southern part of the plain, Rüppel found the level of the Tacazzé 3084 feet above the sea.

North of the Plain of Tembien are those of Shiré and Serawé, which are more elevated than the former. At the base of the ascent to them are situated the towns of Axum and Adowa, the chief towns of the *province* of Tigré. [See Axum and Adowa.] These towns have elevations respectively of 7092 and 6216 feet above the sea; so that the plains of Shiré and Serawé are probably above 7000 feet in elevation. The latter is situated to the north-east of the former, and is celebrated in Tigré for its flowery meadows, shady groves, and rich valleys. It is separated from the Haramat Mountains by a hilly tract, 50 miles in length and 30 wide, which constitutes the principal part of the *province* of Tigré. The rivers originating in this tract run westward, and form, by their collected waters, the river Mareb. It has a great variety both of surface and powers of production.

We turn now from the northern to the southern part of Tigré, lying south of the Plain of Antalo. This portion of the country is not well known, as it has been only hastily traversed by a few travellers. It is of a mountainous character, and includes the upper basin of the Tacazzé and the whole basin of its tributary the Tzelari. Near the sources of this latter river is the water-shed of the streams which flow north to the Tacazzé, and of those which flow south to the Hawash. In this region, also, there are two lakes —the Tzado Bahari, or the great lake of Ashangi, which requires three days to go round it; and Guala Ashangi, or Machakh. The country about these lakes has a great elevation, and is a complete wilderness, the cold being too great for vegetation. The country to the east of this region is inhabited by the Rais or Azabo Gallas, a most savage race of people. Beyond them, again, lies a country called Zobul, which is contiguous to Adal. The large lake above mentioned lies between the districts of Ashangi and Woffla, the smaller is in Woffla. North of Woffla is the district of Wojjerat, where are the sources of the Zamra. North of 12° N. lat. lies the province of Lasta, a mountainous district, which is the most southern part of Tigré. The northern part of Lasta is called Waag, the southern is Lasta Proper. The ridges of the mountains of Lasta are all flat topped, and about the same elevation; so that, seen from an eminence where the valleys are not visible, they appear to form a continuous plain. The tract lying between the Zamra and the Tzelari is a barren mountainous province called Bora, a part of Waag. It is almost uninhabited, and constitutes the natural boundary between Northern and

Southern Tigré. The river Zamra forms the frontier between the province of Bora, in Waag, and that of Salowa, in Tigré. The Tzelari is a river of considerable size, receiving a large proportion of the waters of Lasta as far as Woffla, and when it falls into the Tacazzé, the latter river becomes doubled in volume. The country traversed by the Tzelari and the Zamra, with their tributary streams, is very different from the rest of Abyssinia, being for the most part an uncultivated desert, sandy tract, of much inferior elevation, and almost entirely devoid of water; the so-called rivers being mere *wadies*, which are filled with water only during the rainy season.

The great river of Tigré is the Tacazzé, probably the Astasabas or Astagabas of Strabo, and one of the larger branches of the Nile. It rises in the high mountains of Lasta, in 12° N. lat. and 39° E. long. It receives on the left the Bellegas, and further north the Tzelari, which drains, amongst other districts, the Plain of Antalo, through its tributary the Arequa, which rises near the town. Hitherto the course of the Tzelari is northerly, but it now begins to bend towards the west, and flows in this direction to the boundary of Abyssinia. In this portion of its course it receives, amongst many other rivers, the Angrab from the south, which, together with the Bellegas, drain the volcanic region between the banks of the Tacazzé and the vicinity of Lake Tzana. Rüppel supposes that to the volcanic matter brought down by these rivers is to be attributed the great fertility of the Nile. The Valley of the Tacazzé is very narrow compared with the size of the river; sometimes, indeed, the valley narrows itself into a gorge, with rocks rising abruptly to a considerable height. The river has numerous overfalls, which render it fordable at most seasons of the year; while between the fords deep holes occur, the favourite retreat of the hippopotamus. This amphibious animal, called *gomari* in the language of the country, is common in the Tacazzé. Crocodiles, called by the natives *agoos*, are of an enormous size in the Tacazzé, and more dreaded than the hippopotamus: those which Salt saw seemed to be of a greenish colour.

2. *Amhara.*—This name is applied to the western and southern parts of Abyssinia, from a province of the same name, situated east of the river Abai. We have already stated that Amhara is separated from Tigré by the river Tacazzé, and it remains to state that this second great division of Abyssinia includes all the country extending between the left bank of the above river and the most southern bend of the Abai. How it is separated from Shoa will be shown when we come to that division. The table-land of Amhara contains the highest mountain-range in Abyssinia—the mountains of Samen or Samien, so called from the province of the same name. The range commences with Mount Zozamba, in about 12° 30′, and runs north to near 13° 30′. Towards the north end of the range are the peaks Abba Yaret and Buahat, whose elevations above the sea are respectively 15,006 and 14,364 feet. They are distant only a few miles, and between them, over the ridge connecting their northern declivities, is the Pass of Selki, 12,696 feet above the sea. Between the highest portion of the range and the river Tacazzé, there is a space of 30 miles width, which is covered with mountains, decreasing in elevation towards the river. The climate of this tract is fine, and it is favoured with plenty of rain. The scenery of the higher regions resembles that of the Alps in Switzerland. On the west side of the mountains, is the Plain of Entshetquab, which has a good soil, and is suitable both for pasture and growing grain. The mean temperature of this region for July, August, and September 1832, as determined by Rüppel, was nearly the same, or about 55°. West of Entshetquab is the Plain of Wogghera, one of the richest provinces of Abyssinia, with excellent pasturages, and producing good crops of grain. The streams which drain this province are tributaries of the Bellegas. The rocks of the table-land of Wogghera are of volcanic origin. To the north of it is the Plain of Adarga, which is of much lower elevation than Wogghera, the latter being about 8000 feet, and the former not more than 4000 feet, which indicates an approach to the Valley of the Tacazzé. The road between these two plains lies through the Pass of Lamalmon. The streams which drain Adarga run N.W. through the plain into the Tacazzé. At the upper part of the plain, there are volcanic hills; in the lower part, the country is flat, with a soil of mould, resting on sandstone. West of Adarga are the provinces of Waldubba and Walkeit, which are known to Europeans only from the reports of the natives. The natives describe them as possessing a soil well adapted to agriculture, and also good pasture-lands. South of these provinces is the Kulla, a depression similar to a lake which has a swampy soil, and is uninhabited in consequence of bad air. It is about 5 miles broad, but has a great length from east to west. The Kulla is surrounded by a hilly country of much greater elevation than it, which in the south forms the water-shed between the Lake Tzana and the Tacazzé. The streams flowing north, form by their collected waters the Angrab, one of the principal affluents of the Tacazzé.

We come now to that large portion of Amhara whose waters all run into the Lake Tzana. Lake Tzana or Dembea is the largest in Abyssinia, being about 60 miles long from north to south, and having an average breadth of 35 miles. Its surface is elevated 6110 feet above the level of the sea. It receives the waters of an immense number of streams all round its border, and during the rainy season, it puts under water a belt of flat land of two miles width, surrounding it, which at other seasons is dry. This lake has a large number of islands scattered over its surface, from one of which it takes its name. These islands are mostly inhabited. The lake abounds with fish of various descriptions; the hippopotamus is common; but the crocodile is not found. Lake Tzana is identical with the Coloë of Ptolemy.

The country around Lake Tzana is divided by two offsets from the range of mountains on the west of the Tacazzé into three plains—Dembea or the Plain of Gondar on the north and west, Biegemider on the east, and Miécha on the south.

These plains are named from the provinces in which they are respectively contained. The Plain of Dembea or Gondar—from Gondar, the capital of Amhara—on the north side of the lake, is about 40 miles long from east to west, and 20 miles broad. The parts of this plain near the lake are marshy, even in the dry season; but up towards the roots of the hills, there is a rich soil consisting of disintegrated volcanic matter. That part of the Plain of Dembea which lies to the west of Lake Tzana is a narrow strip of land of great fertility. It is considered one of the granaries of Gondar. Behind it, the country rises to a table-land, whose ridge forms the water-shed between Lake Tzana and the Bahr-el-Azrek. This table-land is divided into the provinces of Kuara and Ras-el-Feel, the former being the southern and the latter the northern part of the table-land. This country sends to the Bahr-el-Azrek, the river Rahad, which rises near Chélga, and flows from S.E. to N.W., nearly parallel to the Azrek, forming the boundary between Abyssinia and Nubia. From the above-mentioned table-land, also, flows the Dender, whose position is not precisely determined; but it seems to take its rise in the south of this region, as the river Gúder, which rises in Mount Barf, in Agaumider (see below), a little west of the sources of the Abai, is one of its tributaries. From the head of the Gúder to the junction of the Dender with the Azrek, is a distance of above 250 miles.—(*L. G. Journal*, vol xvii. part 1.)

The Plain of Biegemider lies, as above stated, on the eastern side of the lake. It stretches from Emfras, on the north, to the banks of the Abai; and its breadth, from the lake to the roots of the mountains on the east, is about 30 miles. Between the Reb and the Fogara, which flow across the plain, the country is fertile, having a fine soil of black mould. This district is well populated. Besides the streams just mentioned, several others, having the common name of Gumára, water the Plain of Biegemider. They take their rise in the high range of Mount Gúna, which bounds the basin of Lake Tzana to the E. or S.E. The mountains rise very abruptly from the Plain of Biegemider. Their elevation is from 7000 to 8000 feet; Dr. Beke assigns the latter elevation to the Pass of Chamma Maragfia, the former to the plain on the north of Mount Melza. Mount Melza is a cross ridge of the range of mountains which forms the water-shed between Lake Tzana and the Tacazzé. The river Reb takes its rise somewhat to the south of Melza. Dr. Beke, on his route to Massówah, passed over the mountains of Biegemider; he describes the country east of the basin of Lake Tzana, as a mass of mountains intersected by deep valleys, getting more barren and desolate the further one proceeds, and speaks of it as scantily peopled and little cultivated.

The Plain of Miécha (Maisha, Matcha), part of the province of that name, extends from Dingelber, on the south-western side of Lake Tzana, to the south-eastern corner of the lake. It widens as it proceeds from the former to the latter point. Where it reaches the Abai River, it is 20 miles wide, extending from the lake to the confluence of the Abai with the Kelti. This plain is very fertile, but also very flat, and consequently not healthy. Behind the low ground, and between it and the Talba Waha Mountains, intervenes a hilly tract, the soil of which consists of decomposed volcanic matter, and is therefore very fertile. Between this hilly tract and the mountain-range, are sporadic mountain summits, with intervening valleys; the most remarkable are Lijambera and Amidamit.

We have now described the basin of the Lake Tzana. The southern portion of Amhara remains to be noticed. This part of Amhara is bounded by the rivers Abai and Bahr-el-Azrek on the south and west, and by a line drawn through the southern extremity of Lake Tzana on the north. The river Abai rises near 11° N. lat. and 37° E. long., at the foot of Mount Giesh, in a swamp full of springs. The elevation of Mount Giesh, from the sides of which several streams besides the Abai take their rise, is 9500 feet; that of the springs of the Abai is 8500 feet.

Abai, the Abyssinian name of this river, is interpreted by some *Parent*—as if it were the same as the Arabic word *Abou*, father; but this is at least doubtful, and those who are disposed to look for Sanscrit roots in the language of this country, might connect *Abai* with the Sanscrit *Ap*, water. The first account of the springs of the Nile is by Father Peter Paez, from whose unpublished MS. Kircher's account is taken; and this agrees with the account of Gregory, the Abyssinian, which Ludolf had directly from him (A.D. 1657). Paez visited them in 1618. Mr. Bruce visited them in 1770, and puts them in N. lat. 10° 59′ 25″, and E. long. 36° 55′ 30″; giving at the same time a much more minute account of them than that in Kircher, which is not very clear. One of the worst blots on the fame of Bruce, is the attempt which he made to deprive Paez of the merit of having anticipated him in the discovery of the sources of the Abai, or, as he supposed, of the Nile. The sources of the Abai have been visited since Bruce's time by many travellers. After a north and north-eastern course of about 70 miles, it enters the Lake of Dembea on the west side, having descended about 40 feet a mile. It has, as might be supposed, a very rapid current, and several cataracts of no great elevation, one of which was visited by Bruce, and another he had heard of. In its course to Lake Tzana or Dembea, the Abai receives several streams. The principal of these is the Jemma, which rises on the northern side of Mount Mizan, and flows northwards between Mount Lijambera and Mount Amidamit. The Abai flows in an easterly direction through Lake Tzana, in which its current is distinctly visible, and flows out of the lake at its north-east corner. About 15 miles down from the mouth of the lake, the Abai is joined on its left bank by the Alata, a small stream, but entitled to particular mention, on account of its proximity to the Cataract of Tis Esát, or the Smoke of Fire, which Europeans, from Father Jerome Lobo downwards, have called the 'Cataract of Alata,' after its name. About half a mile east from the fall, there is a bridge where the river runs with great violence through a deep, narrow fissure in the rock, which immediately above the bridge is not above two yards across. The rapids extend up to the Fall of Alata. Dr. Beke thus describes the Tis Esát: 'The river, gliding through a fine grassy plain between a line of dark foliage on each side, its smooth surface being disturbed by only a few ripples—for so some slight rapids appear in the distance—falls at once perpendicularly over the ledge of the rock which crosses its course, and is lost to sight, whilst in its place arise volumes of vapour having precisely the appearance of smoke; hence the highly expressive and poetical name given to the cataract by the inhabitants, of Tis Esát, or the Smoke of Fire. I was told that by descending into the deep ravine into which the river falls, a view from below might be obtained; but independently of its being late, which rendered my immediate return expedient, I felt no inclination to dispel the charm which the view above leaves on the imagination by going to see a common waterfall.' The height of the fall was given by the people of the place at 60 or 70 cubits—that is, about 100 feet. Somewhat less than 30 miles further down, is another bridge, called the Bridge of Andabiet, or the Broken Bridge, from its ruined condition. This bridge is on the high road from Báso to Biegemider. It has nine arches: the centre one, 60 feet wide, spans the river; the others—three on the Gojam or southern bank, and five on the Biegemider bank—serve for the approach on either side. The bridge has no parapet, and is about 12 feet broad. It is built of rough stones and lime; the arches are turned in large flat bricks. It was erected by the Portuguese in the reign, it is said, of Hatzie Fásil. The centre and the first northern arch have been sprung, and the ruins lie in the river; Ras Fásil, who ruled these provinces in the time of Bruce, is supposed to have been the author of this destruction. At the Broken Bridge, the elevation of the Abai is about 3850 feet, and therefore it has descended 2260 feet in a course of 40 miles, which gives 56 feet per mile. About 10° 45′ N. lat., the Abai receives from the east the large river Bashilo, which collects the waters of the *ancient province* of Amhara. It rises at the northern foot of Mount Sagaral, at the extreme eastern edge of the table-land, near the sources of the Milli and the Berkona, which flow in an opposite direction towards the Hawash. Further south, the Abai receivés the Wálaka or Shónkura; and where it begins to turn towards the west, it receives on its left bank the Jamma, one of its largest tributaries. This river drains a large tract of country to the east of the Abai, as far as the western flank of the Chakka Mountains. Both the Jamma and the Bashilo were first made known by the Portuguese. Just before the junction of the Jamma, the Abai was found by Dr. Beke to be a little under 3000 feet in elevation, which gives a fall of only 850 feet from the Broken Bridge, a distance of above 100 miles. At Melka Kuki—that is, Ford of Kuki—he found the elevation 2815 feet, the distance from the Jamma being about 60 miles. In its course after the junction with the Jamma, the Abai receives numerous streams on both sides; those from the north or Gojam bank being for the most part inconsiderable, whilst those from the south, which water the countries of the Galla tribes, are much larger. The chief of the latter rivers are the Mogur, from the Mountains of Salala, from the opposite flank of which descend tributaries of the Hawash—the Guder, the Agul, and the Dibuk.

The question has been asked and discussed—are the Abai and the Bahr-el-Azrek, or Blue Nile, identical? Bruce not only took for granted that the Abai was one of the branches of the Nile, but believed that it was the main stream. The latter position was subsequently abandoned by all; but it has been generally held that the Abai is identical with the Blue Nile. Dr. Beke, in an article in the *London Geographical Journal*, vol. xvii. part 1, maintains that not the Abai, but the Dedhesa, which comes from the south, and is met by the Abai in 10° 30′ N. lat. and 35° 30′ E. long., is the Bahr-el-Azrek; and states that the natives never apply the name Nile to any other river than the Bahr-el-Abiad, or White Nile. We must refer those who desire to know fully the grounds of this opinion, to the article above mentioned. The general nature of his argument is to the effect, that the Bahr-el-Azrek has been traced further south than the *ascertained extreme* southern limit of the course of the Abai. Dr. Beke determined this limit at 9° 52′, near the Ford of Melka Kuki, in 37° 30′ E. long., whilst the Azrek has been traced to 9° 35′. He concludes: 'It is physically impossible for a river in this position, and with this course, to be the upper portion of the Bahr-el-Azrek, which was traced by Russegger as far southwards as 9° 35′ N. lat., and there found to come from still further south.'

The whole of the peninsula encircled by the Abai and the Zingini is known by the name of Gojam, though the inhabitants of that country distinguish the various provinces by different names—as Gojam, Damot, Enabsie, &c. Near the centre of this peninsula, there is a range of mountains running in a general direction from W.N.W. to E.S.E., extending with varying elevation from Mount Yekandach, near the Abai, in the province of Enabsie, to Mount Eshiti, beyond the Zingini. The most elevated portion of this range lies between 37° 20′ and 37° 50′ E. long., and bears the name of the Talba Waha Mountains. To the west of these mountains, the most prominent summits are Mount Lichema, Mount Giesh, Mount Atzab, Mount Barf, and Mount Eshiti. With the exception of the few which run north into the Lake Tzana, all the streams which rise on the banks of this range run like radii of a circle from its centre towards the river Abai. They are very numerous, but not of large volume. The summit of the pass over this range, through which the road from Báso to Biegemider runs, was estimated by Dr. Beke to have an elevation of above 11,000. Mount Goeba he found to be 8500 feet. At this latter place he found the vegetation to consist in great part of heaths and ferns; at the summit of the pass there was nothing but stunted grass, and the plant *Jibárroa*. Hoar-frost lay on the ground, and ice lined the brooks, on the 8th of November.

We have already described that part of the peninsula lying to the north of Talba Waha, called the Plain of Miécha. The district south of the range is divided into two parts—the Plain of Gojam and the Plain of Damot. The river Godieb, a tributary of the Bir, forms the boundary between these provinces. The breadth of the district included in these provinces may be about 60 miles, of which one-third is occupied by a central plateau, one-third by the slope towards the river Abai, and one-third by the hilly tract adjacent to the Talba Waha Mountains. The table-land has an elevation of from 5000 to 6000 feet; the Abai in its course, along the southern boundary of Gojam (used in the wide sense), has an elevation of from 2000 to 3000 feet. Hence the streams which run south from the roots of the mountains of Gojam, descend from 2000 to 3000 feet in 20 miles. Their course down the declivity is almost a continuous cataract, and their beds have been excavated to a great depth below the general level of the surface.

The greater part of the province of Gojam is an extensive grassy plain, without trees, excepting the small groves, which always surround churches, and with very little population or cultivation. Dámot, on the contrary, is possessed both of fertility and beauty. It has a gently undulating surface, and is copiously studded with fine trees, some of them of considerable size. It is well peopled, and numerous villages are scattered over the country. The inhabitants, however, of Damot have a worse character than those of Gojam. This is owing to the prejudice arising from the belief that they are addicted to witchcraft. Dr. Beke ascribes the symptoms on which the charge of witchcraft is founded, to the greater prevalence of rheumatic complaints in Damot; the people ascribing these complaints to the ill-will of *budas*. Dr. Beke contrasts the country of the peninsula of Gojam with that of Tigré, giving a preference to the former. He remarks that the grand cause of the superiority of the peninsula of Gojam appears to be, that the elevated mountains in the centre of it collect the waters of the heavens more or less at all seasons of the year, so that the numerous rivers descending from them, although they decrease considerably in the dry season, are never quite dry.

West of the Zingini, and between it and the river Durra, lies the region of Agaumider. The Zingini, where Beke crossed it, opposite the district of Tummahá, was about 30 yards broad, but of no depth. Its bed is composed of volcanic rocks; the soil of the country also which stretches along its banks exhibits unequivocal signs of volcanic origin, and is consequently very fertile. In fact, the whole country seems to be of volcanic origin; the mountains often assume the appearance of cones, or high-pointed domes. Such was the character of the country passed through by Beke on his journey through Agaumider, by the districts of Askuna, Bari, and Banja. The surface of this volcanic region is very much broken. The districts of Askuna and Banja, for example, are basins almost entirely surrounded by mountains. The most remarkable of all these conical summits is that of Fudi, which towers far above the others. It is in about 11° 6′ N. lat., and 36° 35′ E. long.

The people of Agaumider, so called in Amharic—the native name is Aghaghá—in appearance, dress, manners, and religion, do not differ from the rest of the Abyssinians, with whom they have for a long time been incorporated. They say that their original country was Lasta. There are also in this country Falashes or Jews, who are mostly weavers, some few are smiths, and the women are potters. Dr. Beke thinks that the Falashes and the Agous are the remains of the early inhabitants of Abyssinia, displaced in the course of ages by settlers from the opposite shores of the Red Sea, or by invaders from the south. West of the Durra lies the country of the Shankalas or Nubas, who are negroes. From this region comes the slave population of Agaumider, where slaves are very numerous, and also that of Damot and Gojam. They are captured by armed expeditions into their country. West of the Shankalas is a Galla tribe, called Wambera, who are also captured in numbers; they are not negroes. North of the Shankalas is the country of Ginjar, inhabited by Mohammedan blacks, whose language is a corrupt Arabic. Their country is subject to inroads from Kuara and Dembea, and furnishes many slaves to the market of Gondar. The chief towns of the peninsula are—in Gojam, Yaush, and Yejubbi, and in Damot, Burie, and Gudera. Yaush is a large town, and contains the monastery of St. Michael. It is situated in a level tract at the foot of the first *step* in the descent to the Abai. This tract is, in its lower part, around Zaush, mostly under cultivation. Yejubbi is situated about two hours to the west of Zaush; it is a large commercial town. Near it is the *market-place* (not town) of Báso. Burie was formerly the capital of Damot, and the residence of the Dejazmaches, but it has been supplanted by Gudera. Burie consists of three villages, distant from each other half a mile, on the banks of the Isser, which contain the three churches of St. Abbo, St. John, and St. Michael. Gudera is placed on a mass of volcanic rocks, rising out of a plain, which during the rains is mostly covered with water, and then forms an extension of a lake to the east of the place. This plain lies at the base of the low ridge which connects Mounts Lichema and Giesh.

Dr. Beke, who in 1841 and 1842 passed a whole year in the peninsula of the Abai, has given an account of the seasons, from which it appears that the rains are more heavy and continual there than in the Plain of Gondar. At the latter place, the annual quantity of rain was, in 1770, 35·5 inches, and in 1771, 41·3 inches.

Shoa.—This division of Abyssinia includes the country bounded by the Hawash on the S. and S.E.; by the Berkona, a tributary of the Hawash, on the N.; and by the Wanchit, an affluent of the Jamma, on the N.W. The whole of Shoa is drained by the Jamma, an affluent of the Abai, and by the Hawash, which pours its waters into Lake Abhebbad, in about 41° 50′ E. long. The water-shed between these two rivers is but imperfectly known; that part of it which lies between Ankobar and Koh-Fara in Gedem, a distance of about 60 miles from north to south, has become known through the routes made by Dr. Beke in that direction. Here the edge of the table-land rises with a steep ascent from the low country bordering the west bank of the Hawash, to a height of from 8000 to 9000 feet. At Melka Kuya, where the road from Tajurrah to Ankober crosses the Hawash, that river has an elevation of about 2200 feet; whilst the summit of the ascent of the Chakka Mountains behind Ankober, is about 9000 feet, which gives a rise of more than 1 mile to a distance of 38 miles. Dr. Beke describes the country he traversed as varying in character from the most complete sterility to the most luxuriant vegetation. He speaks of large plantations of capsicums and of excellent cotton, of rich corn-fields and fertile meadows, the whole studded with trees, and divided by hedgerows of jasmine, roses, and honeysuckle. On the other hand, at Sebcha on the water-shed, in 10° 11′ N. lat., the surface is a swampy moor, with low mountain-peaks on either side. On his journey northwards, Dr. Beke crossed numerous streams which ran eastwards to the Hawash; on his return to Ankobar, he kept to the west of the water-shed, and crossed numerous tributaries of the Jamma.

At its junction with the Abai, the Jamma is less than 3000 feet above the sea; south and east of this point, the country gradually attains an elevation of from 9000 to 10,000 feet. The descent of the table-land on the east, near the sources of the Jamma, is, as already remarked, very steep; on the south, however, the descent to the valley of the Hawash is more gradual. The rivers which water Shoa in the eastern part of the table-land, are dry during some months of the year; those in the western part, on the contrary, flow all the year round. The former region is almost destitute of trees; the latter abounds in forests. Towards the sources of the Hawash, the whole country is almost one forest, where elephants and buffaloes freely roam. The number of the tributaries of the two main rivers is great, particularly those of the Jamma coming from the south. These streams have cut up the surface of the declivity which slopes towards the Jamma by deep ravines, thus giving to the country when seen from the river a mountainous appearance.

Ankobar, the capital of Shoa, is situated in 9° 34′ N. lat. and 39° 55′ E. long. It is built on two wooded hills; the northern one strongly palisaded, being exclusively occupied by the residence of the king and its numerous out-buildings;

the southern, thickly clustered with houses, forming the capital of the kingdom of Shoa. The houses are constructed chiefly of wood, with conical thatched roofs, and are generally surrounded with a garden.

Ankobar is 8200 feet above the level of the sea. West of it a day's journey, is Angollala, situated in an undulating plain, at an elevation of 8400 feet above the sea. The climate of the region around Ankobar is compared with that of spring or autumn in England. Travellers compare the country between Ankobar and Angollala to the Alps, speaking of Alpine air and Alpine plants. The kingdom of Shoa alone in all Abyssinia possesses security and stability. In other parts, political divisions are continually changing; and what were towns a year or two ago, may now be towns no more. Wherever a ruler chooses to make his residence, a town arises; when he departs, it vanishes. This dependence of a town's existence on the influence of the court, holds true in part even of Gondar, Antalo, and Adowa. These are only the shadows of what they have been, although Gondar is still a place of some consequence, being the residence of the *nominal emperor*. For more than a century, Abyssinia, with exception of Shoa, has been bordering on anarchy. The Negus, or emperor, is a mere puppet, with a yearly pension of 300 dollars, and part of the Excise levied on butter sold in the market of Gondar. The wars, which rage continually, injure the country, and thin the population. The kingdom of Shoa, though of modern date, has already acquired consistency and power.

We shall conclude our topographical notice of Abyssinia with a few sentences on the regions adjacent to Shoa on the north.

The country on both sides of the river Bashilo, a tributary of the Abai, and reaching to the region in which are the sources of the Tacazzé, is at present in possession of the Wollo Gallas. This country comprehends the ancient province of Amhara. It is a table-land of very high elevation, and some parts are a complete wilderness, whilst other parts have good pastures, and are fit for cultivation. East of the water-shed, between the Hawash and the Tacazzé, the country, called Angot, is in possession of the Yejjoos, who speak Amharic, and are either Christians or Mohammedans. Near the southern limit of their country is Lake Haik, in which there is an island with a famous monastery.

The table-land of Abyssinia is characterised by an extraordinary depression of the beds of the rivers. They begin to break from the level by fissures in the surface; at first only a few yards in width, and gradually open to the extent of several miles, forming cataracts of 100 feet, or even much more in height, and continuing down a succession of falls and rapids, so as to descend several thousand feet in a few miles. Our description of the Abai and Tacazzé may be referred to for examples.

Another peculiarity is the suddenness of the rise and fall of the Abyssinian rivers. The following from Bruce, referring to the Taranta Pass, will illustrate this phenomenon:—'The river scarcely ran at our passing it; when, all on a sudden, we heard a noise on the mountains above, louder than the loudest thunder. Our guides on this flew to their baggage, and removed it to the top of the green hill, which was no sooner done than we saw the river coming down in a stream about the height of a man, and the breadth of the whole bed it used to occupy.' Another remarkable characteristic is the great number of hill-forts, or Ambas, as they are called, which often rise with steep sides almost inaccessible, except by a few paths; on the top they sometimes display a level surface of considerable extent. Many of these minor elevations are formed of sandstone, lying in horizontal masses, which have been split or worn down vertically, so as to give the whole a castellated appearance. Salt describes Devra Damo, north-east of Adowa, as completely scarped on every side, with one path leading up to it, and in this, as well as in its general appearance, resembling the hill-forts of India.

Productions.—Though a tropical country, Abyssinia resembles the temperate regions in its productions, especially in vegetable products. This is owing to its elevation. No Indian grain is found except *neug* (Sesamum Orientale), and even it is scarce. Wheat and barley are grown extensively, the latter especially, as it is the only corn given to horses and mules. Of leguminous vegetables, the chief are teff, beans, lupines, lentils, and a kind of vetch, which is eaten. A plant, *nuck*, is much cultivated for the seed, from which is got a bad oil. Cotton is grown in the lower parts of the country, as in Shiri, Waldubba, and Walkkeit. Excellent grapes grow at the foot of the rocky masses east of Lake Tzana.

The usual domestic animals are found. The Sanga oxen, found south of Antalo, are remarkable for the great size of their horns. Black sheep are numerous, from which is got the skin called lovisa. Wild animals of all descriptions are numerous. The tiger, however, is not found. The skin of the black leopard is valuable, and is sold at a high price, being worn by the governors of the provinces. The larger quadrupeds are found only in the wildernesses, which extend both on the south and north sides of Abyssinia. Tigré is much infested with locusts, which frequently lay waste the fields.

Abyssinia is poor in minerals; the most common are iron and salt. Iron-ore is found in abundance in the mountains of Lasta; it is worked, and is of good quality. The salt is found in the salt-plain, between the Red Sea and the table-land. Coffin crossed this plain in 1809. It took five hours to cross it; and the traveller was provided by the natives with sandals, made of the leaves of the dwarf-palm, which are always used in crossing this desert. For about half a mile, the incrustation was slippery, and broke under the tread, but afterwards Mr. Coffin found it hard, like a rough irregular sheet of ice. On the west side, he found the Abyssinians cutting out the salt in pieces like a mower's whetstone, which is done with tolerable ease, as it lies in horizontal flakes. The salt near the surface is pure and hard, but that beneath is coarser, and requires some exposure to the air before it is hardened. In some places the salt is three feet deep; but in general at the depth of two feet, it is too much mixed with earth to be fit for use in its native state. This district supplies all Abyssinia with salt. This salt, cut into long flat pieces, is one of the principal mediums of exchange in Abyssinia; its value, of course, increasing the further it is carried westward. 'In the more remote parts of Ethiopia,' says Ludolf, 'you may buy a good mule with two or three bricks of that salt.'—(See Rüppel for the productions of Abyssinia.)

With respect to the *population* of Abyssinia, no definite statement, only a rough approximation, can be made. From the accounts of travellers, we may estimate it at present between three and four millions. Rüppel gives the area of Abyssinia, exclusive of the kingdom of Shoa, at 270,000 sq. miles. The kingdom of Shoa has about 12,000 sq. miles. The main part of the population belong to the Caucasian race, and have features similar to those of the Bedouins of Arabia. Distinct from these are the Gallas, who, however, are not negroes. The Gallas form the majority of the inhabitants of Shoa, and of that vast extent of country, as yet little known, which lies south of the Abai. We have already mentioned that the Shankalas constitute the negro population of Abyssinia. The Falashes and Agous belong to the Caucasian type. The former are of Hebrew origin, but have adopted a few Christian ceremonies. They occupy the strongest and highest points of the Samen Mountains, and have done much damage to the neighbouring provinces. The chief language in Abyssinia is the Geez or Ethiopian. [See ETHIOPIA.] It is a dead tongue; the living languages are dialects derived from it: these dialects are four—the Amharic, that of Tigré, that of Shoa, and that of the Yejjoos. These dialects are closely connected, and are all understood by those to whom any of them is the native tongue. The Galla language is altogether different. Dr. Beke collected vocabularies of thirteen languages and dialects, spoken in Abyssinia and the countries to the south.

Of the manners of the Abyssinians of Gondar, we have an elaborate picture by Bruce, which we believe to be heightened with the usual colouring of that traveller. In his eleventh chapter he describes a feast of the higher classes, in which a cow or bull is brought to the door; the feet are tied; the skin is stripped off the hind-quarters; and the flesh is cut from the buttocks in solid square pieces. 'The prodigious noise the animal makes,' adds Mr. Bruce, with the most comical gravity, 'is a signal for the company to sit down to table.' The licentious termination of the feast exceeds anything that we know of the most barbarous nations of the earth, and may at least be doubted until it is confirmed. As to the Abyssinians eating raw flesh occasionally, or even frequently, *that* does not appear to us to be by any means beyond the reach of probability; and, indeed, we find Mr. Pearce (see Salt, p. 295) corroborating the fact so far as this—that some brutal Lasta soldiers, on a marauding expedition, while driving a cow, cut two steaks from the rump, which they devoured raw, to satisfy their craving hunger. The animal was then driven on to the camp, and killed. But Mr. Pearce, who had been several years in Tigré, never heard of such feasts as Bruce describes. Mr. Salt, when he was in Abyssinia, met with a learned doctor from Gondar, who had known Bruce, and spoke favourably of him. The feast story, however, was more than he would admit, and he expressed great abhorrence at the thought of it. At the same time, he allowed that the licentiousness of the higher orders was carried much further in the kingdom of Amhara than in Tigré. Yet Mr. Salt met with many young men at Chelicut, who came from Gondar, whose dress and manners created a very favourable impression; and he says: 'I have reason to believe, that in general the people of Tigré are much ruder in their habits and fiercer in disposition than those of Amhara.' The prince Kasimai Yasous, who was at Chelicut on a visit from Gondar, had superior accomplishments to most of the young men in the country, and could both read and write the Geez with great facility.

The early Portuguese writers allow the people of Narea the first rank among the Abyssinians for good manners; while their account of the people of Tigré was unfavourable, and in accordance with that of Mr. Salt. Yet this traveller lived three weeks at Chelicut, saw the Ras daily, and was often invited to his evening repasts, without either seeing or hearing of any of the indecencies and grossness which Mr. Bruce describes. Intoxication, however, is common at feasts. The Abyssinian is in general well made, and sometimes handsome, with features completely Roman. Those of Narea are described as not darker than the Southern Europeans, but the people of Abyssinia in general are nearly black. They must not, however, be confounded with the negro tribes, as they have neither the nose, lips, nor hair that characterise the people of Western Africa. It is true, that some of those whom Bruce saw on the Taranta had curly heads and short hair; but this is done by art, 'each man having a wooden stick with which he lays hold of the lock, and twists it round a screw, till it curls in the form he desires.' Mr. Salt saw, on one occasion, the Ras's wife, who was the sister of the Emperor, and he describes 'her form as elegant, though small; her features were regular; and having fine teeth and coal-black hair, she might in any country have been esteemed handsome.'

The Abyssinians even now are not without authors. Mr. Salt brought to England a manuscript, containing an account of the Ras's last campaign against the Galla, which the Ras himself made a present of to Mr. Salt. The history was written by a court scribe, in a style very complimentary to his master. The Ras had a jester at court, whose powers of mimicry, and even of regular acting, were of a very high order. A painter was also in his service; and Mr. Salt has given (p. 394) an outline of one of his subjects, representing a combat between some mounted Abyssinians and Galla, which conveys rather a favourable impression of this artist's skill. The Abyssinians are generally fond of pictures, with which they line the inside of their churches, and decorate their chief apartments, when they can procure them.

Commerce.—The commerce of Abyssinia on the east coast is carried on through Massówah and Tajurrah. Of course the former is the harbour of Tigré and Amhara, the latter of Shoa and the southern countries. Tajurrah is 370 miles from Ankobar, by the caravan-road. The route by this road has been much more frequented since the establishment of the British settlement at Aden. [See Aden.] The great proportion of the goods imported into Abyssinia is consumed there. Some of the articles imported, however, do certainly pass on to countries south of the Abai. The market-place for the commerce of these countries with Abyssinia is at Báso, in Gojam, about 20 miles north of the Abai, and near the towns of Yaush and Yejubbi already mentioned. There are two caravan-roads from Báso to Gondar, and also two from Gondar to Massówah. From the south are brought slaves, ivory, gold, iron, coffee, civet, cloth, cattle. The countries from which these are brought are known by little but the name; but future travellers will no doubt direct their efforts to the exploration of that large region lying between the Abai and the Indian Ocean. It has already been observed that the currency consists of pieces of rock-salt shaped like a whetstone. These pieces of rock-salt are called *amole*. With regard to the manufactures of the Abyssinians, there is little to be said. They do not excel in any department. They are not yet acquainted with the art of printing; and hence the copying of manuscripts has become a distinct branch of industry. They use a kind of cane for a pen, and copy on parchment. Rüppel praises their handwriting as very fine.

(Bruce's *Travels*; Lord Valentia, *Voyages and Travels to India, Ceylon, the Red Sea, Abyssinia, and Egypt*; Salt, *Voyage to Abyssinia and Travels into the Interior of that Country*; Pearce, *Life and Adventures*, by Hall; Gobat, *Journal of a Three Years' Residence in Abyssinia*; Rüppel, *Reise in Abyssinien*; Isenberg and Krapf, *Journals*, detailing their proceedings in the kingdom of Shoa, &c.; Kirk, *Report on the Route from Tajurra to Ankôbar*, in London Geographical Journal, vol. xii.; Beke, *Communications respecting the Geography of Southern Abyssinia* (and his *Route from Ankôbar to Dêrnâ*), in L. G. Journal, vol. xii.; Beke, *Continuation of Routes in Abyssinia*, in L. G. Journal. vol. xiv.)

ABYSSINIAN CHRISTIANS.—The discovery of a body of Christians in so remote a country excited, in no small degree, the attention of Europe in the fifteenth century, which has been again revived by Salt's last mission, in 1810. From the 'Tareek Negushti,' or 'Chronicle of the Abyssinian Kings,' combined with the evidence of the ecclesiastical writers, we learn that Christianity was introduced into Abyssinia, in the time of Constantine, by Frumentius, or Fremonatos, as the chronicles call him. Frumentius, after residing some years in the country, was raised by Athanasius, the patriarch of Alexandria, to the dignity of bishop. He arrived in Abyssinia perhaps about the year A.D. 330, and probably in the reign of the King Aizanas, whose name still exists on the inscription of Axum. It is, however, not certain to which king of the Abyssinian chronicles we ought to apply the names of Aizanas and his brother Saizanas, both of which occur on the inscription, and also in a letter of the Emperor Constantine, addressed to them A.D. 356. When the Greek merchant Cosmas visited Abyssinia, A.D. 525, it was completely a Christian country, and well provided both with ministers and churches. Of the Abyssinian churches, which probably belong to the earlier periods of their conversion, or at least are eight or nine hundred years old, there are still some remains. The most remarkable is Abuhasubha, hewn out of the solid rock, which at this place is soft and easily worked. The Portuguese Alvariz, describes ten such churches as these, of which he has given a plan, and one of them is probably the same as that which Mr. Pearce visited at Jummada Mariam. (Salt, p. 302.) The great church at Axum is comparatively modern, though parts of it, such as the steps, clearly belong to a prior edifice. Mr. Salt describes the well-built remains of a church, or monastery near Yahee, which he assigns to the sixth century of the Christian era.

The monastic, and also the solitary life, spread into Abyssinia from the deserts of the Thebais, and when the Portuguese Jesuits entered the country, they found it full of such devotees; many of them seemed, however, to be monks only as far as celibacy was concerned, for they cultivated the ground and lived in villages.

Though a king of Abyssinia, Zarah Jacob, in 1445, sent an ambassador to the council of Florence, very little was known of the country until the Portuguese entered it. We cannot undertake to explain exactly how the notion of an Asiatic Christian prince residing in India, under the name of Prester John, got abroad; those who are curious may consult Ludolf (book ii. c. 1.) and the first chapter of the second book of Tellez. However this may be, John II. of Portugal, anxious to follow up the Portuguese schemes of discovery, and to discover the true Prester John, sent Peter Covilham and Alfonso Payva to find him out wherever he was. These envoys are said to have gone as far as India, but without success, and Payva returned home. Covilham, however, happening to be in some port of the Red Sea, heard of a Christian prince of the Abessines, whom he forthwith concluded must be the object of his search; and accordingly this enterprising man succeeded in reaching (A.D. 1490) the court of the Negus, or king of Abyssinia, which was then in Shoa. This was the beginning of that connection between the Abyssinians and the Portuguese, which continued for about one hundred and fourteen years; but during this long period the missionaries had one leading idea, which was to bring over the Abyssinians to the Catholic faith. Peter Paez, who entered the country in 1603, actually prevailed on the Emperor, his brother, and the nobles, publicly to declare their adhesion to the Church of Rome.

Though the Jesuits pursued their proselyting practice with such pertinacity, they did not neglect to study the country itself, and, accordingly, it is to them that we owe our first accounts of many parts of Abyssinia; and for some, they are yet the only authorities. A list of the principal works of the Portuguese on Abyssinia is given by Salt, and the reader will see, in the compilation of Ludolf, and the abridgment of Tellez, how much we are indebted to these zealous and often very able men.

With the Christian religion, the Abyssinians received the Holy Scriptures, which they now possess in the ancient Ethiopic version, made, according to Ludolf, from the Greek Septuagint, though nothing is known of the date of this version. As to the New Testament, (says Ludolf,) no entire copy has been yet brought to Europe. Mr. Bruce brought with him from Abyssinia a complete copy of the Scriptures in the Ethiopic language, and also a set of the Abyssinian Chronicles. The Abyssinians divide the Scriptures, which they have entire, differently from what we do, making four principal parts of the Old Testament, and mixing what we call the Canonical with the Apocryphal books. The New Testament is also divided into four parts, to which they add the Book of Revelations as a supplement. For other information respecting the Abyssinian liturgies, and the religious opinions of the Abyssinians. we refer to Ludolf, Book iii. chap. 4, 5. Ludolf denies the existence of the book of Enoch, because he had only seen a spurious copy. A knave who got possession of an Ethiopic book, wrote the name of Enoch upon it, and sold it to Peiresc for a considerable sum of money, and this was the book that Ludolf saw. Bruce brought home three copies of the book of Enoch; one of which he gave to the Bodleian Library at Oxford. This book was originally written in Greek, but the original is lost—all but one large fragment. In the epistle of Jude reference is made to the prophecies of Enoch; and Mr. Bruce says, 'the quotation is word for word the same in the second chapter of the book.' This, however, will not prove the genuineness of the prophecies of Enoch, as Mr. Bruce has very well argued. An English translation of the book of Enoch was published by Dr. Lawrence, Oxford, 1822, 8vo.

The High Priest (or sole bishop) of Abyssinia is called *Abuna*, which signifies Our Father; and as Frumentius, the first bishop, received his appointment from the Patriarch of Alexandria, this dignitary has, probably, always been a foreigner. When Mr. Salt was in Abyssinia (1810), the Patriarch of Alexandria had just sent a Greek as Abuna, or High Priest, who, unfortunately, died of an epidemic disorder soon after his arrival. His followers were going back to Alexandria to see if they could get a new one appointed. The King is the head of the Church. Polygamy, though not allowed by the ecclesiastical canon, is common enough in practice; and Mr. Salt mentions an instance of one gentleman who had five wives at once. The king, of course, marries as many as he pleases: the clergy, also, who are not monks, may marry, but only once. A second marriage renders them unworthy of their sacred office, according to the ancient canons. Circumcision, according to Bruce, is practised in Abyssinia.

It would appear, from what we know of the Abyssinian Church, that its priests, at present, are not well informed, nor are the people in general well acquainted with the principles of the Christian religion, though they may be Christians in name; yet some of their ceremonies are conducted with great decency, and very much resemble those of the Church of England. When Mr. Salt stood godfather to a boy who was baptized into the Christian faith, after naming the child—George, he was requested to say the Belief and Lord's Prayer, and 'to make much the same promises as those required by our own Church.' The head priest then crossed the boy on the forehead, after dipping his hand into the water, and pronounced, 'George, I baptize thee in the name of the Father, Son, and Holy Ghost.'

When Salt was at Chelicut, Lent was strictly observed for fifty-two days, and no flesh was eaten during this period, though fish and various dishes were always plentiful on the table: the people always fasted till sunset. A feast followed this severe and protracted fast, in which they all seemed anxious to make up for lost time, by over-eating and drinking.

The Sacrament is also administered in Abyssinia, in a very decorous manner; and red-wine made of a grape, which is common in some parts of the country, is used on the occasion. Formerly, (says Mr. Salt,) if a man married more than one wife, he was excluded from participating in this rite, but wealth and power have induced the Church to relax its severity in this respect. Marriage itself, in Tigré, appears a mere civil institution: the woman keeps her name, and the parties can separate whenever they agree to do so. In this case the woman has her dowry back, which is not forfeited unless she is manifestly guilty of adultery. The higher classes are subject to no rule, but what may be considered as imposed by the relatives of the male and female. The Abyssinians bury their dead immediately after washing and fumigating the body with incense: while the bearers are putting it in the ground, the priests recite a form of prayer. Other strange ceremonies that follow are described by Salt. —*Ludolf's History of Ethiopia.*—*Bruce*, vol. ii. p. 422.—*Salt's Abyssinia.*

ACA'CIA-TREE. See ROBINIA.

ACA'CIA, the name of a plant of the PEA-TRIBE, mentioned by Dioscorides, as a useful astringent thorn, yielding a white transparent gum. The account given by this Greek author, meagre as it is, accords so well with the gum-arabic trees of modern Egypt, that we can scarcely doubt their identity. Accordingly it is to these, and to others closely related to them, that the classical name is still applied.

With modern botanists, the Acacia is an extensive genus of trees or shrubby plants, inhabiting the tropical parts of both the Old and New World, and, in a very few instances only, extending into temperate latitudes; although over the whole of Australia, and its dependent islands, the species are spread in much abundance.

Some of the species produce catechu and gum-arabic; the bark of others yields a large quantity of tannin, which, in the form of an extract, is annually imported from Van Diemen's Land in considerable quantity; the species from which this substance is procured are chiefly *A. decurrens* and *mollissima*. As objects of ornament they are usually of striking beauty; and it may be doubted whether, in the whole vegetable kingdom, equally brilliant colouring, and elegant foliage, combined with a most graceful aspect, are united in the same individuals.

Botanists are acquainted with nearly 300 species. Of these we shall mention only a few of the most interesting.

GENERIC CHARACTER.

Flowers polygamous.

Calyx, with either four or five teeth.

Petals, either four or five; sometimes distinct from each other, sometimes adhering in a monopetalous corolla.

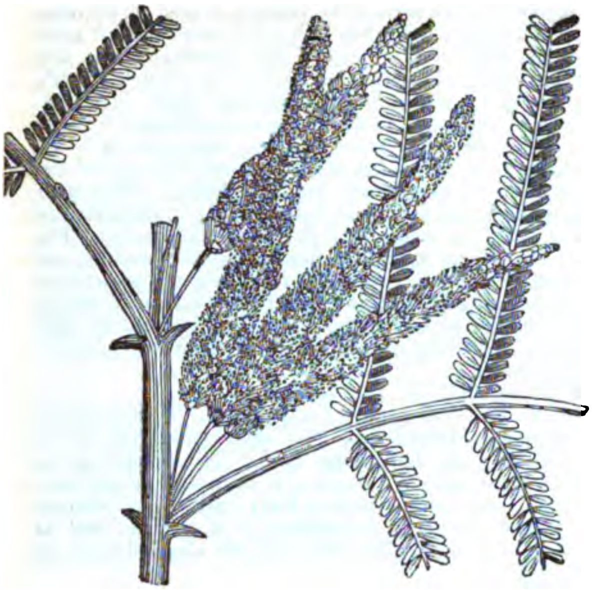
Stamens varying in number from 10 to 200.

Pod not separating into many joints; juiceless, two-valved.

The species are extremely variable in the structure of their leaves and flowers. Some of them have true leaves that are twice or thrice pinnate, with a multitude of minute, shining, or at least even, leaflets; others have, in a perfect state, no leaves properly so called, but, in their stead, the leaf-stalks enlarge, and assume the appearance, and no doubt also the functions, of true leaves: species of the latter description are known by their spurious leaves being expanded vertically, instead of horizontally as in leaves of the ordinary construction. By these very remarkable points of difference in structure the species may be conveniently separated into two great subdivisions.

§ 1. *Leaves pinnated in various degrees.* About 200 species known.

Acacia Catechu. The catechu acacia. (*Willd. Sp. pl.* iv. 1097. Mimosa catechu, *Linn.*) Spines growing in the place of the stipulæ; when young, straight, but afterwards becoming hooked. Leaves in ten divisions; leaflets in from forty to fifty couples, linear, downy; with one depressed gland at the base of the leaf-stalk, and from two to three between the upper divisions. Flowers arranged in cylindrical spikes, which grow two or three together.—A tree with a tolerably high and stout stem; found in mountainous places in the East Indies, especially in Bengal and Coromandel. It is most common in Canara and Bahar. Its pods are from two to three inches long, quite flat, and of a narrow, oval figure. Its unripe pods and wood yield, by decoction, one of the sorts of catechu, or terra-japonica, of the shops, a powerfully astringent substance, formerly thought to be a kind of earth. The other sort of catechu is obtained from a kind of palm. [See ARECA.]



[Acacia Catechu.]

Acacia Arabica, the gum-arabic tree. (*Roxb. Coromand. Plants*, 149.) Spines growing in pairs. Branches and leaf-stalks downy. Leaves in from four to six divisions; leaflets in from ten to twenty couples oblong-linear, with a gland between the lowest, and often between the outermost divisions. Heads of flowers growing in threes upon stalks. Pod necklace-shaped.—An inhabitant of the East Indies, Arabia, and Abyssinia, where it forms a tree thirteen or fourteen feet high, of inelegant appearance; easily recognised by its long, curved pods, which are divided into a number of round compressed joints, by means of contractions between the seeds. This is one of the plants that yield the useful substance called gum-arabic, which is procured by wounding the bark; after which the sap runs out, and hardens in transparent lumps, of various figures, very similar to the concretions found upon the bark of the cherry-tree in this country. Gum-arabic is also produced abundantly by some of the species nearly related to this, such as *A. Nilotica*, or *vera*, found in Egypt; *A. Ehrenbergii*, a native of Dongola; *A. tortilis*, a common plant in the west of Nubia, Kordofan, and Arabia, especially upon Mount Sinai; and *A. Seyal*, an inhabitant of Upper Egypt, Nubia, and western Arabia. It is supposed that gum-arabic is collected indifferently from all these, and that the gums of Jidda and Bassorah, gum-thur, and East India gum, are only picked samples. Gum-Senegal is the produce of a distinct species, called *A. Senegal*, found in Arabia and the interior of Africa. From this tree are said, by some, to be procured the pods called *bablach*, in the continental drug-shops; by others, however, they are referred rather to *A. cineraria*, and some other species.

[Acacia Arabica.]

Acacia discolor, the purple-stemmed acacia. (*De Cand. Prodr.* ii. 468. Mimosa discolor, *Bot. Rep.*) Spines none. Leaves with about five pairs of pinnæ; leaflets glaucous, tinged with purple, in from nine to twelve couples, oblong, smooth, acute, pale beneath; leaf-stalks glandular at the lower end, and covered with down, like the branches. Heads of flowers in long racemes, proceeding from the axillæ of the leaves.—A middle-sized tree, found in the southern parts of New Holland and in Van Diemen's Land, where it, in common with many others of the same genus, is called *Wattle*. It appears better adapted than most other Australian species to support our winters; near London it succeeds perfectly well, all winter long, in the open air, if wrapped round with mats, and it is to be presumed that there is no obstacle to its being almost naturalized in Devonshire and Cornwall and the west of Ireland. It is readily known by its bluish stems and leaves, which are slightly stained with dull purple, and form a strong contrast with its long, erect bunches of yellow blossoms.

Acacia pubescens, downy acacia. (*Hort. Kew.* v. 467.) Spines none. Branches not angular, hairy. Leaves with from three to ten pairs of pinnæ; leaflets in from six to eighteen couples, linear, very narrow. Heads of flowers globose, stalked, arranged in long racemes.—A native of the east coast of New Holland. In this country it is one of the most beautiful of green-house plants; if allowed to grow freely in the border of a good conservatory, it attains the height of ten or twelve feet; and in January and February produces a vast abundance of yellow blossoms, which weigh down the slender graceful branches, and perfume the air with a weak but pleasant odour

Acacia Julibrissin, silk-tassel acacia. (*Willd. Sp. pl.* iv 1065. Mimosa Julibrissin, *Scopoli.*) Spines none. Leaves with from eight to twelve pairs of pinnæ; leaflets in about thirty couples, half-oblong, acute, somewhat fringed, with a flattened roundish gland at the base of the leaf-stalk. Heads of flowers on stalks, arranged in a sort of corymbose panicle at the end of the shoots. Pods flat, membranous, smooth.—A native of Persia and of the Levant. Its specific name is Latinised from two Persian words—*gul*, a rose; and *ebruschim*, silk; by which it is known in the countries where it grows wild. There it becomes a small tree, remarkable for its light airy foliage, and for the great beauty of the clusters of lilac flowers, the long and slender stamens of which stream in the wind, and glitter in the sun, like a number of silken tassels artificially fastened to the boughs. This species is now commonly cultivated in the warmer parts of Europe. In England it is seen trained against walls, where it succeeds indifferently well, flowering only occasionally so far north as the latitude of London. Its great enemy in this climate seems to be, not our winters, but the want of an intensely hot summer to prevent exuberant growth, and to ripen the shoots so perfectly, as to enable them to resist frost.

Acacia acanthocarpa, prickly-fruited acacia. (*Willd. Enum.* 1057.) Spines from the place of the stipulæ, growing in pairs, and hooked. Leaf-stalks without either prickles or glands; leaves in from six to eight principal divisions; leaflets in from six to fifteen couples, oblong, downy. Heads of flowers in pairs, stalked. Pods compressed, plane, falcate, with each margin prickly.—A native of New Spain, where it forms a small tree, with flesh-coloured flowers. It was some years since introduced to the gardens of France, in the southern provinces of which it proves hardy. In this country it is not so capable of resisting frost as *A. Julibrissin*, or some of the New Holland species, notwithstanding it is marked as hardy in some of our garden catalogues. As its flowers have little beauty, it is very seldom cultivated.

The *Black-wood* of Van Diemen's Land is the timber of *acacia melanoxylon;* and the astringent *jurema bark* of Brazil is the produce of *acacia jurema.*

§ 2. *Leaves pinnated in the young plant; in the old, consisting of nothing but the vertically distended leaf-stalks called* Phyllodia. About 100 species.

Acacia decipiens, paradoxical acacia. (*Hort. Kew.* v. 465. Mimosa decipiens, *Bot. Magaz.* t. 1745. Adiantum truncatum, *Burm. Fl. Ind.* t. 66. f. 4.) Stipulæ spiny, deciduous. Phyllodia either triangular or trapezoidal; their midrib nearest the lowest side, and lengthened into a spine; a single glandular tooth on the upper edge. Flowers in nearly solitary compound heads.—This species is remarkable for the blunders to which it has given rise. When botany was only a science of names, its flowerless branches were taken for the leaves of a kind of fern; and, at a later period, when botanical geography was as yet unheard of, it was believed to be a native of the north-west coast of North America; an opinion as probable as that which would now be considered which referred the origin of a race of blackamoors to Great Britain. It is an inhabitant of the south-west coast of New Holland, where it forms a bush of singular aspect. In this country it is cultivated in the green-house, and it flowers in March, April, and May.

Acacia Sophoræ, fragrant acacia, (*Hort. Kew.* v. 462; *Labill. Nov. Holl.* 2 t. 237.) Phyllodia narrow, tapering towards the base, quite entire, with one principal midrib; an oval gland on their upper edge near the stalk. Heads of flowers in dense slender racemes. Pods long, curved, taper-pointed, a little contracted between the seeds.—A native of the south side of New Holland and Van Diemen's Land. In this country it is a very ornamental green-house plant, which, if planted in the open border, will grow as high as eight feet. It flowers during all the early months of the year; producing its numerous clusters of sweet yellow blossoms in great profusion. Few plants are more worthy of a permanent station in a good conservatory.

[Fragrant Acacia.]

Acacia longifolia, long-leaved acacia, (*Willd. Sp. pl.* iv. 1050. Mimosa longifolia, *Bot. Reposit.*, t. 107.) Phyllodia of a narrow, lanceolate form, tapering to each end, with two or three strong veins at the base, and several in the upper part. Spikes of flowers axillary, growing in pairs, on short stalks.—Found very commonly on the eastern coast of New Holland, especially in the neighbourhood of Port Jackson, whence it was introduced into Great Britain, among the first of the natural productions of that remarkable country. It is not sufficiently hardy to bear the open air in this climate, except in the summer, and should be cultivated in the open border of a conservatory, if we wish to have it in perfection. So treated, it is a very elegant plant, growing twelve or fifteen feet high, and bearing large masses of fragrant yellow flowers, in the months of March, April, and May.

Cultivation. The species of this genus are increased artificially in two different ways. Most of them may be multiplied by cuttings struck in silver sand, placed under a bell-glass, and kept in a warm place, to which no direct solar light has access. Such of them, however, as do not increase with sufficient certainty by this method, *A. Julibrissin* for instance, have the power of producing shoots from pieces of their root placed in earth in a hot-bed; and by these the nurserymen generally propagate them. Their seeds, also, are very often received, and from these they can, of course, be multiplied in all cases.

ACADEMY. A house and garden in one of the suburbs of Athens, inclosed by a wall, and having the grounds laid out in walks shaded by trees, was the original Academy. It is commonly stated to have been so called from its original possessor Academus, or Ecademus, who is said to have established here a school of gymnastic exercises. Other etymologies of the term, however, have also been given. About the middle of the fifth century before the commencement of our era, the groves of Academus fell into the possession of Cimon, the Athenian general; and it was he who first adorned the place with statues and fountains, and added other improvements, so as to convert it into a retreat uniting to the charms of natural scenery many of the luxuries of art. At his death he left the garden to the public; and it became a favourite resort of the lovers of philosophy and solitary meditation. Hither Socrates was wont occasionally to repair to converse with his disciples. But it was his illustrious pupil, Plato, who first gave celebrity to the Academy as a seat of philosophy, by establishing here the school over which he presided for nearly half a century. Hence the Platonic philosophy is frequently called Academism, or the philosophy of the Academy; and its followers, Academics, or Academists. Plato died about the year 348 before the Christian era. About the year B. C. 296, one of his successors, Arcesilaus, introduced certain changes into the original doctrines of the school; and he is on this account considered the founder of a second, or Middle, as distinguished from the Old academy. There was also in this sense a third academy, called the New, of which the founder was Carneades, who flourished about a century after Arcesilaus. Some writers even reckon a fourth Platonic academy, founded soon after the time of Carneades, by Philo (not the celebrated Platonic Jew), and Charmidas or Charmadas; and a fifth, designated the Antiochian, from its founder Antiochus, who had been a disciple of Philo. The opinions of these different schools will be explained under the heads PLATO, ARCESILAUS, &c. With regard to the academy of Plato, we may further notice that it was situated in the suburb, lying to the north-west of Athens, called Ceramicus, that is, literally, the Place of Tiles; and it has been remarked, as a curious coincidence, that the principal public garden of that city should thus have apparently had the same origin with the *Tuileries* of the modern capital of France, a name which also indicates that the site was anciently that of a tile-work. Cicero had a country seat on the Neapolitan coast, to which, as one of his favourite retreats for philosophical study and converse, he gave, in memory of the famous Athenian school, the name of Academia. It was here he wrote his Academic Questions. Its remains are still pointed out near Pozzuoli, under the name of the Bagni de' Tritoli.

After the restoration of letters in the fifteenth century, the term Academy was revived in Italy, but with a signification somewhat different from what it had borne in ancient times. It was used to imply, not a school in which philosophy was taught by a master to his pupils, but an association of individuals formed for the cultivation of learning or science, and usually constituted and endowed by the head of the state in which it was established. What was now called an academy, in fact more nearly resembled what was anciently denominated a Museum,—the name given, for example, to the famous association of the learned, founded by the first Ptolemy, at Alexandria, which so long subsisted in that city. The emperor Charlemagne is also recorded, towards the close of the eighth century, to have established in his palace at Aix-la-Chapelle a similar society. It was the fancy of the members of this society to assume each a classical or scriptural appellation. At their meetings they were accustomed to give accounts of such books as they had been studying; and their attention is said to have been also directed, not without effect, to the regulation and improvement of the vernacular language of the country. This association, however, existed only for a few years; and it does not seem to have been imitated elsewhere. Charlemagne was also the founder of the University of Paris, and several other schools and seminaries of instruction; but although the Greek term Academia has often, at least in more recent times, been applied to such institutions, they are altogether distinct in their nature from what is properly called an academy, and they will, therefore, be more appropriately and conveniently considered under the terms *University*, *College*, *Gymnasium*, *School*, according to the names by which they have been severally distinguished, than under our present head. On this point it is only necessary further to remark, that, from the application just noticed of the Greek term, it has of late become common, more especially in England and the United States of America, to give the name of academies to those seminaries in which so many various branches of education are taught as to entitle them to rank, it may be thought, as a sort of minor universities. In this sense, many of the principal towns in Scotland have their academies, which are merely great schools, such as in Germany would be called gymnasia, embracing in some cases both the languages and the sciences, but in general confined chiefly to the latter. In England, again, the colleges of the dissenters are commonly called academies; and the name is also frequently assumed by mere private boarding-houses, on however small a scale. The government institution at Woolwich for the instruction of military cadets is called the Royal Military Academy. It was founded in 1741, and is under the direction of the Board of Ordnance. There is also a Royal Naval Academy at Portsmouth, founded in 1722, under the direction of the Board of Admiralty. The Jewish seminaries for the highest branches of learning, in the different countries of Europe, have usually borne the name of academies. The same name has long been applied to schools of riding, of dancing, and of gymnastic exercises.

On the other hand, many of those associations of the learned, which, in all material respects, resemble the academies that arose in Italy with the revival of letters, are, nevertheless, not known by that name. They are called not academies, but *societies*, *associations*, *museums*, *lycæums*, *athenæums*, *institutes*, &c. If these different bodies were generally connected as parts of a great whole, it might be desirable, notwithstanding this perplexing diversity of appellations, to review them all in the same article; but they are not, in fact, related either as ramifications from a common stem, or by any other principle uniting them into one community; and we shall therefore adopt the plan most convenient for the purposes of reference, of only noticing, under our present head, those of them that are designated academies, and distributing the rest under the other titles by which they happen to be distinguished.

I. ITALIAN ACADEMIES.—Italy, as we have said, was the first country in which literary and scientific academies were established on the modern form, and there they have always flourished in the greatest number. A writer of the name of Jarckius, who, in 1725, published at Leipzig an account of the Italian academies, enumerates nearly 600 as then existing. Scarcely a town is to be found without such an institution, and most of the principal cities have ten or twenty, or more. We shall notice a few of those that have been most celebrated. The first that deserves to be mentioned is the Platonic Academy, established at Florence about 1474, by Lorenzo de' Medici. Its principal object was the study of the works of Plato, to which were afterwards joined the improvement of the Italian tongue, and the perusal and explanation of the poetry of Dante. Marsilius Ficinus, Picus Mirandola, Machiavel, Angelo Politian, and other persons remarkable for learning and genius, were among the early members of this association. The civil troubles of Florence occasioned the dispersion of its members in 1521. In 1560 was established at Naples, the first association for the cultivation of physical science, and the origin and model of many others in different countries of Europe, under the name of the Academia Secretorum Naturæ. It was, however, soon after abolished by the ecclesiastical authorities. To it succeeded the Academia dei Lyncei, founded at Rome, in 1609, by Prince Cesi, of which Galileo was a member. Prince Cesi died in 1632, and soon after the Academy was dissolved. Another of the same name was established at Rome in 1784, which still exists. But the most celebrated of the Italian academies is that named the Academy *della Crusca*, that is, literally, *of the Bran*, or *Chaff*, in allusion to the object of its institution, the purifying of the national tongue, and the sifting, as it were, of its flour from the bran. It was established at Florence in 1582, principally by the exertions of the poet Antonio Francesco Grazzini, who is much celebrated for the purity of his style. The Dictionary of the Academy *della Crusca*, first published under the title of *Vocabolario degli Academici della Crusca*, at Venice, in 1 vol. folio, in 1612; but augmented, in the last edition (Florence, 1729—1738), to 6 vols. folio, is considered as the standard authority for the Italian language; and the writers from whose works it has been collected, or whom it recognizes as classics, such as Boccaccio, Machiavel, &c., are hence frequently denominated *Autori Cruscanti*. The Academy *della Crusca* is now incorporated with two still older societies, the Academia degli Apatici, (or Academy of the Impartials,) and the Academia Fiorentina, originally the Academia degli Umidi, founded in 1549 by Cosmo I. The united institutions bear the name of the Royal Florentine Academy. Another very famous old Florentine academy is that entitled *Del Cimento*, that is, the *Academy of Experiment*. It was instituted for the cultivation of physical science, by the Cardinal Leopold de' Medici, brother of the Grand Duke Ferdinand II., in 1657. Among its first members were Borelli, Viviani, &c. A collection of experiments on the pressure of the air, the compressibility of water, on heat, sound, projectiles, light, and other subjects belonging to natural philosophy, was published in Italian by the Academy del Cimento in 1667, of which Muschenbroeck afterwards gave to the world a Latin translation, with valuable notes. Many of the Italian academies are remarkable for the fantastic names by which they are designated. Of this, indeed, the Academy della Crusca is itself an example. And it seems to have borrowed the idea of its title, and also of its device, a sieve, with the motto, '*Il più bel fior ne coglie*,' (It collects the finest flour of it,) from a previous society, established, soon after the revival of letters, at Perugia, called the Academy degli Scossi, that is, the Academy of the Well-shaken; by way of intimating, it is said, that the mind requires to be thoroughly tossed up, and shaken free of its refuse, before its powers can be properly exerted. The emblem of this society was also a sieve, with the Latin motto, *Excussa nitescit* (Shaken out it shines). There was another academy at Perugia, with which this became eventually united, called Degli Insensati, that of the Fools or Simpletons. In various other towns are or were the Academies of the Anxious, of the Confused, of the Impatient, of the Unstable, of the Drowsy, of the Sleepers, of the Awakened, of the Undeceived, of the Agitated, of the Humid, of the Inflamed, of the Insipid, of the Audacious, of the Dead (*Trapassati*), of the Fantastic, of the Nocturnal, of the Dissonant, of the Fluctuating, of the Thundry (*Fulminales*), of the Smoky, of the Ramblers (*Vagabondi*), &c. &c. The Latin name of the Academy della Crusca, we ought to observe, is the *Academia Furfuratorum*, that is, of the bran-sifters. Some interesting information on the early Italian Academies may be found in the 9th chapter of the Life of Galileo, in the *Library of Useful Knowledge*; and in Morhof's *Polyhistor*, and Tiraboschi's *Storia della Letteratura Italiana*, there referred to.

Among the existing Academies of Italy that have not been mentioned above, the following are some of the principal: the Royal Academy of Sciences and Belles Lettres of Naples, founded in 1779: it has published its Transactions, which contain many valuable papers on mathematical subjects, since 1788. The Herculanean Academy of Naples, founded in 1755: the first volume of its Transactions appeared in 1775, under the title of *Antichità di Ercolano*, and it has been followed by several others. The Academy of Etruscan Antiquities at Cortona founded in 1726, and that at Florence founded in 1807, both of which have published valuable Transactions. There are also academies at Padua, Milan, Siena, Verona, and Genoa, by all of which some volumes of Transactions have been printed. The Academy of Bologna was originally founded in 1690, by the afterwards distinguished astronomer Eustachio Manfredi, then only sixteen. The associates called their institution the Academia degli Inquieti, and took for their motto the words *Mens agitat*. In 1714 this academy was united to the University or Institute of Bologna, since which event it has been called the Academy of the Institute, or the Clementine Academy (from Clement XI., the then Pope.) Its Transactions have been published under the title of *Commentarii*, since 1731. To this list we may add the Royal Academy of Turin, in Piedmont, which was originally a private association founded about the middle of the last century, by the young Lagrange, then, although not yet twenty years of age, holding the office of Professor of Mathematics in the Royal Artillery School of that city. The first volume of its Transactions was published, in Latin, in 1759, and surprised the scientific world by some papers of great originality, to which the name of Lagrange was appended. The Turin Transactions, which continued for some years to be enriched by the contributions of this eminent mathematician, were published, in Latin, till 1784, since which time they have appeared in French.

II. **French Academies.**—We shall not here notice the ancient society established, it is said, about the middle of the twelfth century, at Toulouse, for the cultivation of poetry, or, as it was then called, the Gay Science, although it has been sometimes designated an academy. An account of that, and of other institutions of a similar description, will be more fitly given under the head Troubadours. The earliest of the French Academies, properly so called, is of much more recent date. The Académie Française was instituted in 1635 by Cardinal Richelieu, for an object of the same nature with that proposed by the Academy della Crusca,—the purification, regulation, and general improvement of the national tongue. This society, in imitation of its Italian model, published in 1694 the first edition of a French Dictionary, known by the name of the Dictionary of the Academy, to which it afterwards made many additions in successive reprints. This work, however, has scarcely perhaps attained the same authority with that of the Della Cruscan academicians; partly owing, no doubt, to the comparative immaturity of the French language when it was thus attempted to restrain its further growth. The original number of the members of the Académie Française was forty, from whom were elected a director and a chancellor every three months, as well as a secretary, who held his office for life. It used to meet three times a week in a hall appropriated to its use in the Louvre. This constitution it continued to retain till the year 1793, when it was abolished, with most of the other establishments which had subsisted under the ancient government. Two years after it was restored as part of the Institute, of which we shall presently give an account. The next of the French academies, in point of antiquity, is the *Académie Royale des Inscriptions et Belles Lettres.* It was established in 1663, in the reign of Louis XIV., by Colbert, and consisted originally of a few members selected from the Académie Française, who used to meet weekly in the library of that minister, and to employ themselves in inventing designs for medals to be struck in commemoration of the royal victories, examining the paintings and sculptures proposed for the embellishment of Versailles, and discussing the manner in which the gardens of that palace should be laid out and the apartments decorated. They were called, and not inappropriately, if a reference was intended to their occupations as well as to their numbers, *La Petite* Académie, the little academy. Their place of meeting was afterwards changed to the same room in the Louvre in which the Académie Française assembled, and they then began to hold two sittings in the week. In 1701 this academy was placed, by an edict of the king, upon a new and more extended foundation; and from this date it published every year a volume of memoirs, many of great value, till it was suppressed at the Revolution. It consisted, at the period of its suppression, of ten honorary members, ten pensionaries, and twenty associates, exclusive of several corresponding members. The Académie Royale des Sciences was originally established by Colbert in 1666, but was entirely remodelled in 1699. By the new constitution its researches were confined to the department of the physical sciences. The Académie des Sciences first began to publish its Transactions in 1666, and from 1699 a volume appeared regularly every year till the academy was suppressed in 1793. These three academies, together with the Académie Royale de Peinture et de Sculpture, which had been rather a school of painting than an association of cultivators of the art, were restored by the Directory in 1795, and united into what was called the National Institute. A new organization was given to this establishment by Bonaparte in 1802; and it was finally remodelled in the form in which it still exists soon after the second restoration of the Bourbons in 1816. As now constituted, the *Institut Impérial de France* consists of five academies: 1. The Académie des Sciences, composed of 66 ordinary members, 10 académiciens libres, and 8 foreign associates; 2. The Académie Française, composed of 40 members; 3. The Académie des Inscriptions et Belles Lettres, of 40 members, 10 académiciens libres, and 8 foreign associates; 4. The Académie des Beaux Arts, of 40 members, 10 académiciens libres, and 10 foreign associates; 5. The Académie des Sciences Morales et Politiques, instituted in 1832, composed of 30 members, 5 académiciens libres, and 6 foreign associates. There are, besides, 220 corresponding members belonging to the several Académies. The Académie Française meets twice a week, the others once: the meetings of the Académie des Sciences are open to the public. Vacancies are filled up by the votes of the members, subject to the approval of the chief of the state. Every regular member receives a salary of 1500 francs; a secretary, 6000 fr. (240*l.*) The meetings are held at the Palais Mazarin, a large building on the banks of the Seine. The French Institute has, since its establishment, ranked as the very first of the scientific associations of Europe, the most illustrious of whose philosophers have usually been comprehended in the list of its members.

There is also in Paris the Académie Celtique, founded in 1807, and now called the Société des Antiquaires de France, which has published several volumes of interesting and important *Memoires.* There are likewise academies in many of the provincial capitals of France; among which the chief are those of Soissons (1675), of Nismes (1682), of Angers (1685), of Lyons (1700), of Bordeaux (1703), of Caen (1705), of Montpellier (1706), of Bésiers (1723), of Marseilles (1726), of Rochelle (1782), of Dijon (1736), of Toulouse (1740), of Rouen (1744), of Montauban (1744), of Amiens (1750), of Besançon (1752), of Châlons sur Marne (1753). Many of these institutions have attained considerable celebrity, and some of them have published their Transactions.

III. **Spanish Academies.**—A society for the cultivation of physical science, under the title of Academia Naturæ Curiosorum, was established at Madrid, in 1652, on the model of the old Academia Secretorum Naturæ, already mentioned as having been founded at Naples in the middle of the preceding century. Of the existing Spanish academies the most important are the following:—The Royal Academy of Spain, founded at Madrid, in 1714, principally by the exertions of the Duke of Escalona. It is constituted on the model of the Academia della Crusca and the Académie Française, and has for its object the improvement and purification of the Spanish language, of which it has published a Dictionary, under the title of *Diccionario de la Lengua Castellana*, six vols. fol., 1726-1739. The Royal Academy of Spanish History: this commenced as a private association at Madrid in 1730, but was taken under the royal protection, and incorporated by Philip V. in 1738. It consists of twenty-four members. The first volume of its Transactions was published in 1796, under the title of Memorias de la Real Academia de la Historia. It has also printed some ancient manuscripts, and given new editions of some historical works; and it has long been engaged in preparing a Geographical Dictionary of Spain. There are also an Academy of History and Geography at Valladolid, and a Literary Academy at Seville, both founded in 1753.

IV. **Portuguese Academies.**—An Academy of Portuguese History was established at Lisbon, in 1720, by King John V., consisting of a director, four censors, a secretary, and fifty members. But the principal Portuguese academy is the Academy of Science, Agriculture, Arts, Commerce, and general Economy, founded by Queen Maria in 1779. This institution consists of twenty-four *socios veteranos*, or acting members, and thirty-six honorary and foreign associates. It is liberally endowed by the government, and possesses a library, a museum, an observatory, and a printing-press. The members are divided into three classes—1. that of natural science; 2. that of mathematics; and 3. that of Portuguese literature. It has published several volumes of Transactions in different sets; that entitled De Agricultura, commencing in 1787; de Economica, in 1789; de Letteratura Portuguesa, in 1792; and das Sciencias, in 1797. There is also a Geographical Academy at Lisbon, established in 1799, which has published a map of Portugal.

V. **Austrian Academies.**—Of these the most ancient is the Academia Naturæ Curiosorum, established at Vienna in 1652. In 1687, during the reign of the Emperor Leopold I., it assumed the name of the Academia Cæsareo-Leopoldina. Its Transactions were at first published in separate treatises, but since 1684 they have appeared in volumes, under the title of Ephemerides et Acta Academiæ Cæsareæ Naturæ Curiosorum. The Academy of Arts and Sciences of Vienna was founded in 1705; in 1754, in the same city, an Academy for the cultivation of the Oriental languages; and in 1783, a Surgical Academy. The Academy of Sciences, established in Vienna in 1846, is divided into four classes. 'Reports' of its meetings have been published since 1848, and 'Memoirs' since 1850.

VI. **Prussian Academies.**—The Royal Academy of Science and Belles Lettres of Berlin has long been one of the most eminent among the learned societies of Europe. It was established in 1700, by Frederick I., who appointed the celebrated Leibnitz its first president. The first volume of its Transactions appeared in 1710, under the title of *Miscellanea Berolinensia*, and other volumes followed at intervals of three or four years, till the accession of Frederick the Great in 1740, who, in 1744, took it under his special protection, and proceeded to give it a new organization, with the view of extending its usefulness, and raising it to a higher rank than it had hitherto enjoyed. Maupertuis was appointed its president, and the academy was divided into four classes:—1. The physical class, for natural science; 2. the mathematical class, including astronomy; 3. the philosophical class; 4. the historical and philological class. Each class chooses its own director, who continues in office for life. Vacancies are also filled up by the votes of the members, subject to the approval of the king. Since 1746, a volume of the Transactions has appeared regularly every year. They used to be in French; but are now published in German. The old Memoirs extend to the year 1771; after which date they are called the *Nouveaux Mémoires*, down to 1787; with which year a third series commenced. A history of this academy was published in 1752. In 1798, the Royal Library and Cabinet of Arts were united with, and placed under the superintendence of, the academy; they are now separated. In 1754, was established by the Elector of Mentz, the Electoral Academy at Erfurt, for the promotion of the useful sciences. Its Transactions were originally published in Latin, under the title of *Acta Academiæ Electoralis Moguntinæ Scientiarum Utilium*; but they have of late appeared in German.

VII. Other German Academies.—Of these, the principal are—the Academy of Sciences, otherwise called the Royal Society, of Göttingen, established in 1733; the Electoral Academy of Science and Bavarian History at Munich, first established in 1760, but greatly enlarged since the erection of Bavaria into a kingdom, and which has published its Transactions, since 1763, in German, under the title of *Abhandlungen der Baierischen Akademie*; that of Mannheim, founded in 1755, by the Elector Charles Theodore, and now divided into three classes—historical, physical, and meteorological; the Transactions of the two former of which have been published, under the title of *Acta Academiæ Theodoro-Palatinæ*—those of the last, under that of *Ephemerides Societatis Meteorologicæ Palatinæ*; and the Academy of Suabian History, established at Tübingen, in Wirtemberg.

VIII. Swedish and Danish Academies.—The Royal Academy of Sciences, of Stockholm, was originally a private association, founded by Linnæus, and a few of his friends, in 1739, and was not incorporated by the Crown till two years afterwards. Its Transactions appear in quarterly parts, which form an octavo volume a year. The first forty volumes, from 1739 to 1779, are called the *Old Transactions*; those which have appeared since, the *New*. They are written in Swedish, but have also been translated into German. This academy maintains a professor of experimental philosophy, who, with the two secretaries, is paid from the property which the society has acquired by legacies and donations. From the same source, it distributes every year several gold medals and prizes in money. Stockholm also possesses an Academy of the Belles Lettres, founded in 1753; and an institution denominated the Literary Academy of Sweden, founded in 1786. The object of the latter is the cultivation and improvement of the national language. There is an Academy for the investigation of Northern Antiquities, at Upsal, which has published some valuable volumes of Memoirs. The Royal Academy of Sciences of Copenhagen was founded by the Count of Holstein in 1742, and incorporated the following year. Its Transactions appear in Danish; but they have been partly translated into Latin.

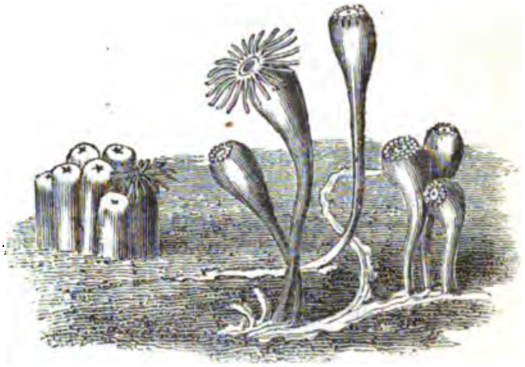
IX. Academies in Russia and Poland.—The Imperial Academy of Petersburg, like most of the valuable institutions of Russia, originated in the bold and contriving mind of Peter the Great. That monarch, however, did not live to carry into effect the scheme which he had arranged, and which is said to have been suggested to him by his inspection of the academies of France, when in that country in 1717, and to have been matured by consultations with Christian Wolff and Leibnitz. But immediately after his death, in 1725, his successor, Catherine I., proceeded to execute the intentions of her deceased husband; and the Academy was forthwith established, and held its first sitting in December of that year. Some of the most distinguished foreign mathematicians and philosophers of the day were wisely selected by the Empress to grace the new foundation, and induced by liberal salaries to accept places in it under the title of professors. Among them were Wolff, Nicholas and Daniel Bernouilli, Bulfinger, &c. Of these professors there are fifteen in all, besides a president and a director. There are also four adjuncts, from whom vacancies among the professors are always supplied, and who, till thus provided for, are permitted to attend the meetings of the Academy. In its earlier days this institution underwent various fluctuations in reputation and efficiency, according as it happened to be patronized or neglected by the reigning sovereign; but since the accession, in 1741, of the Empress Elizabeth, who placed it upon a broader and more independent basis, it has generally maintained a high character. Its annual revenue is considerable; and one important service, which it has thus been enabled to render, has been the exploration of various portions of the Russian empire, by means of the travellers Pallas, Stolberg, Klaproth, and others, whom it has sent out for that purpose. Its Transactions, down to the year 1747, inclusive, forming fourteen volumes, are in Latin, and are entitled *Commentarii Academiæ Scientiæ Imperialis Petropolitanæ*. Twenty volumes more, down to 1777, likewise in Latin, are entitled *Novi Commentarii*. Since 1777, they take the name of *Acta*, and are partly in Latin and partly in French. Of the whole number of mathematical papers which appeared in these Transactions down to the year 1783, in which he died, the celebrated Euler is computed to have written fully one half; and he left behind him about a hundred additional memoirs, which have appeared in the volumes printed since that period. These papers of Euler's contributed, more than any other publications of the time, to the simplification and improvement of the modern analysis. The Imperial Academy possesses a library of some extent, which contains a considerable number of oriental manuscripts, as well as valuable collections of medals and of specimens of natural history. In 1783, an institution, on the model of the Académie Française, having for its object the improvement of the Russian language, was founded at Petersburg; and was soon after united with the Imperial Academy. A Royal Academy was established at Warsaw in 1753.

Among the other European academies, may be mentioned the Medical Academy of Geneva, founded in 1715; the Académie des Sciences et des Belles Lettres of Brussels, which has published its Transactions, under the title of *Mémoires*, since the year 1777; and the institution of the same name at Flushing, whose Transactions have also appeared. In the British dominions there are no associations for the cultivation of science or learning, which have this name, except the Royal Irish Academy, founded in 1782, and which has published its Transactions since 1787. In North America, as in England, such institutions are, for the most part, called *Societies*, and will be noticed under that term. The following are the only academies which we find enumerated in the *Encyclopædia Americana*, published in 1829:—the American Academy of Arts and Sciences, established at Boston in 1780, which had in 1829 published four volumes of Transactions; the Connecticut Academy of Arts and Sciences, founded at Newhaven in 1799, which had then published one volume; and the Academy of Natural Science, founded at Philadelphia in 1818, of whose Memoirs five volumes had appeared.

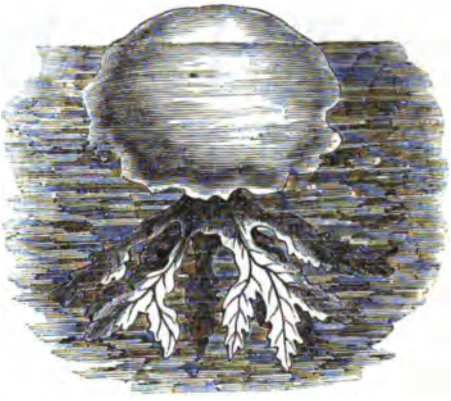
Academy is also the name usually given, both in this country and on the Continent, to an institution established for the cultivation and promotion of the fine arts, that is, of painting, sculpture, architecture, and music. Such institutions commonly partake both of the character of academies, in the sense already explained, and of schools or colleges, consisting, on the one hand, of an association of amateurs and distinguished proficients, professing to have in view the diffusion of a taste for the arts among the public generally, by publications, exhibitions, or any other means which may be made available for that end; and, on the other, of an establishment of teachers or professors, for the instruction of youth in the practice of some one or more of the branches in question. The latter object is effected by lectures, by prescribed tasks, and by the distribution of prizes and honours. Societies of painters, for the promotion and protection of their art, are of very ancient date. So early as the year 1345, the painters of Venice are recorded to have formed themselves into an association of this description. A few years afterwards, —namely, in 1350—those of Florence did the same. In 1391 the artists of Paris followed the example of their Ita lian brethren, and founded what they called the Academy of St. Luke. This establishment was formally recognized by Charles VII. in 1430; and the privileges which he conferred upon it were confirmed by Henry III. in 1584. In 1613 the Academy of St. Luke formed a union with the Society of Sculptors; and the institution subsisted till the Revolution. Towards the middle of the seventeenth century, however, it had been thrown into the shade by a new association, founded by Lebrun, Corneille, and several others of the painters licensed by the king. A royal edict, in favour of this association, was issued in the beginning of the year 1648; and in 1655 letters-patent were granted to it by Cardinal Mazarin. Some time after, it was allowed a hall in the Louvre; and, finally, in 1663, during the administration of Colbert, there was settled upon it a revenue of 4000 livres annually. In 1671, an Academy of Architecture was established by the same minister. These two establishments were abolished with the other academies at the Revolution; but they have since been revived, and now form together the fourth division of the Institute, under the name of the *Académie des Beaux Arts*. It consists of 40 members, 10 foreign associates, and a few corresponding members. A branch of this academy still subsists at Rome, which was established in 1666 by Louis XIV., with a revenue of 35,000 livres. There are also Academies of the Fine Arts in many of the chief provincial towns of France. Of the Italian academies of this description, that of San Luca at Rome was established in 1593, by the eminent painter Frederic Zucchero, who erected an elegant building for it at his own expense. There are others at Milan, Bologna, Parma, and many of the other principal towns. The oldest German Academy of the Fine Arts is that of Nuremberg, founded by Joachim Sandrart, an artist of great ability, in 1662 That of Dresden was established in 1697, and was united with those of Leipzick and Meissen in 1764, when it received the form which it still retains. There are others at Berlin, at Vienna, at Munich, at Weimar, and in various other cities. In Spain an Academy of Painting and Sculpture was established at Madrid in 1753. At Amsterdam, Antwerp, and Brussels, there are similar institutions. The Academy of the Fine Arts at Stockholm was established, in 1733, principally by the exertions of the celebrated Charles Gustavus, Count de Tessin; and that of Copenhagen in 1738, though it was not incorporated till 1754. To this institution the famous sculptor Thorwaldsen was indebted for his early education. The *Académie Imperiale des Beaux Arts* of Petersburgh was founded in 1765 by the Empress Catherine II., who endowed it with a considerable revenue. It consists of six professors of painting, sculpture, and architecture, with an adjunct, or assistant, to each, twenty-four honorary members, six councillors, a president, three rectors, and three adjuncts to the rectors. This institution has greatly contributed to the introduction and dissemination of a taste for the arts in Russia, by the pupils whom it has sent out and supported during their studies in foreign countries. A letter, printed by Steele in the 555th No. of the *Spectator* (the last of the original series), speaks of an Academy of Painting, then (1712) lately established in London. Sir Godfrey Kneller is mentioned as its president. This institution, however, probably soon fell into decay. The present Royal Academy originated in an association of painters, who obtained a charter, in 1765, under the title of the Incorporated Society of Artists of Great Britain. This society, however, was soon after broken up by disputes among its members; and in 1768 the Royal Academy of Arts was incorporated in its stead. It consists of forty artists bearing the title of academicians, of twenty associates, of six associate engravers, and of three or four individuals of distinction, under the name of honorary members. From the academicians are selected the professors of painting, of sculpture, of architecture, and of perspective; and there is also a professor of anatomy, who is commonly a member of the medical profession. Nine of the academicians are likewise appointed annually to officiate in setting the models, and otherwise superintending the progress of the students. The sovereign is patron of this institution; but its funds are, we believe, entirely derived from the money paid by the public for admission to the annual exhibition, which usually opens on the first Monday in May. A branch of the English Royal Academy was established some years ago at Rome. The Edinburgh Royal Academy of Painting was founded in 1754. A similar institution has also been established in Dublin, under the title of the Royal Hibernian Academy. An Academy of Ancient Music was established in London so early as the year 1710; but a disagreement among its members occasioned its dissolution after it had existed above twenty years. Some time after this the Royal Academy of Music was instituted, with Handel at its head, and for ten years, during which the operas of that great composer were performed under its superintendence in the Haymarket Theatre, enjoyed splendid success. But discord here also came at length to divide and disperse the professors of harmony; and in the year 1729 the institution was broken up. A new Royal Academy of Music, which holds its meetings in a hall in Tenterden-street, was established in 1822. The French Opera, it may be added, is styled the *Académie de Musique*.

ACA'DIA, by the French called **ACADIE**, is the genuine Indian name of the present province of Nova Scotia. The chief river of Nova Scotia is still called *Shuben-Acadie*, or the *river of Acadie*. [See NOVA SCOTIA.]

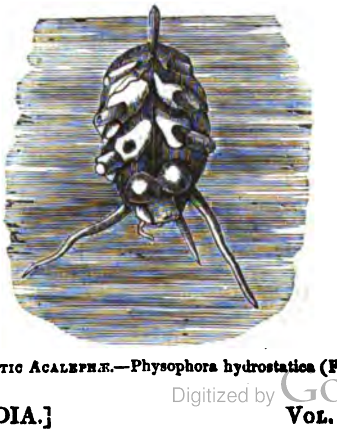
ACALE'PHÆ, a Greek word, signifying nettles. These animals form the third class of Baron Cuvier's zoophytes. Many of them are popularly named *sea-nettles*, from their causing, when touched, a disagreeable sensation similar to the sting of a nettle. Their form is always circular and radiated. There is only one opening into the body, which serves both for the mouth and the vent, and a single cavity which is at once gullet, stomach, and intestines; so that some writers have represented them as being all stomach.



FIXED ACAL.—Alcyonium mammillosum (ELLIS). Actinia sociata (ELLIS).



FREE ACALEPHÆ.—Rhizostoma cerulea (CUVIER).



HYDROSTATIC ACALEPHÆ.—Physophora hydrostatica (FORSKAL).

These animals were originally grouped in three orders—1. Fixed; 2. Free; and 3. Hydrostatic.

I. The Fixed (*Acalephæ stabiles*) can at pleasure either attach themselves to stones or other objects in the sea, or creep and swim about on the waves. The *Actiniæ*, or sea-anemones, the *Zoanthæ*, and the *Lucernariæ*, belong to this order.

II. The Free (*Acalephæ liberæ*) are not found attached to any object, but always floating about in the water. The *Medusæ* belong to this order.

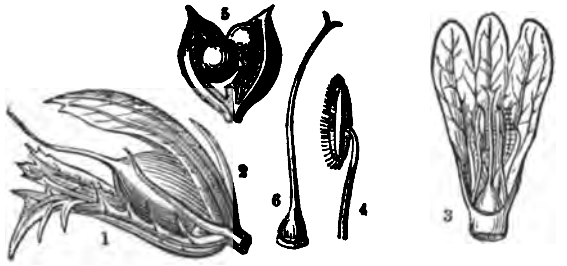
III. The Hydrostatic (*Acalephæ hydrostaticæ*) are thus named on account of one or more air-floats, by means of which the animals can raise or sink themselves in the water. These are mostly compound individuals. The order comprehends the *Physaliæ* and the *Physophoræ*.

In the last edition of the *Règne Animale*, Cuvier makes only two orders—1. The Simple (*Acalephæ simplices*); and, 2. The Hydrostatic.

A detailed account of these animals will be given under the separate orders. Huxley and others have recently thrown much light on this subject.

ACANTHA'CEÆ, a tribe of plants forming one of the natural orders in the Monopetalous division of Dicotyledonous or Exogenous Vegetation. (See DICOTYLEDONES and EXOGENÆ.) Its name is derived from the genus Acanthus, which has been considered characteristic of the whole tribe. The plants of which it is composed are either altogether of an herbaceous nature, or shrubby in a slight degree only; they are extremely common in every tropical country, where they may be considered to occupy the place of the mints, dead-nettles, thymes, and sages of Europe; a few only are found beyond the limits of the tropics. Many of the species are mere weeds; others bear handsome flowers with gaudy colours, but seldom with any odour; a very small number has been occasionally employed medicinally as emollients or diuretics.

The roots of Acanthaceæ are either annual or perennial. The stems are usually four-cornered when young, but afterwards become nearly round; their inside is occupied by a large proportion of pith, which is enclosed in a thin layer of imperfectly formed wood; and at each joint there is a slight tumour with an articulation, by which they are readily known from both Scrophularineæ and Verbenaceæ. Their flowers are often inclosed within large, leafy, imbricated bracteæ (1). The calyx (2) is usually composed of either four or five parts, which overlap each other, and occasionally grow together at the base. The corolla (3) is monopetalous and irregular. The stamens (4) are either two, or four, but in the latter case are of unequal lengths. The pistillum (6) is superior and turcilled. The seed-vessel (5) contains two cells, which burst when ripe, often with elasticity, and expose a few roundish seeds hanging to the cells by curious-hooked processes.



[Analysis of Acanthaceæ.]

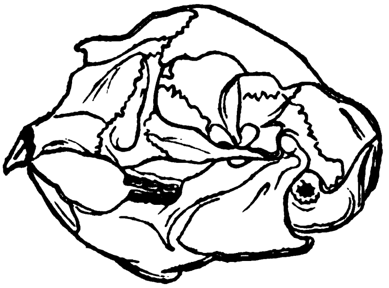
The stems of all the species emit roots very readily from their tumid articulations; on which account gardeners universally increase them by cuttings of the full-grown branches. They are always easy to cultivate, provided they are not kept in too cold or too dry a situation. The annual kinds freely produce seeds, by which they are readily multiplied.

The most common genera are Justicia, Acanthus, Ruellia, Thunbergia, Barleria, and Eranthemum, which see.

For further information, consult Brown's *Prodromus Floræ Novæ Hollandiæ*; Bartling's *Ordines Naturales*; Lindley's *Introduction to the Natural System*; and also Nees von Esenbeck's *Exposition*, in the third volume of Dr. Wallich's *Plantæ Asiaticæ Rariores*.

ACA'NTHION, in Zoology, a genus of Rodentia, established by M. F. Cuvier, and embracing two species, which are only known at present by their osteology. In the number and form of their teeth, these animals agree in all respects with the common porcupine, from which, indeed, they only differ in the general form or outline of the cranium, and the comparative developement of the bones of the face and skull; characters which have no very assignable influence upon the habits and economy of animal life, and which will, probably, be merged in others of greater importance, when we come to be better acquainted with the species in question. Indeed we have introduced the present article principally for the purpose of attracting the attention of travellers and residents in our Indian Colonies; many of whom have daily opportunities of elucidating this and other obscure subjects in zoology, and only require to be informed of its wants to render the most essential service to the science.

Fig. 1.



To guide observers who may have an opportunity of pursuing this inquiry, we have engraved (*fig.* 1) the skull of a species of porcupine sent from Java by the French traveller, Duvancelle, and figured by M. F. Cuvier, in the ninth volume of the *Mémoires du Museum*, as the type of his genus *Acanthion*.

Fig. 2.

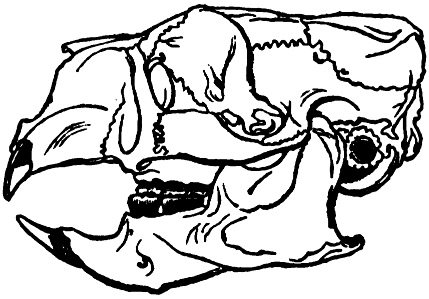


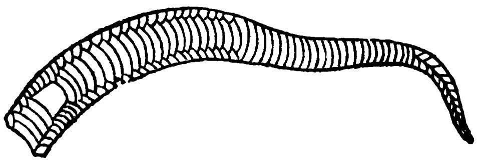
Fig. 2. represents the skull of the common Italian porcupine, for the purpose of comparison. The principal differences which these skulls present, when compared with one another, consist in the surface of the forehead being nearly flat in the acanthion, instead of forming a spherical elevation as in the porcupine; and in the nasal bones being of much smaller dimensions in the former than in the latter animal. The sense of smell would thus appear to be less acute in the Javanese porcupine than in that of Europe and Africa; but it has the region of the brain comparatively larger. M. Cuvier reckons two species:—

1. *The Acanthion Javanicum*, founded upon the skull already mentioned, as having been sent from Java by M. Duvancelle. This is, probably, the *Babi-landak*, mentioned in Marsden's *History of Sumatra*, and which that author identifies with the *Hystrix Macroura* of Linnæus, a species equally obscure. This animal is represented as having five toes on each foot, the body covered with weak spines, and a long tail, terminating in a thick tuft, of which the spines are knotted, and spring out of one another like grains of rice.

2. *The Acanthion Daubentonii*, founded upon a skeleton formerly described by Daubenton, but which he mistook for that of the common porcupine. The locality from which this skeleton was obtained is not exactly known; but there is reason to believe that it was brought from some part of Africa. It may, perhaps, belong to the fasciculated porcupine, which has been lately found to inhabit the Island of Fernando Po; and which, to judge from the external appearance of the living specimen formerly possessed by the Zoological Society, appears to have all the characteristic marks which M. F. Cuvier assigns to the genus Acanthion.

It may be observed, in conclusion, that, besides the common porcupine (which inhabits every part of the Indian Continent, as well as Africa and the South of Europe), the large islands of Borneo, Sumatra, and Java, the Malayan Peninsula, and probably other parts of Eastern Asia, contain three or four different but closely allied species, of which we have, at present, but a very vague and confused account.

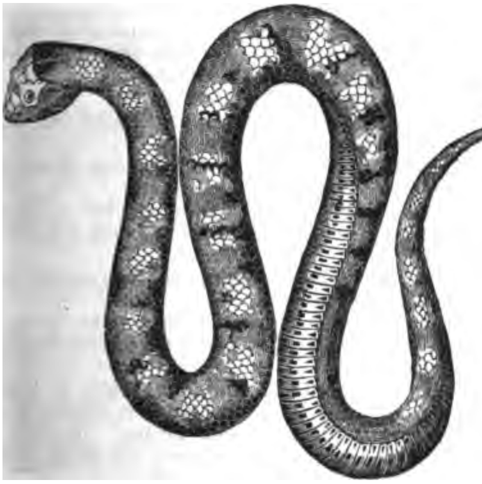
ACA'NTHOPHIS, in Zoology, a genus of venomous serpents, allied to the vipers, but distinguished by having a single series of plates beneath the tail, excepting towards the very extremity, where they are, in some cases, separated into two small rows. The bodies and tails of these animals are elongated and cylindrical; their heads round, obtuse, rather prominent over the eyes, and covered in front with nine or ten polygonal plates. The back and upper surface of the tail are covered with reticulated scales of a rhomboidal form: the breast and belly are covered with single transverse plates; as is likewise the tail, excepting towards the very extremity, which is sometimes furnished with a double row of plates, as in the common viper. The tail is terminated by a little spur, or horny excrescence, which has suggested the name of Acanthophis (that is, *thorn* or *spur* snake), for this genus. This is, however, but a very secondary characteristic, and of little use in distinguishing these animals; since it exists equally in many other species of very different genera, such as the collared, and the black and white snakes, and even in the common viper. It springs out of the very end of the tail, and does not appear to be of the same utility as the two horny spurs which grow upon each side of the anus in the pythons and boas, and which being retractile, or capable of being erected and depressed at will, execute important functions in the economy of these animals.



[Tail of the Acanthophis.]

The head of the acanthophis is broad and compressed, the mouth capable of great distension, and furnished on each side, besides the retractile poison-fangs common to all the family of truly venomous serpents, with a double row of sharp, curved teeth. The species of this genus are of small size, reside on the surface of the dry land, and feed upon frogs, lizards, and small mammals. They are viviparous, and secrete themselve in rat holes, or beneath the roots of trees; never strangle or crush their prey by coiling themselves round its body, but expect a more speedy and certain victory from the deadly effects of their poison. The most commonly known species is—

The Acanthophis Cerastinus, first described by Merrem, and so named from the general similarity which it bears, at first sight, to the cerastes, or horned viper, in its short body, large flat head, and eyes surmounted by prominent scales.



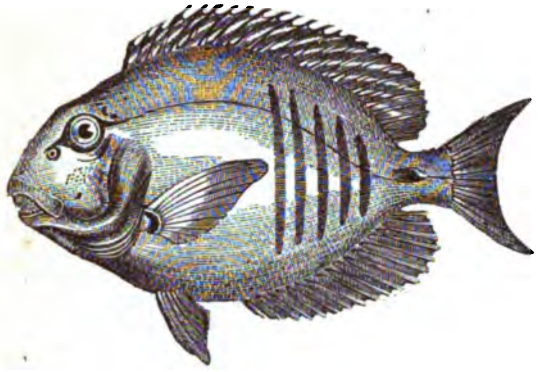
[Acanthophis cerastinus.]

The length of this species is about fifteen inches, of which the tail measures rather more than a fifth part; the body is thick in proportion to its length, having a circumference of two inches and a half in the middle, from whence it gradually tapers towards either extremity. The colour is a pearly-grey above, with obscure transverse dusky or bluish undulations beneath, pale yellow brown, with a small transverse oval black spot on the edge of every abdominal plate; and, in the middle, a similar range of spots from the vent to the end of the tail. The tail itself is cylindrical on the upper surface, and flat beneath, and the spur which terminates it is extremely sharp-pointed, compressed, and slightly bent upwards. The native country of this species is unknown; at least Merrem, who first described it, was ignorant of the country from which his specimen was obtained, and it does not appear to be indicated by any traveller.

The Acanthophis Brownii is briefly described by Dr. Leach, and figured in the first volume of the *Naturalist's Miscellany*. The specific name is given out of compliment to Mr. Robert Brown, the celebrated botanist, from whose manuscripts the brief description of Dr. Leach was taken. The body is said to be of a uniform dark brown, the under lip whitish, the upper with a transverse groove in front, the tail small and rather abruptly contracted at its junction with the body, and the apex compressed laterally. Such, with the additional fact that it is an inhabitant of New Holland, is the very meagre account of this serpent, supplied by Dr. Leach. Mr. Peter Cunningham, however, in his entertaining publication on the present state of New South Wales, informs us, that it is the most venomous serpent of that colony; and suspects that this and a kindred species, of a light orange colour, are male and female, as they have been found to inhabit the same hole. He relates a remarkable fact proving the tenacity of life of these animals. Two individuals, a male and female, were discovered by the dogs of a sportsman: the black one was killed, and the head completely severed from the body, but the female escaped into the hole; upwards of ten minutes afterwards one of the dogs, in hunting about where the snake had been killed, was bitten in the foot by the head which had been cut off, and shortly after died in the most dreadful convulsions.

ACANTHOPTERY'GII, in Zoology, one of the three primary grand divisions, or natural orders, of fishes, which Cuvier has finally established, or rather restored, in his *Histoire Naturelle des Poissons*, a work which he left unfinished. This great naturalist has divided fishes into three orders, — *Chondropterygii* (from χονδρος cartilage, and πτέρυξ a wing or fin), or *Cartilaginous* fishes, without a solid bony skeleton; *Acanthopterygii*, fishes having bony skeletons with prickly spinous processes in the dorsal fins (hence their name); and *Malacopterygii*, (μαλακός, soft, &c.) fishes with bony skeletons, indeed, but with soft articulated radii in the dorsal fins. These three grand divisions, founded upon natural and intelligible principles, because characterized by modifications of organic structure, which exercise an obvious and important influence upon the habits and economy of these animals, were first of all recognized by our celebrated countrymen, Willoughby and Ray. These naturalists were the earliest in the attempt to give a systematic form to zoology, and to raise this branch of knowledge to the rank and importance of a *Science*, by applying to its investigation the principles of the inductive philosophy. The system which these great men had left incomplete and imperfect, a thing unavoidable in all first attempts, was further develeped by the celebrated Artedi, in whose hands the three orders above-mentioned became co-ordinate divisions, together with the *Branchiostegi*, since suppressed by Baron Cuvier. After undergoing various changes in the hands of intermediate zoologists, and being even discarded altogether by the school of Linnæus, the system of Artedi is still triumphant. It was completely restored by M. Cuvier, who, after many years devoted to the study of this branch of zoology, and after various attempts to form a system of his own, finally acknowledged that it was the only arrangement conformable to the actual phenomena which we observe among these animals. M. Cuvier divided the Acanthopterygious fishes into fifteen families, which are as follow:—*Percidæ*, the Perches; *Triglidæ*, the Gurnards; *Sciænidæ*, the Maigres; *Sparidæ*, the Sea-bream family; *Menidæ*, the Menides; *Squammipennes*, the Scaly-finned fishes; *Scomberidæ*, the Mackerels; *Tænidæ*, the Riband fishes; *Theutyes*, the Lancets; *Anabadæ*, the Climbing fishes; *Mugillidæ*, the Mullets; *Goboidæ*, the Gobies; *Lophiadæ*, the Anglers; *Labridæ*, the Wrasses; and *Fistularidæ*, the Pipe fishes.

ACANTHU'RUS, a genus of Acanthopterygious Fishes, founded by Bloch and Lacepede, and adopted by subsequent writers. This genus, separated from the Chætodons of Linnæus, contains, at present, a great number of species, many of which are remarkable for the beauty of their external forms, and the variety of their colours. They are distinguished from proximate genera by the form of the body and tail, which are exceedingly compressed;—so much so, that the depth of the body, measured from the dorsal to the pectoral fins, is always equal to, and often exceeds, its length from head to tail;—by their trenchant teeth, denticulated like a very fine comb; but above all, by the moveable spines, edged and sharp like a lancet, with which they are armed on each side of the tail, and with which they inflict dangerous wounds upon the hands of those who touch them incautiously. It is this circumstance that has acquired for the Acanthuri the name of 'Doctors,' by which they are well known to the English sailors and colonists. These animals have the mouth small, and the muzzle rather advanced: they are among the small number of fishes which live entirely upon vegetable substances, feeding only upon algæ, fuci, and other marine plants; their intestinal canal is, consequently, longer and more complicated than in other species, and their flesh has a peculiar flavour, very different from that of the piscivorous genera. The dangerous weapons with which Nature has provided these otherwise harmless fishes, are well calculated to defend them from the attacks of the ravenous enemies which every where surround them. As they are not obliged to resort to rapine for procuring food, they are by nature inclined to peace, and never voluntarily commence an attack; but they defend themselves with courage and success against the largest of their assailants. Their lancets, also, are placed in the very situation in which, above all others, they are most efficient and dangerous; not only because the greatest strength of fishes lies in the tail, but likewise because it is in this quarter that their enemies are at once most likely to make the attack, and least prepared to expect resistance. The acanthures abound in all the tropical seas, both of the East and West Indies; they are never known to advance beyond the tropics, and are, consequently, unknown in the more temperate latitudes.


[Chætodon Chirurgiens. Bloch.]

ACA'NTHUS (in Architecture). The name by which the broad raffled leaf used in the enrichment of the Corinthian capital is known. It is thus called because of its general resemblance to the leaves of a species of the acanthus plant; or rather because of a pretty traditional story which the Roman author Vitruvius tells of the fancied origin of the Corinthian capital, in which the leaves are said to be imitated from those of the acanthus. (See Capital, Corinthian.) The same leaf, however, is commonly used in architectural and sculptural enrichments generally; in the enrichment of modillions, of mouldings, and of vases, as well as of foliated capitals; and we gather from Virgil, that the acanthus was by the ancients also employed as an ornament in embroidery. In the first book of the *Æneid*, verse 649, and again at 711, a veil or vest is said to be interwoven or embroidered with the crocus-coloured or saffron acanthus.

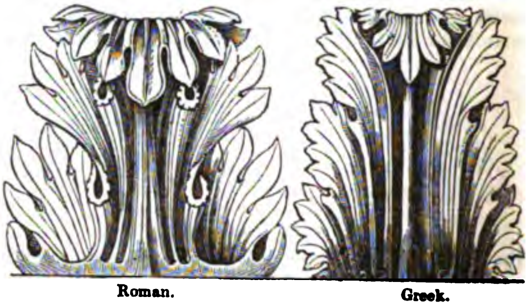
Indeed, it appears to have been a great favourite with that poet himself, both as a plant and as an ornament in works of art. Speaking of the most delightful trees and shrubs for a garden for bees, in the fourth book of the *Georgics*, verses 122 and 123, he says, 'nor could I have passed over in silence the late-blooming narcissus, or the twig of the flexible acanthus;' and in the third eclogue of the *Bucolics*, verse 45, he describes two beautiful beechen cups, on which was carved the scene of Orpheus enchanting the trees, with 'the soft acanthus folded round the handles.'

The application of the brank-ursine acanthus (see next article) to sculptural enrichment is further illustrated in the following passages:—Theocritus, describing a cup of Ætolian manufacture, says, 'the pliant acanthus is expanded all round the cup;' and Ovid (*Met.* 13. v. 701.) represents a vase of bronze as being adorned on the outside with a mythological story, and the border above this figured portion as covered with acanthus leaves wrought in gold. Now of these two modes of applying it, as well as of that described by Virgil in his third eclogue, we have very many instances in ancient vases still extant.

Athenæus relates that, in the splendid procession ordained to convey the corpse of Alexander the Great to its final destination in Egypt, the coffin was placed in a car, which was adorned with a small colonnade of golden pillars, and a golden acanthus was set at intervals between the columns.

Pliny the elder, in his *Natural History*, describes the acanthus in such a manner that it can only be recognized in the brank-ursine; and his nephew, in speaking of the successful cultivation of the same plant as an ornament to his garden, leaves no doubt that the brank-ursine is identical with the common architectural and sculptural acanthus.

This ornament, in the ancient Greek and Roman models, is very characteristic of the styles of architectural enrichment of those nations; in the Roman it is full and somewhat luxuriant, and in the Greek more restrained, but simple and graceful.


Roman. Greek.

ACAN'THUS. Under this classical name have been described, by ancient authors, at least three totally different plants. Firstly, a prickly tree with smooth evergreen leaves, and small round saffron-coloured berries, frequently alluded to by Virgil; this is conjectured to have been the *Holly*. Secondly, a prickly Egyptian tree, described by Theophrastus as having pods like those of a bean; it is probable that this was the *Acacia Arabica* (see Acacia). Thirdly, a herb mentioned by Dioscorides, with broad, prickly leaves, which perish at the approach of winter, and again sprout forth with the return of spring. It is said that the idea of the Corinthian capital of Greek columns was taken from some of the leaves of this acanthus. To this latter plant the name is now applied. The word, in all cases, alludes to the prickly nature of the leaves or stems.

In modern botany, Acanthus is a genus of herbaceous plants found in the south of Europe, Asia Minor, and India, belonging to the natural order *Acanthaceæ*.

Generic Character.

Calyx in four divisions, of which the upper and lower are much larger than the other two.

Corolla one-sided, with three lobes; no trace of an upper lip to be found.

Stamens four, in two lengths; anthers never containing more than one cell, fringed, the upper ones erect, the lower horizontal.

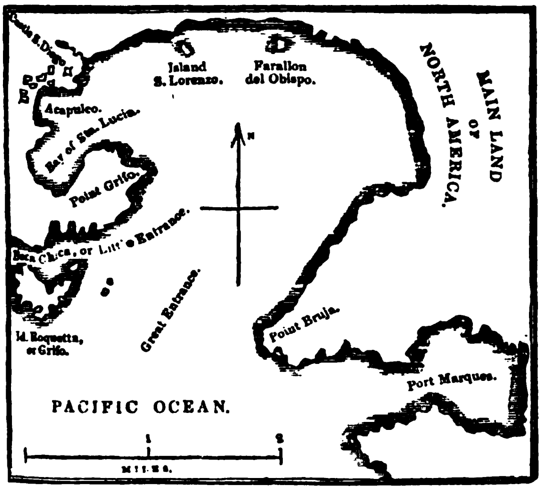
Seed-vessel two-celled, compressed, four-seeded, with sides of the texture of paper.

Flowers growing in a terminal leafless spike, having at their base three floral leaves, of which the intermediate one is fringed with bristles.

The commonest species is *Acanthus mollis*, or *Brank-ursine*, a native of many parts of the South of Europe, growing in shady moist places, among bushes. Its stem is about two feet high, and is covered from the middle to the top with fine large white flowers, slightly tinged with yellow. The leaves are large, soft, deeply cut, hairy, and shining, and surround the lower part only of the stem. Both the leaves and the roots, which are perennial, abound in mucilage, which has caused them to be substituted in domestic medicine for the marsh-mallow. It is this species which is usually supposed to have given rise to the notion of the Grecian capital. But it appears, from the investigation of Dr. Sibthorp, that it is no where to be found, either in the Greek islands, or in any part of the Peloponnesus, and that the plant which Dioscorides must have meant was the *Acanthus spinosus*, still called ἄκανθα, which is found, as he describes it, on the borders of cultivated grounds, or of gardens, and is frequent in rocky moist situations. This species differs from *A. mollis* in having a dwarfer stem, flowers tinged with pink instead of yellow, and spiny leaves, much more deeply cut. Both the one and the other are half-hardy perennials, increased by division of the summit of the root. They have been long cultivated in the gardens of Great Britain, but perish, if not protected, from severe frost.

[Acanthus spinosus.]

ACAPU'LCO, a city in the province of Mexico, about 183 miles S.S.W. of the capital, Mexico; N. lat. 16° 50′, W. lon. 99° 48′. It stands in the recess of a bay, close to a chain of granite mountains, and is the best Mexican port on the coast of the Pacific Ocean. The bay has two entrances formed by the island Roquetta; the comparative dimensions of which may be estimated from the scale attached to the small map. The port is capable of containing 500 ships, and is deep enough to allow vessels to lie close to the rocks.



Acapulco is but poorly built, and is a most disagreeable and unhealthy place. Lying within the torrid zone, and surrounded by mountains, it is intensely hot, and the inhabitants, particularly new comers, are liable to dangerous fevers. Some time back an opening was cut through the rocks on the west to let in the sea-breeze, but a dirty swamp on the east side of the town probably still remains undrained, and is one of the sources of the annual fevers. The city of Mexico, in the interior, communicates with the Pacific by the town of Acapulco, which once had a considerable trade, particularly with Manilla, the capital of Manilla, or Luzon, one of the Philippine islands. Under the Spanish dominion a vessel of the largest size used annually to leave Acapulco for Manilla about February or March, loaded with commodities and specie; and when the English were at war with the Spaniards, the Manilla ships were carefully looked after as a rich booty. The vessel returned to Acapulco in August, carrying back muslins, printed calicoes, coarse cotton shirts, porcelain, Chinese jewellery, &c. Its arrival was the signal for a great concourse of merchants to Acapulco, who swelled the population for the time to about 9000. The monopoly enjoyed by Acapulco while under the dominion of Spain, being now abolished, the India and China trade has shifted to the ports of Sam Blas, Mazatlan, and Guaymas. The present number of inhabitants is stated at about 4000, who are principally people of colour. Its exports are cochineal, indigo, silver, and some skins. Owing to unexpected and long-continued calms, the voyage between Callao, in Peru, and Acapulco, is often longer than between Callao and Cadiz.

ACA'RIDÆ, a division of ARA'CHNIDA, which comprehends the small spider-like animals popularly termed mites (*Acari*), as well as water-mites and ticks: some of these are wanderers on land or in water; others are fixed upon various animals, whose blood or humours they suck, and even insinuate themselves beneath the skin, and often multiply prodigiously.

These minute animals are not considered by modern naturalists to rank among insects, on account of their structure being very different, and from their having, in most cases, like spiders, eight feet, while no insect has more than six feet. Their mouths, in some, are furnished with jaws (*mandibulæ*), either having pincers or claws, but concealed in a projection of the breast-plate (*sternum*) in form of a lip; in others it is in the form of a syphon or sucker; and in others it presents a simple cavity. M. Latreille makes four divisions of the *Acarides*: 1. Mites (*Trombidites*). 2. Ticks (*Ricinites*): 3. Water Mites (*Hydrachnellæ*): and 4. Flesh Worms (*Microphthira*); the latter distinguished from the other three by having only six feet.

ACARNA'NIA, an ancient division of Northern Greece, which was bounded on the north by the Ambraciot Gulf, now the gulf of Arta, on the north-east by the small territory of Amphilochia, and on the west and south-west by that part of the Mediterranean to which the Greek and Roman writers gave the name of the Ionian Sea. The eastern boundary is not so easy to determine. It extended in the time of Thucydides east of the river Achelous, and encroached upon the territory which seemed the property of the Ætolians. Under the Romans, or somewhat earlier, the Achelous was made the dividing line. Acarnania afterwards became part of the Roman province of Epirus, and Ætolia was attached to the province of Achæa. Along with Ætolia, it now forms one of the ten *nomes*, or departments, into which the modern kingdom of Greece is divided.

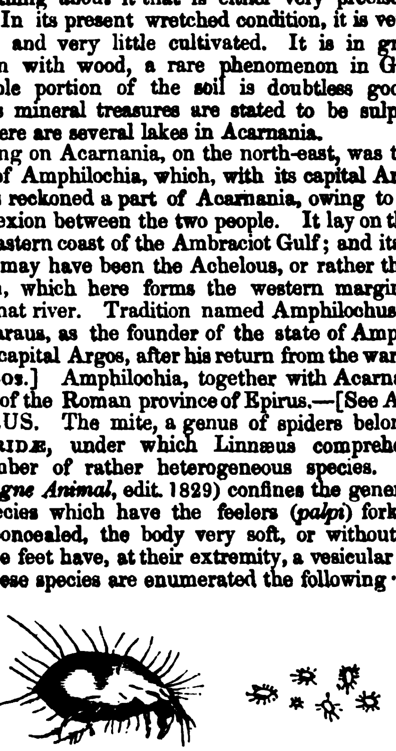
The modern island of Santa Maura, anciently Leucas or Leucadia, was at one time a peninsula. The narrow channel which now separates it from the mainland was cut by the Corinthians. The length of sea-coast from Actium, near the entrance of the Ambraciot Gulf to the mouth of the Achelous, is reckoned, by Strabo, to be about 570 stadia, or 57 miles, reckoning 10 to a mile. Our modern charts give a length of from 70 to 80 miles, measuring in a rough way, along the very irregular outline of the coast. Several good ports are found on this coast, which, added to the general fertility of the country, might have made the people wealthy; but the primitive inhabitants never attained any reputation either in commerce, or the arts, sufficient to transmit their fame to our days. Their best ports were occupied by Corinthian colonies; and the inhabitants, engaged in continual wars with their neighbours, are characterized by Thucydides as living in a state of piracy and robbery, at a time when Athens (which was not 150 miles from the mouth of the Achelous) had seen the dramas of Æschylus and Sophocles, and was adorned with the great works of Phidias.

Thucydides, who wrote during the Peloponnesian war (which commenced B.C. 431), is the earliest extant writer who gives us any exact information about a people called Acarnanians, inhabiting the country which we have called Acarnania. It is difficult to give, in a limited space, any definite or correct idea of the origin of many of the Greek nations. The Acarnanians are never mentioned by Homer, though their neighbours and brethren, the Ætolians, are; and this would tend to prove that the name of Acarnanians as the name of a people, is not so old as the time of Homer. They belonged, probably, at least in part, to an old and widely diffused race called the Leleges; and, by gradual intermixture with Hellenic (Greek) stock, became, to a certain extent, a Greek people. In the course of time they formed a kind of union and civil polity, which Aristotle thought worth describing; but his work is lost.—[See Ætolians.]

We have hardly attempted any description of the interior of this country, because it is next to impossible to state anything about it that is either very precise or important. In its present wretched condition, it is very thinly inhabited, and very little cultivated. It is in great part overgrown with wood, a rare phenomenon in Greece; a considerable portion of the soil is doubtless good; and among its mineral treasures are stated to be sulphur and coal. There are several lakes in Acarnania.

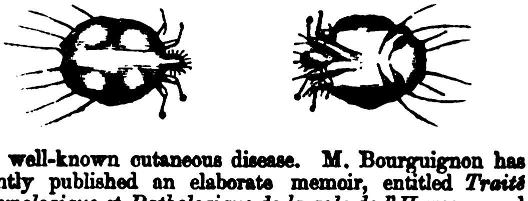
Bordering on Acarnania, on the north-east, was the small territory of Amphilochia, which, with its capital Argos, was sometimes reckoned a part of Acarnania, owing to the political connexion between the two people. It lay on the south-east and eastern coast of the Ambraciot Gulf; and its eastern boundary may have been the Achelous, or rather the mountain chain, which here forms the western margin of the basin of that river. Tradition named Amphilochus, the son of Amphiaraus, as the founder of the state of Amphilochia, and of its capital Argos, after his return from the war of Troy. [See Argos.] Amphilochia, together with Acarnania, became part of the Roman province of Epirus.—[See Actium.]

A'CARUS. The mite, a genus of spiders belonging to the Acaridæ, under which Linnæus comprehended a great number of rather heterogeneous species. M. Latreille (*Règne Animal*, edit. 1829) confines the generic name to the species which have the feelers (*palpi*) forked, very short or concealed, the body very soft, or without a scaly crust. The feet have, at their extremity, a vesicular cushion. Among these species are enumerated the following:—



The domestic mite (*Acarus domesticus*, De Geer), is very commonly found in collections of insects and stuffed birds, and is exceedingly destructive to cabinets. The effluvia of camphor has some effect in destroying this pest, but is not powerful enough to prevent it altogether. Moistening the specimens with a weak solution of corrosive sublimate, is said to prove an effectual preventive.

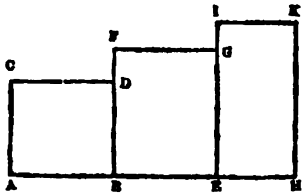
The itch mite (*Acarus Scabiei*, Fabricius) is a microscopic animal, found under the human skin in the pustules of a well-known cutaneous disease. M. Bourguignon has recently published an elaborate memoir, entitled *Traité Entomologique et Pathologique de la gale de l'Homme;* and by a series of experiments has shown, that an ointment, composed of three parts of stavesacre powder, in five parts of lard, will destroy the insects, and cure the eruption in four days. The iodide of sulphur and solution of iodide of potassium mixed, will kill the *acari* in eight minutes; but it acts as a severe irritant upon the patient's skin.

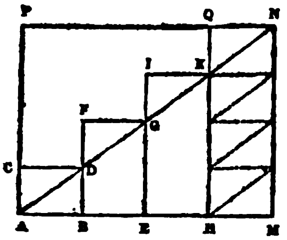


The sparrow mite (*Acarus passerinus*, Fabricius) is distinguished by the remarkable size of its third pair of legs. Geoffroy called it the bat tick, and Latreille formerly placed it in his genus *Sarcoptes*. The common harvest-bug, or *A. tellarius* of Linnæus, is another familiar example of this genus.

ACCELERATED MOTION, ACCELERATING FORCE, ACCELERATION. When the velocity of a moving body is continually increased, so that the lengths described in successive equal portions of time are greater and greater, the motion is said to be accelerated, which is the same thing as saying that the velocity continually increases. [See Velocity.] We see instances of this in the fall of a stone to the earth, in the motion of a comet or planet as it approaches the sun, and also in the ebb of the tide. As it is certain that matter, if left to itself, would neither accelerate nor retard any motion impressed upon it, we must look for the cause of acceleration in something external to matter. This cause is called the *accelerating force*, see Inertia, Force, Cause, to the remarks in the last of which articles we particularly refer the reader, both now and whenever the word cause is mentioned. At present the only accelerating forces which we will consider, are the action of the earth, and the various weights produced by it.

It is observed, that when a body falls to the ground from a height above it, the motion is *uniformly* accelerated; that is, whatever velocity it moves with at the end of the first second, it has half as much again at the end of a second and a half; twice as much at the end of two seconds; and so on. At least this is so nearly true, that any small departure from it may be attributed entirely to the resistance of the air, which we know from experience must produce some such effect. And this is the same with every body, whatever may be the substance of which it is composed, as is proved by the well-known experiment of the guinea and the feather, which fall to the bottom of an exhausted receiver in the same time. The velocity thus acquired in one second is called the measure of the accelerating force. On the earth it is about 32 feet 2 inches per second. If we could take the same body to the surface of another planet, and if we found that it there acquired 40 feet of velocity in the first second, we should say that the accelerating force of the earth was to that of the planet in the proportion of $32\frac{1}{6}$ to 40. By saying that the velocity is $32\frac{1}{6}$ feet at the end of the first second, we do not mean that the body falls through $32\frac{1}{6}$ feet in that second, but only that if the cause of acceleration were suddenly to cease at the end of one second, the body would continue moving at that rate. In truth, it falls through only half that length, or $16\frac{1}{12}$, in the first second. It may be proved mathematically, that if a body, setting out from a state of rest, has its velocity uniformly accelerated, it will, at the end of any time, have gone only half the length which it would have gone through, had it moved, from the beginning of the time, with the velocity which it has acquired at the end of it. Thus, if a body has been falling from a state of rest during ten seconds, (the resistance of the air having been removed,) it will then have a velocity of $32\frac{1}{6} \times 10$ or $321\frac{2}{3}$ feet per second. Had it moved through the whole ten seconds with this velocity, it would have passed over $321\frac{2}{3} \times 10$ or $3216\frac{2}{3}$ feet. It really has described only the half, or $1608\frac{1}{3}$ feet. We may give an idea of the way in which this proposition is established, as follows:—The area of a rectangle [See Rectangle], that is, the number of *square feet* it contains, is found by multiplying together the numbers of *linear feet* in the sides. Thus, if AB be 4 feet, and AC 5 feet, the number of square feet in the area is 4×5, or 20. Again, the number of feet described by a body moving with a uniform velocity, for a certain number of seconds, is found by multiplying the number of seconds by the number of feet per second, or the velocity. If, then, AB contain as many feet as there are seconds, and AC as many feet as the body moves through per second; as many feet as the body describes in its motion, so many square feet will there be in ABDC. That is, if we let AB *represent* the time of motion, and AC the velocity, the area ABDC will *represent* the length described in the time AB, with the velocity AC. Not that ABDC is the length described, or AB the time of describing it; but AB contains a foot for every second of the time, and ABDC contains a square foot for every foot of length described. Similarly, if at the end of the time just considered, the body suddenly receives an accession of velocity DF, making its whole velocity BF per second; and if with this increased velocity it move for a time which contains as many seconds as BE contains feet, the length described in this second portion of time will contain as many feet as BEGF contains square feet: and the whole length described in both portions of time will be represented by the sum of the areas ABDC and BEGF. And similarly for another accession of velocity GI, and an additional time represented by EH. Now, let a body move for the time represented by AM; at the beginning of this time let it be at rest; and by the end, let it have acquired the velocity MN, so that had it moved from the beginning with this velocity, it would have described the length represented by AMNP. Instead of supposing the velocity to be perpetually increasing, let us divide the time AM into a number of equal parts—say four, AB, BE, EH, HM, and let one-fourth of the velocity be communicated at the beginning of each of these times, so that the body sets off from A, with the velocity AC, which continues through the time represented by AB, and causes it to describe the length represented by ABDC. We know from geometry [See TRIANGLES, SIMILAR] that BD, EG, and HK, are respectively one-fourth, one-half, and three-quarters of MN, which is also evident to the eye, and may be further proved by drawing the figure correctly, which we recommend to such of our readers as do not understand geometry. Hence GE or BF is the velocity with which the body starts at the end of the time AB; EI at the end of AE; and HQ at the end of AH. Consequently, the whole length described is a foot for every square foot contained in ABDC, EBFG, EIKH, and HQNM, put together. But this is not a uniformly accelerated velocity, for the body first moves through the time AB, with the velocity AC, and then suddenly receives the accession of velocity DF. But if, instead of dividing AM into four parts, we had divided it into four thousand parts, and supposed the body to receive one four-thousandth part of the velocity MN at the end of each of the parts of time, we should be so much nearer the idea of a uniformly accelerated velocity as this, that instead of moving through one-fourth of its time without acquiring more velocity, the body would only have moved one four-thousandth part of the time unaccelerated. And the figure is the same with the exception of there being more rectangles on AM, and of less width. Still nearer should we be to the idea of a perfectly uniform acceleration if we divided AM into four million of parts, and so on. Here we observe, 1. that the triangle ANM is the half of APNM; 2. that the sum of the little rectangles ACDB, BFGE, is always greater than the triangle ANM, by the sum of the little triangles ACD, DFG, &c.; 3. that the sum of the last-named little triangles is only the half of the last rectangle HQNM, as is evident from the inspection of the dotted part of the figure. But by dividing AM into a sufficient number of parts, we can make the last rectangle HQNM as small as we please, consequently we can make the sum of the little triangles as small as we please, that is, we can make the sum of the rectangles ACDB, &c., as near as we please to the triangle ANM. But the more parts we divide AM into, the more nearly is the motion of the body uniformly accelerated; that is, the more nearly the motion is uniformly accelerated, the more nearly is ANM the representation of the space described. Hence we must infer (and there are in mathematics accurate methods of demonstrating it), that if the acceleration were *really* uniform, ANM would really have a square foot for every foot of length described by the body.

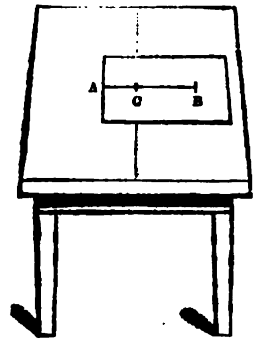




That is, since ANM is half of APNM, and the latter contains a square foot for every foot of length which *would have been* described if MN *had been* the velocity from the beginning, we must infer that the length described by a uniformly accelerated motion from a state of rest, is half that which would have been described, if the body had had its last velocity from the beginning.

If the body begins with some velocity, instead of being at rest, the space which it would have described from that velocity must be added to that which, by the last rule, it describes by the acceleration. Suppose that it sets out with a velocity of 10 feet per second, and moves for 3 seconds uniformly accelerated in such a manner as to gain 6 feet of velocity per second. Hence it will gain 18 feet of velocity, which, had it had at the beginning, would have moved it through 18 × 3 or 54 feet of length, and the half of this is 27 feet. This is what it would have described had it had no velocity at the beginning; but it has 10 feet of velocity per second, which, in 3 seconds, would move it through 30 feet. Hence 30 feet and 27 feet, or 57 feet, is the length really moved through in the 3 seconds.

Similarly we can calculate the effects of a uniform *retardation* of velocity. This we can imagine to take place in the following way. While the body moves uniformly from left to right of the paper, let the paper itself move with a uniformly accelerated velocity from right to left of the table. Let the body at the beginning of the motion be at the left edge of the paper, and let that edge of the paper be placed on the middle line of the table. Let the body begin to move on the paper uniformly 10 inches per second, and let the paper, which at the beginning is at rest, be uniformly accelerated towards the left, so as to acquire 2 inches of velocity in every second. At the end of 3 seconds, the body will be at B, 30 inches from A, but the paper itself will then have acquired the velocity of 6 inches per second, and will have moved through the half of 18 inches or 9 inches; that is, AC will be 9 inches. Hence the distance of the body from the middle line will be CB, or 21 inches. Relatively to the paper, the velocity of the body is uniform, but relatively to the table, it has a uniformly retarded velocity. At the end of the fourth second, it will have advanced 40 inches on the paper, and the paper itself will have receded 16 inches, giving 24 inches for CB. At the end of the fifth second, AB will be 50 inches, AC 25 inches, and CB 25 inches. At the end of the sixth second, AB will be 60 inches, AC 36 inches, and BC 24 inches, so that the body, with respect to the table, stops in the sixth second, and then begins to move back again. We can easily find when this takes place, for, since the velocity on the paper is 10 inches per second, and that of the paper gains 2 inches in every second, at the end of the fifth second the body will cease to move forward on the table. At the end of 10 seconds it will have returned to the middle line again, and afterwards will begin to move away from the middle line towards the left. At the end of the twelfth second, it will have advanced 120 inches on the paper, and the paper will have receded 144 inches, so that the body will be 24 inches on the left of the middle line.



The general algebraical formulæ which represent these results are as follow. Let a be the velocity with which the body begins to move, t the number of seconds elapsed from the beginning of the motion, g the velocity acquired or lost during each second. Then the space described in a uniformly accelerated motion from rest is $\frac{1}{2}gt^2$; when the initial velocity is a, the space described in an accelerated motion is $at+\frac{1}{2}gt^2$, and in a retarded motion the body will have moved through

$at-\frac{1}{2}gt^2$ in the direction of its initial velocity if at be greater than $\frac{1}{2}gt^2$, or will have come back and passed its first position on the other side by $\frac{1}{2}gt^2-at$, if at be less than $\frac{1}{2}gt^2$. In the last case it continues to move in the direction of its initial velocity for $\frac{a}{g}$ seconds and proceeds in that direction through the space $\frac{1}{2}\frac{a^2}{g}$.

For further explanation as to velocities which are accelerated or retarded, but not uniformly, see VELOCITY.

ACCELERATION *of the Moon's Mean Motion.* } See PLANETARY PERTURBATIONS.
ACCELERATION *of the Motion of Comets.* }

ACCENT (in Mathematics). To avoid the confusion arising from the use of many letters in an algebraical problem, and on other accounts, it is customary to signify different magnitudes of the same kind, or magnitudes similarly connected with the question, by the same letter, distinguishing these magnitudes from one another by accents. It is, therefore, to be understood, that the same letter with two different accents, may stand for magnitudes as different in value as those represented by different letters. The convenience of the accent may be illustrated as follows. If a men can do b things in c days, and e men can do f things in g days, we have the following equation:—

$$afc = ebg.$$

Now, instead of using e, f, and g, in the second part of the question, let us use the letters which stood for the corresponding quantities in the first part, with accents; that is, let a' men do b' things in c' days. The equation then becomes

$$ab'c = a'bc'.$$

In this new form of the equation some things are evident to the eye, to ascertain which, had the first equation been used, we must have had recourse to the question itself. For instance, that if a'', b'', c'' express men, things, and days, as above, $ab''c = a''bc''$, only placing two accents now where there was one before. In many investigations the judicious use of accents gives a symmetry to the processes and expressions which could scarcely be otherwise obtained.

For the unmathematical reader, we may illustrate the use of accents in the following way. Let us suppose a bookcase to consist of four rows of shelves, each divided into six compartments. If we call the six compartments in the lowest range, A, B, C, D, E, and F, respectively, we might let the compartment directly over A be called G, and so on; but it would be much simpler and easy of recollection to call this compartment A′, the one over *it* in the third row A″, and so on. Thus each letter would indicate a certain vertical line of compartments, while the accent would point out in which horizontal line the one designated is to be found. This is precisely the mathematical use of the accent. All quantities of the same kind, or which the problem places in similar positions, are designated, with regard to this question, by the same letter.

The accented letter a' is read *a accented*, or *a dashed*; a'' is read *a twice accented*, or *a twice dashed*, or more conveniently, though without much attention to idiom, *a two dash*, &c.; where accents become too many to be used with convenience, the *Roman* figures are substituted for them. Thus a^{v} would be used for a'''''. The Roman figures prevent this being taken for a^4, or a multiplied three times by itself. The young algebraist should be cautious how he uses accents, until experience has taught him to do so with propriety. The accented letter is the *metaphor* of algebra; and expressions of the greatest symmetry may be deprived of all their beauty, and even much of their meaning, by a wrong use, or even a want of this notation.

ACCENT. When a child begins to read, he is apt to pronounce all the syllables of a word in the same key, with the same loudness and clearness, dwelling the same time upon each, and pausing the same time between each pair. He soon, however, learns that, in nearly every word, there is one syllable at least which must be distinguished from the rest by a more impressive utterance, as in the examples *respéct, respéctful, respéctable.* If the word is a long one, it requires a second accent, as *respéctabílity, mánufáctory, immórtalíze.* On the other hand, when short words come together, one or two are often devoid of accent, as in the phrase *ón the tóp of a híll.* When it is stated that the accented syllable is pronounced more impressively than the rest, it is not meant that all accented syllables are to be equally impressive. In the examples given above, the first accent in *mánufáctory* seems to be weaker than that on the third syllable; so the last accent in *immórtalíze*, and that attached to the preposition *on*, among the six monosyllables, *ón the tóp of a híll*, are comparatively very faint. The consideration of accent often determines whether or not we pronounce the initial *h* [See A or AN]; and, consequently, whether the article *an* or *a* is to be used before such a word. Upon accent depends the melody of verse, at least in modern languages. Of the ancient, particularly the Greek accent, it is better to abstain from speaking, because the opinions of people on the subject of Greek accent are both unsettled and contradictory. We may remark, however, that it is the practice of the modern Greeks, in a very great number of instances, to put the chief stress on that syllable which, in our printed Greek books, has the accentual mark (′) on it; but, in doing this, they frequently and unavoidably neglect the stress on those syllables which we are accustomed to pronounce most emphatically. It is said that the principle of Greek versification is *quantity*, or, as it is defined, the mere duration of a sound. Possibly, on a closer examination of the question, it would be found, that what the ancients meant by *quantity*, was not very different from what we mean by *accent*. To return to the safer ground of our own language, the reader of our older writers, Shakspeare and Milton, for instance, should know that the accents of words from time to time are changed, and even variable at the same time. Thus, the verb which we call *tríumph*, was with Milton generally *triúmph*; the noun and the verb being commonly distinguished by him in the same way as *próduce* the noun and *prodúce* the verb are at the present day. What we call *spírit*, was with him more commonly *spiríte*, or almost *spríte*; and *áspect, prócess*, were *aspéct, procéss*. Even in our own time, *advertísement* has become *advértisement*. In these changes, the usual tendency in our language is, and has been, to throw the accent farther back from the end of the word. Such a tendency is, perhaps, inherent in all languages, and seems to arise solely from an endeavour to save labour by rapidity of utterance.

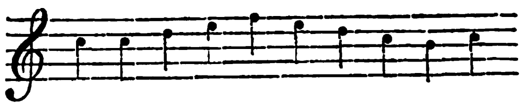
The symbols employed to denote accents are three, the acute (′), the grave (‵), and the circumflex (^). We have hitherto spoken only of the first. The second in the ancient languages is said to denote the opposite to the acute, or, perhaps, the absence of it; while the circumflex, we are told, marks a compound of the two, first a rising and then a falling of the voice in the articulation of the same syllable.

These three little marks, as employed in the orthography of the French language, have a signification altogether different. As the French, like all other languages, is deficient in the number of characters used to mark the vowel sounds, it has been found convenient to employ the three symbols given above. Thus, the sounds of *e, é, è, ê*, in the mouth of a Frenchmen, differ not so much in point of *accent* as in the real articulation.

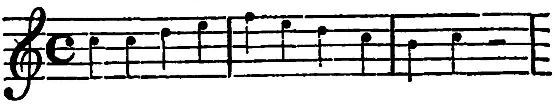
Emphasis differs from *accent*, and is properly used with reference to some one word, or part of a sentence, to which a speaker wishes to draw attention by giving it a more marked pronunciation. (See EMPHASIS.)

ACCENT, in Music, signifies, in a general sense, emphasis, and is either grammatical or oratorical.

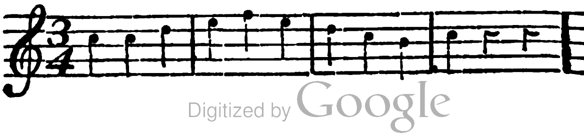
Grammatical accent is the emphasis, always slight, and indeed only just perceptible, given to notes which are in the accented parts of a bar (see *below*), and may be thus exemplified:—



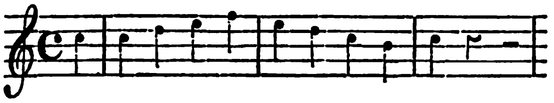
Now, without accent, these notes would have no measure, that is, would not be in any musical time; but if the first, fifth, and ninth are accented, the whole will be divided into bars of common, or equal, time. Ex.



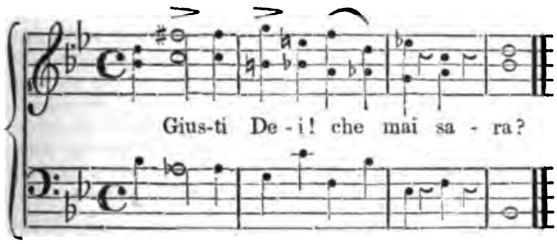
If an emphasis is given to the first, fourth, and seventh notes, the series will divide into bars of triple time. Ex.



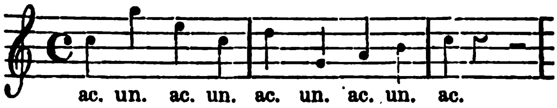
Again, an entirely different effect will be produced by throwing the accent on the first, third, fifth, &c., notes of the same series. Ex.



Oratorical accent is expression—is the accent dictated by feeling—and not confined to any particular part of the bar. It often is required, though the composer may not have marked it by any sign, but left it to the knowledge and taste of the performer to discover and enforce. Commonly, however, the terms *rinforzato* (strengthened), and *sforzato* (violently forced), are used for the purpose, though these participles are too often thought synonymous. An acute angle (>) is also employed to indicate such emphasis. The annexed passage, from Mozart's *Figaro*, is an example of oratorical accent, the stress being laid on notes in both the unaccented and accented parts of the bar, the words 'Giusti Dei!' (Just Gods!) demanding strong expression:—

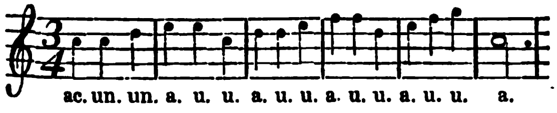


ACCENTED Parts of a Bar, in Music, are such as naturally require some emphasis. In common time, the bar of which is divided into four parts, the first and third are accented, the second and fourth unaccented. Ex.



If the movement is very slow, the accent will fall on the first, third, fifth, and seventh parts,—on every other quaver.

In triple time of three crotchets, the accent is on the first; the second and third are unaccented. Though some writers are of opinion that the last ought to have a very weak stress. Ex.



In three-quaver time the accent is on the first quaver only. In six-quaver time, it is on the first and fourth quavers. Nine-quaver and twelve-quaver times, which are only multiples of the two former, follow the same rule as those. The extremes, however, of slowness and quickness in times, though not altering their names, change the number of accented parts. Thus, as we have before remarked, each bar of common time in an *adagio* (a very slow movement) has four accented parts; and when six-quaver time is very rapid, or *presto*, the first note in each bar is alone accented. The various times (as well as the many clefs) ought to be reduced in number, by which the laws of accent might be much simplified, and confined to two very plain rules. [See Clef and Time.]

ACCEPTANCE. [See Bill of Exchange.]

ACCESSARY—from the low Latin *accessorius vel accessorium*—is, in law, one who is guilty of a felonious offence, not as chief actor, but as a participator without being present at the time of the actual committing of the offence, as by command, advice, instigation, or concealment, &c.

A man may be accessary either before the fact or after it. An accessary *before the fact*, is defined by Lord Hale to be one who, 'being absent at the time of the crime committed, doth yet procure, counsel, or command another to commit a crime.' The absence of the offender is necessary to constitute him an accessary, as otherwise he would be a principal; and he must have procured the commission of the crime, either by direct personal communication with the actual perpetrator, or by conveying his advice or command through some indirect channel. But the mere concealment of a felony intended to be committed, without actual instigation, will not make a man an accessary; as that is only a misprision of felony. It is an established rule, that where a man commands another to commit an unlawful act, he is accessary not merely to the act commanded, but to all the consequences that may ensue upon it, except such as could not in any reasonable probability be anticipated or feared. But a man will not be guilty as accessary before the fact if he command another to kill A, and he kills B, knowing that it was not A, because the particular crime he contemplated has never been completed. It is otherwise where the directions have been *substantially* pursued, although the crime may not have been committed precisely in the *manner* in which it was commanded to be done, as where a murder is effected by means of stabbing instead of poisoning.

Such is the general law as to accessaries before the fact. In those offences, however, which are sudden and unpremeditated, as manslaughter and the like, there cannot of course be any accessaries *before* the fact.

An *accessary after the fact*, is one who, knowing that a man has committed a felony, receives, relieves, or assists him. In general, any assistance given to a felon, to hinder his being apprehended, tried, or suffering punishment, as by affording him the means to escape the pursuit of justice, will constitute the assister an accessary after the fact; but it is not so if the assistance given have no such tendency, as when clothes or necessaries are supplied to a felon in jail. Although any *act done* to enable the criminal to escape the vengeance of the law will make a man guilty as accessary after the fact, a mere omission to apprehend him, without giving positive assistance, will not have that effect. Also, if the crime be not completed at the time of the relief or assistance afforded, the reliever or assister is not adjudged an accessary to it; as where a mortal wound has been given, but the murder is not then consummated by the death of the party; yet, the crime once complete, not even the nearest ties of blood can be pleaded in justification of concealment or relief, except alone in the case of a wife, whom the law supposes to be so much under the coercion of her husband, that she ought not to be considered as accessary to his crime, by receiving him after it has been committed.

By the late statutes of 7 and 8 Geo. IV., and 11 and 12 Vict. c. 46, the punishment of accessaries before the fact is assimilated to that which is by law inflicted on the principal; and accessaries after the fact are made punishable with transportation, imprisonment, or (if a male) with whipping.

Formerly, no accessary could be tried until after the conviction of the principal, the crime of the former being regarded as in a manner dependent on that of the latter; but that rule is now abolished by the 11 and 12 Vict., c. 46, which also provides that accessaries *before* the fact shall be tried in all respects as if they were principal felons. By the same statute, accessaries *after* the fact may be tried and convicted, either as accessary or for a distinct substantive felony, without waiting for the conviction of the principal, who may not be within the reach of justice, or who may, perhaps, have been acquitted through accidental failure of evidence.

It remains to be observed, that the distinction between principals and accessaries holds only in cases of felony. In treason, there are no accessaries, but all are principals. So, too, in all crimes under the degree of felony, there are no accessaries either before or after the fact, but all persons concerned therein, if guilty at all, are principals; the same rule holding with regard to the highest and lowest offences, though upon different reasons. In treason, all are principals *propter odium delicti*; in inferior crimes, all are principals, because the law does not descend to distinguish the different shades of guilt in crimes below the degree of felony.

The Scotch law on this subject differs somewhat from that of England. According to the Scotch law, there may be accessaries *before* or *at* the fact; but it recognises no accession *after* the fact, except by such conduct as infers by legal evidence previous knowledge, counsel, or co-operation. And in Scotland it is settled that the principal and accessaries may be tried on one and the same indictment, and at one and the same time; or the trial of the accessary may take place without the principal. (See Alison's *Criminal Law of Scotland*, vol. i. pp. 57-71, and the authorities there cited.)

ACCIDENT, see PREDICABLES.

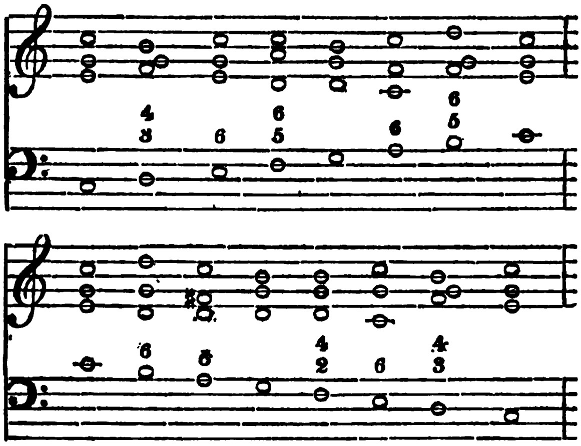
ACCIPENSER, in Zoology, a genus of fishes. [See STURGEON.]

ACCOLA'DE. This French word, derived from the Latin *ad*, to, and *collum*, the neck, signifies, in familiar speech, an embrace. Some, accordingly have supposed that, when used as descriptive of a certain part of the ancient ceremony of conferring knighthood, the particular act which it denoted was the *embrace*, accompanied with a kiss, which was bestowed upon the new-made knight, in token of the brotherhood established between them by his admission into the order of chivalry. It has, however, been the more generally-received opinion, that the accolade was what we call in English (though perhaps improperly) the dubbing, the slight blow given to the cheek or shoulder of the knight, 'as an emblem,' to use the language of Gibbon, 'of the last affront which it was lawful for him to endure.' There is no doubt as to the great antiquity of this custom. Gregory of Tours, writing in the sixth century, describes the blow on the shoulder as part of the ceremony with which the kings of France, of the first race, were wont to confer the honour of knighthood.

ACCOMPANIMENT, in Music, is the subordinate part, or parts, accompanying a voice, or several voices, or a principal instrument, &c. The piano-forte or guitar part of a song is the accompaniment, the air itself being the principal, the other only the useful ally, the support. In a concerto the whole band accompany the instrument for which the chief and prominent part is composed, except in the *tutti* parts, (*i.e.*, those portions of the concerto in which the principal instrument rests,) then the orchestral parts take the form of a full piece.

Accompaniment is also the harmony of a figured base, or another word for what is, by a foolish, unmeaning term—but too generally adopted to be at once discarded—called *thorough-base*.

The *Accompaniment of the Scale* is the harmony assigned, partly by what may be called nature and partly by custom, to that series of notes denominated the *diatonic scale* ascending and descending, such scale being taken as a base. Ex.



The diatonic scale adopted as a melody has one simple accompaniment, consisting almost exclusively of common chords; but it is also susceptible of many different harmonies, the study of which is of the utmost importance to the singer, as well as the accompanist and composer. [See DIATONIC SCALE.]

Dr. Burney (in Rees' *Cyclopædia*) seems very much inclined to favour the opinions concerning accompaniment which Rousseau endeavoured to propagate in his *Lettre sur la Musique Française*. This acute French writer, the zealous defender of the Italian school when, as relates to dramatic music, it certainly was the best, thinks that an accompaniment of the smallest possible number of notes is to be preferred; and he appears to have been enraptured by a little boy who, at the performance of an Italian burletta in Paris, accompanied, on the harpsichord, the airs with harmony of the most meagre kind, sometimes playing with only two fingers. Rousseau had not acquired a taste for rich harmony, for with the music of the German school he was very little, if at all, acquainted; but that our celebrated and generally very judicious English writer, to whom the finest compositions of Germany were well known, should have sanctioned opinions formed upon the imperfect knowledge of the subject existing in the middle of the last century, is somewhat a matter of surprise; and as Dr. Burney is an authority, it is more necessary, for the sake of the art, to demur to his judgment here. *Est modus in rebus*—and sensible accompanists well know this medium. The old Italian accompaniment can now hardly be endured; while, certainly, many ultra-Germanists of the present day overpower melody by the multitude of notes which, for want of sound judgment, and in a true pedantic spirit, they are so prone to employ.

ACCOMPTS.—[See BOOK-KEEPING.]

ACCOUNT or **ACCOMPT** (from the low Latin *Computus*), is a form of action which in the earlier times was much resorted to, and of which frequent mention is made in the old law books. Strictly, it lay only against a bailiff or receiver, requiring him to render an account of the moneys received by him as such bailiff or receiver; but the form of action being found to be one of the most convenient at that time, it was extended to cases where the person called upon to account was neither a bailiff nor an authorized receiver, if he had in any way received and retained money which it was his duty to have handed over to the claimant. At present the action of account is rarely used, a bill in equity being found to be in practice a much more effectual mode of settling disputed accounts; whilst in the other cases formerly embraced by the action of account, various modern and more simple forms of proceeding are adopted in preference to this, which is difficult, dilatory, and expensive.

ACCUMULATION, in Political Economy, is the act of adding one *Saving* to another for the purpose of forming *Capital*. Every saving indicates an excess of production over consumption, and the accumulated excess constitutes individual and national riches.

In 1851, 30,184,604*l.* was the amount of deposits in savings-banks in England, Scotland, and Ireland, made by 1,161,838 depositors. This large capital was an accumulation, penny by penny, shilling by shilling, and pound by pound, of the savings of that class of persons who, in every country, have the greatest difficulty in accumulating. Habitual efforts of self-denial, and a rigid determination to postpone temporary gratification to permanent good, could alone have enabled these accumulators to retain so much of what they had produced beyond the amount of what they consumed. This sum of 30,184,604*l.* represents as many products of industry as could be bought by that sum. It is a capital which remains for the encouragement of *productive* consumption; that is, it is now applied as a fund for setting others to produce,—to enable them to consume while they produce,—and in like manner to accumulate some part of their productions beyond what they consume. The whole amount of our national riches—the capital of this, and of every other country—has been formed by the same slow but certain process of individual savings, and the accumulations of savings.

The consumption of any production is the destruction of its value. The production was created by industry to administer to individual wants, to be consumed, to be destroyed. When a thing capable of being consumed is produced, a value is created; when it is consumed, that value is destroyed. The general mass of riches then remains the same as it was before that production took place. If the power to produce, and the disposition to consume, were equal and constant, there could be no saving, no accumulation, no capital. If mankind, by their intelligence, their skill, their division of employments, their union of forces, had not put themselves in a condition to produce more than is consumed while the great body of industrious undertakings is in progress, society would have been stationary,—civilization could never have advanced. Whatever is consumed by those who are carrying forward the business of production, is called *productive* consumption. Whatever, on the other hand, is consumed by those who are not engaged in re-producing, is called *unproductive* consumption.—1. A shoemaker, we will say, rents a shop, works up leather and other materials, uses various tools, burns out candles, and is himself fed and clothed while in the act of producing a pair of shoes. This is productive consumption;—for the pair of shoes represents the value of the materials employed in them, the commodities consumed by the shoemaker during their production, and the wear and tear of the tools applied in making them. If the shoes represent a higher value than what has been consumed, in consequence of the productiveness of the labour of the shoemaker, the difference is *net* produce, which may be saved, and with other savings, become capital.—2. The shoemaker, we will suppose, accumulates profits sufficient to enable him to live without making shoes, or applying himself to any other branch of industry. He now uses no materials, he employs no tools, but he consumes for the support and enjoyment of existence, without adding anything to the *gross* produce of society:—this is unproductive consumption. It would be well to note, however, that there may be direct production, and indirect production. The shoemaker is an example of the one case;—the man of science, who enlarges the bounds of human knowledge, and thus enables others to produce more successfully, is an example of the other. [See CONSUMPTION.]

Accumulations merely hoarded up, and not put to use, have been denominated savings: when they are applied to the encouragement of production, they are capital, and are capable of producing profit. The savings of the artisans, domestics, and labourers, who make up the depositors in savings-banks, are capital, and produce profit to the accumulators, in the shape of interest. If a man is engaged in manufactures or trade of any sort, his savings can be readily invested as capital; because every saving applied to his own branch of production enables him to extend the quantity of what he produces. If his savings exceed the demands of his business, he lends a portion of his capital, either directly or indirectly, to some other producer, who pays him a part of his profits as interest. Those who derive their income from revenue, and not from profit or labour, either consume as much as they receive, or they accumulate more capital. Whatever they save is—like every saving of every class—a clear addition to the general riches, and a means through which productive takes the place of unproductive consumption.

Whatever is saved and accumulated is a saving and accumulation of commodities which have been produced. The value of the accumulation is most conveniently expressed by an equivalent in money; but only a very small part of the accumulation is actually money. A few millions of bullion are sufficient to carry on the transactions of this country; its accumulations, or capital, could not be purchased by several times the amount of all the bullion that exists in the world. A great part of what is saved, therefore, is an accumulation of products suitable for consumption. The moment that they are applied to the encouragement of production, they begin to be consumed. They encourage production only as far as they enable the producers to consume while they are in the act of producing. Accumulation, therefore, is no hindrance to consumption. It encourages consumption as much as expenditure of revenue unaccompanied by accumulation. It changes only unproductive into productive consumption; it enables the things consumed to be replaced, instead of being utterly destroyed. The manner in which this effect is brought about requires to be shown a little in detail; and we may probably make the subject clearer if we exhibit the influence upon society of the conduct of three different individuals, each of whom may be taken as examples of a class.

1. The prodigal, who utterly destroys the accumulated property which the labours of others have created, is, fortunately, an exception to the general mass of consumers. As mankind have become more instructed, they have been less disposed to look with complacency upon the career of such an individual. Even amongst ill-informed people, it is not uncommon to hear it said of such an unhappy person, that he has eaten his estate. It is not, of course, meant by this expression that his house or his lands are actually consumed; but, though the house and lands remain, something equal in value has been destroyed by his extravagance. He mortgages or sells his house or lands; and the proceeds of the sale are consumed by riotous companions, by thoughtless domestics, by ministers to his sensual passions, by the persons who have been engaged in preparing for him foolish gratifications. The capital which has bought his house and lands has been withdrawn from productive consumption. It was employed, we will say, in a particular species of manufacture; and the workmen whom it called into action were accustomed to consume in the most advantageous way for production, whilst they were themselves reproducing. The capital is withdrawn from manufactures to support the consumption of a number of persons whose command of the means of consumption will soon be at an end; and whose consumption, while it lasts, is so capricious, that no regular branch of industry can address itself to its supply. The productive consumers, who were maintained while the capital was engaged in manufactures, lose their employment; they become competitors in the market of labour; their competition diminishes wages; and the whole body of productive consumers in their department of industry are compelled to consume less. The unproductive consumption of the prodigal goes on till he can consume no longer. The value of his estate is utterly destroyed; it is so much completely wasted of the general capital. If all capitalists were to pursue the same course as the prodigal, in less than a generation the most civilized country would return to a state of the most helpless barbarism. There would be no fund for the maintenance of labour. Adam Smith says of the man who encroaches upon his capital, 'By diminishing the funds destined for the employment of productive labour, he necessarily diminishes, so far as it depends upon him, the quantity of that labour which adds a value to the subject upon which it is bestowed, and, consequently, the value of the annual produce of the land and labour of the whole country, the real wealth and revenue of its inhabitants.'

2. The proprietor who systematically consumes his revenue, without taking from or adding to his capital, is not a public enemy, as the prodigal is, but he is certainly not a public benefactor. As far as the mere act of consumption goes he destroys without reproducing. But he may consume to the full extent of his income, furnishing no funds for reproductive consumption, without any fault of his own; and, in some respects, he may accumulate whilst he consumes, so as to enable others to consume profitably. If he have children whom he trains to manhood, bestowing upon them a liberal education, and causing them to be diligently instructed in some calling which requires skill and experience, he is an accumulator. By the capital thus spent in enabling his children to be producers, he has accumulated a fund out of his consumption which may be productive at a future day. He has postponed his contribution to the general stock; but he has not withheld it altogether. Speaking generally, however, of the class who consume all their income, we may be warranted in saying that the encouragement which they afford to industry never advances, because there is no accumulation to give employment to new industry. A man who receives a thousand a year, and spends it, may give employment to twenty men; but, after he has spent this sum for twenty years, he will, in the twentieth year, give employment only to the same number of men that he did in the first year. The fund which sets the labourers in action cannot increase, and therefore the labourers cannot increase, because the amount of labour to be performed cannot increase. If the labourers increase beyond the labour, they each labour less, and are each worse paid.

3. Let us take a capitalist with an income of a thousand a year, who consumes three-fifths of that income unproductively, and employs two-fifths in productive consumption. By his unproductive consumption of six hundred a year, twelve men are maintained, taking the proportion of the former case. By his productive consumption of four hundred a year, either in agricultural or commercial undertakings, or by lending the money to others, he employs eight men. The effect of the expenditure upon labour is so far equal in this case and the former. But when a profit is made, there is an essential difference; for if twelve and a half per cent., or fifty pounds profit, is annually made upon the four hundred pounds, there is a fund created for the constant employment of another labourer. The twelve and a half per cent. profit upon the profit, in five or six years, enables a second additional labourer to be employed, and so on. It is in this way that profits, gradually accumulated, enable the number of labourers to increase; and thus in all countries where capital is saved for productive consumption, the population may be doubled, and the larger number be yet better fed, and lodged, and clothed, than the smaller.

The accumulations of a nation, in its collective capacity, must be determined by the extent of individual accumulations. National accumulations facilitate individual, by rendering industry easier and more effective. They are exhibited in the form of roads, canals, harbours, docks, bridges, water-works, public buildings, endowments for education. These facilities for accumulation follow the accumulations of individuals, although a feeble accumulation may be rendered powerful by a judicious expenditure upon a great public object. The formation of a road, for instance, through an agricultural district, by opening a market, may enable the agriculturists to accumulate various savings arising out of that ready communication.

Whatever tends to enlighten the great body of the people facilitates individual accumulation. A large portion of the productions of industry, especially amongst the humbler classes of the community, is wasted, in addition to that portion which is enjoyed. Every consumption that is saved by habits of order, by knowing the best way of setting about a thing, by economy in the use of materials, is so much saved of the national capital; and what is saved remains to give new encouragement to the labour of the producer, and to bestow an increase of comforts upon the consumer. Again, the more that professional skill of every sort is based upon real knowledge, the more productive will be the industry of every class of labourers. Above all, sound morals, and pure and simple tastes, are the best preservatives from wasteful expenditure, both in the rich, and in the poor; and he that limits his individual gratification to objects worthy of a rational being, has the best chance of acquiring a sufficiency for his wants, and of laying by something to provide a fund for that productive consumption by which the wants of others are supplied. [See Smith's *Wealth of Nations*, Book ii. chap. iii. Say, *Cours Complet*, tom. i. chap. xiii. and xiv. M'Culloch's *Principles*, Part I. chap. ii. § 3. Mill's *Elements of Polit. Econ.* chap. iv. § 1.]

ACCUSATIVE CASE, a term used in the grammatical system of the Latin language, and thence unnecessarily introduced into that of the English language. In Greek this case is not called *accusative*, but the same idea is expressed by a corresponding term in that language. In the article *ablative case*, the meaning of the word *case* was explained. In that article it was seen that the little syllable *em* is attached to the end of Latin nouns, and has the meaning of *motion to*. But where the simple Latin noun terminated in a vowel, the *e* of *em* was absorbed by that preceding vowel. Thus, to take an example, *Roma* was, and is, the name of the Roman capital, though, by Englishmen, generally corrupted into *Rome;* consequently, *to Rome* was expressed by *Romam* (a contraction from *Roma-em*); so, *in Romam*, expressed *into Rome*. *In Roma*, without the *m*, would signify merely *in Rome*. The accusative then signifying, originally, the object to which any motion is directed, was afterwards, by a very natural metaphor, employed to distinguish the object of any action or feeling; thus, *incendere Romam, to burn Rome*. The Spanish and Portuguese have, in their languages, very closely imitated the Latin in this respect: *despidio de su casa à mi Dulcinea*—if translated word for word would be—he despatched from his house *to my Dulcinea;* but nothing more is meant than what we express by—he despatched my Dulcinea from his house. The *despatching* is with reference to Dulcinea. The employment of the letter *m*, with or without a weak vowel before it, occurs likewise in the Sanscrit language; and indeed in our own, in the pronouns *him* and *whom*, from *he* and *who*. The Greeks preferred the allied letter *n*, which is also found in some classes of the German nouns, as *den Grafen, the Count*, from the nominative *der Graf.* When the term *accusative case* is used in the grammar of our own language, it is only in this second or metaphorical sense, and, consequently, it is equivalent to what many grammars call by the better name of the *objective case*, or more simply the *object*.

ACER, a name given by the Romans to the tree called maple by the English. It is now applied to a genus of arborescent or shrubby plants, many of which are extremely valuable, for the sake either of their timber, or of their ornamental appearance. As they are for the most part hardy, we shall enumerate all the species that are known, giving characters to the most remarkable only. In order to assist the reader in distinguishing them, we have added figures, on a reduced scale, of the leaves of the more important kinds.

Acer is also the principal genus in the natural order called Acerineæ; which see.

Generic Character.

Flowers green and inconspicuous, either containing stamens only, or pistilla only, or both united, upon the same individual.

Calyx divided into five lobes, of uncertain length.

Stamens occasionally five; more frequently varying from seven to nine.

Leaves in all cases simple.

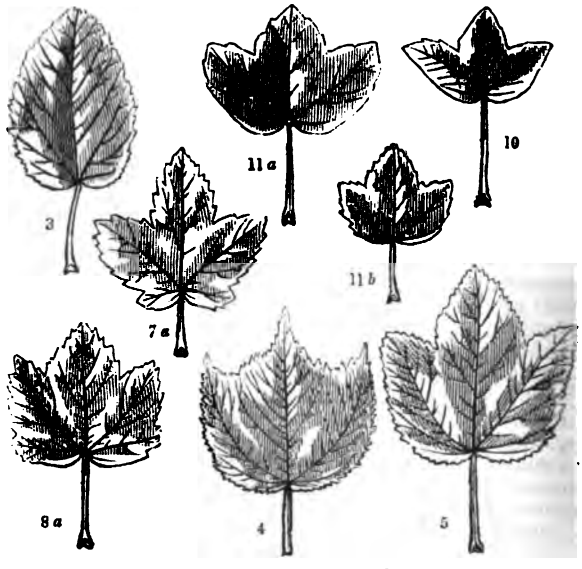
Fruit double; each division containing one single-seeded cavity, and extended at the back into a kind of wing; called *key* in English, or *samara* by botanists.

1. *Acer oblongum*, oval-leaved maple (*Wallich in De Cand. Prodr.* i. 593).—An evergreen tree, of rapid growth, native of the northern parts of India, both in Nepaul and Kumaon. In this country, it is a very tender shrub, and if cultivated in open ground should be planted against a wall. Its leaves, which have a tendency to become lobed, are six or seven inches long, without any divisions, of an ovate figure, tapering into a narrow point; they stand upon slender footstalks, and are smooth and glossy above; beneath, they are covered with a slight bloom, and are finely netted. The keys are nearly parallel with each other.

2. *Acer lævigatum*, the polished maple (*Wallich, Pl. as. rar.* 2. 3. t. 104). Leaves oblong, taper-pointed, slightly serrated, shining, green beneath. Flowers white, in branched erect thyrses. Keys broad, short, smooth.—Found in the woods of the higher mountains of Nepaul, and also in the Alps of Sirmore, where it acquires a trunk thirty or forty feet high, and from three to four feet thick. Its growth is slow; its timber is said by Dr. Wallich to be used by the inhabitants of Nepaul for rafters, beams, and similar building purposes.

3. *Acer Tataricum*, the Tartarian maple (*Linn. Sp. pl.* 1495). Leaves heart-shaped, oblong, unequally serrated, usually undivided; the veins downy beneath. Flowers in short, erect, branched racemes. Keys diverging a little, rounded at the point.—An ornamental tree, or rather large bush, from twenty to thirty feet high, often met with in gardens and plantations. Its native countries are the southern provinces of Russia in Asia, whence it extends as far as Hungary, there finding its most western limit. The Calmucs call it *zarza-modon*, or *locust-tree;* from its keys, deprived of their wings, they form, by the aid of boiling water, an astringent beverage, which, mixed with an abundance of milk and butter, forms a favourite article of their diet. The wood is hard and white, mixed with brownish veins.

4. *Acer striatum*, the striped-bark maple (*Lam. Dict.*, 2. 381. A. Pennsylvanicum, *Linn.* A. Canadense, *Du Ham*). Leaves roundish, finely serrated, divided at the upper end into three nearly equal tapering lobes; when young covered with a mealiness, which is gradually thrown off as they increase in size. Flowers in drooping racemes. Keys short, blunt, diverging. Bark striped with black and gray.—A native of North America, from Canada to the high lands in Georgia. In those countries it forms a considerable part of the undergrowth of the woods, among sugar-maples, beeches, birches, and hemlock-spruce firs. It rarely exceeds eight or ten feet in height, except in a few very favourable situations, when it will occasionally grow double that height. Its wood is very white, and is used by the North Americans for inlaying cabinet-work; its shoots afford food to various animals, especially to the moose-deer, in winter and spring, whence it has acquired the name of *moose-wood*. In Europe it is occasionally seen in plantations, where it is remarkable for the bright rosy tint of its young leaves in spring. When cultivated, it frequently grows to thrice its native size, in consequence of being grafted upon the sycamore maple.



3. A. tataricum. 11*a* and *b*. A. creticum.
10. A. monspessulanum. 7*a*. A. opulus. 8*a*. A. obtusatum.
4. A. striatum. 5. A. barbatum.

5. *Acer barbatum*, the bearded maple (*Mich. Fl. Am. bor.* 2, 252). Leaves heart-shaped, three-lobed, nearly equally serrated; the lobes of nearly equal size, or the lateral ones much the smallest; nearly smooth beneath. Clusters sessile; the stalks of the female flowers simple; of the male flowers, branched. Calyx bearded internally. Keys smooth, diverging but little.—This is a very doubtful species, and Messrs Torrey and Grey, in their *Flora of North America*, vol. i. p. 249, state their belief that Michaux gave his description from specimens of A. Sacchárinum, which species has the sepals bearded inside.

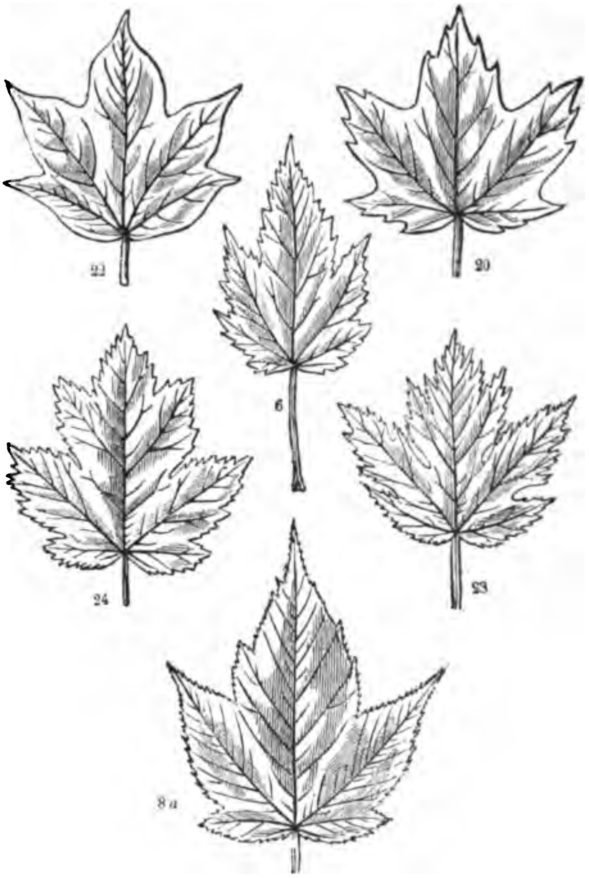
6. *Acer spicatum*, the spike-flowered maple (*Lam. Dict.*, 2. 381. A montanum, *Ait.*). Leaves heart-shaped, smooth above, downy and glaucous beneath, of an oblong figure, with about five unequal, tapering, coarsely and unequally serrated divisions. Flowers small, green, in upright racemes. Keys short, rounded, a little diverging.—A small tree, of rather inelegant appearance, found on mountains in the United States and in Canada. It is frequently seen in plantations in this country among other exotic trees. The red colour of its keys in the autumn is very ornamental.

7. *Acer opalus*, the Gueldres-rose-leaved maple (*Ait. Hort. Kew*, 3. 436. A. rotundifolium, *Lam.* A. opulifolium, *Villars*). Leaves more or less heart-shaped, roundish, five-lobed, smooth beneath; the lobes generally obtuse, and coarsely serrated. Flowers in drooping corymbs. Keys smooth.—A small tree, ten or twelve feet high, found in France, especially in Dauphiny, where they call it *ayart*, and also in Spain. It is, in some respects, like *A. obtusatum*; but is readily known by its leaves being smooth beneath, and is far inferior to that noble species. It is not uncommon in botanical collections. Its leaves are sometimes very round, and sometimes have the lobes tapering; both are figured.

8. *Acer obtusatum*, the Neapolitan maple (*Willd. Sp. pl.* 4. 984. A. Neapolitanum, *Tenore*). Leaves heart-shaped, roundish, five-lobed, woolly beneath; the lobes either obtuse or pointed, and coarsely serrated. Flowers in drooping corymbs. Keys smooth.—Hungary, Croatia, and many parts of Italy, produce this beautiful species. On all the hills and lower mountains of the kingdom of Naples; in Camaldoni, Castellammare, and the Abruzzi, it is found abundantly, growing usually to the height of forty feet; it is extremely striking, with its reddish-purple branches in the wood of Lucania, between Rotonda and Rubia; and in the Basilicate and Calabria it is said, by Tenore, to acquire colossal dimensions. It is certainly very singular that so fine a tree as this, occupying so large a tract of country, frequently visited by English tourists, should be almost unknown in this country; and yet, although it is perfectly hardy, and very easily multiplied, it is scarcely ever met with in any but botanical collections. Two forms of the leaf are figured, one with blunt, and the other with pointed lobes.

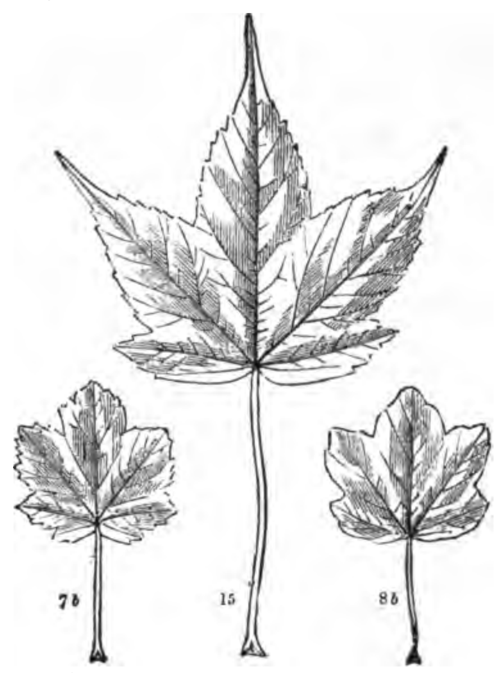
9. *Acer campestre*, the common maple. (*Linn. Sp. pl.* 1497.) Leaves heart-shaped, with three or five deep segments which are not serrated, but generally two or three-lobed, and narrow at their base; downy beneath, at least when young. Branches covered when old with a corky bark. Flowers in erect, branched, downy corymbs. Keys short, smooth, with nearly parallel edges, diverging at right angles.—Such appears to be the most general character of this very common species, found in every hedge-row in England, and spread over the greater part of Europe. It is said not to be indigenous in Scotland, and on the Continent it does not approach the north nearer than the southern provinces of Sweden. It advances as far to the eastward as the range of the Caucasus, where it disappears. In England this is either a bush or a small tree, of inelegant appearance, and its wood is of little value, except for the use of the turner, who makes it into cups, bowls, &c.; in the southern region of Caucasus, we are told by Pallas that it becomes a tree of handsome aspect, with a trunk as thick as a man's body, and that its wood is so hard as to be in request for the manufacture of musket-stocks: it must, however, be remarked, that this writer states the keys of his plant to be covered with down; it is, therefore, to be suspected that the Caucasian plant is distinct from our maple, in which the keys are always smooth. It is much to be wished that this point, which is of some importance, were cleared up. The common maple is sometimes planted by farmers upon bad land, for the purpose of fencing, for which, however, it is ill adapted.

There is a supposed variety of this, called *Acer austriacum*, found in the woods of Hungary and Austria, which has the segments of the leaves always broadest at the base and scarcely lobed.



22. A. Lobelii. 20. A. saccharinum. 24. A. rubrum.
23. A. eriocarpon. 18a. A. caudatum. 6. A. spicatum.

10. *Acer Monspessulanum*, the Montpellier maple (*Linn. Sp. pl.* 1497. A. trilobatum, *Lam.* A. trilobum, *Mönch*). Leaves deciduous, very slightly cordate and downy at the base, with three perfectly entire, nearly equal, diverging lobes, slightly hairy beneath. Flowers in small, loose, erect bunches, on long capillary stalks. Keys short, smooth, but little diverging.—Found in dry, stony situations in Languedoc, Dauphiny, Provence, and Piedmont; it even occurs as



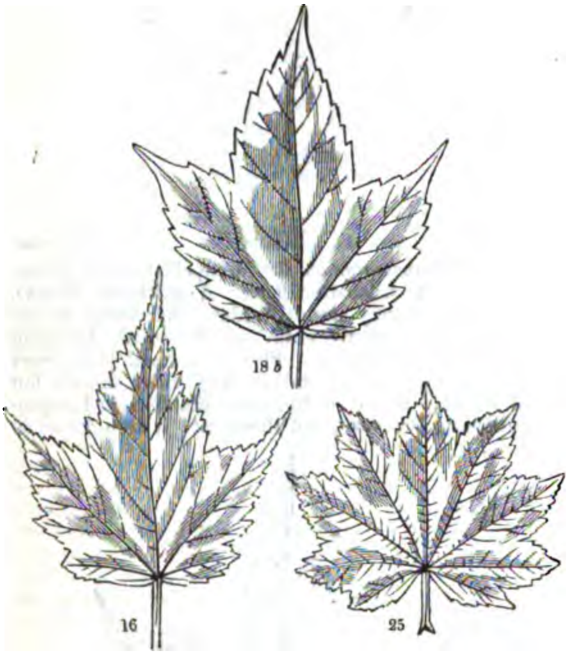
7b. A. opalus. 15. A. sterculiaceum. 8b. A. obtusatum.

far north as the departments of the Rhine. A small tree of rather handsome appearance, not uncommon in our shrubberies. It has in some respects the appearance of *A. campestre.* The little tuft of hair on the leaves at the point whence the principal veins radiate, is a good characteristic mark.

11. *Acer creticum,* the Candian maple. (*Linn. Sp. pl.* 1497. A. coriaceum, *Hort.*). Leaves evergreen, variable in form, wedge-shaped at the base, leathery, glossy, smooth, with three entire or serrated lobes, of which the side ones are the shortest, sometimes undivided. Flowers in small, erect clusters. Keys small, broad, but little diverging.—A very handsome evergreen shrub or small tree, which grows twenty feet high, found on the mountains of Candia and the Grecian Archipelago; and in this country it thrives very well as a shrub, especially if planted in the shade. The plant usually called *A. creticum* in this country is *A. heterophyllum.*

12. *Acer heterophyllum,* the variable maple (*Willd. Arb.* 10. t. 1. f. 1). Leaves evergreen, ovate, unequally serrated, entire or occasionally three-lobed, very glossy.—This is the plant sold in the English nurseries under the name of *A. creticum.* It is rather delicate, and is seldom met with in this country more than seven or eight feet high, when it becomes a scrubby bush, having little to recommend it except its rarity. There does not seem good ground for regarding this as distinct from *A. creticum.*

13. *Acer pseudo-platanus,* the sycamore maple (*Linn. Sp. pl.* 1496.) Leaves heart-shaped, coarsely and unequally serrated, glaucous and downy on the veins beneath; with five lobes, of which the lower ones are generally the smallest. Flowers in short, pendulous, slightly divided racemes, seated upon a hairy axis. Keys hairy when young, smooth when old, long, curved, and diverging.—This noble tree is scarcely met with in a truly wild state beyond the limits of middle and southern Europe: it is said to be wild on the edges of the high moors of Northumberland, out this is doubted; it is occasionally seen on the lower ridges of Caucasus, and does not appear to extend much farther eastward. In Italy it is said to arrive at its greatest degree of perfection, acquiring the height of fifty and sixty feet. Its English name has originated in an erroneous notion that this is the sycamore of Scripture,—a totally different tree, for an account of which see FICUS. Although the wood of this species is not particularly valuable, being chiefly used for coarse work, where lightness and toughness are required, yet there is scarcely any more universally cultivated for the sake of the striking effect it produces, whether as a single tree, or planted in avenues, or in masses. It thrives upon poor, sandy, or gravelly soil, especially near the sea, where few other trees will succeed; and will even bear the smoke of London, although not so well as some others.



18. A. caudatum. 16. A. villosum. 25. A. circinatum.

Many varieties are known to gardeners of which the following are the most deserving notice:—

i. *The Red or Gold-striped.*—Leaves stained with yellow and red.

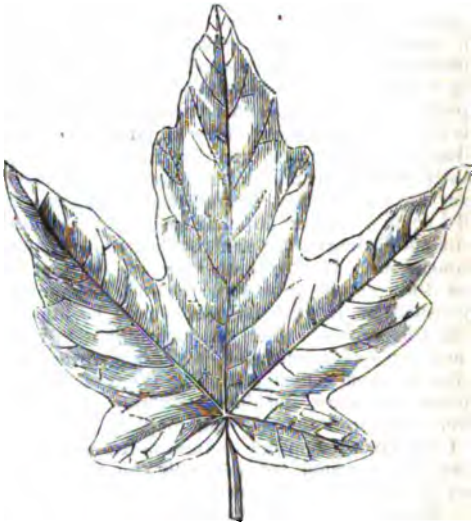
ii. *The Silver-striped.*—Leaves marked with streaks of white.

iii. *The Golden.*—Leaves having altogether a yellow tint.

iv. *The Corstorphine Plane.*—Distinguished by its broad leaves, and more vigorous mode of growth.

There is also found in the woods of Hungary, near Szánto, what botanists consider a variety, with the lower lobes of the leaves as large as the upper. By some this is called *A. palmifolium.*

14. *Acer macrophyllum,* the broad-leaved maple (*Pursh, Fl. Am. Bor.* 267). Leaves deeply heart-shaped, not serrated, divided into five deep, spreading, slightly-lobed segments, the middle one of which is often narrow at its base, and the lower ones generally smaller than the others; when young slightly downy, when old shining and perfectly smooth. Flowers in drooping very compact racemes, large, pale, yellowish green. Keys long, straight, diverging, covered at the base with long stiff hairs.—A tree of this fine species, now about 50 feet in height, was, 25 years ago, procured in a living state, by the Horticultural Society, from the north-west coast of North America, where it forms a very large tree, having a dense umbrageous head, and yielding a timber apparently of considerable value; specimens of it, brought from North America, are scarcely inferior in beauty of the grain to the finest satin-wood. It proves to be a hardy tree, of very rapid growth, sometimes making shoots six or seven feet long in a season; and is remarkable for the unusual size of its leaves, some of which, on young vigorous shoots, have measured as much as ten inches in diameter.



14. Acer macrophyllum.

15. *Acer sterculiaceum,* the shady maple (*Wallich, Pl. as. rar.* 2. 3. t. 105). Leaves heart-shaped, downy on the under side, with five ovate, taper-pointed, serrated lobes, of which the lowest are very small. Flowers in very short, drooping racemes.—A large tree, with a trunk often three feet in diameter; found in Nepaul, upon Mount Sheopore. It is not yet in England.

16. *Acer villosum,* the shaggy maple (*Wallich, Pl. as. rar.* 2. 4). Leaves heart-shaped, three-lobed, occasionally with two very obscure lateral lobes near the base, shaggy beneath; the lobes ovate, taper-pointed, remotely but equally serrated. Flowers in copious, nodding, shaggy, branched clusters. Keys downy.—A very large tree, found on the high Alps of India, approaching the limits of perpetual snow in Sirmore and Kumaon. This very distinct species is one of the finest trees in the north of India. It would, no doubt, prove hardy in this country, and it is much to be wished that it could be procured.

17. *Acer cultratum,* the curve-keyed maple (*Wallich, Pl. as. rar.* 2. 4).—A large tree, native of the regions towards the Himalaya, in Kamaon and Srinaghur.

18. *Acer caudatum,* the long-pointed maple (*Wallich, Pl. as. rar.* 2. 4.)—Native of the highest regions of Nepaul towards Gossain Than, of Sirmore, Kumaon, and Srinaghur.

19. *Acer Platanoides*, the Norway maple (*Linn. Sp. pl.* 1496). Leaves heart-shaped, very smooth, except at the axillæ of the veins; five-lobed, the lobes taper-pointed and diverging, with a few taper-pointed diverging teeth. Flowers in loose, erect, stalked corymbs. Keys smooth, diverging.—A fine tree, with very handsome glossy deep-green leaves, for the sake of which it is a great deal cultivated. The northern and midland parts of Europe, and the north of Asia, as far as the Ural chain, produce this species. In the Russian empire it passes from the state of a shrub, in the northern provinces, to that of a handsome tree with a trunk two feet thick, in the more southern districts. Its wood is valued for turners' work; from its ascending sap a kind of coarse sugar has been procured, in the same way as from the *A. saccharinum*, in America. Two varieties are known to gardeners; one, *the silver-striped*, in which the leaves are slightly stained with white; and the other, the *cut-leaved*, in which the leaves are deeply and irregularly jagged. When the foot-stalks of the leaves are broken they exude a milky fluid. The seeds ripen in this country.

20. *Acer saccharinum*, the sugar maple (*Linn. Sp. pl.* 1496). Leaves heart-shaped, glaucous beneath, very smooth, except at the axillæ of the veins; five-lobed, the lobes taper-pointed, and very coarsely toothed. Flowers in nodding corymbs. Keys not much diverging.—From a little to the north of Saint Jean, in Canada, to the woods of Upper Virginia, and probably still farther South, this species prevails; and it forms a large portion of the vegetation of New Brunswick, Nova Scotia, Vermont, and New Hampshire, sometimes becoming as much as eighty feet high. In the autumn the woods of those countries are dyed of a crimson hue, by the changing leaves of the sugar maple. The wood is hard, and has a satiny lustre, but it is readily attacked by insects, and is not of much value, except when its grain is accidentally waved, and then it is in request for the cabinet-makers. The younger Michaux states, that it may be at all times known from that of the red maple by a very simple test. If you pour a drop or two of solution of sulphate of iron upon the wood of the sugar maple, in a minute it becomes of a greenish cast, while that of the red maple becomes deep blue. The saccharine matter contained in its ascending sap is the principal cause of this species being in so much request. From this, obtained by tapping the trunk in the spring, during the space of six weeks, a very considerable quantity of a fine brown sugar is procured; as much, it is said, as 33 lb. per tree. The sugar maple does not generally succeed very well in England, where it is rarely seen; and even when in health is not more than fifteen or sixteen feet high.

21. *Acer nigrum*, the black sugar maple (*Michaux, Arb.* ii. p. 238, t. 16).—This plant is a native of similar situations with the last, of which perhaps it is only a variety. It differs, however, in having leaves of a deeper green, whence its name *black*, with their base much more heart-shaped, and much more downy beneath. It appears to possess the properties of the sugar maple, but in a very inferior degree. It attains a height of fifty feet.

22. *Acer Lobelii*, Lobel's maple (*Tenore Corse Botanico*, iv. 174). Leaves very slightly heart-shaped, imperfectly and irregularly toothed, divided into five shallow, abruptly pointed lobes; quite smooth beneath, except at the point, whence the principal veins radiate. Keys smooth, very much diverging.—This large tree, by some considered a variety of *A. Platanoides*, has a perpendicular trunk and a handsome pyramidal head. It is found among the mountains in the north of the kingdom of Naples. There is a specimen of this beautiful acer at Croome, in Yorkshire, twenty feet in height.

23. *Acer eriocarpon*, Sir Charles Wager's maple (*Michaux, Fl. Am. sept.* ii. 253. A. dasycarpum, *Willd*). Leaves truncated at the base, glaucous and smooth beneath, deeply divided into five jagged, taper-pointed lobes. Flowers in thick clusters, without any petals. Keys large, green.—Found in most parts of North America on the eastern side, where it is commonly called *white maple*. It grows with great rapidity, especially on the banks of clear rivulets with a gravelly bottom, and is perhaps one of the most ornamental of the genus. It is extremely common in the plantations of all Europe, where it is remarkable for the deep crimson hue of its leaves in autumn. Its wood is light, and of little or no value except to the turner. It is said to make excellent charcoal for gunpowder. The height of this species often bears so little proportion to its other dimensions, that, according to the testimony of the younger Michaux, trees are found, especially at the mouth of the rivers Mononghahela and Alleghany, as much as fifteen feet in circumference at their trunk, without corresponding height. The nurserymen usually call this species the *cut-leaved scarlet maple*.

24. *Acer rubrum*, the scarlet maple (*Linn. Sp. pl.* 1496. A. coccineum, *Hort.*). Leaves slightly heart-shaped, glaucous beneath, divided into about three coarsely-toothed and lobed segments. Flowers clustered, with petals. Keys small, red.—The deep-red colour of the flowers in the spring, and of the keys and leaves in autumn, have given rise to the name of this species, which is found, from Canada to Florida, growing in swamps along with alders. With us it is one of the first trees that put forth their blossoms in the spring; and it is delightful to see its slender branches teeming with rosy life in the beginning of March, when almost all Nature is elsewhere still. Its wood is far more valuable than that of the *Acer eriocarpon;* it is not only constantly used by the Americans for articles of furniture, but is also in request for the stocks of rifles,—for which, when it is what they call *curled*, its toughness renders it well adapted. Two varieties of this species are cultivated in this country, under the names of *A. coccineum* and *A. intermedium*.

25. *Acer circinatum*, the curled maple (*Pursh, Fl. Am. sept.* i. 267). Leaves deeply cordate, roundish, divided into seven shallow, sharp-pointed, serrated lobes. Flowers in few-flowered corymbs.—On the north-west coast of North America this grows in company with A. macrophyllum. It is a beautiful tree, but those are very poor specimens growing in the garden of the Horticultural Society of London.

Besides the foregoing, the following are mentioned by botanical writers, but little is known of them.

26. *A. hybridum* (Bosc, Dict. Agr. 5.251). Origin unknown: cultivated in France.

27. *A. obtusifolium* (Fl. Græca, t. 361). Found on the Sphaciote mountains of Greece.

28. *A. ibericum* (Bieb. Fl. Taur. Cauc.). A small tree, like A. monspessulanum: found in Iberia.

29. *A. dissectum* (Thunb. Jap. 160.)	All natives of Japan.
30. *A. Japonicum* (Ib. p. 161.)	
31. *A. palmatum* (Ib. l. c.)	
32. *A. septemlobum* (Ib. p. 162.)	
33. *A. pictum* (Ib. p. 162.)	
34. *A. trifidum* (Ib. p. 163.)	

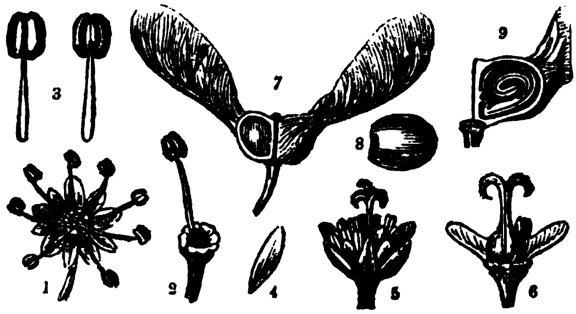
For A. Negundo, see NEGUNDO.

Cultivation.—The hardy maples, which are the only kinds of any importance in this country, are all increased either by seeds or layers. The European species readily yield their *keys*, which should be gathered when fully ripe, and immediately buried in heaps of river sand, where they may remain till the following February; they may then be sown in beds, rather thinly, and, when one year old, should be transplanted and treated like other forest trees. They ought never to be headed back, as oaks and Spanish chestnuts are. From layers they all make excellent plants very rapidly. They are occasionally budded upon the common sycamore, but this mode is little practised in England.

ACERINEÆ, a tribe of plants comprehending only the maples (see ACER) and the ash-leaved maples (see NEGUNDO). They belong to the Polypetalous division of the Dicotyledonous class, and are related to *Tiliaceæ*, or the Linden tribe: they are also akin to a tribe of tropical plants called *Malpighiaceæ*, which see. They are known—1. by their flowers being what is called unsymmetrical, that is, not having the various parts agreeing in number: for instance, while the calyx and corolla are divided each into five parts, there are seven, eight, or nine stamens, and three divisions of the pistillum—2. by their stamens being hypogynous, and inserted upon a disk—3. by their winged fruit, or *keys*—and, 4. by their petals having no appendages upon them. The species are all trees or shrubs, with opposite stalked exstipulate leaves, and are found exclusively in the north of Europe, Asia, America, and India. A sweet, mucilaginous sap is common in these plants, from which sugar can be manufactured.

CHARACTER.

Flowers either unisexual (1) or bisexual (5). Calyx and corolla (1) equal in the number of their parts, with an imbricated æstivation; the corolla sometimes absent. Petals (4) without appendages; stamens (3) hypogynous, inserted upon a disk (2.6), which arises from below the pistillum, not agreeing in number with the divisions of the calyx and corolla. Pistillum (6) two-lobed, each lobe having a wing at its back. Style one. Stigmata two. Fruit (7) formed of two samaræ, or keys, with long wings at their back, each containing one cell and one erect seed (8). Embryo (9) curved, with leafy, shrivelled cotyledons, and no albumen. Trees or shrubs, with opposite leaves, without stipulæ.



ACETATE, a salt resulting from the combination of the acetic acid with a base which may be either a metallic oxide or an organic compound with basic properties. The various acetates are prepared by different processes, according to circumstances. The acetate of soda, which is an alkaline acetate, may be formed, though not advantageously, by single affinity, or saturating the acid with the caustic soda: the acetate of lime, an earthy acetate, is easily procured by single elective affinity and decomposition, as when carbonate of lime (chalk) is added to the acid as long as it will dissolve; and the acetate of zinc, which is a metallic acetate, may be obtained by mixing a solution of acetate of lead with one of sulphate of zinc: in this case acetate of zinc is produced by double elective affinity and decomposition. All acetates, and indeed all salts whatever, are the result either of single, single elective, or double elective affinity.

The acetates may be divided into two great groups—the *inorganic* and the *organic* acetates. The former includes those produced by the combination of acetic acid with the oxide of a metal, such as soda or lime; and the latter comprehends those in which the acid is combined with an organic substance, such as ether or morphia.

Although the classes of acetates possess some properties in common, yet, from the very different nature of their bases, it can hardly be expected that the points of agreement should be numerous. Thus, the acetate of ammonia is sublimed by heat, whilst the other alkaline acetates are not merely decomposed at a high temperature, but the acid its if undergoes this change, and its carbon and oxygen, or a portion of them, recombine so as to form carbonic acid; and some acetates, that of soda for example, are converted by heat into carbonates. Many of the earthy acetates suffer similar changes; thus, the acetate of lime is reduced by heat to a carbonate, but if the heat be long continued, and stronger than required for the formation of the carbonic acid, the carbonic acid is subsequently expelled, and pure lime remains instead of the carbonate.

Some of the metallic acetates, when subjected to distillation at a high temperature, yield a large portion of acetic acid of considerable purity. This is the case with the acetate of silver, and also with that of copper, after it has been redistilled. But there are other metallic acetates—as the acetate of lead and of zinc—which, besides acetic acid, furnish a peculiar volatile inflammable fluid called pyro-acetic spirit: this is derived from the decomposition of a part of the acetic acid, and the recombination of its elements in different proportions. In general those acetates which are easily decomposed give most acetic acid and least pyro-acetic spirit, and *vice versâ*.

In the retort in which the metallic acetates are decomposed by heat during distillation, their bases, in some instances, remain in the metallic state. This happens with the acetates of copper, lead, and silver; while the acetates of iron, manganese, and zinc leave the bases in the form of oxide: in both cases the residue is mixed with charcoal, which results from the decomposition of a portion of the acetic acid; and, derived from the same source, there are evolved carbonic acid gas, and carburetted hydrogen gas.

The vegeto-alkaline acetates, such as those of morphia, quina, &c., are decomposed and totally dissipated when exposed to heat in open vessels. As the affinity existing between the acetic acid and the bases with which it combines is but weak, all acetates are decomposed by the more powerful acids. On this circumstance depends the preparation of acetic acid from some acetates, especially those of soda and lime, by the action of sulphuric acid (oil of vitriol). This stronger acid unites with the bases, and expels the acetic acid, which is condensed in proper receivers.

Although most acetates are artificial products, yet the acetate of potash exists in the sap of some plants. The acetates are, with few exceptions, readily soluble in water, and many of them are easily crystallized: they are a very important class of compounds; some of them, as already noticed, are used in the preparation of acetic acid. The acetate of alumina and the acetate of iron are largely employed by calico-printers; and many of the metallic acetates are used also by them, and by dyers and colour-makers.

ACETIC ACID. This acid, sometimes called also acetous acid, is the sour part of vinegar, and that to which its peculiar and valuable properties are owing. Vinegar, in whatever way made, is, in fact, dilute acetic acid, mixed with colouring matter, and some slight impurities. Acetic acid, as will presently be more particularly mentioned, is a compound of the elements oxygen, hydrogen, and carbon; these bodies, however, cannot be made to combine by direct chemical action, but must be separated from previous combination, either by the agency of fermentation or the action of heat, and they then re-combine to form the acid in question.

The acetic acid exists in the juice of some plants, as will be shown when the chemistry of vegetable substances is treated of; at present it is to be considered as procured,—*first*, by the fermentation of saccharine or sugary matter,—*secondly*, by the action of heat upon wood; the product of the former constituting vinegar, and of the latter, what was formerly called pyroligneous acid, but which is now largely employed, when purified, for most of the purposes to which vinegar is applied.

It is well known that, when certain vegetable juices which contain much sugar, such as that of the grape, are fermented, the first operation, if the heat be not too great, is that of causing the decomposition of the sugar, and the recombination of its elements, so as to form carbonic acid, or fixed air, most of which escapes in the state of gas; and alcohol, or spirit of wine, the greater part of which remains with the fermented juice: this is called the *vinous* fermentation, the product being wine. Now sugar is a compound of three elements, which also form spirit of wine or alcohol,—viz. oxygen, carbon, and hydrogen; and while a portion of the two former unite to yield the carbonic acid, a part of the three combine to form alcohol or spirit of wine.

When the fermentation proceeds farther, as it is apt to do with very weak wines, if exposed to air, and a higher temperature than that at which they were produced, the alcohol absorbs oxygen from the air, a new arrangement of the carbon, hydrogen, and oxygen takes place, and the whole is converted into acetic acid, or vinegar and water. This is what has been called *acetous* fermentation. There can be scarcely a doubt that vinegar, as its name implies, was first procured, and most probably by accident, from the passage of the vinous into the acetous fermentation; and, in fac it is now usually prepared in wine countries by exposin the wine in casks to the action of the air, at a temperatu of about 76° of Fahrenheit's thermometer.

In this country vinegar is procured from an infusion malt, termed *wort*, which is fermented in the usual way. is then put into barrels, which are arranged in stoves, wi their bungs out, and kept at a temperature of about 84° At this heat, which is higher than that required for t vinous fermentation, acetification proceeds; a further supp of oxygen is absorbed; and the alcohol derived from t sugar of the malt passes into vinegar. This process is t one generally followed in this country, and is called t *slow* method, in contradistinction to a *quick* method pursu largely in Germany, and to a small extent in this count The latter plan is usually called the German process, a consists in allowing the alcoholic liquid to percolate do through a barrel loosely filled with curled beech shavin In this way, the alcohol being exposed on the large surf presented by the shavings, is much more readily acted on the oxygen of the air, and the production of vinegar of ne sity occurs more swiftly, so much so, that what takes mon by the *slow*, is accomplished in days by the *quick* metho

Vinegar possesses the usual power of acids to red vegetable blue colours; it combines with the alkalies, ear and metallic oxides to form salts, which are termed acetates, some of which are of considerable importance, being largely used both in the arts and medicine.

Vinegar is generally mixed with sulphuric acid, which is allowed to the extent of one gallon in every thousand gallons of the vinegar, and is often more or less coloured by the addition of burned sugar. From these and other impurities it may be freed by distillation. Many vinegars have an agreeable fragrant odour, imparted to them from the presence of a minute quantity of acetic ether being produced during the oxidation of the alcohol. When vinegar is exposed to a low temperature, it is principally the watery part which freezes; and although the fluid portion is thus rendered stronger, it is unfit, on account of the presence of the colouring matter and sulphuric acid, for use as acetic acid.

The *second* method of obtaining acetic acid is by heating wood, as the dried branches of trees, in hollow iron cylinders, with a proper arrangement of coolers or condensers and receivers.

The acid thus procured, is called pyroligneous acid, and was at first supposed not to contain the acetic but a peculiar acid, different from all others. It is of a dark brown colour, has a strong burnt acid smell, is very sour to the taste, and acts strongly on vegetable blue colours. It contains a quantity of tar and oily matter; from these it is purified, in a considerable degree, by redistillation, but it is still very impure. It is then to be mixed with chalk or with lime; and when saturated, so as to be converted into acetate of lime, the solution is evaporated to dryness, and then it is what is termed pyrolignite of lime; but it is, in fact, an impure acetate of that earth.

In order to render the acetic acid sufficiently pure, or rather to obtain an acetate fit for that purpose, the pyrolignite of lime is dissolved in water, and there is added to it a sufficient quantity of sulphate of soda (Glauber's salt) also dissolved. Owing to the greater affinity existing between the sulphuric acid contained in the sulphate of soda, and the lime contained in the acetate or pyrolignite, they combine; and the sulphate of lime formed being very sparingly dissolved by the water, it is precipitated in the state of a bulky powder: the soda of the sulphate then unites with the acetic acid of the acetate of lime, and the salt which they form is acetate of soda. This is readily dissolved by the water, and by proper evaporation crystals are obtained, which, by re-dissolving in water and again crystallizing, may be rendered much purer. But if the salt should be still impure, it must be heated pretty strongly in an iron vessel. If the operation be carefully conducted, the impurity only of the acetate of soda is decomposed by the action of the heat; it is then to be again dissolved in water and crystallized, and the crystals, after being once more pretty strongly heated to deprive them of their water, give an acetate of soda fit for use, and yielding pure acetic acid in a mode which we shall now describe.

Reduce seventeen parts of dried acetate of soda to coarse powder, and put it into a glass retort; upon this pour gradually ten parts of sulphuric acid, and subject the mixture to slow distillation in a sand heat. By the mutual action of these substances, the sulphuric acid, on account of the greater affinity existing between it and the soda of the acetate, than between the soda and the acetic acid, combines with the former and releases the latter, which comes over in the form of vapour, and is to be condensed in a glass receiver. In the retort there remains sulphate of soda, which is to be dissolved out and retained for a future operation, with pyrolignite of lime.

The acetic acid thus procured has the following properties: it is fluid and colourless, its smell is exceedingly pungent, and its taste very acrid and sour; if applied to the skin it occasions smarting, and even raises blisters upon it. When heated, the vapour which rises from it takes fire if a lighted taper is exposed to it. At about 45° of Fahr. a portion of this acid becomes solid and shoots into beautiful crystals; these contain no sulphurous acid, even though the product should not have been re-distilled; but a portion of sulphurous acid, formed during distillation, by the decomposition of a part of the sulphuric acid, remains with the uncrystallized acid, from which it may be separated by mixing it with a small quantity of deutoxide of lead (red lead) and re-distillation. The crystals of acetic acid melt at a little below 60° of Fahr.; and the specific gravity of the solution at 60° Fahr., is 1.06296, water being 1. This crystallized acetic acid is sometimes called radical vinegar and glacial acetic acid.

Acetic acid generally exists in combination with water, or a base, as the alkali soda; and when in the latter state of combination, and quite dry, it consists of

Three equivalents or atoms of			oxygen,	8×3=24
Three	do.	do.	hydrogen,	1×3= 3
Four	do.	do.	carbon,	6×4=24
			Equivalent or atomic weight,	51

Anhydrous acetic acid (the acid free from water) may be obtained by heating together acetate of potash and chloride of benzoyle. It is a colourless mobile fluid, with a very powerful smell, and when thrown into water, falls to the bottom in oily drops, only dissolving after the lapse of some time. The strongest vinegar is known by the number 24, and contains 5 per cent. of *real* acetic acid, whilst what is known as glacial acetic acid contains 85 per cent.; the remainder in either case being water.

Recently it has been shown that the vinegar process, by many called the *acetous* fermentation, cannot be considered a *fermentation* at all, but is simply a case of slow combustion or eremacausis. The presence of a ferment is necessary to commence the change, but once begun, the alcohol continues to absorb oxygen, and passes by partial burning into acetic acid. In the infusion of malt generally used in this country there is abundance of ferment present to accomplish the change referred to; but in Germany, where the dilute alcohol is often nearly free from albuminous matter, it becomes necessary to add about $\frac{1}{1000}$ of a ferment, such as vinegar, must of beer, or honey.

The principle involved in the vinegar process is well illustrated by a method to a small extent pursued in Germany. The alcohol is placed in earthen dishes, near or over which some platinum powder is brought. The latter absorbs and condenses the oxygen of the air, and thus enables the alcoholic vapour to combine more easily with it. The change may be exhibited symbolically; 1 atom of alcohol ($C_4H_6O_2$) passing into acetic acid ($C_4H_3O_3$) absorbs 4 atoms of oxygen (O) thus:

$$C_4H_6O_2 + O_4 = C_4H_3O_3 + 3HO.$$

The uses to which acetic acid, in the state of vinegar, is applied are well known; in the form of pyroligneous acid it is employed to preserve meat, and to impart to it a smoky flavour. Pure acetic acid is used in chemical researches, and especially for preparing various acetates. In a less pure state it is employed in the arts for preparing acetate or sugar-of-lead, acetate of copper or verdigris, and acetate of alumina, largely used by calico-printers as a mordant.

`ACHÆ'A, one of the ancient divisions of the Peloponnesus, and forming, with Elis, a *nome* of modern Greece. It extended from the river Larissus, along the coast of the Corinthian Bay (Gulf of Lepanto), as far east as the small territory of Sicyon, which separated it from that of Corinth. The Sythas, a petty stream, separated Achæa from Sicyonia. The greatest length, in a straight line between the western and eastern boundaries, is about sixty-five English miles. The breadth of the province varies irregularly from about twelve to twenty miles. Being, for the most part, only a narrow slip between the Arcadian mountains and the sea, the courses of the numerous streams that flow into the Corinthian Gulf are short; and many of them are quite dry in summer.

This province contains many defiles and mountain-passes formed by branches of the great Arcadian ridge, which, in some parts, run down to the Corinthian Gulf. The coast is generally low, and has few good ports.

Before this country was occupied by the Achæi, it was called Ægialos, afterwards Ionia, and sometimes Ægialeian Ionia, which probably means no more than 'Ionia on the sea-coast:' it then contained twelve cities or states. The same number of political divisions subsisted under the Achæi in the time of Herodotus, and retained their names under Roman dominion; at present Patræ, now Patras, situated on the coast, about six miles from the entrance of the gulf of Corinth, is the only Achæan town that maintains any importance. The very sites of some of them are, at least, doubtful or unknown. Vostitza is probably the ancient Ægium, where the states of Achæa used to meet. Helice, on the coast, was destroyed by an earthquake, accompanied by an irruption of the sea, B.C. 373. [*Pausanias* b. 7. chap. 24.] Bura, at the same time, was so violently shaken, that the old statues in the temples were destroyed, and only those persons escaped who happened to be absent from the town. Their descendants were the people who formed one of the members of the subsequent Achæan confederation.

After the Roman conquest of Greece, the term Achæa received an extension in its signification, principally due to the importance which the Achæan league had obtained. The Roman province of Achæa comprehended all Peloponnesus with northern Greece south of Thessaly, perhaps not including Acarnania. But it is exceedingly difficult to fix the precise limits of the Roman provinces of Macedonia and Achæa. Nicopolis, a town which Augustus built near the *northern* entrance of the Ambraciot Gulf (Gulf of Arta) to commemorate his victory at Actium, is included in the province of Achæa, in a passage of Tacitus. (*Annals*, II. 53.) The towns generally preserved their own internal administration, except that the municipal power was put into the hands of the richer citizens.

Achæa was also an early name of the south-eastern portion of Thessaly. [See ACHÆI.]

ACHÆ'I. The Achæi are first mentioned by Homer, as the ruling people of the eastern and south-eastern part of the Peloponnesus. Among the chief cities in their dominions were Argos, Sparta, Mycenæ (the capital of Agamemnon,) Corinth, Sicyon, and the island of Ægina. Among the followers of Achilles to the war of Troy, Achæi are mentioned as well as Hellenes; the latter name, in course of time, prevailed so far as to become the characteristic name of all that people whom we call Greek. From comparing Homer with Strabo and Pausanias, we infer that the Achæi came from Thessaly, and that, at the time of the war of Troy, according to Homer's notion, they were the ruling nation in a large part of the Peloponnesus, and the chief people in the war against Troy. The dominions of Agamemnon comprised the whole country, afterwards called Achæa, which then was probably peopled by Ionians.

The old tradition, as mentioned by Pausanias (vii. 1.), is, that Archander (leader of men) and Architeles (leader of bands) came to Argos from Phthia (otherwise called Phthiotis) and married two daughters of Danaus King of Argos. From this time the name of Achæi prevailed in the Peloponnesus as a *general* name, though Homer also speaks of Argeii and Danai: the last name clearly having a reference to the ancient dynasty or royal family of Argos. The meaning of this story is, that a tradition prevailed that Argos and Mycenæ were, at a period before the war of Troy, occupied by military bands from Phthiotis, and the prevalence of the name Achæi is to be attributed to the warlike character of this people. According to the Odyssey we find the Achæi also in Ithaca.

Eighty years after the war of Troy (B.C. 1104), a fresh band of invaders from the north, the Dorians, drove the Achæi from Laconia and Argolis. Those who did not leave the country became an inferior caste, and entered into the condition of a conquered people; but a large part retreated to the Ægialeian Ionia, and expelled the Ionians. From this date the name of Achæa was given to that province.

The history of the Achæans forms an inconsiderable part of the general history of Greece till about B.C. 251. During the invasion of Greece by the Persians, they took no share in the battles of Marathon, Salamis, and Platæa; nor, during the long war of twenty-seven years, did they take anything more than a kind of forced part in this protracted struggle between Athens and Sparta. At the commencement of this war (B.C. 431), they were, with the exception of Pelléne, neutral; but afterwards favoured the Lacedæmonian interest, in compliance with the general feeling that prevailed in the peninsula. The cause of their taking no part in the general affairs of Greece may probably have been the want of union among the twelve little states; for though they acknowledged a common origin, and had a kind of connexion, they seem not to have had any complete federal system. Yet they probably attained, at an early period, a considerable degree of prosperity and internal good policy, for we find that the Achæans founded several flourishing colonies in Southern Italy; and the political institutions were considered preferable to those of most states, and were often imitated as a model.

During the struggles of the Southern Greeks against the successors of Alexander, the Achæans still wished to remain neutral; but, like all weak spectators of a contest in which they refuse to engage, they became the prey of the victorious party, and suffered under the Macedonians all the evils of anarchy and civil war. Some cities were compelled to receive first the garrisons of Demetrius and Cassander; and afterwards those of Antigonus Gonatas, or to submit to tyrants. There would be little in the whole history of the Achæan states to attract attention, were it not for the federal union which arose out of these discordant elements.

Four of the western states of Achæa, Dyme, Patræ, Tritæa, and Pharæ (Polybius, ii. 41), seeing the difficulties in which Antigonus Gonatas, King of Macedonia, was involved, formed a union for mutual protection, B.C. 281. Five years afterwards Ægium ejected its garrison, and Bura killed its tyrant, which examples moved Iocas, who was then tyrant of the neighbouring town of Ceryneia, to surrender his authority, and save his life. These three towns joined the new league. In B.C. 251, Aratus having delivered Sicyon, which was not an Achæan town, brought it over to the confederacy, of which he contrived to get himself elected head. In 243, having succeeded in driving the Macedonian garrison out of the strong hold of Corinth, which is the key of Southern Greece, this town also joined the league. Megara, Epidaurus, and Trœzen, followed soon after. Our object is not to write the history of the league, but to show how it gradually rose to importance; we, therefore, refer to the article ARATUS for the events belonging to his period. In the year B.C. 208, five years after the death of Aratus, Philopœmen was elected general of the confederacy, to which he gave a new life by his activity and wisdom (see PHILOPŒMEN). As the Romans had now humbled Philip II. of Macedonia (B.C. 197), and reduced him to the rank of a dependent king, it was their policy to weaken the power of the confederation, and this was easily effected by the Roman and anti-Roman parties, which had been for some time growing up in the Greek cities. In 191, however, Sparta became a member of the Achæan league, and the design of its leaders was to include all the Peloponnesus within its limits. After the death of Philopœmen (B.C. 183) the Roman party grew still stronger under the influence of Callicrates, and the league remained, in appearance at least, on the side of the Romans in their final struggle with Perseus, king of Macedonia, which ended in the defeat and death of the monarch (B.C. 168). The influence of Callicrates was now almost supreme, and, so far from opposing, he urged the Romans to demand 1000 of the noblest Achæans to be sent to Rome to answer for their conduct in the late war. Callicrates and his party had named more than 1000, of whose guilt, however, no proof was adduced; his only object was to humble the party of his opponent Lycortas. Among the accused who were sent to Rome, and there detained for seventeen years, was the historian Polybius, the son of Lycortas, and the strongest support of his father's party.

The last war of the league was with Sparta, which was brought about (150 B.C.) through the influence of Critolaus, one of those who had been detained at Rome. This, which the Romans chose to consider as a kind of attack on themselves, joined to the contumacious treatment of the Roman commissioners at Corinth, which will be presently mentioned, induced the Republic to send L. Mummius to chastise the Achæans; and a fitter man for the purpose could not have been found. The treatment of the Roman commissioners did not tend to soften the ferocity of their barbarian opponent. The Achæan general Diæus met Mummius on the isthmus of Corinth, and fell an easy prey to the Roman general, who, after the battle, burned Corinth to the ground (B.C. 146). Mummius and ten other senators then changed Greece into the Roman province of Achæa, leaving, however, to certain cities, such as Athens, Delphi, &c., the rank of free towns. Corinth afterwards received a Roman colony.

To those who study the history of civil polity, it is a matter of some interest to trace the formation of federative systems, or those by which a number of states unite for certain general purposes, while each maintains all its sovereignty except that portion which is surrendered to the sovereignty of the united states. The object of such associations is two-fold—to secure peace and a ready intercourse between all the states, and all the members of them; and, secondly, to facilitate all transactions with foreign states, by means of the sovereign power given to the united body. Defence against foreign aggression is one of the main objects of such a union; while foreign conquest is, strictly speaking, incompatible with it.

The history of the Grecian states presents us with many examples of federal unions of various kinds, but none is more familiar to the ear than the Achæan, about which, however, our information is not complete, nor yet always precise. We shall endeavour to state what is known in as brief a way as possible.

Each state had an equal political rank, retained its internal regulations, and its coins, weights, and measures, as we know from extant specimens, though the general government also had its coins, weights, and measures, which were uniform. We are speaking of the league as it existed in its completest state. The ordinary general assemblies were held twice a year at Ægium (afterwards at Corinth), and they deliberated for three days. Extraordinary assemblies might meet at other places, as, for instance, at Sicyon. At the Spring meeting, about the time of the vernal equinox, the public functionaries were chosen; the *stratêgos*, or head of the confederation, was there chosen, with the *hipparchus* or master of the horse, who held the next rank, and ten functionaries called *demiurgi*. This was the time of election, in the time of Aratus at least. In the earlier times of the league they had two strategi and a secretary, as the Romans had two consuls; but, in B.C. 256, after twenty-five years' experience, it was found that one head was better than two. The strategos appears to have been elected for a single year, and not to have been re-eligible till he had been one year out of office. We find that Aratus filled the office of strategos seventeen times in thirty-three years, and Philopœmen was elected eight times in twenty-four years; Marcus of Ceryneia was the first sole strategos. If the strategos died in office, his predecessor assumed the functions till the legal meeting of the congress. The functions of the ten demiurgi we are not able to state satisfactorily; they probably possessed the legal right to summon and preside in the ordinary meetings; and certainly they must have prepared the business which was to be so summarily despatched in three days. It seems that they had the power, within some limits, of referring matters to the public body or not, according to a majority of votes in their own body: they were, in fact, a committee, having a kind of initiatory (Liv. xxxii. 22). It may be asked how was the general council composed, particularly after the League comprised within itself so many states? Did the states send deputies? Had they, in fact, a representative government? It is difficult to answer this question, though we are inclined to think there was no strict system of representation. The short time for discussion, the two yearly meetings, the general character of Greek democracy, as well as most passages in which the congress is spoken of, lead us to infer that this deliberative body consisted of every citizen of the confederate states who chose to attend. That this, however, could only be the case with the wealthier class, and that the poor could not attend to such business so far from home, must be self-evident. It is also certain that, on extraordinary occasions, a much larger number of men assembled than was usual when things were going on in a more regular course. We read of one special instance (Polyb. xxxvii. 4) when the Roman commissioners were kicked out of the congress, then sitting at Corinth, with scorn (B.C. 147); and Polybius adds, by way of explanation, 'for there was assembled a number of the working class, and of those who followed mechanical occupations, greater than on any former occasion.' As Corinth, however, was one of the greatest manufacturing towns of Greece, and the working class occupied a higher station there than those in most other places, it is possible that the regular meeting was disturbed by a body of intruders, as we sometimes have seen at our own elections. We are, however, inclined to adopt the opinion of there being no representative system in the Achæan congress. Another passage of Polybius tells us that Eumenes offered the congress, then sitting at Megalopolis, a large sum of money, that they might, with the interest of it, pay the expenses of those who attended the congress: this would imply that the number was in *some way* limited, but *how* we do not undertake to say. The offer of Eumenes was rejected. Other matters relating to the Achæan league, though curious to the scholar, are too little fixed to be admissible here.—[See *Polybius*, Book ii. 4, &c. (Hampton's Translation); *Strabo*; *Pausanias*, Book vii.; *Schlosser s Universal History*; *Hermann, Lehrbuch der Griechischen Staatsalterthümer.*]

ACHARD (FRANCOIS-CHARLES), a chemist and experimental philosopher, supposed to have been of French extraction, was born at Berlin in 1753 or 1754, and died in 1821. He was the author of various works, written in the German language, on experimental physics, chemistry, and agriculture; and he was long an active contributor to different scientific journals, particularly the Memoirs of the Academy of Berlin. In 1780 he published, at Berlin, a work entitled *Chymisch-Physische Schriften*, which contains a great number of experiments on the subject of the adhesion of different bodies to each other. Tables containing the results of these experiments, which seem to have been conducted with great care, may be seen in the *Encyclopédie Methodique Chimie*, tom. 1, p. 469.

Achard is, however, chiefly known for his proposal to extract sugar from beet-root. Another Prussian chemist, Margraff, had discovered the existence of a certain portion of sugar in this root, as early as 1747. He communicated his discovery to the Scientific Society at Berlin; but he himself thought it of little practical importance, as he declared he could not produce sugar under 100 francs the pound. Achard, who in this particular appears to have been somewhat of a visionary, on the contrary, described the beet-root as 'one of the most bountiful gifts which the divine munificence had awarded to man upon the earth.' He affirmed that not only sugar could be produced from beet-root, but tobacco, molasses, coffee, rum, arrack, vinegar, and beer. 'The Institute of Paris,' in 1800, gave Achard the honour of a vote of thanks; but after a series of careful experiments they reported that the results were so unsatisfactory, that it would be unwise to establish any manufacture of sugar from beet. But Napoleon, in 1812, succeeded in forming an imperial manufactory of sugar at Rambouillet, when his decrees had deprived France of the produce of the West Indies. The sugar made at home was sold at a great price; and, consequently, after the peace, when foreign sugar was once more introduced, its cheapness gave a severe check to the beet-root establishments. The government of France, however, chose to levy high duties upon foreign sugar, in order to protect the produce of her own colonies of Martinique, Guadaloupe, and Bourbon. These duties, in fact, amount to a prohibition; and the supply of sugar from her own colonies being insufficient, especially since the emancipation of the slaves in 1848, there has been a great rise in the price of sugar in France, and a revival of the manufacture from beet-root; and at the same time improvements in the culture of the plant and in the process of manufacture. In 1828, it was as low as 4,000,000 kilogrammes; in 1851, it amounted to 75,000,000 kilogrammes. In plain words, the manufacture is flourishing because the people of France are compelled to buy dear sugar instead of cheap. One consequence is, that the yearly consumption of sugar in France by each individual is only one-fifth of what it is in Britain, or 7 lbs. instead of 35 lbs. The expectations which Achard formed of the blessings which the beet-root was to produce have not therefore been realised.

ACHELO'US (now ASPRO POTAMO, or WHITE RIVER) is the largest stream in Greece, properly so called, and was considered navigable in ancient times as far as Stratos, the ruins of which town, according to Pouqueville, are about a mile and a half south of a village now called Lepénu. The Achelous rises in the lofty mountain range of Pindus, which is the back-bone of northern Greece, and, after flowing through a very uneven country, enters the level land of Acarnania. Here it discharges itself into the sea; in ancient times having near its outlet the town of Œniadæ. Its general course is from north to south, and its length may be from 120 to 140 miles. In the time of Thucydides (B.C. 431) the lower waters of the Achelous were considered as belonging to Acarnania, but at a later period this river formed a boundary between Acarnania and Ætolia. At the time when the present king of Belgium, Leopold I., had the offer of the sovereignty of Greece from the three great powers, this river was intended to form the north-western boundary of the new state, as far as a point in its course from which it struck eastward through the lakes of Ætolia; but Acarnania is now included in the kingdom, and the limits are determined by a line running from the Gulf of Arta to that of Volo.

The Achelous, flowing from a high mountain-range, and in the winter season being loaded with water, carries down an immense quantity of earthy particles, which have formed a number of sand-banks and small islands at its mouth, called in ancient times the Echinades: this phenomenon was remarked by Herodotus, one of the earliest observers of geological facts whose writings have come down to us, who compares the increase of the Egyptian Delta, from the quantity of alluvium brought down by the Nile, with the effects produced by the deposits of the Achelous. In the time of Thucydides these islands were increasing so fast, that he predicts (ii. 102) all of them will be shortly joined to the main land; some, he says, were already attached to it. There is still, however, a great number of small islands near the mouth of the Aspro Potamo, but whether some of them have been formed since the time when Thucydides wrote (which is above 2000 years ago), or are the same islands, which the Athenian historian tells us were uninhabited in his time, we do not know. Nothing but a much more minute survey of these islands, and the lower course of the Achelous, together with the present workings of the river, will enable us to come to any probable conclusion as to the changes that have taken place about its mouth. It was a tradition extant in the time of Thucydides that there were no islands at the mouth of the river about a century before the war of Troy; yet, in Homer, we find the Echinades mentioned as sending troops to Troy, while the Echinades of Thucydides' time were uninhabited. All this will tend to prove that the term Echinades was not always used exactly in the same sense as to the number of islands which it included, and also that very great changes had taken place near the mouth of this river. Were the localities examined with scientific accuracy, it might lead to important results as to the progress of deltas within given periods and under certain conditions.

A'CHERON, a small stream of Elis, that runs into the Alpheus; better known for the importance assigned to it in the Greek mythology than for anything else. In the neighbourhood of this river, says Strabo, they honour Ceres, Proserpine, and Hades. The Acheron was one of the rivers of the realms below, over which the dead had to pass; sometimes it is the Lake Acherusia, that is 'the stream which is to be crossed.' There was also a river called Acheron, in Thesprotis, a part of Epirus: this stream rises in the mountain range of Pindus, forms, in its course, a considerable lake, called Acherusia, and finally enters the sea, forming a bay, called, by Strabo, Sweet-port (Glykys Limen), and now Porto Phanari.

There was a third river called Acheron, in Southern Italy. The name Acherusia was given to the Lucrine, or else to the lake of Avernus, in Italy; and the hot springs in the neighbourhood were supposed to be near Pyrophlegethon, or the river of fire, in the infernal regions.

It is curious to observe how widely the name of Acheron was diffused by the people of Greek stock, and was always connected with the supposed character of the world below. The origin of this appears to have been some local peculiarities, which fear, proceeding from ignorance in remote ages, turned into objects of superstitious veneration. Even on the coasts of the Euxine, near Heraclea (Erekli), we find a peninsula called Acherusia, where Hercules is said to have descended to bring up the dog Cerberus. The Greek historian, Xenophon, who gravely reports this story, adds, what is more important, that there is there a deep chasm or ravine, extending several hundred yards in length.

ACHILLEA, a genus of plants, consisting of sixty or seventy species, found exclusively in the colder climates of the northern hemisphere. They are all herbaceous, perennial weeds, and have an ethereal oil, also bitter, resinous, and astringent matters in their foliage.

ACHI'LLES. One of the most celebrated characters of the mythic age of Greece; a distinction due rather to his having been selected by Homer as the hero of the Iliad, than to the number or wonderful nature of the exploits ascribed to him. He belongs to that intermediate period between truth and fiction, during which it is generally hard to say how much is real—how much imaginary. In the circumstances of his life, however, as they are told by Homer, there is scarcely anything impossible, or even improbable, allowing for a reasonable quantity of poetical embellishment. Beyond Homer's account, however, everything is fabulous; and as poets seem to have regarded these mythic stories as fair ground on which to exercise their own taste and invention, careless of making their additions consistent with what others had said before, it is not wonderful that the accounts of this prince, as of many others, abound in contradictions which it would be fruitless to try to reconcile.

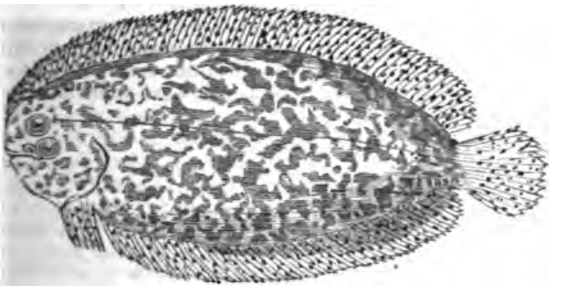
The story of Achilles, as we find it in Homer, is soon told. He was the son of Peleus, king of Phthia, (see Achæi,) and the adjoining parts of Thessaly, and of Thetis, a sea goddess, daughter of Nereus. He was educated by Phœnix, a refugee, at his father's court. Fate had decreed that, if he fell before Troy, he should gain everlasting renown; if he returned home he should enjoy a long but inglorious life. He chose the former alternative, and joined the Grecian army, in which he was pre-eminent in valour, strength, swiftness, and beauty. During the first nine years of the war we have no minute detail of his actions: in the tenth a quarrel broke out between him and the general-in-chief, Agamemnon, which led him to withdraw entirely from the contest. In consequence the Trojans, who before scarcely ventured without their walls, now waged battle in the plain with various issue, till they reduced the Greeks to extreme distress. The Greek council of war now sent its most influential members to soothe the anger of Achilles, and to induce him to return to arms, but without effect. He allowed his friend and companion, Patroclus, however, clothed in the celestial arms which Hephæstus (Vulcan) gave his father, Peleus, to lead the Myrmidons, his followers, out to battle. Patroclus was slain, and stripped of these arms by Hector. Rage and grief induced Achilles now to return to battle. Thetis procured from Hephæstus a fresh suit of armour for her son, who, at the close of a day of slaughter, killed Hector, and dragged him at his chariot wheels to the camp (not thrice round the city, as in later authors). Here ends the history of Achilles, so far as it is derived from Homer, except that we may infer, from a passage in the last book of the Odyssey, that he was slain in battle under the walls of Troy. But the genuineness of the last book of the Odyssey has been disputed both by some excellent ancient and modern critics, and, as we think, on very good grounds.

By later authors a variety of fable is mixed up with this simple narrative. Thetis is said to have dipped him, while an infant, in the Styx, which rendered him invulnerable except in the heel, by which she held him, and he was killed at last by a wound in the heel. The centaur Chiron is made his tutor, instead of Phœnix, and feeds him upon the marrow of lions and other wild beasts, to improve his strength and courage. From this singular instructor he learned music and a number of sciences, even before the age of nine years, at which Thetis, anxious to prevent his going to Troy, removed him, disguised as a girl, to the court of Lycomedes, king of the island Scyros. Here he became the father of Neoptolemus, or Pyrrhus, by the king's daughter, Deidamia, rather precociously; for he had not been a year on the island, when Ulysses was sent by the confederate Greeks to seek him, in consequence of an oracle, which declared that Troy could not be taken without the help of Achilles. Ulysses arrived at the island, discovered him among the females of Lycomedes' household, and carried him away to join the army. He was betrothed to Iphigenia, daughter of Agamemnon. The manner of his death is variously told. Some make him fall in battle; others say that he was treacherously slain in a temple, on the occasion of his nuptials with Polyxena, daughter of Priam; but it is generally agreed that he was killed by Paris, Apollo aiding him, and directing his arrow. He was entombed on the promontory of Sigæum, and a mighty barrow raised over his remains, which still rivets the attention of travellers; though it must always remain doubtful to whose memory this mound of earth was really raised. Here Alexander of Macedon celebrated splendid games in honour of the hero whom he affected to emulate.

The most valuable historical facts relative to Achilles are contained in the following passage of *Homer's Iliad*, book II. 681, &c., where he is giving a list of the warriors who went to Troy:—'I will now tell of those who inhabited Pelasgic Argos, with Alus, Alope, and Trechis; and those who dwelt in Phthia and Hellas, famed for beautiful women, and were called Myrmidons, and *Hellenes* and *Achæi*; the commander of their fifty ships was Achilles.' From this we learn that there was a people in Thessaly called Achæi, as well as a people in the Peloponnesus; and we see also that the name of Hellenes, afterwards the generic name of the Greek nations, originated, as far back as we can trace it, in the basin of Thessaly.

ACHI'LLES TA'TIUS, a Greek astronomer, who lived probably, in the first half of the fourth century of our æra and wrote a treatise on the sphere. There is still extant fragment of Achilles Tatius, entitled *An Introduction t the Phænomena of Aratus*: it may be seen in the Uranologion of Petavius. Suidas, the lexicographer, confounds thi Achilles Tatius with another of the same name, called b him Achilles Statius, who lived later, and wrote a Greek romance, *The History of Leucippe and Clitophon*. This Achilles was a native of Alexandria in Egypt, and though it is difficult to fix his era with any precision, we may assume him to be later than Heliodorus, whose romance served as a kind of model to all the subsequent Greek writers of that class, as well as to Achilles. Probably, Achilles Tatius wrote near the close of the fifth century. His romance is in eight books, and is preferred by some of the earlier critics to that of Heliodorus, which latter, however, appears to us one of the most insufferably tedious stories that ever was written. Later critics give the preference to Heliodorus. Those who have not the opportunity of reading the Greek romance writers, may form some idea of their subjects, and the mode of treating them, by dipping into some of the older romances of modern times, such as *Apollonius, King of Tyre*, on which the tragedy of *Pericles*, which, bad as it is, has been supposed to have had some touches from Shakspeare, is founded. The Greek romance writers give us no vivid picture of the times in which they lived, but a distorted image of forms of society far anterior to their own age, without being able to infuse into them the spirit of historic truth. [*Schoell, Hist. Greek Litt.*—See an article on the Greek Romances in the *Foreign Quarterly Review*, No. 9.]

ACHI'RI, in Ichthyology, a genus of flat-fish, belonging to the order Malacopterygii, and family Subbranchia, of Cuvier. In external form these animals resemble the common sole: like the pleuronectes, in general, they have the body and tail very much compressed, and the eyes both on the same side of the head; but they are easily distinguished from all other genera of flat-fish by the total want of pectoral fins. These organs, it is true, are very much reduced in all the pleuronectes; because, being placed in a different situation from the fins of ordinary fishes, they no longer perform the same functions in relation to the medium in which they move, but the stability of the animal's equilibrium is preserved, and its movements of locomotion performed, by the dorsal and caudal fins, instead of by the pectoral and ventral. Hence it is that the former fins always acquire such an enormous development in flat-fish; being generally continued in an uninterrupted line from the head to the tail, and not unfrequently surrounding the whole body.



[Achirus Marmoratus.]

The achiri have no air-bladder, and consequently remain, for the most part, at the bottom of the sea; being, in fact, ungifted with the faculty of increasing or diminishing their specific gravity, which the possession of this important organ bestows upon ordinary fishes. Their power of locomotion in other directions is, however, considerable; and, notwithstanding the disadvantages of their form, and the oblique direction in which this necessarily compels them to move, their motions are frequently very rapid. Their habits, as far as at present known, are similar to those of the other pleuronectes. They are found in the warmer regions both of the East and West Indies, but not in deep water, or in situations far removed from land; they abound along the shores, and furnish a plentiful and wholesome food to the inhabitants.

Lacepede and some other naturalists have divided the achiri into two subgenera; the first of which is distinguished by having the eyes on the right side of the head, and the caudal fin distinct from the dorsal and anal; the second, by having the eyes placed on the left side, and the dorsal and anal fins joined to the caudal, so as to form but a single uninterrupted line of fin around the entire body, the head alone excepted.

Various species of achiri have been enumerated by zoologists, the most remarkable of which appears to be the *Achirus Marmoratus* of Lacepede. This species has the caudal fin distinct from the anal and dorsal, all of which are of a pale bluish-white colour, sprinkled with innumerable small black spots; the body is covered with very diminutive scales, and the flesh is of a delicate flavour, and highly esteemed: it inhabits the coasts of the Isle of France. But the most remarkable fact relating to this species is reported by Commerson, who informs us that there is a small pore at the base of each of the rays of the fins, from which issues, upon pressure, a milky fluid of the consistence of olive oil. We are entirely ignorant of the purposes which this fluid serves in the economy of the animal; undoubtedly, it has its uses, and probably is under the control of the creature's volition, and may assist it, in some manner, either in capturing its prey, or in eluding the attacks of its enemies. The *Achirus Pavonicus* is distinguished by the beauty of the spots, which, like the eyes on the peacock's tail, cover its body; and the *Fasciculatus* and *Bilineatus* are easily recognized by the characters from which they respectively derive their names. The former is found on all the coasts of America and the West Indian isles: the latter inhabits the shores of China, and feeds upon small crustacea and mollusca. It has a long intestinal canal, with numerous reduplications; its jaws are armed with short obtuse teeth; and each of its nostrils has two distinct orifices. Various other species are found in the Atlantic and Indian oceans: they are enumerated in a note, vol. ii. p. 343, of the second edition of the *Règne Animal*, and described at length by Lacepede, and other writers upon ichthyology. To these sources we must refer such of our readers as are desirous of further information regarding the external forms, and specific differences of the achires. All that is known of their habits and economy has been brought together in the present article.

ACHMIN, or **ACKMIN**, a town in Middle Egypt, N. lat. 26° 38′, on the right bank of the Nile, with which it is connected by an ancient canal. Achmin contains above 3000 inhabitants, who manufacture some coarse cotton cloth; 2000 are Catholic Copts, who have a large church. This town is the Chemmis of Herodotus and other Greek writers, the Arabic name, Achmin, being formed by prefixing the letter A, which we find to be the case in many other names. Herodotus mentions a large temple here with colossal statues. At present there are the ruins of two temples to be seen at Achmin, and on an architrave, at this place, a Greek inscription has been discovered, which contains a dedication to the god Pan; thus confirming the opinion that the Panopolis of the later writers was the old Chemmis of Herodotus, a name which endures to the present day. The hills in the neighbourhood of this town are full of excavations, which perhaps originally served to receive the mummies of Chemmis, and afterwards to shelter the Christians during the cruel persecutions of Diocletian. [See *Ritter, Afric.*]

ACHRAS, a genus of tropical plants belonging to the natural order Sapoteæ. The name strictly belongs to the wild pear, and seems to have the same root as Acacia, Acanthus, and other words indicating something prickly. Linnæus, with a capriciousness too usual with him, gave it to this West Indian genus, which has nothing whatever in common with the pear.

GENERIC CHARACTER.

Calyx divided into six parts.
Corolla monopetalous, divided into six lobes.
Stamens twelve; of which six are sterile, and six fertile.
Ovarium with from six to twelve cells.

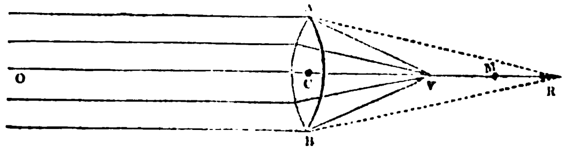
Fruit resembling an apple, with from one to twelve seeds, contained in hard bony nuts, which have a shining coat, and a long hard scar over the whole of their inner angle.

The genus contains only one species, which yields a copious milky fluid when wounded. Its leaves are entire, leathery, undivided, shining, of a lanceolate form, without stipulæ. The flowers are large, white, bell-shaped, and grow singly from the axillæ of the leaves. This is called, in the West Indies, the *Sapodilla Plum*, and *Nispero* by the inhabitants of New Spain. The fruit in size and shape resembles a bergamot pear: like the medlar, it is only eaten in a state of decay; before that period it is austere and uneatable, but in the proper state it is so rich and sweet, as by some to be considered only inferior to the orange. For other presumed species of Achras, see LUCUMA.

ACHROMA'TIC. An optical term, derived from the Greek, and signifying 'without colour.' It is used in speaking of telescopes and other combinations of glasses, to designate those which are so contrived that the light which is broken into various rays of different colours by one glass, is re-collected, or nearly so, by another; so that the image does not present those coloured fringes round its edge, which are always observable in bad telescopes.

It is well known that light is not a simple body, but is divided or decomposed into various colours by passing it through glass, or any other transparent substance, the sides of which are not parallel to one another. [See Society's Optics, ch. viii. ix.; also the articles PRISM, SPECTRUM.] That is, whenever an object is seen through a common lens, there are, in fact, several images which arise from rays of different colours being collected at different points, as follows:—

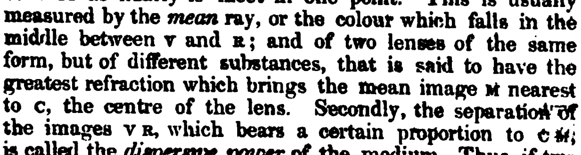
Fig. 1.



A B is the section of a double convex lens, which may be made by the revolution of the figure A B about the axis O R. We suppose rays to fall upon it coming from a point in the axis O R so distant from the lens, that they may be considered as parallel. The light in passing through the lens is refracted; that is, the rays of each separate colour are directed nearly to the same point, the violet rays being brought nearest to the glass at V, and the red rays being farthest from it at R. Between V and R will be scattered a succession of images of those colours which lie between the violet and red. In this we observe two distinct effects. First, the general *refraction* of the rays, by which they are bent so as nearly to meet in one point. This is usually measured by the *mean* ray, or the colour which falls in the middle between V and R; and of two lenses of the same form, but of different substances, that is said to have the greatest refraction which brings the mean image M nearest to C, the centre of the lens. Secondly, the separation of the images V R, which bears a certain proportion to C M, is called the *dispersive power* of the medium. Thus, if two lenses of the same form, but different substances, have V R the same in both, it does not follow that the dispersive powers of the two are the same. If C M should happen to be in the first substance double of what it is in the second, V R being the same in both, the dispersive power of the first would be only half that of the second. The dispersive power is found thus:—Divide the difference between the *refractive indices* (see REFRACTION) for red and violet rays, by the refractive index of the mean ray diminished by unity. To make A B achromatic, we must find another substance, differing from the substance of A B, so that some lens of it, placed before A B, will collect the light scattered by A B, without causing the rays again to become parallel to one another. To do this we first lay down the following rules for computing the distance of any one image from the centre of the lens, or what is called the *focal* distance of that image. These may be seen more at length in the art. LENS.

I. There are six species of lenses, made by the revolutions of the following figures about the axis:—

Fig. 2.



(1) is called double convex; (2) plano-convex; (5) plano-concave; and (6) double concave. The two remaining ones (3) and (4) might be called *concavo-convex*; but this name is usually applied to (4) only, in which the concave side belongs to the smaller circle; while (3), in which the concave side belongs to the larger circle, is called the *meniscus*.

II. Of these, in (1), (2), and (3), parallel rays are made to converge as in *fig.* 1,—that is, they are actually collected on the other side of the lens: in (4), (5), and (6), on the contrary, they are made to *diverge*,—that is, they are not collected at all, but proceed as if they came from some point on the same side of the lens as that on which they fell; the general rule is, that those with sharp edges make parallel rays converge, while those with flat edges make them diverge. It is usual to give the name of *convex* to the sharp-edged, and of *concave* to the flat-edged lenses.

III. To find the focus, that is, either the point at which the rays really do converge, or that from which they appear to diverge, divide the product of the radii of the surfaces by their sum, when both sides are of the same name (that is, for the double convex and double concave); by their difference, when the sides are of different names (that is, for the meniscus or concavo-convex), and divide the quotient by the refractive index of the substance, diminished by unity. The result is the distance of the focus from the centre of the lens. When one side is plane (as in the plano-concave and plano-convex), divide the radius of the other side by the refractive index diminished by unity. For common glass the refractive index is nearly $\frac{3}{2}$, or, according to Dr. Brewster, varies from 1·5 to 1·54 for *plate* glass, from 1·525 to 1·563 for *crown* glass, and from 1·576 to 1·642 for *flint* glass. This, diminished by unity, is nearly $\frac{1}{2}$ in all cases, and dividing by $\frac{1}{2}$ is the same as multiplying by 2. Hence, for a double convex lens, the radii of whose surfaces are 6 and 8 inches, the product of 6 and 8 divided by the sum of 6 and 8 is 3 inches, and $\frac{3}{7}$ of an inch nearly; and twice this quantity gives 6 inches and $\frac{6}{7}$, or 4 inches nearly, for the *focal distance* of the lens.

IV. When two lenses are placed close together, one of which has sharp edges and the other flat, and parallel rays fall on them, the focus of the two together falls on the side of the stronger, or of that which has the *least* focal distance. When both edges are sharp or both flat, the focus of the two falls on the same side as that of either lens.

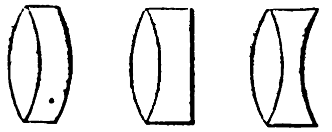
V. The focal distance of such a compound lens is found by dividing the product of the single focal distances by the sum, when both are sharp or both flat; or by the difference when one is sharp, and the other flat on the edge.

To make one lens achromatic by the addition of another, involves a process of reasoning which we shall omit, and merely give the result:—

1. No such single additional lens can give entire achromatism or absence of colour; all it can do is to bring some two images of different colours into the same place. If we thus choose to bring the two extreme images together, the remaining ones, though not actually brought into the same place with the two first mentioned, will yet come so near them, that, for practical purposes, the object in view will be attained.

2. A lens of the convex species, a double convex for instance, may be made very nearly achromatic, by applying to it one of the concave species, which fits one side of it exactly, so that the section of the double lens shall be one of the following—

Fig. 3.



provided the materials of the two lenses have different dispersive powers.

The rule is:—Let the focal lengths of the two lenses be in the same proportion as the dispersive powers of their material. The substances usually employed are *crown* glass and *flint* glass; the former for the convex, the latter for the concave lens.

The dispersive power of flint glass is nearly double that of crown class; while the refractive powers of the two are nearly the same for the *mean* image. Suppose we have a convex lens of plate glass, of 10 feet focal distance for the mean image, which we wish to achromatize by a lens of flint glass, the refractive indices being as follows—

	Red.	Mean.	Violet.
Crown . . .	1·526	1·533	1·547
Flint	1·623	1·637	1·666

The dispersive power of the crown glass, or, as before explained, the quotient of ·021, the difference between the red and violet refractive indices, divided by ·533, is ·0394. That of the flint glass, or ·043 divided by ·637, is ·0675. Hence, 10 is to the focal distance of the lens required as ·0394 to ·0675, or as 394 to 675, which gives 17 feet 2 inches nearly, so that the focal length of the whole lens, found as in rule (5), is about 24 feet.

If the focal length of the concave lens be too short for the purpose, the defect may be remedied by separating the lenses a little, instead of putting them close together.

By the preceding account, some idea may be formed of the manner in which chromatic aberration is destroyed in the object-glass of a telescope. Newton, who imagined that the dispersive and refractive powers were always in the same proportion, thought it would be impossible to construct an achromatic glass. This was first done, as far as we know, about the year 1730 by Mr. Hall, a gentleman of Essex; but he concealed his discovery. Dollond (see his life) was the first who publicly made achromatic telescopes. Huyghens had accidentally constructed an achromatic *eye-glass*, in the course of an experiment for a different purpose. On this part of the subject consult the article Telescope; we also refer the mathematical reader to Mr. Coddington's Optics, and to a paper by Professor Airy, on achromatic eye-pieces, published in vol. ii. of the *Cambridge Phil. Trans.*

ACIDS. The acids are a numerous and important class of chemical bodies. As the word acid is, in common language, almost synonymous with *sour*, it might be supposed that the taste of a substance would determine whether it was included among the acids. The term has, however, been so much extended by chemists beyond its original meaning, that some bodies, which are nearly or quite devoid of sourness, are considered as acids because they agree with them in some other qualities. The acids are generally sour; usually, but not universally, they have great affinity for water, and are readily soluble in it: they redden most vegetable blues and purples, such as infusions of litmus and red cabbage, and act upon and unite with most metals or their oxides with great facility. These are the properties of the greater number of acids; but the last only —namely, great powers of combination—belongs to them all. Many acids are entirely natural products, some both natural and artificial, while others are altogether the result of chemical agency. They are derived from various sources, and, except in the few particulars above named, they vary greatly in their properties. Thus, under common circumstances of temperature and pressure, some are gaseous in form, as the carbonic acid; others are fluid, as the nitric; or solid, as the boracic acid: some require water or a base to retain their elements in combination, which is the case with the oxalic acid; while others, as the sulphuric, may exist independently of either. Most acids are colourless, but the chromic is red; some are inodorous, as the sulphuric; others pungent, like the muriatic acid. There are acids which are comparatively fixed in the fire—the phosphoric, for example; others are volatilised by a more moderate heat, which is the case with the sulphuric acid; whilst those which are pungent to the smell, like the muriatic acid, are, to a certain extent, volatile at all temperatures.

No simple or elementary substance has the properties of an acid, and, consequently, all acids are compounds of two or more elements. In almost every case one of these elements is either oxygen or hydrogen: those acids which contain the former, are sometimes termed *oxacids;* and those into the composition of which hydrogen enters, are called *hydracids*. Oxygen in some instances gives rise to different acids, by combining with the same element in various proportions; thus, oxygen and nitrogen (azote) form three acids; oxygen and sulphur, seven; and oxygen and phosphorus, three; but hydrogen does not in any case combine with the same element to form more than one acid. The oxacids greatly exceed the hydracids in number.

Acids occur in all the kingdoms of nature: the phosphoric acid existing in bone is of animal origin; the citric and the oxalic acid are products of vegetation; while the chromic and the arsenic acid enter into the composition of certain minerals. In many instances, however, acids are not exclusively derived from one source, but are sometimes produced by them all, and may be also artificially formed. This is the case with the phosphoric acid, which occurs in animals, plants, and minerals, and is formed whenever phosphorus is burned; the citric acid is produced only by the process of vegetation; but the oxalic acid, also found in plants, may be obtained by chemical agency. The carbonic and the sulphuric acid are very common in mineral bodies, and may also be artificially produced; the former is also one of the results of respiration, combustion, and of animal and vegetable decomposition; and both the carbonic and sulphuric acid may be obtained by combining their bases with oxygen. The chromic and the arsenic acid are found only in mineral bodies, but they may be formed by chemical agency; and, indeed, except many of the organic acids, there are but few which cannot be so prepared.

Soon after Dr. Priestley's celebrated and important discovery of what he called *dephlogisticated air*, in 1774, it was found that several substances, such as sulphur and phosphorus, were converted into acids by combining with this elementary gas. On this account it was assumed, hastily and incorrectly, that all acids contained dephlogisticated air, and derived their acidity from it; on this account the name *oxygen* was given to it, signifying *acid-making*, and it was regarded as the universal acidifying principle; not, indeed, that it always formed an acid when combined with a body, but that no acid existed without it. It has, however, since been found that there are acids, the muriatic acid for example, which contain no oxygen: and, further, it has also been proved, by the brilliant discoveries of Sir H. Davy, that oxygen, by combining with certain elementary bodies, converts them into *alkalis;* a class of substances possessing properties diametrically opposite to those of the acids.

Moreover, there is a class of acids called sulphur acids, in which sulphur takes the place of oxygen. This is the case in sulpharsenious and sulpharsenic acids, which resemble arsenious and arsenic acid in composition, but contain sulphur instead of oxygen.

The theory of the constitution of acids has recently undergone considerable discussion; and the new views advocated by the leading chemists of the day are rapidly gaining ground. The principal point of the new doctrine is, that every acid is composed of a radical, simple, or compound, united to hydrogen. This theory reduces all acids to one class, and simplifies the theory of the formation of salts; but though acknowledged to be the more correct view, yet the older theory still holds its place in treatises and lectures on chemistry.—(See Salts in the *Supplement.*)

It may be here proper to notice the method adopted by the framers of the French nomenclature, in giving names to different acids. It has been already mentioned, that oxygen was supposed to be the acidifying principle, and it was found that, by combining in different proportions with the same substance, it formed acids of very different properties; but it was not then known that oxygen combined with any one body to form more than two acids. It was, however, proved to unite with sulphur in two different proportions; and in this, and similar cases, the name of the acid which contained least oxygen was made to end in *ous*, and that which contained more in *ic;* thus sulphur*ous* acid contains less oxygen than sulphur*ic* acid.

Cases have, however, occurred during the progress of chemical science, requiring an extension of this principle: an acid has been formed which contains less oxygen combined with sulphur than in the sulphurous, and this is called *hypo*sulphurous acid; and another containing more oxygen than the sulphurous, but less than the sulphuric, and this is termed *hypo*sulphuric acid. An acid has also been formed which contains more oxygen than the chloric—this has been called *per*chloric acid: the term is objectionable for reasons hereafter to be stated; *oxi*chloric is a better, and *hyper*chloric the best name. Although in the course of the present work some acids of minor importance will occasionally be mentioned, the following are those which, as being used either in scientific researches, in medicine, or the arts, will be more particularly treated of in their respective places:—

ACIDS.

Acetic
Antimonic
Antimonious
Arsenic
Arsenious
Benzoic
Boracic
Bromic
Camphoric
Carbonic
Chloric
Chloriodic
Chlorocarbonic
Chlorocyanic
Chromic
Citric
Columbic
Cyanic
Ferrocyanic
Fluoboric
Fluosilicic
Formic
Fulminic
Gallic
Hydriodic
Hydrobromic
Hydrocyanic
Hydroselenic
Hyponitrous
Hypophosphorous
Hyposulphuric
Hyposulphurous
Iodic
Kinic
Lactic
Lithic
Malic
Manganesic
Manganesious
Meconic
Molybdic
Mucic
Muriatic
Nitro-muriatic
Nitric
Oleic
Oxalic
Oxichloric
Pectic
Phosphoric
Phosphorous
Pyrophosphoric
Saccholactic
Sebacic
Selenic
Selenious
Stearic
Succinic
Sulphuric
Sulphurous
Sulphocyanic
Sulpho-naphthalic
Sulpho-vinic
Tartaric
Titanic
Tungstic

ACONITE, WINTER. [See Eranthis.]

ACONI'TUM, a genus of poisonous plants belonging to the natural order Ranunculacea. From very early times it has borne the same name, and has been known for the dangerous properties of many of its species. They are all hardy, herbaceous plants, many of them of great beauty; and are so easily cultivated, that one of them, A. Napellus, is found in every cottager's garden. The English call them *Wolf's-bane*, which name corresponds with the French *tue-loup* (kill-wolf). From all other ranunculaceous plants, Aconitum is at once known by its having the very large uppermost segment of its calyx overhanging the petals and other parts in the form of a helmet.

The common species, *A. Napellus*, is one of those in which the greatest degree of virulence has been found to reside.

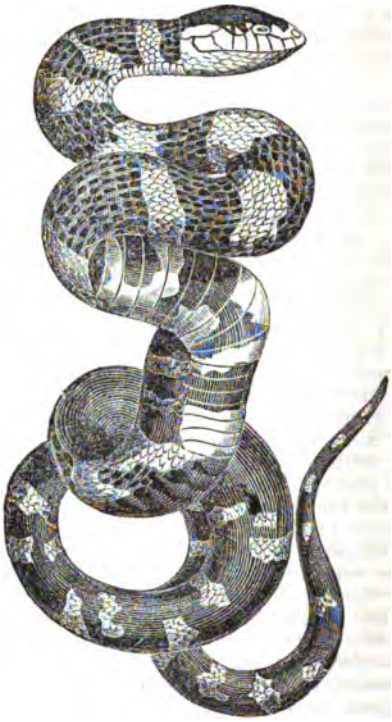
It is a native of Alpine pastures in Switzerland and other mountainous parts of Europe. Its leaves are very dark green, deeply cut into from five to seven long segments. The stem is about three feet high. The flowers are in long stiff spikes, and of a deep blue colour; they appear from May to July. All the parts of this plant are extremely acrid, especially the roots, which are scraped and mixed with food to form a bait for wolves and other savage animals. According to the observations of Orfila, the juice of the leaves introduced into the stomach occasions death in a short time; the root is far more energetic. The poison acts upon the nervous system, and produces death by paralysis.

Aconitum Napellus.

These properties are probably found in all the species of the genus. *A. cammarum, lycoctonum*, and *anthora* are certainly equally dangerous. None of them, however, not *A. Napellus* itself, can be compared for fatal energy with the dreadful *Bikh* or *Bish* of Nepaul, the *Aconitum ferox*, which seems to possess the concentrated power of all the European species.

ACO'NTIAS, in Zoology, the name of a genus of serpents established by Baron Cuvier for the purpose of distinguishing certain species hitherto confounded with the *Angues*, or common snakes, but which recent observations have proved to differ from these animals in their habits and internal anatomy. The family of serpents which M. Cuvier denominates *Ánguis*, differs from all other ápodal (footless) reptiles in certain peculiarities of osteology and internal structure, whereby they approximate more nearly to the lizards than to the true serpents. Some writers have even gone so far as to include them among the genera of the lizard family, whilst others are more inclined to consider them as forming a distinct and separate family of themselves, intermediate between the two. In fact, the generality of these animals, though externally deprived of feet, have yet an imperfect pelvis and a complete sternum, omoplate (shoulder-blade) and clavicle, concealed beneath the skin; their bodies are uniformly covered, both above and below, with small scales, as in the common lizard; and the osteology of the head is in all respects similar. But these characters, so unequivocal in other genera of the family Anguis, are for the most part wanting in the Acontias, which are thereby definitely distinguished, and form, as it were, the passage from the common snakes to the true serpents. It was upon these considerations that M. Cuvier was induced to establish this new genus. It is characterised by the absence of all the bones which represent the extremities in the other angues, while it retains the structure of the head common to these animals and to the lizards, and has the body similarly covered with small scales only, without the horny plates which guard its under surface in the common serpents, and protect them from injury in the various rapid motions which they perform.

As might naturally be expected from this conformation, the progressive movements of the acontias are very different from those of common serpents. They do not glide along the surface like these animals, but boldly carry their heads and breasts erect, and if closely pursued defend themselves courageously, and dart with the velocity of an arrow against their assailant. Though dreaded in their native countries, because confounded with their venomous congeners, these animals are perfectly harmless, and neither possess the means nor have the desire of being injurious. They have no poison fangs, and their cheek-teeth are so small as, in some species, to be barely perceptible. Their habits are gentle; and they are so timid that they generally fly at the least noise, or, upon the slightest appearance of danger, conceal themselves under some shrub or tuft of grass, or even bury themselves underground when no other refuge is at hand.



[Acontias Meleagris.]

The species belonging to this genus are, generally speaking, of a small size; and, as their mouths are not susceptible of the enormous dilatation possessed by the true serpents, they are incapable of swallowing any animal approaching to their own dimensions, and feed upon worms and insects. Different species of acontias are found in almost every part of the old world. The arid plains of Syria and Palestine produce a species which has been mentioned by the prophet Isaiah (c. xxxiv. v. 15), under the Hebrew denomination *Kippoz*, improperly translated *the great owl* in our common version of the Sacred Scriptures, but which the learned Bochart (*Hierozoicon*, pars post. lib. iii. cap. xi.) has shown to refer more properly to the acontias or anguis jaculus, the arrow or dart-snake of the Greeks and Romans. Other species inhabit Asia Minor, Egypt, and Persia; their singular mode of progression could not fail to attract the attention of the ancients, who often mention them by the appellation which M. Cuvier has lately revived. India and China have also their acontias; and the Cape of Good Hope produces a species without eyes.

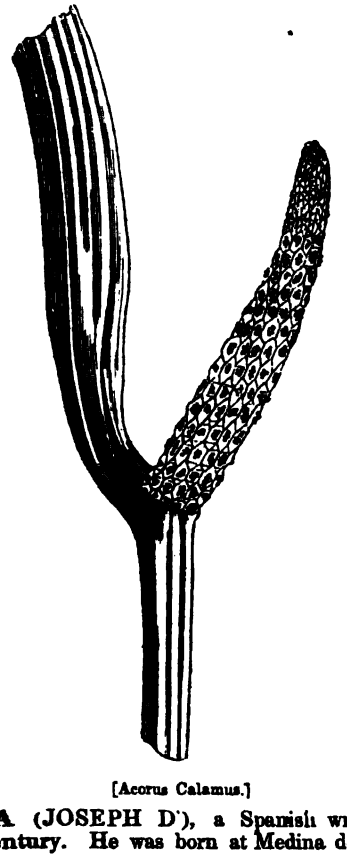
Of the common Egyptian Acontias many fables are recorded by ancient authors, principally arising from confounding this really harmless species with the more deadly and venomous serpents of the same localities. Agatharchides, Diodorus, and Strabo, call the Acontias the most poisonous of all serpents, and consider its bite to be absolutely incurable; Ælian relates that it will occasionally spring to the distance of twenty cubits; Galen, Isidorus, and others, say that it lurks among the branches of trees, from whence it darts suddenly upon whatever animal happens to come within its reach; and Avicenna even adds that it propels itself with so much force in these formidable springs, as to bury itself, like an arrow, in the body of its victim. All these fables, and many others recorded of this serpent, plainly arise, partly from the habits and mode of progression peculiar to the Acontias, and partly from confounding it with the Cerastes, or horned viper, the Dipsas, Asp, and other Egyptian species. Nor have the poets failed to contribute their share to the general stock of wonders related of this animal. Lucan, for instance, often mentions it with many of the attributes above recorded; and indeed its natural habits, without the aid of imaginary qualities, are too remarkable to be overlooked, even by the most inattentive observer.

It is no part of our plan to give a complete enumeration of the species which have been described as belonging to this or any other common genus of reptiles. Such a dry and formal catalogue would possess few charms for the general reader, and be of little use to the scientific zoologist. We must, therefore, refer those who are desirous of further information concerning the names and descriptions of these serpents, to the works of Merrem, Schneider, Lacepede, and Daudin, where their curiosity will be amply gratified.

ACORINÆ, in Botany, a section of Aroideæ, which see.

ACORN, the English name of the fruit of the oak. [See Quercus.]

A'CORUS, the botanical name of the plant that produces the drug called in the shops *Calamus aromaticus*. It belongs to the natural order Aroideæ, in the acrid properties of which it participates in a slight degree, and is found abundantly in the fresh-water marshes of many parts of England. It has a perennial, creeping, horizontal stem, as thick as the finger, the whole of the under side of which emits roots into the mud or soft earth, in which the plant uniformly grows. From this spring many deep-green, sword-shaped leaves, about three feet long. In the midst of all is a leaf-like stem, from below the point of which protrudes a cylindrical, or rather conical, spadix of greenish flowers, which are so closely packed together, that the stalk is not to be seen. The leaves when bruised are fragrant; for which reason they were formerly employed to strew the floors of rooms, or of churches, under the name of rushes. This practice is still maintained in some places, where the plant is common, as at Norwich, the cathedral of which city is strewed with sweet rushes upon certain high festivals. The flowers are so seldom produced, that it is a common belief that they never are borne. *Calamus aromaticus* is slightly aromatic, and is occasionally used as a stimulant; but is of very little importance. The part employed is the dried creeping stem, or, as it is improperly called, root.



[Acorus Calamus.]

ACOSTA (JOSEPH D'), a Spanish writer of the sixteenth century. He was born at Medina del Campo in Leon, about the year 1539; and, before attaining the age of fourteen, entered the Society of the Jesuits, to which his four elder brothers already belonged. He was remarkable, while pursuing his academic studies, for his diligence and his rapid progress both in literature and science; and on finishing his course, he became Professor of Theology at Oraña. This situation he retained till 1571, when he was dispatched as a missionary to South America. He was eventually made provincial of his order at Peru; and did not return to Spain till 1588. During his residence in South America, he had employed part of his time in writing an account of that continent, which was published at Seville, in 4to. in 1590, under the title of *Historia Natural y Moral de las Indias*. This work, which has been often reprinted (the edition of 1591, in 8vo., having received considerable corrections and additions from the hand of the author), is highly esteemed as an authority on the early condition of South America. It has been translated into French, Italian, German, Dutch, and English. The English translation, which appeared at London, in 4to., in 1604, and again in 1684, bears to be performed by E. G., supposed to be the initials of Edward Grimestone. There is also a Latin translation of the work in Part IX. of De Bry's *Collectiones Peregrinationum in Indiam*. Acosta, after his return to his native country, became a great favourite of Philip II., and had successively the dignities of Visitor of his order for Arragon and Andalusia, Superior of Valladolid, and Rector of the University of Salamanca. While holding this last situation he died on the 15th of February, 1600. Besides the work we have mentioned, he is the author of another on the same subject, published in 1589 in Latin, under the title of *De Natura Novi Orbis Libri Duo*, which was afterwards translated by himself into Spanish, and inserted in his history. He is also the author of several theological treatises; and, among the rest, of a volume of sermons, in Latin.—[*Moreri*—*Biog. Univ.*—*Robertson's America*—*Biblioth. Scriptor. Soc. Jesu, a Ribadeneira, Allegambe, et Sotvello.*]

ACOTYLE'DONES, or **ACOTYLEDONEÆ**, the name of the first class in Jussieu's Natural System of Botany. It is derived from the circumstance of all the plants which it comprehends vegetating without the aid of the seed lobes called cotyledons. Such plants are also in all cases destitute of flowers, and are in fact the same as what Linnæus called *Cryptogamous*. It having been found, by more recent and exact observations—1. That many plants, that really do bear flowers, have no cotyledons; and 2. that all flowerless plants are altogether destitute of seeds, so that they might as well be named *aspermous* as *acotyledonous*, because cotyledons can only be present in seeds strictly so called, the term Acotyledones has fallen into disuse, and Cellulares has been substituted for it, which see.

ACOUCHY, a small species of Cavy, sometimes called the Surinam Rabbit.—(See Agouti.)

ACOUSTICS, a word derived from the Greek, and signifying, the science of hearing. In treating this, and all other general scientific terms, we shall confine ourselves to the elucidation of those first principles, without which the applications cannot be understood; noticing the application only so far as their mention can be made serviceable in explaining and referring to particular articles for more specific information. Thus the reader must consult the articles Pipe—Chord—Vibration—Harmonic—Speaking Trumpet—Ear—Larynx—Echo, &c., for many explanations, which it would be necessary to insert here. if we were writing a treatise on acoustics.

We need not say what sound is, or dwell on the fact that some sounds differ only in intensity or loudness, as the reports of a cannon and a musquet; others in musical pitch, as two notes of the same instrument; others again in character or tone, or, as the French call it, *timbre*, such as the same note sounded on a flute and a trumpet. This being understood by all, we proceed to inquire what is the agent in conveying these different sounds to the ear; in what ways it is acted upon in sounds of different loudness, tone, or character; and how far we can explain a most remarkable phenomenon, though not generally believed to be such, on account of the frequency of its occurrence, viz., that we can hear and distinguish, at the same time, almost any number of different sounds. Unfortunately, our knowledge is limited by the nature of the question, which requires the improvement of one of the most difficult branches of mathematical analysis; and by our very imperfect knowledge of the constitution of matter, and the effect which putting in motion some particles of a body has upon the rest. Strictly speaking, we ought to say that sound has no existence except in the ideas of the hearer; but, in accordance with common phraseology, we shall speak of a body as *sounding* when it is in that state in which it would produce the impression of sound, if the proper medium were placed between it and the ear.

No body can produce a sound, as we know from observation, unless its parts be put into rapid motion. We have evidence of this in a tuning fork, the string of a musical instrument, the parchment of a drum, &c. Neither will any sound be perceived unless there is a continual supply of solid or fluid matter, possessed of a moderate degree of elasticity, between it and the ear. Thus a bell, when rung in an exhausted receiver, hardly yields any sound; and the small portion which it does give may be altogether destroyed or materially diminished by lining the receiver with cotton or wool. The air is generally the medium through which sound is conveyed; but only because this is most commonly the one with which the *tympanum* or drum of the ear is in direct communication. A bell rung under water has been very well heard at a distance of 1200 feet by an observer with his head under the same body of water; those who work in one shaft of a mine can often distinctly hear the sound of the pickaxe in another shaft through the solid rock; and persons wholly deaf, who therefore are not at all affected through the ear, have received pleasure from music, by placing their hands upon a shutter or other solid body near the instruments. We confine ourselves particularly to what takes place in air.

The body of air which surrounds us produces no sound if it be all moved together, that is, if the velocity of all its particles be the same. The highest wind makes no noise except when it is forced against some obstacle, and the sound of a cannon is heard in whatever direction the wind may blow. Neither does the strongest band of music produce any sensible wind in any direction. It is therefore unto some other sort of motion that we must look for the agent of sound, and the manner in which sonorous bodies move immediately points it out. If a tuning fork or a string be struck, a rapid succession of vibrations is the consequence, which, as we shall see, causes the particles of air to vibrate in a similar manner. And we find, that in order to produce a note, not only must there be a succession, but a *rapid* succession, of vibrations; experiments show that the ear is not capable of receiving the impression which we call sound, unless the particles of air in contact with it vibrate at least thirty times in a second. The vibration produced in the particles of air by a sonorous body may be distinctly proved by the following experiment. Let a tuning fork be sounded, and while yet in vibration, let it be stopped by the finger. A sensation will be felt for an instant, for which we have no name in our language, arising from the prong of the fork rapidly, but gently, striking the finger, and very different from that produced by merely touching the fork when at rest. Now, blow into a common flute, stopping two or three of the higher holes, gently. The same sort of sensation, though in a much smaller degree, will be felt on that part of the fingers' ends which is in communication with the interior air. The fingers should be warm, and if the observer be not used to the instrument, the effect is made more certain by tuning the string of a violoncello to the note which is to be fingered on the flute, and then sounding the former strongly, while the latter is held over it, with the fingers placed as before. That any very violent and sudden noise produces a concussion in the air even farther than the sound can be heard, is proved by the fact, that the explosion of a large powder-mill will shake the windows in their frames for nearly twenty miles round.

We now proceed to describe, as far as the same can be simply done, the motion which takes place in the air when the impression of sound is communicated; and here we stop to explain a method of making the eye help the reason in many cases. Suppose we wish to register what takes place in the vibration of a spring, of which the position of rest is A B, but which, having been set in motion, (*Fig.* 1.) passes through all positions between A C and A D. The spring being at A C, and the finger or other disturbing cause being removed, the elasticity of the metal makes continued efforts to restore it to its first position A B, by which it is made to move, and with continual accession to its velocity, until it actually does arrive at A B, where, if the velocity were suddenly destroyed, it would rest. But the velocity still continuing, the spring continues to move towards A D, with a change of circumstances, inasmuch as the elasticity, now opposing its motion, gradually destroys the velocity by the same steps as it was before gradually created; so that when the spring comes to A D, it will be again at rest, but will not continue so, since the elasticity will cause the same phenomena to be repeated, and the spring will move back again towards A C. But for friction and the resistance of the air it would again reach A C; it does not, however, get so far, owing to these causes, which always diminish, and never increase, velocity. This alternation will go on until the spring is reduced to a state of rest. Similar phenomena occur in the motion of a pendulum, of the string of a harpsichord, and generally, wherever small vibrations are excited in a body, which remove it, but not much, from its position of rest. We might, perhaps, conclude, that each successive oscillation is performed in a shorter time than the preceding, seeing that a less space is described by the spring. But this is not the fact; it can be observed, as well as demonstrated, that the oscillations which take place before a body recovers the effects of a small disturbance and resumes the state of rest, are severally performed, if not in the same time, yet so nearly in the same time, that the difference may be entirely neglected in most practical applications: for the reason of which, see OSCILLATION. Such being the case, we may omit the effects of friction and resistance, so far as the *time* of vibration is concerned, and consider the spring as describing exactly the same path in each successive vibration. Let D C be the line described by the top of the spring, which we may call a straight line, since it is very nearly so, and while the spring moves from D to C, imagine a curve D y C to be drawn, in such a way that, the spring being at x, the perpendicular $x\,y$ is the rate per second at which the top of the spring is then moving. A little attention will show that the curve we have drawn represents the various changes of motion just alluded to: thus T B, the greatest perpendicular, is over the point B where the spring moves fastest; and at D and C there is no perpendicular, the spring coming to rest when it reaches those points. During the return from C to D, in which the motion is the same, but in a contrary direction, let a similar branch C t D be drawn, on the other side of C D. We will call the whole curve D T C t D the *type* of the double vibration of the spring, the two branches being the types of its two halves. Now, suppose a column of air inclosed in a thin tube A B, which is indefinitely extended towards B, but closed at A by a piston which moves backwards and forwards from A to C, and from C to A, after the manner of a spring, the type of its motion being represented by the curves on A C. And first let the piston be pushed forward from A to C. If the air were solid, we should say that a column of air A C in length would be pushed out of the end B of the tube (*Fig.* 2.), in the time in which the piston is driven in. As to how far we should be justified in saying so, we refer the reader to the article ELASTICITY; we certainly can have no notion that such an effect would be produced upon a column of elastic fluid like the air. Experiment, as well as mathematical demonstration, show us that though every particle of the fluid will finally be put in motion, yet that those particles which are nearer the disturbing piston receive their first impression sooner than those which are more distant; and we find that this successive *propagation*, as it is called, of the disturbance, goes on *uniformly* at the rate of about 1125 feet in a second, the temperature being 62° of Fahrenheit; for example, a second must elapse before those particles, which are 1125 feet distant from A, will have their first news, so to speak, of what is going on at A, and in the same proportion for other distances. It is also shown that the velocity of communication is not affected by the greater or less degree of violence with which the air is struck, but remains the same For

Fig. 1

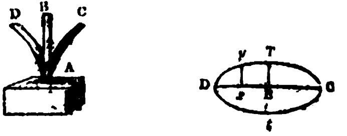
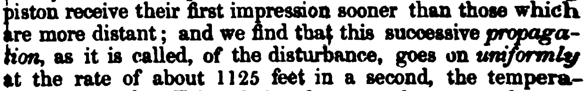
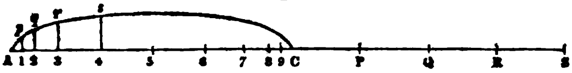


Fig. 2



every sort of disturbance. With such a velocity, we may see that the column of air made up of all the particles which feel, or have felt, the effects of the disturbance, must be very long when compared with A C, the extent of an almost insensible vibration; so that it will lead to no sensible error if we suppose that the effect of the piston at every point of its course is propagated instantaneously to C, and from *thence* only, with the velocity of 1125 feet per second. We will now consider what this effect is. Divide the whole length A C, *fig.* 3, into a large number of very small parts, *described in equal parts*, and instead of the piston moving continuously, and with imperceptible changes of velocity, along A C, let it move by starts from each point to the next, with the proper increase or decrease of velocity. In the figure we have divided A C into ten parts, but the same reasoning applies to any greater number, and the reader may refer to ACCELERATION for an instance in which the truth, as regards motion gradually increased, is come at by a similar supposition. We have much enlarged A C (*Fig.* 3), to give room for the figure: the reader may help his ideas by supposing that A C is viewed through a powerful microscope, and the rest of the tube by the naked eye. Whatever may be the common time of moving through each of the parts A 1, 1 2, &c., the portions of the column affected by the starts of the piston will be of the same length, and each will be as much of 1125 feet as the time of each start is of one second. Set off the lengths C P, P Q, Q R, &c., each equal to this length, and for the present let us agree to call the common time in which the piston starts through A 1, 1 2, &c. an *instant*. The reader must bear in mind throughout that we intend to carry the supposition of dividing A C into parts to its utmost limit, by which we shall have to suppose C P, P Q, &c. very small, though still great when compared with A 1, 1 2, &c. We also think it right to repeat, that all the figure on the left of C is immensely magnified, and that the propagation is supposed to be instantaneous from 1, 2, &c. to C. In the first *instant*, the piston moves through A 1, with the velocity p 1 per second, and forces the column of air A 1 into C P, which, therefore, has its density increased, or is compressed, the air which was held in C P and A 1 together being now confined in C P. As the propagation has not travelled farther than P, the effect is just the same as if there had been a solid obstacle at P during the first instant. The portion C P is then compressed, strictly speaking, *unequally*, that is, the parts near to C are more compressed than those near to P; but on account of the small length of C P, and the rapidity of the transmission, we may suppose all the parts equally compressed. Again, the particles near C begin to move towards P, and for a similar reason we may suppose the velocities of all the particles the same; this velocity being that of 1 during the first instant. The reader must not confound the absolute velocity of the several particles, which is always small, with the rate at which they transmit their velocities and compressions, which is very great. We will use the phrase that the portion C P has received its *first compression*. If the piston were stopped at the end of the first instant, the whole effect upon C P would be transferred to P Q in the second instant, both as to compression and velocity, and the particles of C P would return to their first state, and receive no further modification. But in the second instant, the portion C P receives its *second compression*, which is greater than the first, since a column 1 2 longer than A 1 is forced into it. Similarly the velocity is increased, being 2 q per second instead of 1 p. If the spring were then stopped, the third instant would see the portion P Q transmit its velocity and compression to Q R, C P to P Q, and C P would resume its natural state. But in this instant, C P receives its third compression, which is greater than the former two, and the same process goes on, each portion transmitting its velocity and compression to the *succeeding* one, receiving in its turn more than it parted with, from the *preceding*. This continues until the piston has reached the middle point of A C, after which the compression of C P still continues, but becomes less and less in successive instants, because 5 6, 6 7, &c. down to 9 C decrease in length, in the same way as A 1, 1 2, &c. increased. When the piston begins to return through C 9, in the eleventh instant, the portion C P receives its *first rarefaction*; for the air in C P now occupies C P and C 9; the particles in C P therefore move towards C instead of from it, and the preceding modifications are successively repeated in *quantity*, but changed into their contraries; that is, each portion undergoes successive rarefactions, equal in amount to the former condensations, and the particles move *towards* C with the same velocities which they formerly had *from* C. This continues until the piston reaches A again, after which the same phenomena recommence in the same order. Thus it appears that the absolute velocity of each particle is in the direction of the propagation so long as it is compressed; but in the contrary direction, when it is rarefied, and that each particle, during the progress of a double series of compression and rarefaction, moves forward in the direction of propagation, and back again to its former place, where it rests, unless a third vibration follows the first two. When we talk of the compression of a particle, we mean that it is nearer the succeeding particle, than it would have been in its natural state; and *vice versâ* for rarefaction. We may represent these phenomena in the following table, which, to save room, is made on the supposition that A C was divided into four parts, and might be equally well constructed if the number of parts into which A C was divided had been greater. The numbers in the top horizontal line are the successive portions of the tube, those in the left vertical column the successive instants of time, and under any portion of the tube, opposite to any instant of time, will be found the state in which that portion of the tube is at that instant of time: 1 denoting its first compression; 1′ its first rarefaction; these latter numbers recommencing when a complete cycle of changes is finished. The blanks denote that the effect has not yet reached the corresponding particles.

Fig. 3.

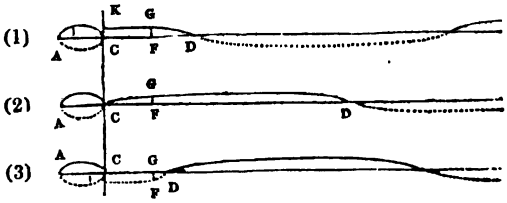


	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1															
2	2	1														
3	3	2	1													
4	4	3	2	1												
5	1′	4	3	2	1											
6	2′	1′	4	3	2	1										
7	3′	2′	1′	4	3	2	1									
8	4′	3′	2′	1′	4	3	2	1								
9	1	4′	3′	2′	1′	4	3	2	1							
10	2	1	4′	3′	2′	1′	4	3	2	1						
11	3	2	1	4′	3′	2′	1′	4	3	2	1					
12	4	3	2	1	4′	3′	2′	1′	4	3	2	1				
13	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1			
14	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1		
15	3′	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1	
16	4′	3′	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1

On casting the eye down any vertical column, we see the state of the same portion in successive instants of time: on looking along a horizontal column, we see the state of all the portions of the tube at the same instant, as far as the effect has reached them. Doing the latter, we see that all the successive states are continually repeated, in such a way that whatever states two portions may be in, the intermediate portions have all the intermediate states. There is also at the beginning an unfinished series in process of formation. If we look down a column, we see that any one particle successively undergoes the different states, from the moment when the effect first reaches it. We shall now suppose the division of A C to go on without end, and examine the final result. The different states of compression or rarefaction will then become more and more numerous, but the difference of quantity between each and its preceding will become less and less, so that when we at last give to the piston a *continuous* or gradually increasing and decreasing velocity, we must also suppose a continuous or gradually increasing and decreasing compression or rarefaction of the air in the tube. This being premised, we return to the figure, and construct the *type* of the motion of the piston, both backwards and forwards, and also the *type* of the state in which the particles of air actually are for two or three several positions of the spring:

as in the figure below, which we proceed to explain. (*Fig.* 4.)

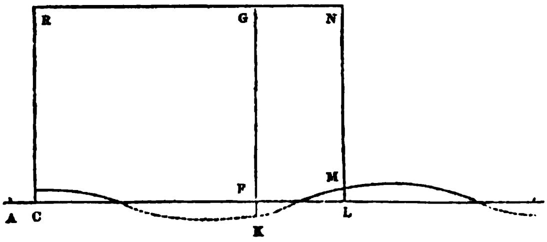
Fig. 4.



In *fig.* 4 (1), the piston has travelled from A to the small perpendicular, through something more than a quarter of a vibration: the first disturbance has reached D, and the curve D K is the *type* of the state of each particle as to velocity; that is, the perpendicular F G is the rate per second at which the particle F is moving from C, and the same for every other perpendicular.

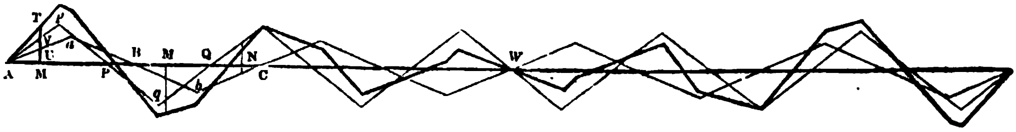
If the piston be performing its third complete vibration, or its second vibration *forwards*, there will have been a preceding series of compressions and rarefactions propagated onwards, as in the figure 4 (1). In *fig.* 4 (2), a vibration forwards has been completed; the curve on C D now represents a complete undulation, as far as the compressions are concerned. In *fig.* 4 (3), the return of the piston has commenced, and the particles between C and D are rarefied, and moving towards C; this we explain by placing the *type* beneath the tube, and dotting the curve; F G expressing the velocity per second of the particle F towards C. The length of the whole wave C D is easily calculated. If, for example, the single vibrations of the piston are made in $\frac{1}{100}$ of a second, the first impulse will have travelled through one hundredth part of 1125 feet, or $11\frac{1}{4}$ of a foot. This is the length of C D, in *fig.* 4 (2). The complete series of compressions is called a *wave of compression;* and that of rarefactions a *wave of rarefaction.* And the same type which represents to the eye the velocities of the various particles, will also serve to represent the degrees of compression or rarefaction. For those particles which are moving quickest from C are most compressed, and those which move quickest towards C are most rarefied. In returning to figure 3, we see that A 1, 1 2, 2 3, &c., are spaces described in equal times, and are therefore in the same proportions as the velocities, that is as 1 *p*, 2 *q*, 3 *r*, &c. But these spaces, in the preceding explanation, are proportional to the degrees of condensation; these latter then are proportional to the velocities. If, then, we suppose the series of compressions and rarefactions to have gone on for some time, and an unfinished wave of compression to have been formed at the instant we are considering, we may represent the whole state of the particles in the tube at that instant by the following figure—(*Fig.* 5):—R G N is a line parallel to the tube, and therefore G F is of the same length for all positions of F. It is to be made 1125 feet in length. Its use depends upon the following proposition:—That in the simple undulation which we are now considering, so long as the disturbance is small, the velocity of any particle bears to the *velocity of propagation* (two very distinct things, as we have before observed) the same proportion as the change in the density bears to the density of undisturbed air. This follows from the investigation attached to *fig.* 3: for, in the fourth instant for example, the column 3 4 of air is forced into C P, and 3 4 and C P being spaces described in equal times with velocities 4 *s* and 1125 feet per second, are spaces proportional to these velocities. And the compression will be the same if we increase C P in any proportion, provided we increase the quantity of air forced into it in the same proportion. A similar proposition holds for rarefactions. Or, in other words, F K being the velocity with which the particle at F is moving *towards* C, the rarefaction of the particles at F is that which would be obtained by allowing the air naturally contained in a tube G F, 1125 feet long, to expand into the length G K. Similarly, the compression at L is that which would be obtained by compressing the air in a tube N L into the shorter tube N M. If we wish to see the state of these particles at any succeeding instant, let the *curvilinear* part of the figure travel uniformly forward at the rate of 1125 feet per second, new curves being continually formed and finished at C: we shall thus have the state of the whole tube at any succeeding moment. Before proceeding to apply this explanation to the phenomena of sound, we must see what will take place if the tube be agitated by several different undulations at once.

Fig. 5.



All readers, however little acquainted with Mechanics, are aware, that if a body be impressed by two forces in the same direction, it will proceed with the sum of the velocities produced by the two forces; and with the difference of the velocities, if the forces strike in contrary directions, the motion in the latter case being in the direction of the greater of the forces. Hence, if there be different undulations excited in the same column of air, the velocities of each particle will be made up of the *sum* or *difference* of those which it would have received from each undulation, had each acted alone; the *sum* when it would have been compressed by both, or rarefied by both, and the *difference* when it would have been compressed by one and rarefied by the other. And the compressions or rarefactions being proportional to the velocities, a similar proposition will hold of them. Underneath we have represented the state in which a column of air would be at a given instant from two different waves, the types of which are drawn, and the broad line is the type of their united effects. We know [see INCOMMENSURABLE] that any two lengths are either in the proportion of two whole numbers, or if not, two whole numbers can be found, which are as nearly proportional to them as we please. We have, to take a simple case, drawn the lengths of the waves in the proportion of 5 to 4. (*Fig.* 6.)

Fig. 6



The types of the waves are different portions of straight lines, one whole condensation and rarefaction taking place, as indicated by A*a*B*b*C in the first, and by A*p*P*q*Q in the second. We suppose the waves to commence together. This supposition, of the condensation and rarefaction proceeding in such a way that their types shall be parts of straight lines, is not to be obtained in practice, since, as we have seen, such motion as that of a spring, and we may add of a string or drum, would produce regular curves. But it is as allowable in illustrating the effects of combined undulations as any other; and if, moreover, we round the corners of the types of the single waves, thus making them present an appearance similar to that in the preceding figures, a slight rounding of the corners of the broad line will show sufficiently well what the combined wave would have been, if the preceding figures had been rounded. And the supposition of rectilinear types facilitates the drawing of such figures, (which we would recommend to our readers,) since, as they will observe, the type of the combined wave consists also of portions of straight lines which break off only when the type of one of the single waves changes from one line to another. The general rule for forming the broad line, derived from a preceding observation, is—let the perpendicular or ordinate [See ABSCISSA] be the *sum* of the perpendiculars of the types of the waves, when they fall on the *same* side of A P, and the difference when they fall on different sides; observing, in the latter case, to let the broad line fall on the side of that wave which has the greatest perpendicular. Thus at the first M, M T is the sum of M U and M V, and particles at M are in a greater state of compression than the first wave would give them, which arises from the second; similarly at the second M there is an increase of rarefaction. At N, the air is compressed by one wave, and rarefied by the other, but more compressed than rarefied. At P, B, Q, C, &c., where one of the waves causes neither compression nor rarefaction, the broad line coincides with the other wave.

On looking at the figure thus produced, we see—

1. That it is composed of a cycle of successive compressions and rarefactions, in which, however, the rarefactions differ in kind from the preceding compressions; so that we must not give the term *wave* to each set of compressions or rarefactions, as we reserve this word to denote cycles of changes, which are following by similar cycles of contrary changes.

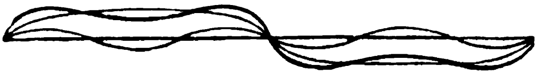
2. That when the lengths of two waves are as five and four, four of the first will be as long as five of the second; so that the waves recommence together at W, but not exactly as before, the wave of condensation from the first being accompanied by the wave of rarefaction from the second. This difference, however, is not found at the end of the second similar cycle of four and five; so that after eight of the first waves, corresponding to ten of the second, the combined wave begins again to have the same form as at first.

3. The complete cycle denoted by the oroad line may be divided into two, joining at W; in the second of which a series of rarefactions is found similar to every series of compressions in the first, and *vice versâ*. We may, therefore, give the name of wave to the part of the broad line intercepted between A and W, consistently with our definition of this word.

4. If the waves had not begun together, a wave would have resulted of the same length as the preceding, if we began at any point where the compression from one was exactly compensated by the rarefaction from the other.

5. If both waves had been of the same length, the resulting wave would have had that length; or if the first wave had been contained an exact number of times in the second, the resulting wave would have been of the length of the second. We subjoin a cut, representing a wave contained three times in another wave, and the resulting wave. (*Fig.* 7.)

Fig. 7.



We have hitherto considered combined undulations as propagated in the same direction: let us now take two waves of equal lengths propagated in opposite directions, arising, as we may suppose, from two pistons, one at each end of the tube. After a certain time, depending on the length of the tube, two waves will meet, by which we mean that the particles will begin to be affected by the motion of both pistons, and the manner in which the joint effect is represented is the same as before, though the phenomena are very different. In the former case, having represented the resulting wave at one instant, we could trace the change of state throughout every particle of the fluid, by supposing the type of that resulting wave, or a succession of such types, to move along the tube at the rate of 1125 feet per second; in the present case, the waves are propagated in contrary direction, so that any given effect from the first wave is no longer continually accompanied by another given effect from the second wave. We must also recollect, that the motion of the particles in each wave of compression is in the direction of the propagation; so that a particle under the action of two waves of compression, has opposite velocities impressed upon it, and therefore moves with the difference of the velocities; and so on.

Now let A, B, C, D, &c., be the points where the two series of waves meet in the axis, and let us choose the instant of meeting for the time under consideration. Let the continued line represent the waves propagated from left to right, and the dotted line those propagated from right to left, as marked by the arrows at the parts at which they end; the arrows above them representing the directions of the absolute velocities which the waves over which they are placed give to the particles. (*Fig.* 8.) All the particles are now neither compressed nor rarefied; for it is evident that, whatever condensation or rarefaction a particle experiences from the wave moving to the right, there is a contrary rarefaction or condensation from that which moves to the left. But every particle has the velocity derived from either wave doubled by the other. Again, the particular points A, B, C, D, &c., are never put in motion; for it is plain that by the time any point P comes over C, giving it the velocity of P*p* to the left, the point Q, similarly placed on the other wave, will also have come over C, giving it the equal and contrary velocity Q*q*; so that, as far as velocity is concerned, all the impression produced on A, B, C, D, &c., is equivalent to two equal and contrary velocities, or to no velocity at all. But when P has come over C, the compression, answering to P*p*, is doubled by that answering to Q*q*. So that the particles at A, B, C, &c., undergo no change of place, but only condensation or rarefaction. Also the particles at *a*, *b*, &c., halfway between A and B, B and C, &c., never undergo compression or rarefaction, but only change of velocity. For by the time any point R, from one wave, has come over *a*, with the condensation answering to R*r*, S will have come over it from the other, with the equal rarefaction answering to S*s*; so that the effect of the combined waves upon *a*, is always that answering to equal condensation and rarefaction, or no change at all. But the velocities answering to R*r* and S*s* are equal, and in the same direction; so that the points *a*, *b*, &c., have the velocities which one wave would have given them doubled by the other. Hence at *a*, *b*, *c*, &c., the particles suffer no change of state, but are only moved backwards and forwards. Now, let the time of half a wave elapse, in which case the types of the undulations will coincide, and those parts will be over the capitals on the axis, which are now over the small letters, and *vice versâ*, as in *fig.* 9, where the coincidence is denoted by a continued and dotted line together, the latter being, of course, a little displaced. (*Fig.* 9.)

Fig. 8

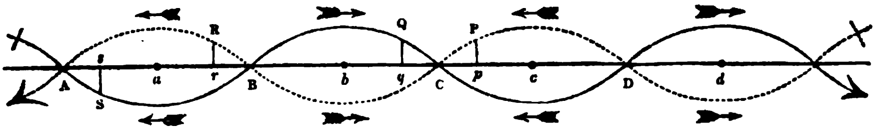
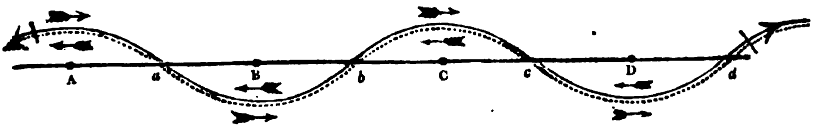


Fig. 9



Half a wave since, all compression and rarefaction had disappeared throughout the tube, the velocity of every particle being double that which either wave would have caused. The case is now altered; no particle has any velocity, since there are the signs of equal and contrary velocities at every point of the tube; but every particle is either doubly compressed, or doubly rarefied, except *a*, *b*, &c., which, as we proved, are never either compressed or rarefied. In one more half wave, the phenomena of the first supposition will be repeated: that is, all condensation or rarefaction will be destroyed throughout, the particles, however, being all in motion, except A, B, &c., but in directions *contrary* to those they had at first; while, at the end of a fourth half wave, the phenomena of the second supposition will be repeated, that is, all velocity will be destroyed, the particles being all *condensed* or *rarefied*, according as they were before rarefied or condensed. The reader may easily convince himself of these facts by drawing the corresponding figures. To put the results before the eye, suppose the tube to be of a highly elastic material (thin Indian rubber, for example), so as to bulge outwards a little when compressed from the interior, or to contract in diameter by the pressure of the outward air when the inward is rarefied. Recollect, also, that A, B, C, D, &c., remain without motion, their only change being condensation or rarefaction; while *a*, *b*, *c*, &c., are never compressed or rarefied, their only change being that of place. We exhibit side by side the successive appearances of the tube, and the relative situations of the types between A and C, the arrows always representing the direction of the motion of the particles. A half-wave elapses between each two configurations. (*Fig.* 10.)

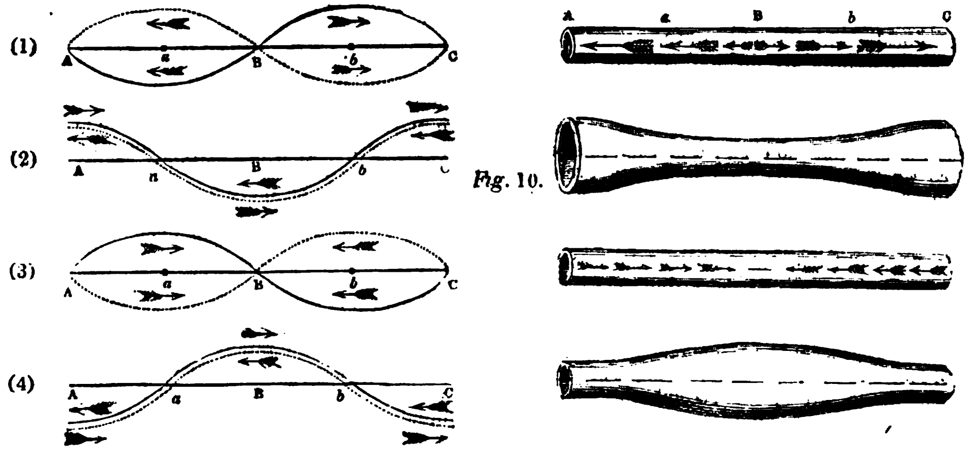


Fig. 10.

These phenomena will recur in the same order, and this mode of undulation, though it is necessary to show how it arises from the combination of two waves, is nevertheless more easy to be explained by itself than either of these two. For if we recollect that when particles of air move away on both sides from a given point, there must be a condensation in the parts towards which they move, and a rarefaction in those which they quit, (2) will evidently follow from (1). At this second period, the elasticity of the air will have opposed and destroyed the velocities of the particles; so that there now only remains a tube of particles at rest for the moment, condensed towards the ends and rarefied in the middle. There will, therefore, immediately commence a rush of air towards the rarefied parts, which will end by producing the state represented in (3), where equilibrium is restored, as far as compression and rarefaction are concerned; but where, at the moment under consideration, nothing has yet taken place to deprive the particles of the velocity which they received from the elasticity of the air before the natural state was recovered. There is now a motion of particles, in all directions, towards B, which will go on producing compression at B, and rarefaction at A and C, until all the velocity is destroyed. This is the state represented in (4), from which (1) follows again; and so on. The states of the column intermediate between the times of (1), (2), &c., are easily imagined. Between (1) and (2) the compression at the extremities will have begun; but not yet to the complete destruction of the velocities. Between (2) and (3) the motion of the particles towards the middle will have begun; but will not yet have placed them in their natural positions; and so on. The particle at B is evidently never in motion, being always equally pressed on both sides. The same would be seen of A and C, if the tube were extended on both sides.

It is evident also, that except at the instant when compression and rarefaction are all destroyed, there must be a point at which the transition occurs from condensation to rarefaction; and *vice versâ*. It is not, however, so evident, in this way of viewing the subject, that these points always remain in the same position at *a* and *b*, which is the result of our previous investigation. The reader must however recollect, that, when we talk of the points *a* and *b* being always free from condensation or rarefaction, we do not say that it is *the same air* which is always uncondensed or unrarefied, but only that the different portions of air, which pass by *a* and *b*, are in their natural state at the instant of the passage.

Now it must be evident, that if, in the motion of a fluid, there be certain particles which remain at rest, it is indifferent whether we suppose those particles to be fluid or solid; for all that we know of a solid, as distinguished from a fluid, is, that the particles of the latter yield *sensibly* to any applied force, while those of the former do not. Hence, when such impulses are communicated to a fluid, that some of its particles must remain at rest, the question never arises, so to speak, as to whether those particles would, or would not, move with the fluid, or resist, if the conditions of motion were so altered, that forces, which did not counterbalance, would be applied to those particles. Let us now suppose that a solid diaphragm is stretched across the tube at A; the motion will still continue exactly as before; and we may produce this species of complex undulation by a piston at one end only of the tube, provided the other end be closed. For, on this supposition, all the successive states into which the air at the end furthest from the piston is brought, cannot be communicated to the outside air, and must, therefore, be either retained, or returned back again through the column of air. The latter effect results; and the returning wave, which is of the same kind as the advancing wave, produces the phenomena just explained. If A and B were both closed during an undulation, no piston would be necessary, if it were not that there is no substance but what will vibrate in some small degree, and the vibrations communicated to the tube from the internal air gradually destroy the internal motion, by the communication of motion to the external air.

We have hitherto considered only the motion of air in a small tube, and have found that the velocity of the particles, as well as the condensation and rarefaction, may be propagated undiminished to any extent. The case is somewhat different when we consider undulations propagated in all directions at once. Imagine a small sphere, which is uniformly elastic in every part, and which, by some interior mechanism, is suddenly diminished in its dimensions, and afterwards as suddenly restored. A wave of rarefaction and condensation will be propagated in every direction; which wave, at any instant, will be contained between two spheres, concentric with the sphere already mentioned, the radii of which differ by the length of the double wave: at least, unless there be some reason in the state of the atmosphere, why the propagation should take place more quickly in one direction than another. We have no reason, at first sight, to suppose that the velocity of propagation would be exactly, or even nearly the same as if a portion of the air through which the waves pass had been contained in a tube, unconnected with the exterior air. But it is found, both by mathematical analysis and experiment, that the velocity of propagation remains unaltered in both cases; and also that the *absolute* velocities of the particles diminish. This last is a natural consequence of a very simple principle—namely, that when one body, or collection of bodies, strikes a larger body, or collection of bodies, in such a way that its whole motion is destroyed, the velocity of the larger body will not be so great as that of the communicating body, but less in the same proportion as its mass is greater. The law of this diminution should be, from theory, *inversely as the distance;* that is, by the time the wave has moved from 3 miles to 5 miles, the compressions and velocities should be as 5 to 3; but we have no direct means of submitting this to experiment, the absolute velocities being imperceptible.

We now proceed to the application of these principles. We know that when the air is violently or rapidly propelled in any direction, that undulations such as we have described are produced, and that the impression called sound is produced also. When a gun is fired, the great elasticity of the gases which are disengaged by igniting the gunpowder, forces the air forward out of the gun, which the instant afterwards is allowed to return. If feathers or dust be floating in the air, they have been observed to move forwards, and then back again, just as we have found the particles of air around them would do in the course of a double wave. The intensity or loudness of the sound seems to depend upon the greatest absolute velocity of the particles, and not at all upon the velocity of propagation, which is found to be the same for all sounds. Thus in a musical chord, spring or drum, the harder the metal or parchment is struck, the louder is the sound, but without any difference of tone, character, or velocity of propagation. There is no instrument of which the sound may not be made louder or weaker without any other change than giving greater velocity to the immediate cause of sound. We will not enter further into this part of the subject than to observe, that, generally speaking, we are not authorized to say that sound travels with equal loudness in all directions. It might do so in the case where it was communicated by the sudden contraction and expansion of an elastic sphere, as above supposed; but this is a supposition which we cannot put in practice. If a tuning fork be sounded and turned round in the hand while held up before the ear, very perceptible diminutions and augmentations of loudness will be perceived.

The immediate communicator of sound is the tympanum or drum of the ear, an elastic membrane, which is set in vibration by the motion of the particles of air against it, and vibrates in the same time with them. The impression is conveyed to the brain by certain neighbouring nerves. [See Ear.] We might expect, that when the wave of sound is of considerable length, we should hear its different parts, that is, feel a difference between the beginning and end where the velocities and compressions are small, and the middle where they are greatest. This happens to a small extent, in the difference, for example, between the 'roar' of a cannon and the 'report' of a musket. No explanation can convey a better idea of the difference than these two words. These simple uncontinuing sounds are the result of few waves, there being no cause for their continuance.

We have not room in this article for any discussion of the manner in which sounds are conveyed through other bodies besides air, for which see Vibration. Noises conveyed through solid bodies travel generally quicker and are heard better; the scratch of a pin may be distinctly perceived through a long spar of wood, though inaudible by the person who makes it. With regard to gases, both theory and experiment agree in enabling us to assert, that any two of the same pressure and temperature, (that is, in which the barometer and thermometer would stand at the same height,) convey sound with velocities which are inversely as their densities. Thus, air being about thirteen times as heavy as hydrogen, the velocity of propagation in the latter is about thirteen times that in the former. Such a result cannot be directly submitted to experiment; but, as we shall see in the article Pipe, there are methods equally certain for ascertaining the truth.

The velocity of sound had been determined by experiment before the time of Newton, who gave the first mathematical solution of the question, with the following result: that if the atmosphere, instead of decreasing in density as we ascend it, were all to be reduced to the density at the earth's surface, but to be so diminished in height, that the pressure at the earth's surface should not be altered, the velocity of propagation would be that acquired by a heavy body falling unresisted from half the height of this *homogeneous atmosphere*. This reasoning, however, gave the velocity nearly *one-sixth* too small; and the cause of the difference was afterwards supplied by the sagacity of Laplace. This we shall try to explain. We know that air and all gases resist compression, and will expand themselves if the pressure of the superincumbent atmosphere be removed. This tendency is what we mean by the *elastic force* of the air or gas. If we take a column of air reaching from the earth's surface to the top of the atmosphere, the elastic force at any one stratum is equal to the weight of the superincumbent column, since it balances that weight. Moreover, it is observed, that, *at the same temperatures*, the elastic forces of two different strata are as their *densities*, that is, for air of half the density of common air, the elastic force is only half as great, and so on. It is also observed that any increase of temperature increases the elastic force if the density remain the same, and also that compression always increases the temperature; and *vice versâ*. If, therefore, a vessel of air were pressed into half its dimensions, it would double its elastic force from the condensation, which would also receive a further addition from the increase of temperature. Again, if the same were rarefied into double its first dimensions, the elastic force would be halved by the rarefaction, and receive a further decrease from the diminution of temperature. The increase or decrease arising from temperature would not last long, since the altered mass would communicate heat to the surrounding bodies in the first case, and receive it from them in the second; but in calculating such instantaneous effects as the propagation of sound, it is evident they ought not to be neglected. The supposition on which Newton went was, that the elastic forces of two strata of air are always in the same proportion as their densities, which is not true, unless the temperatures are the same. We may also here remark, that an alteration in the *barometer* only, produces no alteration in the velocity of air; for, if the barometer rise, though the pressure of the air is increased, yet the density is increased in the same proportion; that is, the force which is to set each mass in motion receives no greater increase in proportion than the mass which is to be moved. But a rise in the thermometer, accompanied by no change in the barometer, increases the velocity of sound, for there is an increase in the elastic force, without any increase in the density. A very good measure of this velocity made near Paris in 1822, under the directions of the Academy of Sciences, gave 1118 feet per second at the temperature of 61° of Fahrenheit. Earlier experiments had given 1130 feet, which, if the French measure is assumed as accurate, represents the velocity at a somewhat higher temperature. The number which we have adopted, viz., 1125 feet per second, at 62° of Fahrenheit, is shown by Sir John Herschel, in his masterly treatise on 'Sound' in the *Encyclopædia Metropolitana*, to accord very nearly with the mean of the best experiments. Every increase or decrease of temperature of 1° of Fahrenheit, causes a corresponding increase or decrease of $1\frac{14}{100}$ of a foot in the velocity of sound, which gives about 1090 for the velocity when the air is at the freezing point. We may add, that in the present state of our knowledge of the manner in which the temperature and elastic force of the atmosphere are connected, observation and theory give results which differ from one another by about a hundredth part of the whole.

When the exciting cause of sound is continued, as for example, when a board is scratched with a pin, we have a continued sound, caused by the succession of waves which the ear receives, which waves we have no reason to believe are all of the same length. But whenever the exciting cause is one, the vibrations of which can be shown to be performed in exactly the same time, so that the waves caused by them are all of the same length, we perceive a sound which gives pleasure to the ear, and has the name of *harmonious* or *musical*. This, however, only happens when the vibrations are at least thirty in a second, or the wave of a sound at most about 38 feet long. This fact is so well established, that we may consider it as certain that the pleasure arising from musical sounds is a consequence of the perfectly equal times of the vibrations which produce them, and of its result, the equal lengths of the sonorous waves propagated from them through the atmosphere. This will not appear so extraordinary, if we consider the very delicate nature of our organ of hearing. A person of tolerable ear can distinguish between two sounds, which only differ in that the one is a consequence of 400 vibrations in a second, and the other of 405. We must therefore grant to the ear a much higher power of perception as to sounds than the eye has as to length or surface. Some increase of the perceptive power may arise from the very great number of vibrations, since a result in some degree corresponding is observed in vision. If we look at a large number of parallel lines ruled close together at equal distances, any little deviation from parallelism or equidistance is much more sensibly seen than when the number of lines is small. And even to the eye, any moderately rapid succession of objects of the same kind is much more pleasing when they follow at equal distances and periods of time.

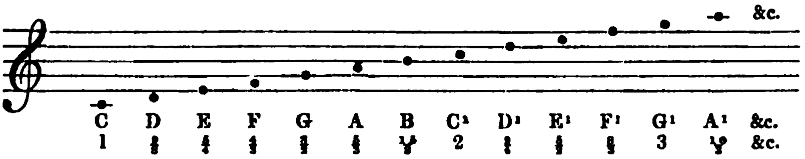
The difference between two musical sounds, which we express by saying that one is higher or lower than the other, is a consequence of the different number of vibrations performed by the two in the same time, and the sound which we call *higher* has the greater number of vibrations. And some sounds, when made together, produce an effect utterly unbearable, while others can be tolerated; others again are extremely pleasant, while some, though very different in pitch, appear so alike, that we call them the same, only higher. It is found by experiment that two sounds are more or less *consonant*, when heard together, according as the relation between their vibrations is more or less simple. Thus, when two vibrations of the first are made in one vibration of the second, (which is the simplest ratio possible, when the sounds are really different,) that similarity is observed to which we have just alluded; the first sound is called the octave of the second, and both are denoted in music by the same letter. When the number of vibrations of the two are as 3 to 2, the one which vibrates three times while the other vibrates two, is called a *fifth* above the other; because in the musical scale of notes

C D E F G A B C^1 D^1 &c.

the vibrations of C and G are in this proportion, and G is the *fifth* sound reckoned from C. If the ratio of the vibrations be that of 3 to 4, that is, if the higher note makes four vibrations, while the lower note makes three, which is the case with C and its *fourth* F; or that of 4 to 5, which happens with C and its *third* E; the combined effect of the two is agreeable. The same may be said of C and its *sixth* A, in which the ratio is that of 3 to 5, or of E and its *minor sixth* (see MUSIC) C^1, in which the ratio is that of 5 to 8; or of E and its *minor third* G, in which the ratio is that of 5 to 6. We write underneath, the common musical scale in the treble clef, with the denominations of the notes and the fraction of a vibration which is completed, while the first C completes one vibration, which fraction is greater than unity, as the notes are rising. Thus while C vibrates once, D vibrates once and one-eighth; or 8 vibrations of C take place during 9 of those of D.

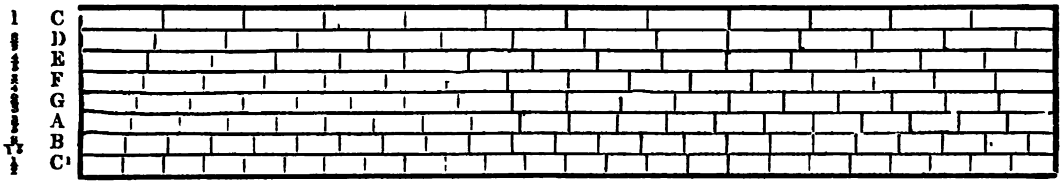
This is the musical scale pointed out by nature, since all nations have adopted it, or part of it at least. It fully verifies our assertion that the ear delights in the simplest combinations of vibrations. It would be hardly possible to place between 1 and 2, six increasing fractions where numerators and denominators should, on the whole, contain smaller numbers. We find, in the six intermediate fractions, only 2, 3, 4, and 5 singly, or multiplied by one another, no product exceeding 15. Neither has the whole of this scale always been adopted. It seems to have been formerly universal to reject F and B, the *fourth* and *seventh* of the scale; as is proved by the oldest national airs of the orientals, the northern nations, and even of the Italians. [See SCALE.]

Fig. 11.


&c.
C D E F G A B C^1 D^1 E^1 F^1 G^1 A^1 &c.
1 $\frac{9}{8}$ $\frac{5}{4}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{5}{3}$ $\frac{15}{8}$ 2 $\frac{9}{4}$ $\frac{5}{2}$ $\frac{8}{3}$ 3 $\frac{10}{3}$ &c.

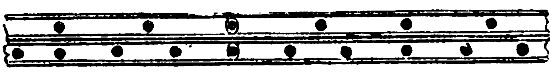
The following table will represent the proportions of the lengths of the sonorous waves which yield the preceding notes. These lengths decrease, as we have seen, as the *times* of vibration *decrease*, or as the numbers of vibrations in a given time increase.

Fig. 12.



Now, let two of these notes be sounded together, for example, C and G, in which two waves of C are equivalent to three of G. The resulting wave is, as we have seen in the preceding part of this article, twice as long as the wave of C, and the curve which represents the condensation and velocity of the particles of air is compounded, as before described, of those of the waves of C and G. The ear is able to perceive three distinct sounds, one of which is almost imperceptible, and indeed inaudible, unless carefully looked for. The two perceptible sounds are those of C and G from which the wave was made; nor are we well able to explain how this can be. Undoubtedly, if the curve, which is the type of the compound wave, were presented to a mathematician, he would be able, with consideration and measurement, to detect its elements; and to make that resolution which is done by the most unpractised ear. But we may, perhaps, assert that a savage, or a person totally unused to music, would not separate the sounds, but if C and G were sounded separately, and afterwards together, would imagine he had heard three distinct notes. The third sound, which is very faint indeed, is that belonging to the whole compound wave, which, being twice as long as the wave of C, belongs to the note called C, an octave below the first C of the preceding scale, which may be denoted by C$_1$. We may perhaps give an idea of this combination in the following way:—Let us suppose a series of equidistant balls to roll past us at the rate of two in a second, and another series at the rate of three in a second,—and let us moreover suppose that these balls roll in tubes placed one over the other, so that we only see each as it passes an open orifice in its tube, as in the figure.

Fig. 13.



It is evident that we thus obtain three distinct successions: 1, that by which we might count 3 in a second from the lower tube; 2, that by which we might count 2 in a second from the upper tube; 3, that by which we might count single seconds, from observing when two balls pass together, and waiting till the same happens again. And we must recollect that any sound, however unmusical in itself, produces a musical note, if it be repeated regularly and often; so that it is not from the phenomenon itself, but from the frequency of its succession at equal intervals, that the pleasant sensation is derived. Thus in a passage, which has a strong echo, that is, where waves are reflected from wall to wall, as in the tube closed at both ends, already described, if the foot be struck against the ground, a faint musical note is heard immediately after the echo has ceased. By the action of the foot, shorter waves are excited, as well as the long wave, by the reflection of which the echo is caused. None of these would be repeated were it not for the reflection; but when the main sound is weakened by reflection, the shorter waves begin to produce the effect of a musical note, being, as we must suppose, less weakened than the longer wave. And we may here take occasion to observe, what will be further discussed in the articles PIPE and CHORD, that it is difficult to excite a perfectly simple wave, unaccompanied by shorter ones, which latter are always contained an exact number of times in the longer. Thus, if the note called C$_1$, or an octave below C in *fig.* 11, be struck on a piano-forte, the sounds G and E^1 (see the figure) will be distinctly heard as C becomes weaker, the waves of these notes being respectively one-third and one-fifth of those of C. When two notes are struck together, the effect is not pleasing, except when the numbers of waves per second in the two bear a very simple proportion.

We have noticed all the cases which the musicians call *concords;* the remainder, though contributing much to the effect of music, being called *discords*. Thus, if F and G be sounded together, in which (*fig.* 11) F makes $\frac{4}{3}$ of a vibration while G makes $\frac{3}{2}$, or F makes 8 vibrations while G makes 9, the effect is disagreeable, at least if continued for some time. On the piano-forte, in which the notes when struck subside into comparative weakness, this is not so much perceived; but on the organ, in which the notes are sustained, the effect is intolerable, and accompanied by an apparent shaking of the note, producing what are called *beats*, which we shall presently explain. Nevertheless, it becomes endurable, if not too long continued, provided F, the *discordant note*, as it is called, is allowed to pass to the nearest sound, which will make one of the more simple combinations of vibrations with G. The nearest such sound is E, which makes 5 vibrations, while G makes 6. For further information, we must here refer to the article HARMONY.

We now come to the absolute number of vibrations made by musical notes; all that we have said hitherto depending only upon the proportions which these numbers of vibrations have to one another; so that any sound might be called C, provided the sound produced by twice as many vibrations in a second were called C^1, and so on. We do not know that any measurements have lately been made in this country, but, from the Memoirs of the Academy of Berlin for 1823, it appears that the middle A of the treble clef, or the A in *fig.* 11, was produced by the following numbers of waves per second in the following different orchestras, showing a *small* variation between them, but one by no means insensible to the ear.

Theatre at Berlin - - - - - -	$437\frac{32}{100}$
Paris, French Opera - - - - -	$431\frac{34}{100}$
— Comic Opera - - - - -	$427\frac{61}{100}$
— Italian Opera - - - - -	$424\frac{17}{100}$

From this we may form an idea how many vibrations are necessary to create the sensation of a musical sound, and also at what point of the scale the vibrations per second would become so numerous that this effect should cease. If we take one of Broadwood's largest piano-fortes, and recollect that they are generally tuned (for private purposes) a little below the pitch of the orchestra, we shall not be far wrong in assuming that the A above-mentioned on these instruments is the effect of 420 vibrations per second. The lowest note, which is almost inappreciable (that is, though perfectly audible as a sound, yet hardly distinguishable from the notes nearest to it), is the fourth descending C from this A, and the highest is the third F above it, though the C above that, or the *fourth* ascending C from the A, can be well heard, and may be had by whistling into a very small key. We must however remark, that the point at which a series of undulations ceases to give a sound either from its slowness or rapidity, is different to different ears; sometimes so much so, that while one person complains of a note as too shrill, another cannot hear it at all. We write the above scale below, putting the A, whose vibrations we know, in its proper place,—

$$C_3 \quad C_2 \quad C_1 \quad C \quad A \quad C^1 \quad C^2 \quad C^3 \quad C^4.$$

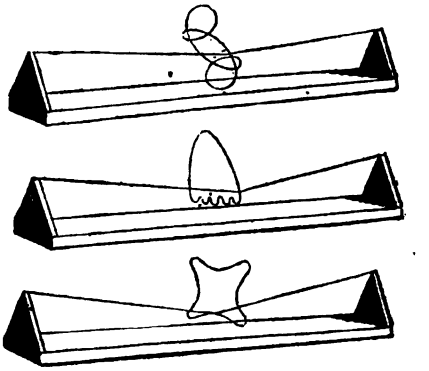
On looking at *fig.* 11, we see that A makes 5 vibrations while C makes 3; that is, A making 420 vibrations per second, C makes 252; therefore, C_1 makes the half of this, or 126; C_2 makes 63, and C_3 31½. Again, C^1 makes twice as many vibrations per second as C, or 504; C^2 makes 1008, C^3 2016, and C_4 4032 vibrations per second. That is to say, in round numbers, the ear receives a musical impression from any sound which arises from a number of vibrations between 30 and 2000; and we may certainly say that, in every orchestra, the hearers are employed in distinguishing and discriminating between various rates of succession in the undulations of the air around them from 60 to 2000 per second.

We have previously alluded to a phenomenon of sound, or rather of combined sounds, called a *beat*. If two notes whose vibrations are either nearly in the same ratio, or nearly in one of the simple ratios above-mentioned, be sounded together, the effect of their being out of tune is a tremulous motion of the sound, the pulsations or beats of which can be counted if the notes be not too high. For example, suppose two simultaneous notes whose vibrations are 100 and 104 per second. Here 25 vibrations of the first are made during 26 of the second; and the reader who has studied the preceding part of this article will see that the resulting wave is as long as twenty-six of the second waves; but that if the waves from the two be much alike in their types, this resulting wave will consist of a cycle of rarefactions and condensations very much resembling the separate waves. The whole resulting wave being twenty-six times as long as the second wave, will run through all its changes *four* times in a second, which is not sufficient to give a musical sound, but will only add to the sound of one of the waves the periodical tremulous sensation which is called a beat, which may be imitated by ringing the syllables *who, ah*, in rapid succession on the same note of the voice. For information as to the use made of these beats, see the article TEMPERAMENT.

It only remains to consider the different character of sounds. The same note, as to *pitch* or tone, may be sounded by a horn and a flute; nevertheless, each instrument has a character of its own, which enables every one to distinguish between the two. It is not to the different loudness of the two, for either, by skilful players, may be made to give the weaker sound; neither does it depend on the number of vibrations, for that, as we have seen, determines only the pitch of the note: the only difference between one wave and another of the same length, is in the *form* of its type; that is, in the different manner in which the air is condensed and rarefied. There is also only this feature left, to account for the difference between the tones which different players will draw out of the same instrument; since both Paganini and an itinerant street musician would make the same string vibrate the same number of times in a second. The late Dr. Young, to whom the world is much indebted on this subject, as on almost every other, examined the string of a violin when in motion, and by throwing a beam of light upon it, and marking the motion of the bright spot which it made, he found that the string rarely vibrated in the same plane, but that the middle point would describe various and very complicated curves, corresponding to different manners of drawing the bow. [*Lectures on Natural Philosophy*, vol. ii. plate 5.]

We give three specimens, merely to show how much the vibration produced by one player may differ from that of another. The waves proceeding from all three will be of the same length, the vibrations being performed in the same time; but the condensations and rarefactions will evidently be such as to give very different relative states to contiguous particles of air. The middle of the stretched wire describes the curve on which it is placed, during what we have hitherto called two vibrations.

Fig. 14.



It might tend to throw light upon this part of the subject if practical musicians would observe, in the same manner, the curves which they produce, and describe the different qualities of tone arising from them. As yet, we have no direct experiments which tend to connect any particular form of vibration with any particular quality of sound. We shall enter upon the best method of doing this in the article CHORD.

Some confusion arises in books on this subject, from the use which different authors make of the words *vibration* and *wave*. Some mean, by a vibration, a motion to and fro, which, in this article, we have called *two* vibrations; and by a wave, the complete succession of condensations and rarefactions, which we have called *two* waves, one of condensation, the other of rarefaction. For further information, we refer the reader to Sir J. Herschel's article, already cited, to Robison's *Mechanical Philosophy*, Biot's *Précis Elémentaire de Physique*, and Pouillet's *Traité de Physique*.

ACQUAPENDENTE, a town in the Roman States, near the confines of Tuscany, on the high road from Florence to Rome. (Lat. 42° 46′ E., long. 11° 52′.) The name is derived from the fall of water from the rock on which it stands. It is built on a steep hill which rises above the river Paglia, and is surrounded by walls. Girolamo Fabrizio, a celebrated anatomist and professor at Padua in the sixteenth century, was a native of this town. It was but an insignificant place until 1650, when Pope Innocent X. having razed to the ground the neighbouring town of Castro, where a bishop had been murdered, transferred the see to

Acquapendente. The town looks ill-built and dull: it belongs to the delegation or province of Viterbo, and is seventy miles N.N.W. of Rome. It contains a cathedral, and about 2400 inhabitants.

ACQUITTAL (from the French *acquitter*, to free or discharge) signifies a deliverance and setting free of a person from a charge of guilt; thus a man who, upon his trial for a criminal offence, is discharged by the jury, is said to be acquitted. The acquittal by the jury has, however, no force in law until judgment has been given upon the verdict by the court in which the proceedings are instituted.

After judgment of acquittal, if the party be indicted a second time for the same offence, he may plead his former acquittal as a bar or a complete answer to the second charge, and upon such former acquittal being admitted or proved, the person indicted will be entitled to be discharged, as the punishment for the same offence, arising out of the same facts.

ACQUITTANCE is a discharge in writing of a debt, or sum of money due. A general receipt or acquittance in full of all demands will discharge all debts, except such as are secured by what are termed *specialties*—namely, bonds and instruments under seal; which are considered by the law as of too great force to be discharged by a verbal concord and agreement, or any less formal and solemn acquittance than a deed.

Courts of equity, and even courts of law, will, in some cases, order accounts to be gone into anew, notwithstanding the production of a general acquittance or receipt in full of all demands, upon proof that such acquittance was obtained by fraud or given under a mistake, and that the debt or other demand has not been in fact satisfied. In the Scotch law, the discharge may be either verbal or in writing, according to the nature of the obligation. [See DISCHARGE.]

ACRE (Latin, *ager;* Gr. *αγρος*; Ger. *acker*, all signifying field) meant originally a field, but was afterwards limited to a definite quantity, of land. This quantity, however, varies in England, Scotland, and Ireland. The English statute acre consists of 4840 sq. yds. The chain with which land is measured is 22 yds. long; hence, a sq. chain contains 484 sq. yds., and 10 sq. chains make an acre. The following table shows its divisions:—

Acre.		Roods.		Perches.		Square Yards.	Side of equivalent Squares in Yards.
1	=	4	=	160	=	4840	69·57
		1	=	40	=	1210	34·785
				1	=	30¼	5·5

162 English acres = 100 Irish acres, nearly;
61 English acres = 48 Scottish acres.

The English statute acre is used in the United States of North America.

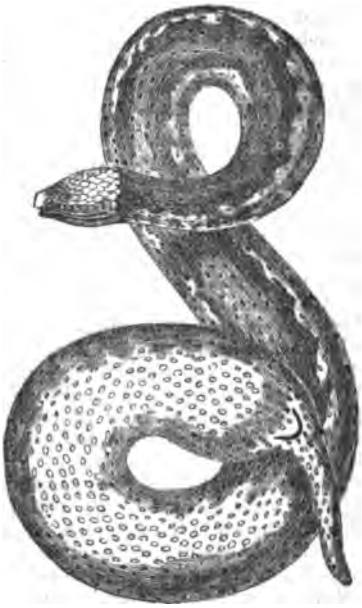
The French *are* is a square whose side is 10 metres. 1000 English acres = 40,466 ares.

For further information on the comparison of English and other acres, we refer the reader to Kelly's *Cambist;* a very useful work.

ACRE (ST. JEAN D'), a town of Syria on the sea-coast (N. lat. 32° 54′, E. long. 35° 5′), and on a small promontory which, with Mount Carmel on the south, forms a circular bay. It is sometimes called Acra and Acca. Its oldest name was Acco, which was changed to Ptolemais during the Greek supremacy. Since its occupation by the Knights of St. John of Jerusalem, its prevailing name all over Christendom has been St. Jean D'Acre, or simply Acre. It was taken in 1191 by Philip Augustus of France and Richard I. of England. During the occupancy of the Knights of Malta, it was strongly fortified, and filled with churches. Subsequently it fell into a ruinous condition; but it was restored by Sheik Daher in the middle of the eighteenth century. Jezzar Pasha, his successor, fortified the place very strongly, and built a new mosque in it. The streets of Acre are narrow; and the houses, which are of stone, have flat roofs. Europeans carry to Acre cloth, lead, tin, &c., and receive in exchange some cotton and rice.

The town is famous for two attacks it has undergone in modern times. In 1799, Bonaparte tried to storm it with 12,500 men; but after sixty days spent before it, and a loss of 3000 men, he was compelled to retreat to Egypt. Jezzar Pasha commanded the garrison; he was aided by Sir Sidney Smith with some English sailors. The second attack was in 1840. In 1832, Acre had been taken from the Sultan by Ibrahim Pasha for Mehemet Ali, who thereafter rendered the place almost impregnable. Great Britain, Austria, Prussia, Russia, and Turkey, concluded a treaty at London, 15th July 1840, to drive the Egyptians out of Syria, and restore it to the sultan, and thereupon an Anglo-Austrian fleet attacked and took the Syrian seaports. The admiral of the English fleet was Sir Robert Stopford; Sir Charles Napier acted under him as commodore. This fleet arrived off Acre 2d November 1840. The attack commenced on the 3d. About four P.M., after two hours' firing, a sensation was felt on board the ships similar to an earthquake, which was ascertained to have been the effect of a tremendous explosion of the grand powder magazine. This explosion annihilated 1200 of the enemy, who were standing near in battle-array, as well as many living in the vicinity. At dark, the firing was discontinued on both sides; and it was expected that in the morning the allied forces would be landed to storm the town. During night, however, the Egyptians evacuated the fortress; and on the morning of the 4th, the allied flags were displayed on the citadel. The loss of the allies was very small—18 killed and 41 wounded. The fall of Acre compelled Ibrahim Pasha to evacuate Syria and retire to Egypt. Acre was subsequently restored to the Turks; its population is about 15,000. Acre is also the name of one of the Syrian Eyalets. [See SYRIA.]

ACROCHO'RDUS (a word formed from the Greek, which signifies *a wart*), in Zoology, a genus of serpents discovered in Java by the traveller Homstedt, and described in the *Memoirs of the Stockholm Academy of Sciences* for 1787. This genus is easily distinguished from others of the innoxious family of serpents by the innumerable small scales which cover every part of the head and body both above and below, and which in preserved specimens, or when the live animal distends the lungs and body with air, assume the appearance of so many granulated warts or tubercles. This circumstance has suggested the name of acrochordus, which conveys a pretty accurate idea of the external covering of the animal described by Homstedt.



[Acrochordus, from Lacepède, Hist. des Ovipar.]

The acrochord, in fact, is covered with scales like all other serpents, though they are minute and separate from one another: each of them is marked with three small ridges, and it is only when the skin is inflated, and apparent between the scales, that these assume the granulated or warty appearance expressed by the name. The head of the acrochord is flat, the mouth provided with a double row of small, sharp teeth, but without poison fangs, and the throat capable of enormous dilatation. Though deprived of the ordinary apparatus by which venomous serpents convey their poison, zoologists are not yet agreed in considering the achrocord as altogether innocent. MM. Appel and De Blainville affirm that they have found a peculiar bone in the head of this serpent, which they conceive to supply the place of the poison fang. Cuvier, on the other hand, denies the existence of this bone altogether, and brings forward the testimony of M. Leschenhault in favour of the harmless nature of the acrochord; and as the latter gentleman travelled for some time in Java, and made various experiments upon the live animals, for the purpose of ascertaining this point, there seems to be no reason to doubt the truth of his report. The tongue of the acrochord is short and thick, the vent simple and without the horny spurs which are common to many other genera of serpents. The only species sufficiently known at present is

The *Oular Carron* of the Javanese, the *Acrochordus Javanicus* of Lacepède and others. The scales of this serpent are marked by three small carinated elevations; the body is black above, greyish-white beneath, and the sides are marked with black spots on a ground of the same colour as the belly. The head is covered with small scales, the mouth is contracted, and the under jaw shorter and broader than the upper. This animal averages from six to eight or ten feet in length, and its shape is altogether peculiar: the body does not gradually become thinner from the middle towards either extremity, as in the generality of serpents, but grows gradually thicker from the head to the vent, and there suddenly contracts, so as to form a very short, slender tail. In the thickest part of the body, immediately above its junction with the tail, the individual procured by Homstedt, of which the entire length was eight feet three inches, measured three inches in diameter, whilst the greatest breadth of the tail did not exceed half an inch, and its length was scarcely a ninth part of that of the whole body. This individual was a female, and, when opened, was found to contain five young ones perfectly formed, and about nine inches in length. It was caught in a plantation of pepper-trees, and the Chinese, who accompanied Homstedt, cooked and ate its flesh, and reported it to be of a most delicious flavour. The stomach contained a quantity of half-digested fruit, from which it has been inferred that this serpent is frugivorous, and, contrary to the habit of all other known species, feeds upon vegetable substances. Cuvier is incredulous upon this point: it is certainly a singular circumstance, and should be received with caution; but, on the other hand, we have no reason to doubt the testimony of Homstedt; and the mere singularity of the fact does not necessarily destroy its probability. We know, moreover, that tortoises, turtles, some genera of fishes, and even certain species of lizards,—all of them cold-blooded animals, and some approaching very nearly, in nature and organization, to the family of serpents to which the acrochord belongs,—live entirely upon vegetable food; and the knowledge of this fact ought to prepare us beforehand to expect the discovery of similar habits among certain tribes of serpents, rather than to reject them as impossible and as absurd fictions.

ACRO'NYCHAL (sometimes incorrectly written Acronical, and Achronical), a word derived from the Greek, signifying 'that which determines the extremities, or the beginning and end, of the night.' It is only used in reference to the rising or setting of the stars; and a star is acronychal or rises acronychally when it rises at or very near sunset, and consequently sets at or near sunrise. To determine what stars rise acronychally on any given night, elevate the pole of a common globe so that the arc intercepted between it and the horizon may be equal to the latitude of the place. Turn the globe until the sun's place is on the horizon at the *western* side, then will all stars which are either on or within a short distance of the horizon on the *eastern* side be acronychal.

ACRO'POLIS, a Greek compound word signifying 'the highest point of a city.' It was used to denote some hill, rock, or natural elevation, such as we find forming part of the sites of many ancient cities in Greece. It seems natural to conclude that such strong holds were among the places first occupied, and that they served as the kernel of a larger city. In course of time, when building spread, such eminences became strong posts analogous to castles or citadels in modern cities; and in many instances the possession of such posts was considered as equivalent to the possession of the cities themselves. Religious edifices also generally formed part of the structures of an Acropolis.

In modern times they have often served as places of refuge to the inhabitants from the attacks of an enemy, or from the incursions of corsairs. The term Acropolis is now most commonly applied to the rocky eminence of Athens, on which the remains of the Parthenon or Temple of Minerva stand; but this is only a limited use of the word. Corinth had an Acropolis called Acro-Corinthus, which is a much loftier and more commanding eminence than that of Athens. The view from the summit is extensive, and the temple or the Acropolis of Athens, nearly fifty miles distant, is distinctly seen. An eminence close upon the modern Argos in the Peloponnesus was the Acropolis of the ancient Argos and then it was called Larissa. A ruined castle of comparatively modern construction occupies the summit of this rocky eminence, and shows in some parts traces of much earlier building. The Acropolis of Messene in the Morea, situated on Mount Ithome, is another remarkable specimen of these natural bulwarks which were once fortified according to the principles of Greek military science. [See Leake's *Morea*, 3 vols. 8vo.—Society's Plan of Athens.]

ACROSTIC, a Greek term, signifying literally the beginning of a line or verse. An acrostic is a number of verses so contrived that the first letters of each being read in the order in which they stand shall form some name or other word. According to some authorities, a writer named Porphyrius Optatianus, who flourished in the fourth century, has the credit of being the inventor of the acrostic. It is probably, however, of older date. Eusebius, the bishop of Cæsarea, who died in A.D. 340, gives in his *Life* of Constantine, a copy of Greek verses which he asserts to be the composition of the Erythræan Sibyl, the initial letters of which make up the words ΙΗΣΟΥΣ ΧΡΙΣΤΟΣ ΘΕΟΥ ΥΙΟΣ ΣΩΤΗΡ, that is, Jesus Christ, the Son of God, the Saviour. These verses, which are a description of the coming of the day of judgment, have also been translated into Latin hexameters so as to preserve the acrostic in that language, in the words Jesus Christus Dei Filius Salvator. The translation, however, wants one of the wonderful qualities of the original; for it will be observed that the initial letters of the five Greek words being joined together, form the word ΙΧΘΥΣ, that is, *the fish*, which St. Augustine, who quotes the verses in his work entitled *De Civitate Dei*, informs us is to be understood as a mystical epithet of our Saviour, who lived in this abyss of mortality without contracting sin, in like manner as a fish exists in the midst of the sea without acquiring any flavour of salt from the salt water. This may be therefore called an acrostic within an acrostic. But there are also other ways of complicating these ingenious productions. Addison, who notices this along with other sorts of false wit, in his lively papers on that subject in the first volume of the *Spectator*, says, 'there are *compound* acrostics, where the principal letters stand two or three deep. I have seen some of them, where the verses have not only been edged by a name at each extremity, but have had the same name running down like a seam through the middle of the poem.' There are even instances of the same name being five times repeated in so many successive columns. Such an acrostic has been designated a *pentacrostic*. This species of elaborate trifling was extremely fashionable among the early French poets, from the age of Francis I. down to that of Louis XIV. Some also of our English poets of considerable eminence used formerly to amuse themselves in the same way. Thus, for instance, among the works of Sir John Davies, are twenty-six short poems entitled *Hymns to Astræa*, each of which is an acrostic on the words *Elizabetha Regina*. These, which were first published about the end of the sixteenth century, are perhaps the most elegant compositions of this description in any language. Afterwards such puerile ingenuity fell into disrepute; and Dryden, in his *Macflecknoe* (published 1682), contemptuously makes the dying monarch of the realms of nonsense and dulness address his son and successor Shadwell:—

'Leave writing plays, and choose for thy command
Some peaceful province in acrostic land.'

The acrostic, being addressed merely to the eye, and conveying no pleasure either to the imagination or to the ear, cannot of course add to the poetical effect of the lines which it ornaments—any more than would the printing of the initial letters in a differently coloured ink. But it is sometimes useful, as an aid to the memory, in recollecting such verses as are composed only to be got by heart, for the sake of the facts of which they form a summary. Thus, in some editions of the Latin dramatist Plautus, we find prefixed to each play a few verses which contain at the same time an acrostic on its name and a sketch of the plot. In this case, the knowledge of the initial letter of each line must help the memory to recover it, if it should be forgotten. There are two epigrams in the Greek Anthology, one in honour of Bacchus and the other of Apollo, which are called acrostics, though of a somewhat peculiar fashion. Each contains twenty-five verses, of which the first introduces the subject of the poem, and each of the twenty-four others consists of four words, which are epithets of the god: all the epithets in the first line begin with A, those in the second with B, and so on. These poems, therefore, are merely acrostics on the alphabet, four deep. The Jews sometimes employ a sort of acrostic in designating many of their writers. Thus the commentator on *Maimonides*, Rabbi Yom Tof bar Abraham, is commonly called Ritba, from the initial letters of the five words composing his full title. (See this explained in the article entitled 'Literary Chronology,' in the *Companion to the Almanac* for 1832.) The initial syllables of the verses of the Psalms were anciently called acrostics. The following is a curious specimen of a Latin acrostic:—

SATOR
AREPO
TENET
OPERA
ROTAS

ACROTE'RION (in Architecture), a Greek term, signifying 'the extremity of anything.' It is used technically to designate the statue or other ornament on the summit or upper angle, and is sometimes applied also to the similar ornaments over the feet, or lower angles, of a pediment; in the latter case they are all included under the plural *acroteria*. Some writers understand by this term only the bases or pedestals on which the acroterial ornaments are placed; for this restriction, however, there is no good reason, but rather the contrary, as it would leave the ornaments themselves without an appropriate designation. It may, indeed, with great propriety be used much more extensively than has been the custom. The *finial* on the apex of a spire, pinnacle, or gable, in works of pointed architecture, is an acroterion; and in St. Paul's Cathedral in London, although the pediments over the entrance fronts have their acroteria, which are statues of some of the Apostles, yet the acroterion of the edifice is the cross which surmounts the grand central part of the composition. This term is not found in many ancient authors; we derive it from Vitruvius, who uses it in the plural sense abovementioned. Plutarch, in his life of Cæsar, makes use of it in the singular number, and in the purely architectural sense as we have rendered it.

ACT OF PARLIAMENT.—See STATUTE.

ACT (in the Universities). An exercise to be performed by students before they are admitted to their degrees. In the University of Oxford it has almost fallen into disuse, and in Dublin is a mere form; but at Cambridge it is still preserved as a preliminary test of the comparative merits of the candidates for the degree of Bachelor of Arts, who aspire to University honours. It is also performed by candidates for the degrees in law, physic, or divinity. The student proposes certain questions connected with his subject to the presiding officer of the *schools* (the place in which acts are kept), who thereupon nominates other students to oppose them. The discussion is carried on syllogistically and in Latin, and terminates by the presiding officer questioning the *respondent* or the person who is said to 'keep the act,' and his *opponents*, and dismissing them with a short compliment to each, in proportion to his deserts.

The severest exercise of this kind being that undergone by candidates for the degree of Bachelor of Arts, with *honours*, at Cambridge, we will describe it more particularly. The *moderator*, or examiner for the year, gives notice to a student that he is to keep an act; who thereupon writes three questions which he proposes to maintain and defend. The first is always from Newton's *Principia;* the second from any other mathematical subject; and the third from some metaphysical or moral writer. The following is an example of the form in which they are given:—

Rectè statuit Newtonus in Sectione primâ libri primi.

Rectè statuit Lagrangius in capite primo libri de theoria functionum.

Rectè statuit Lockius de principiis innatis.

The above signifies that the student intends to maintain the correctness of the first section of Newton's *Principia*, the first chapter of Lagrange's *Theory of Functions*, and the chapter of Locke on the *Human Understanding* which treats of innate principles.

The moderator, on receiving these, nominates three students, whose attainments, he thinks, will enable them to propose arguments on the other side. On the day appointed, the moderator having taken his chair, the *respondent* reads a Latin thesis, usually on the third subject; after which the opponents, in succession, propose their arguments against the several subjects, which, of course are usually ingenious fallacies. If the respondent can answer them, he does so; if not, the moderator endeavours, by questioning him, to find from what defect in his knowledge of the subject this arises. As each opponent is dismissed he is also questioned by the moderator, as above stated.

The chief purpose of an act now-a-days is to get a sort of notion of the qualifications of the candidates, as the examination is proportioned in severity to their supposed capacities. In older times, an act was a very important feature in obtaining a degree. A proceeding of the same kind is one of the forms observed in admitting or 'calling' to the Scotch bar.

ACT (in the Drama.) That portion of a play, which is separated from the rest by an interval, during which the stage is left empty, and the action is supposed to proceed unseen by the spectators. In the Greek drama there were no acts; although in some modern editions, such as Burton's *Pentalogia*, we find Greek plays thus divided. The language does not possess a word answering to the Latin and English *Act*. Among the Greeks the stage was never left empty from the beginning to the end of the performance; when the other actors retired, those forming the chorus still remained, and continued the business of the play by their songs. For these songs, it is important to observe, were in general essential parts of the drama; they were not of the nature of a piece of music, or a dance, or any other extrinsic representation, thrown in merely to fill up a chasm in the action; they carried forward the action in the same manner as the ordinary dialogue did. For an exact copy of the form of a Greek drama in this respect, the English reader may be referred to the *Sampson Agonistes* of Milton. In that play there is no division into acts; nor is there any such division in Buchanan's two Latin tragedies, entitled *Jephthes* and *Baptistes*, which are also professedly composed upon the Greek model. The latter poet, we may add, has followed the same plan in his translations of the Medea and the Alcestis of Euripides. From this constitution of the Greek drama, it naturally followed, that the real duration of the action of any play could not well be supposed greatly to exceed that of its theatrical representation. In other words, what has been called the Unity of Time became a principle almost invariably observed in every dramatic composition. On the Roman stage there was no chorus, and the play was divided into acts, as on our own. But, although Plautus has frequently in his comedies supposed a considerable portion of time to pass between the close of one act and the opening of another, the most famous of the Latin dramatists, Terence, has not availed himself of this liberty, but has adhered closely to the practice of his Grecian models, in not permitting the interval between the acts to form more than a very short interruption of the progress of the story. By modern dramatists, however, the practice of dividing a play into acts has generally been taken advantage of to extend the time of the story greatly beyond the space to which it was necessary to confine it on the Greek stage. Each act, in fact, is now what the Greeks would have called a separate drama, except that it does not contain a complete plot; and the whole play may be compared to those Trilogies of the Greeks, in which three dramas, representing so many successive separate parts of the same history, followed one another in one theatrical exhibition. Perhaps it was this consideration which made the Romans call each of the separate portions in question an *Act* or *Actus;* for that word is exactly a translation of the Greek δρᾶμα, which was used to designate an entire play. The term, therefore, may be taken as in its original and proper sense, denoting a distinct, and, to a certain extent, independent theatrical action or picture, although capable also of being introduced as one of a series of such pictures, united by some common subject. And this is precisely what Shakspeare must be understood to mean, when, in the famous speech which he puts into the mouth of Jaques in *As you like it*, comparing the world to a stage, he goes on to say, 'One man in his time plays many parts, his *acts* being seven ages.' The infant, the school-boy, &c., are *acts*, only in the sense of being so many separate pictures or exhibitions of human life, each complete in itself, although following each other according to a natural order of succession, like the acts of a play. Viewed in this light, it will be perceived, that the division into acts, is really that distinction of the modern drama which more than anything else gives to it its peculiar character. Dr. Johnson has observed, in modern plays, 'The time required by the fable elapses, for the most part, between the acts; for of so much of the action as is represented, the real and poetical duration is the same. . . . . . The drama exhibits successive imitations of successive actions; and why may not the second imitation represent an action that happened years after the first, if it be so connected with it, that nothing but time can be supposed to intervene. Time is, of all modes of existence, most obsequious to the imagination; a lapse of years is as easily conceived as a lapse of hours.'—*Pref. to Shakspeare.*

We may here remark, that although the French dramatic writers have adhered to the principle of leaving the stage empty only at the end of an act, many of the English have followed a different practice. In Shakspeare particularly, every successive scene uniformly presents a new set of characters, and most commonly a change of place also. He rarely interrupts the action, however, for any considerable space, except during the interval between two acts; but here he does not hesitate to pass over any length of time he may find convenient. In the *Winter's Tale*, Perdita, who was a new-born infant at the end of the third act, is grown-up a young woman at the beginning of the fourth. In this instance, indeed, the dramatist introduces Time to explain and apologize for the licence he had taken to

> ———— 'Slide
> O'er sixteen years, and leave the growth untried
> Of that wide gap.'

Time is here said to appear 'as Chorus;' and in the beginning of Henry V., Chorus is also brought forward to request the audience to allow their thoughts in the course of the representation to pass from one place to another—

> ———— 'Jumping o'er times;
> Turning the accomplishment of many years
> Into an hour-glass.'

Neither of these personages, however, performs exactly the office of the ancient chorus.

We may add, that the old English Mysteries and Moralities, the first produce of our national dramatic genius, were long destitute of any division either into scenes or acts. This is the case, for instance, with Parfre's Mystery entitled *Candlemas Day, or the Killing of the Children of Israel*, written in 1512, and first printed in Hawkins's *Origin of the English Drama.* In this performance there are not even any stage-directions. The Morality of *Every Man*, printed early in the reign of Henry VIII., and that of *Hycke Scorner* of the same age, are, in like manner, without either stage-directions or any division into acts or scenes. In the Morality of *Lusty Juventus*, again, which was published in the reign of Edward VI., there are stage-directions, but still no mention of acts or scenes. The earliest of the Moralities which assume the regular dramatic shape are not more ancient than the beginning of the reign of Elizabeth. Moralities continued to be both printed and acted long after this date. We may mention, among others which appeared after Elizabeth came to the throne, Skelton's *Life and Repentance of Mary Magdalene*, 1567; *The Marriage of Wit and Science*, 1570; *The Conflict of Conscience*, 1581; *The Three Lords of London*, 1590; &c. Even Mysteries were performed in the reign of Mary. Nay the Chester Mysteries were performed in the year 1574. Down to this time there is every reason to believe that the scene never was changed from the beginning to the end of any stage-spectacle. As for the Moralities, they were acted even in the reign of James I., and they are enumerated under the name of 'Morals' in the licence granted to the company of which Shakspeare was a member in 1603. But even several of our early tragedies and comedies, down to an era subsequent to this, were without any division into either scenes or acts. There is no such division in Preston's *Cambises*, the play to which Shakspeare is supposed to allude in *Henry V.*, and which the author entitles *A lamentable Tragedy mixed full of pleasant Mirth*, printed in 1561; nor in Peele's *David and Bethsabe*, which appeared in 1579. In the tragedy of *Soliman and Perseda*, 1599 (supposed to be by Kyd), there are acts, but not scenes; but there are neither one nor other in Dekker's *Satiromastix, or the Trussing of the Humorous Poet*, nor in the comedy of the *Wily Beguiled*, both of which appeared after the commencement of the seventeenth century, the latter so late as 1623.

Much discussion has taken place among the critics on the reasons of the rule which restricts a regular dramatic composition to the extent of neither more nor less than five acts; and which Horace, in his Art of Poetry, has laid down in a peremptory and well-known verse. Upon this subject the French writer, Marmontel, has delivered a very sensible judgment:—'The established usage of distributing a tragedy into five acts, neither stands upon such a foundation as to constitute it an essential law, nor is it so unreasonable as to deserve to be banished from the theatre. When the subject is such as to furnish that number, five acts allow a desirable extension to the action; in that space great events find room; great interests and great characters have freedom to develop themselves; the situations lead in each other; one incident announces the next; the sentiments are introduced without bluntness or harsh collision; the movement of the passions has time to attain the requisite acceleration, and the interest to grow to the highest degree of pathos and intensity. It has been found by experience that the attention, the illusion, and the emotion, which a spectacle of this duration excites, are not too great for the audience. * * * But the subject may be naturally such, as, not affording room for more than two or three points of repose, not to be susceptible of more than the same number of situations striking enough to form successive steps in the action. Must the subject in that case be abandoned, although pathetic, interesting, and teeming with beauties? or must it be overlaid with scenes and incidents that do not properly belong to it? By no means. The action must have its just extent given to it, and no more. The law of nature must be followed, which is superior to that of art.'—[*Encyclopédie*, Art. *Acte.*]

ACT of FAITH.—[See AUTO DA FÉ.]

ACTA DIURNA (proceedings of the day) was the title of a gazette, to use the nearest modern term, drawn up and published daily at Rome both under the republic and the empire. It appears to have contained an abstract of the proceedings of the public assemblies, of the law courts, of the punishment of offenders, an account of any public buildings or other works in progress, together with a list of births, deaths, marriages, and divorces, &c. In the very earliest times of Rome provision was made under a religious sanction for the due registration of birth, assumption of the *toga virilis* (or dress of manhood), and death, accompanied by the payment of a certain fee into the respective treasuries of the goddesses *Juno Lucina*, *Juventas*, and *Venus Libitina.* From the registers thus formed such extracts as were important might be made for publication. The law courts would furnish authority for the statement of divorces; and in this article of news there was no deficiency. Not a gazette appears, says Seneca, without its divorce, so that our matrons, from constantly hearing of them, soon learn to follow the example. The due supply of information on political and judicial affairs was to be obtained, as now, by reporters (*actuarii*). In the celebrated debate of the Roman Senate, upon the punishment of those who had been concerned in the Catilinarian Conspiracy, we find the first mention of short-hand writers, who were specially employed by Cicero to take down the speech of his friend Cato; and it is interesting to observe that this was the only speech of that extraordinary man which still existed in the age of Plutarch. But it must not be inferred from this fact, that these reporters or any other persons were at liberty to publish an account of any proceedings in the senate. Until the first consulship of Julius Cæsar the senate was a close court. This great man, by a ludicrously distorted view of Roman history, has been generally represented as the destroyer of his country's liberties, and he was doubtless prompted by motives of personal ambition; yet he no sooner entered upon his office than he made provision for giving the same publicity to all the proceedings of the senate which already existed for the more popular assemblies; and this single act was, perhaps, the most fatal blow which Cæsar gave to the aristocratic interest. [Suetonius, *Life of J. Cæsar*, c. 20.] Under the despotism of Augustus such an institution was inconvenient, and, therefore, repealed. The *Acta* of the senate, though, of course, still registered, were no longer published; and, as all the popular assemblies were now deprived of real authority, the *Acta Diurna* henceforward can have had little political interest. Even in its best days this state gazette was, no doubt, an extremely meagre document,—conducted as it was on government authority, without the advantages of competition, and what is still more important, without the possibility of extensive circulation; for what could a newspaper have been before the art of printing was discovered? Yet, with all these disadvantages, the *Acta Diurna* were often consulted and appealed to by the historians of after times, as documents of the highest authority. [For a more minute account, see Lipsius in his *Excursus* on the Annals of Tacitus. Lib. v. c. 4.]

ACTA ERUDITO'RUM, the title of one of the oldest and most celebrated literary and scientific journals. It began to be published at Leipzig in January 1682, under the conduct of the learned Otto Mencké, one of the professors of the university, assisted by several of his brother professors, and especially by Carpzov (Morhof, *Polyhistor*, i. 178. edit. 1747). The numbers, which were in 4to., appeared once a month. On the death of its original editor in the beginning of the year 1707, the management of the journal was undertaken by his son John Burchard Mencke; on whose death, in 1732, the charge devolved on his son Frederic Otto. The property of the work seems to have remained to the last in the hands of the Mencke family, or their heirs; but the latter editors were not men of distinguished name. The last was Charles Andrew Bel, professor of philosophy in the university, who, after managing the publication from 1754, died on the 4th of April, 1782. The volume for 1776, was only published in that same month. It was the last which appeared; although the publisher intimates his hope that the work will regain its ancient reputation, having thus got rid of the editor who had allowed it to fall so sadly into arrear, a matter, he remarks, concerning which the less that is said the better. The Acta Eruditorum was the first critical journal published in Latin; and it did not confine itself merely to reviews of books, but inserted also accounts of scientific discoveries, and of the general progress of mathematical and physical science. It was here that Leibnitz, who was a frequent contributor in the early period of the work, first announced his method of the differential calculus. In the hands of its early editors, it was considered to be admirably conducted; and Morhof congratulates his countrymen on having, in this publication, produced something which even commanded the approbation of foreigners, 'who rarely,' he is pleased to add, 'find anything done by us (the Germans) to their taste.' He mentions a translation of the Acta into French, which had been undertaken; but this undertaking does not appear to have proceeded beyond the first volume, which was published in 12mo. at the Hague in 1685, under the title of *Ouvrages des Savans, publiés à Leipzig*. After the first fifty volumes, coming down to the end of the year 1731, the journal took the name of the *Nova Acta*, or the New Acts. The first series, besides the fifty regular volumes, consists of ten supplementary volumes, one having been published every five years. Occasional supplements also appeared in the course of the new series; which, together with several volumes of Indices, make the complete work amount to 117 volumes.

Many other journals established in imitation of that of Leipzig also assumed the name of Acta; as, for instance, the *Deutsche* (or German) *Acta Eruditorum*, begun to be published in 8vo., at Leipzig, in 1712, and which was continued till 1740, the whole forming 20 volumes; the *Fränkische Acta Erudita et Curiosa*, a journal of French literature, published at Nuremberg, from 1726 till 1732; the *Deutsche Acta Literaria*, which began at Leipzig in 1715, but did not last above a year or two; &c. Under this head also we may notice the English journal, entitled the *History of the Works of the Learned*, of which the first monthly number appeared at London, in small 4to., in January 1699, and of which 13 volumes were published under that title, when it was discontinued at the end of the year 1711. The same title, however, was again adopted in 1737, by a periodical work which first appeared in 1735, under the name of the *Literary Magazine*, or *Select British Librarian*. It continued to flourish under its new designation till the year 1743, when it closed with the publication of its 14th volume. This publication is not to be confounded with another critical journal which appeared at London in 4to., in 1694, under the title of *The Works of the Learned*, by J. la Crose, a late editor of the *Universal Bibliotheque*. It continued only for a few years. The *Universal Bibliotheque* was an English translation, which was published for a short time, of Le Clerc's *Bibliothèque Universelle*, begun at Amsterdam in 1686. There was also a work called an *Historical Account of Books and Transactions of the Learned World*, which began to be published at Edinburgh in 12mo., in 1688. [See Watt's *Bibliotheca Brit.*] The title Acta has also sometimes been given to the published Memoirs or Transactions of Learned Societies.—[See ACADEMY, and SOCIETY.]

ACTÆ'A. Under the name of ἀκτῆ, the Greeks described a medicinal plant, which the moderns have ascertained to be what is now called *Sambucus ebulus*. [See SAMBUCUS.] Linnæus applied the name to a genus of perennial herbaceous plants found in various parts of Europe, and the north of Asia, and America, belonging to the natural order Ranunculaceæ, and only in a slight degree resembling the species intended by classical authors. The genus thus understood is known from all others of the Ranunculus tribe by its anthers being turned inwards, so that when they burst, the pollen may immediately fall upon the stigma, while its flowers have only four sepals and four petals. All the species have their leaves in many broad divisions, and their blossoms arranged in tall, branched panicles; these are followed by little fleshy, berry-like fruits, of a black, or white, or red colour. The properties of all the species are nauseous and deleterious, as might be expected from their affinity to the poisonous Aconite.

One species, *Actæa spicata*, a common European plant, is found in mountainous limestone tracts; and in Yorkshire it is often called Black baneberries, and also Herb Christopher. It has purplish-black juicy fruits, which would be dangerous from their tempting appearance, if the fetid odour of the leaves did not prevent their being touched.

Another species, the *A. cimicifuga*, a North American plant, derives its name from the belief that its fetid leaves have the power of driving away bugs.

ACTI'NIA, a genus of animals belonging to the sea nettles (*Acalephæ*, Cuvier), and distinguished by the form of their body, which is simple, cylindrical, soft, fleshy, and susceptible of contraction and dilatation. The same aperture, which serves for the mouth and the vent, is terminal, and margined with one or more rows of tentacula. These can be folded down into the aperture, and concealed under the outer envelope. When they are extended, they give the animal the appearance of a flower, increased by the lively colours with which they are adorned—a circumstance that has given rise to the popular names of *animal flowers* and *sea anemonies*, usually applied to the various species of *actinia*.

The internal structure of the genus was very carefully investigated by Dr. Spix, a Bavarian naturalist, well known by his travels in Brazil. Dr. Spix found in these animals an alimentary cavity, ending in a single aperture, very large at the lower end, and so elastic and contractile, that it could easily be turned inside out. The cavity is surrounded with flat muscles, running lengthwise and parallel. He also described a series of nervous ganglia, giving off filaments or branches; but no one has since been able to demonstrate their existence.

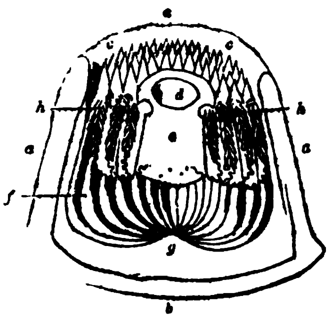
The egg organ (*ovarium*) in a female was found to be filled with small eggs, and was composed of three or four tubes, cylindrical, cohering, and forming by their union a sort of egg tube (*oviductus*), which opened into the stomach. These tubes communicate with the tentacula in such a manner that the eggs may either make their exit through them, or through the mouth. [These details, as will be presently shown, have not been fully borne out by the investigations of later observers.]

Baron Cuvier describes the parts in question as a rather complicated and obscure organization between the inner cavity and the outer skin, consisting chiefly of vertical and fibrous plates (*feuillets*), to which the egg organs adhere, similar to threads very much twisted. The intervals between these plates communicate with the tentacula; and it further appears that water can enter and escape through the minute

Fig. 1.

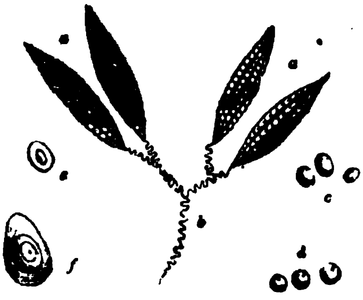
Small leathery animal flower (Actinia coriacea).

Fig. 2.



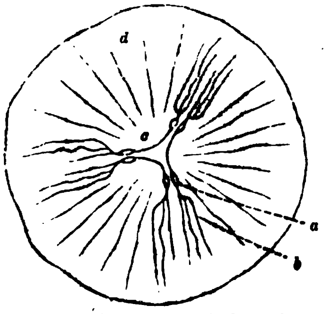
Vertical section of the above, to show its interior structure.
aaa. The skin.
b. The base, by which the animal is fixed to the rocks.
c. The three rows of feelers (tentacula).
d. The mouth.
e. The stomach.
f. Longitudinal muscles.
g. Point in which they unite.
h h. The ovaries, said to open by their oviducts into the stomach.

Fig. 3.



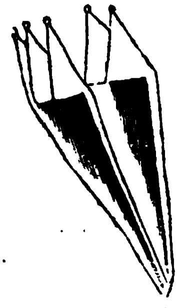
a a. The ovaries greatly magnified.
b. The oviduct.
c. Eggs.
d. Ditto, with the first appearance of the embryo.
e. Ditto, further advanced.
f. Ditto, ditto.

Fig. 4.



Dr. Spix's view of the nerves, at the base of the actinia.
a. The nervous ganglions.
b. Nerves.
c. Nerves of communication between the ganglions.
d. The longitudinal muscles.

Fig. 5.



Longitudinal muscles, with the feelers (magnified).
[These cuts are from the Annales du Museum, vol. xiii. plate 33.]

openings of these around the mouth; at least, the animal can thence squirt out water.

Recent researches have done much to elucidate the structure of the helianthoid polypifera. In particular, we may mention the researches of Teale, Agassiz, Siebold, Hollard, Dana, Burnett, and Cobbold, the general result of whose inquiries may be stated as follows:—

The stomach is formed in the young state by an involution of the integument of the ovum, after the cilia have disappeared, at which time also the tentacula and membranous septa are developed. In the adult actinia, there is a small opening at the base of the stomach, which communicates with the general cavity of the body and interseptal chambers. According to Hollard, the leaf-like laminæ or septa are not all of equal breadth, but are alternately broad and narrow; Mr. Teale has also shown, that but very few of them are prolonged and attached to the stomach throughout the whole extent of their inner border.

The integumentary system exhibits the ordinary epithelium, but in addition, develops a number of small and remarkable bodies, known as the stinging organs, which are so largely developed in the true acalephæ or jelly-fishes. These bodies, examined microscopically, appear to be cylindrical, fusiform or club-shaped cells, which contain in their interior a slender thread or filament, spirally twisted. Their presence has given rise to much misunderstanding, owing to their having been confounded with the muscular tissues lying immediately beneath. When any stimulus is applied to the integument, the spiral filament is suddenly uncoiled, and darted forth; and it is its adhesiveness when applied to the hand that gives rise to the peculiar nettling sensation, so familiar to all who have studied the habits of this interesting group of animals.

The thread cells in question were first discovered by Wagner, who confounded them with the spermatozoa of the same polyps, and which they somewhat resemble. The latest inquiries on this specialty are those of Agassiz and Dr. Burnett; they have shown that in some instances the thread or lasso-cells are of a most complicated structure—the surface of the filaments being covered with minute cilia or barbles, arranged in a spiral manner around the filament or projectile. We must here refer the reader for further details on this score to Agassiz's *Memoir on Astrangia Dana*, just published in the sixth volume of the 'Smithsonian Contributions to Knowledge.' In reference to the organs of reproduction, the observations of Teale and Dana are worthy of notice. According to the former, the ovaries of actinia number about 200, and each of them consists of several horizontal plaits, which are made up of a membrane folded on itself, and enclosing the ova in its interior. The testes, which are recognised by their contained spermatozoa, are placed close beside the ovaria, and present the characteristic of vermiform tubuli; they are much contorted, and supported by a membranous fold or mesentery. These latter processes are commonly seen projecting from the bodies of actiniæ after they have been torn or rudely detached from the rocks.

The young polyps first appear in the form of ciliated ova; they escape into the ovarian chambers; there they become fertilised, and ultimately make their exit by the stomach and mouth. This last-mentioned fact was first ascertained by Spix, and it has since been confirmed by the late Sir J. G. Dalyell, Dr. Cobbold, and several other observers. When the young have attained the condition of completely tentaculated polypes, they very much resemble in their appearance and behaviour the ordinary *Hydræ;* they have been observed to move about by means of the tentacula, and having selected a favourable spot, to attach themselves by the base, and in this way they become more or less permanently fixed for life, deriving their nourishment in the same manner as the parent actinia.

A strong light incommodes the *actiniæ*, noise startles them, they are affected by odours, and fresh water causes them to die. These various feelings originate in their great irritability, which appears to increase according to their sufferings. They can support a temperature as low as 45°, and up to 140°, Fahr.; but beyond these extremes they perish. They are often left exposed to the air during spring-tides; but in such cases they always retain a great quantity of water, which they squirt out with force when molested.

These singular creatures have a power of reproduction equal to that so well known in the fresh-water polypus. (*Polypus viridis*, Bory.) They may be cut perpendicularly or across, and each cutting will give origin to a new animal. According to Dalyell, a natural process of self-fission obtains in *Actinea lacerata*, and sometimes the base of the old animal is dissevered, a portion remaining attached to the rock, where it continues to live, increasing in size, becoming more and more rounded, while, in a short time, a mouth, stomach, and tentacula are formed, presenting, to the surprise of the observer, a complete *actinia*. At length, the side portions of this base give out globules, which are detached, fix them selves upon adjacent rocks, where they grow, and produce a new colony like the parent animal.

The *actinia* feed upon *medusæ*, and other small crustaceous and molluscous animals and fishes, which they seize with their tentacula, and afterwards disgorge what they cannot digest. They are found in every sea, some suspended from the vaults of sub-marine reefs, others covering the more exposed sides of rocks with a sort of flower-like tapestry, and some confining themselves to the smooth sands, on the surface of which they spread out their tentacula, and even withdraw under the sand when danger threatens. Each species, indeed, generally selects a peculiar haunt. With the exception of the green species (*Actinia viridis*, Forskal), none of them sting when touched in the manner of the *medusæ*.

Many of the species are used as food in tropical countries, on whose coasts they are more numerous than in colder climates. Of those found in a submarine rock-basin at Barbadoes, we have a curious account by Hughes, in his Natural History of the Island.

'In the middle of the basin,' he says, 'there is a fixed stone or rock, which is always under water. Round its sides, at different depths, seldom exceeding eighteen inches, are seen, at all times of the year, issuing out of little holes, certain substances that have the appearance of fine radiated flowers, of a pale yellow, or a bright straw colour, slightly tinged with green, having a circular border of thick-set petals, about the size of, and much resembling, those of a single garden marigold, except that the whole of this seeming flower is narrower at the discus, or setting on of the leaves, than any flower of that kind.

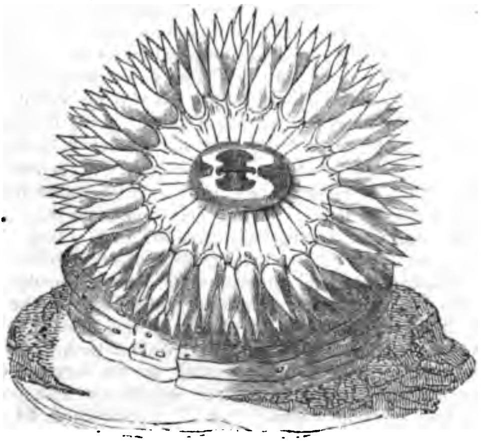
'I have attempted to pluck one of these from the rock, to which they are always fixed; but never could effect it: as soon as my fingers came within two or three inches of it, it would immediately contract close together its yellow border, and shrink back into the hole of the rock; but, if left undisturbed for about four minutes, it would come gradually in sight, expanding, though at first very cautiously, its seeming leaves, till at last it appeared in its former bloom. However, it would again recoil, with a surprising quickness, when I came within a little distance of it. Having tried the same experiment, by attempting to touch it with my cane and a small slender rod, the effect was the same.

'Though I could not by any means contrive to take or pluck one of these animals entire, yet I once cut off (with a knife which I had held for a long time out of sight near the mouth of a hole out of which one of these animals appeared) two of these seeming leaves. These, when out of the water, retained their shape and colour; but being composed of a membrane-like substance, surprisingly thin, it soon shrivelled up and decayed. Many people coming to see these strange creatures, and occasioning some inconvenience to a person through whose grounds they were obliged to pass, he resolved to destroy the objects of their curiosity, and, that he might do so effectually, caused all the holes out of which they appeared to be carefully bored and drilled with an iron instrument, so that we cannot suppose but their bodies must have been entirely crushed to a pulp; nevertheless, they appeared in a few weeks from the very same places.'

Twenty-five species of *actinia* have been described, but many of them not with sufficient distinctness, and it is probable many more will be ultimately ascertained. The following are not uncommon:—

The leathery animal-flower (*Actinia senilis*, Gmelin), which is three inches broad, with a leathery, unequal envelope of an orange colour; the tentacula in two rangs, usually marked with a rose-coloured ring. Its abode is usually in the sand.

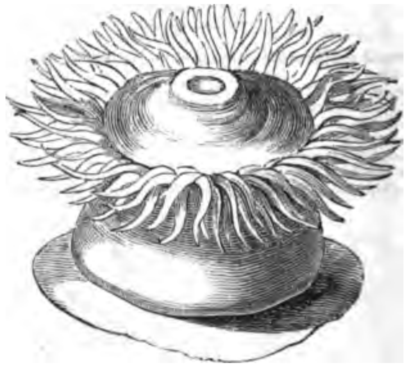
Fig. 6.



Great leathery animal flower (A. senilis).
[This, and the remaining figures, are from Ellis, Phil. Trans., vol. lvii.]

The purple animal-flower (*Actinia equina*, Dicquemare), which has a soft skin, finely striated, usually of a beautiful purple, often clouded with green. The tentacula, to the number of a hundred, vary much in colour. When the tide retires, this species may be seen ornamenting the sea-rocks with its beautiful colours—'purple, violet, blue, pink, yellow, and green, like so many flowers,' says M. Lamouroux, 'in a meadow.

Fig. 7.



Purple animal flower (A. equina).

The white animal-flower (*Actinia plumosa*, Cuvier) is four or more inches broad, of a white colour; the margins of the mouth expanded into lobes, all furnished with innumerable tentacula. There is an inner row of these, still larger.

Fig. 8.

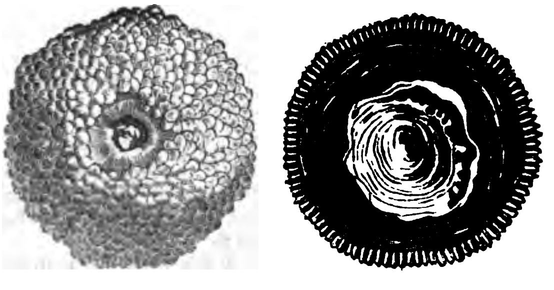
White animal flower (A. plumosa).

The brown animal-flower (*Actinia effæta*) is of a clear brown, radiated lengthwise with white, and of a longish shape, often contracted at the base. The skin is glistening; the tentacula numerous. When it contracts itself there frequently issue from the mouth long filaments, which come from the egg organs (*ovaria*). It attaches itself chiefly to shells, and is very common in the Mediterranean.

The carnation animal-flower (*Actinia Jordaica*, Linnæus) has very numerous tentacula, which are of a deep crimson, and, when expanded, give the animal the appearance of a fine double carnation. The inhabitants on the shores of the Mediterranean, particularly the Italians, esteem this species as very delicate for the table.

Dr. Rüppel subsequently divided from the other *actinia* those whose tentacula are branched (*Thalassiantha*, Rüppel), and those whose tentacula are so short as to be scarcely obvious (*Discosoma*, Rüppel).

Fig. 9.



Upper part. Base
Animal sunflower (A. helianthes).

ACTINOLITE, a crystallized mineral of a green colour, a variety of hornblende, found in primary stratified rocks, and occasionally in trap-rocks. The name is derived from ἀκτίν (*actin*), a ray of light, and λίθος (*lithos*), a stone, from the crystals being arranged in the form of rays.

ACTION (in law) is the mode of proceeding by which a man seeks to recover, through the intervention of the law that which is legally due to him: it has been defined by some ancient writers to be 'a lawful demand of one's right;' and by others, 'the right of a man to prosecute by a judicial proceeding that which is his due.' The general object of actions is to put a party into possession of a right of which he has been injuriously deprived by another. This may be effected, where lands or goods are wrongfully withheld, by the actual delivery of them to the legal proprietor; but in the case of assaults, slander, breaches of contract, or other personal wrongs, the only possible remedy is to award to the sufferer a pecuniary compensation for the injury he has sustained. By the law of England, certain specific forms are appointed in which legal remedies are to be enforced in the infinite variety of disputes and controversies arising between individuals. The various modes and instruments by which those remedies are pursued and obtained are, in popular language, called actions or suits. The term 'action' is usually applied in the English courts to litigation in the Courts of Common Law as distinguished from Courts of *Equity*, where the term 'suit' is used.

Actions in England are usually divided into three kinds, according to the subjects of them—namely, real, personal, and mixed.

Real actions are so called because they exclusively refer to real property, or subjects connected with land. The law regards this as the highest kind of property, and distinguishes it from all other or *personal* property by the name of *real*. Real actions are brought for the recovery of lands or tenements, rents, advowsons, or other hereditaments. Real actions were, in the earlier periods of the history of English law, of constant and daily occurrence; and our ancient books of reports are principally occupied with cases in pleas of land, which, before the country had attained to commercial importance, was the most valuable and ordinary species of property, and, consequently, the most fruitful source of litigation. From the nicety and inconvenient length of the process, they are at the present day almost entirely discontinued; and more simple and expeditious modes of trying titles to land by mixed and personal actions are generally introduced.

Personal actions are by far the most numerous class of actions. It is by them that the innumerable differences respecting debts, promises, and contracts are settled; and that compensation is sought for personal insults and injuries of almost every description, including even some of the minor crimes and misdemeanours, which thus become punishable both as crimes and as civil injuries.

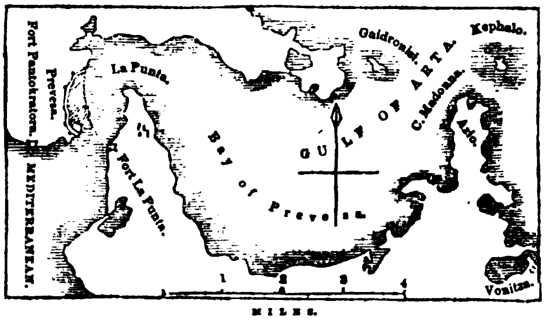
Mixed actions partake of the nature of both the former actions, being brought for the recovery of lands, and also for personal damages—either for some injury done to the land, or some other wrong, such as the illegal detention of it from the proper owner. The action of waste is a good example of this; the owner of the inheritance brings his action against the tenant for life who has committed waste on the land by cutting down trees or otherwise. In this action, he not only recovers the place upon which the waste was committed (which, if it were the only effect, would make it a *real* action), but by the statute of Gloucester he is entitled to treble damages as a *personal* compensation for the injury done to the land; and thus both kinds of action being joined together, give to the compound the denomination of a *mixed* action.

The outline of the general course of proceedings in an action at law is as follows:—The injured person (called the plaintiff) obtains a *writ* against his adversary (the defendant), who, upon being taken by virtue of the writ, gives *bail* in order to secure his appearance at the trial. When this is done, the plaintiff makes a written statement or *declaration* of the ground of his action, and prays to be restored to his right, or compensated for the injury which he alleges himself to have sustained. The defendant then *pleads*—that is, answers the declaration by contradicting the allegations contained in it; asserting his own right, or justifying his conduct: to this the plaintiff may reply; and thus the parties may continue to altercate in legal language, or special pleading, until one or more material questions of fact are distinctly asserted by one party and denied by the other. These questions, which are called the *issues* in the cause, are then to be tried by the jury, who, after hearing the *evidence* of both parties, give their *verdict* either for the plaintiff or defendant. In pursuance of this verdict, the *judgment* is pronounced by the judges of the court to which the proceeding belongs, and the judgment is *executed* by the sheriff or other proper officer. The issue, however, may be an *issue in law*, as it is called—that is, an issue assuming or admitting the fact as pleaded, but denying the legal consequence sought to be put upon the fact. This issue in law is raised by what is called a *demurrer*, or an 'objection to the relevancy,' as the Scotch lawyers say; and it is at once argued before the court, whose judgment upon the issue in law or demurrer usually ends the litigation. Until lately, it was not permitted to a defendant both to plead and demur. He had to make his election, and in either case *final* judgment was pronounced. But now, by the 15 and 16 Vict. c. 76, called the Common Law Procedure Act, a defendant may plead and demur at the same time.

ACTIUM, a point of land at the entrance of the Ambraciot bay, now the gulf of Arta, which derives its chief importance from the sea-fight which took place near it in the bay of Prevesa, between Cæsar Octavianus, afterwards the Emperor Augustus, and Marcus Antonius, B.C. 31. The latter was completely defeated, and fled with his mistress Cleopatra, who was present at the engagement, into Egypt.

The conqueror, to commemorate his victory, beautified the temple of Apollo which stood at Actium, and erected NICOPOLIS, or 'the city of victory,' on the northern side of the gulf, a few miles from the present city of Prevesa. In the article 'Achæa' we stated that Tacitus includes Nicopolis in the limits of the Roman province of Achæa; and of course Actium also would be comprised within the same political division. We find it still impossible to fix the northern limits of Achæa with accuracy; but we may here remark that what we called the Roman province of Epirus was probably contained within the limits of the extensive government of MACEDONIA.

The exact site of Actium has been a subject of dispute, some placing it at La Punta, or Fort La Punta, and others at Azio, as represented in the accompanying plan, which is taken from a recent survey. The plan shows only part of the gulf of Arta (see ARTA). The name Azio would appear to favour the supposition of this point being the ancient Actium, but it is merely a Venetian term, probably given through some misunderstanding as to the locality of Actium. Strabo says that Actium is that point which forms one side of the entrance of the bay, and it is also clear from what he further says, that he considered the entrance of the bay to be between Prevesa and fort La Punta. He also gives to this passage a width of a little more than four stadia, or half a mile, which appears from the plan to be true when applied to the first narrow entrance, but not to the second. Anactorium, a place about four miles from the temple of Apollo which stood at Actium, is described by Strabo as 'situated *within* the bay,' while Actium 'makes the mouth of the bay.' According to this statement Actium is La Punta, and Cape Madonna is at or near Anactorium. To make it still clearer to his readers, Strabo, after describing the coast *northwards* of the entrance of the bay, comes to the *entrance* itself, following the line of coast, and this word *entrance* can only be applied to the strait of La Punta. 'Near the entrance on the right,' says Strabo, 'is the sacred place of Apollo of Actium, an eminence with a temple on it, and below, a plain with a grove of trees and a dock-yard.'



This description is said by some to suit C. Madonna better than La Punta, because Madonna is high and Punta low. But Strabo says the temple is on an eminence, and this eminence some distance from the sea; he does not say that the temple was on an eminence, which eminence was on the sea.

Actium is a name derived from a Greek word *acte*, which, in a geographical sense, is worth explaining. An *acte* is a piece of land projecting into the sea, and attached to another larger piece of land, but not necessarily by a narrow neck. Thus, the projecting land on which La Punta and C. Madonna stand can both have the name of *acte*. Herodotus calls Asia Minor itself an *acte* compared with the whole of Asia; and Africa itself (which he believed to be much smaller than it is) an *acte*, projecting from the mass of Asia.

ACTIVE MOLECULES, in plants, are extremely minute, apparently spherical, moving particles, found in all vegetable matter when rubbed in pieces and examined under very powerful microscopes. In size they vary from the $\frac{1}{15000}$ to $\frac{1}{20000}$ of an inch in diameter, and are only to be detected with lenses capable of magnifying at least 300 diameters. Viewed under favourable circumstances, immersed in water, and with transmitted light, they are seen to have a rapid motion of an oscillating nature, so that a minute drop of the fluid in which they swim seems to be as it were alive. In the pollen of plants they are extremely numerous, and perfectly distinct from each other, so that a grain of pollen crushed in water is one of the best subjects for the observer to select; he will there find the active molecules mixed with [*fovilla* or] cylindrical particles, of a larger size, and equally in motion; the latter are the spermatic granules, by the agency of which the fertilization of plants probably takes place, as will be hereafter explained under the article POLLEN. To find the active molecules in other parts of plants, it is necessary that they should be crushed and rubbed in water till it becomes greenish; a drop of the coloured fluid will be found to contain vast numbers of these molecules moving about with great rapidity and exhibiting every appearance of animal life. Curious as these circumstances undoubtedly are, it is still more singular that the movements of the molecules do not cease with the life of a plant; on the contrary, they have been witnessed by Dr. Brown even in the fossilized remains of vegetables, and may be readily seen by colouring water with the dead vegetable matter called Gamboge, when the molecules are instantly set at liberty and commence their motions.

It appears from these facts that if plants are reduced to their organic elements, they are all composed of the same simple molecular matter, in different states of combination; that the huge mahogany trees that form our furniture, and the humble lichen that encrusts our ancient buildings, are alike composed of similar particles, which are capable of motion when at liberty; that they lose that power, and apparently their separate life, when they are combined by the irresistible laws of nature into other beings of a more complicated structure, but still forming life; that their inherent vitality does not cease with that of the object into which they have been combined, but endures through many ages even when buried in the bowels of the earth; and, finally, that their original powers are restored to them the instant they are liberated from their prison.

It has been thought by some, that the motions above described could be accounted for by evaporation, or by the unstable equilibrium of the molecules in the fluid in which they are suspended, or by currents in the fluid, or by a slow but gradual dissolution of the molecules, or by attractions and repulsions among the molecules themselves; but it is difficult to reconcile with such hypotheses the following ingenious experiments of Dr. Brown, the great observer of these phenomena, to whom the world is indebted for the most accurate information upon the subject. Take a drop of water in which a small quantity of the molecules is known to be floating; mix it well, by shaking it violently, among a much larger quantity of almond oil; the water will then be divided into extremely minute globules, each of which will be inclosed in a coating of oil; if the smallest of the globules, thus obtained, be examined, they will be found to contain two, or three, or even one only of the molecules, caught, as it were, in a trap, where they may be kept for many weeks and observed. Under such circumstances, no alteration whatever can be discovered in their movements, which continue the same as before the water in which they float was coated with oil. The inversion of this experiment by mixing a small quantity of oil, in like manner, among a large quantity of water, produces drops no bigger than the molecules themselves; but these drops, when mixed with the molecules and observed under precisely the same circumstances, exhibited no movements whatever.

For further information upon this subject, see Brown's *Account of Microscopical Observations*, made in June, July, and August, 1827.

ACTON, JOSEPH, the prime minister of the court of Naples for several years, was the son of an Irish gentleman who practised medicine at Bensançon, in France. He was born in 1737. He was originally in the French naval service; but subsequently obtained the command of a frigate from Leopold, Duke of Tuscany. In an unsuccessful expedition against Algiers, in 1774, in which the government of Tuscany co-operated with that of Spain, Acton commanded the Tuscan vessels; and by his gallant conduct succeeded in saving three or four thousand Spanish soldiers, who must otherwise have perished. His good conduct here was the cause of his advancement. He was recommended to the service of the king of Naples. His intriguing disposition secured him the favour of the king and queen of Naples; and he was successively minister of the navy, of war, of finance, and ultimately became prime minister. In his policy he was constantly opposed to the French party in Italy. Many of the persecutions for political opinions, and the violations of justice, which occurred at Naples subsequent to the period of the French invasion, in 1799, are ascribed to the power or the influence of Acton. He is said to have died in obscurity in Sicily, in 1808.

ACTOR and ACTRESS.—[See DRAMA.]

ACTS OF SEDERUNT (in the municipal law of Scotland) are statutes made by the Lords of Session, by virtue of a Scottish Act of Parliament, passed in 1540, empowering them to make such constitutions as they may think expedient for ordering the procedure and forms of administering justice. These are called Acts of *Sederunt* because they are made by the Lords of Session *sitting* in judgment.

ACTS of the APOSTLES.—[See APOSTLES.]

ACTUARY, a word which, properly speaking, might mean any registrar of a public body, but which is generally used to signify the manager of a joint-stock company under a board of directors, particularly of an insurance company; whence it has come to stand generally for a person skilled in the doctrine of life annuities and insurances, and who is in the habit of giving opinions upon cases of annuities, reversions, &c. Most of those called actuaries combine both the public and private part of the character.

An actuary combines with the duties of a secretary those of a scientific adviser to the board which gives him his office, in all matters involving calculation, on which it may be supposed that the members of the latter are not generally competent to form opinions themselves.

The name has a legal character from its being recognised in the statute 59 Geo. III. c. 128 (or the Friendly Societies' Act of 1819), which enacts that no justice of the peace shall allow of any tables, &c., to be adopted in any Friendly Society, unless the same shall have been approved by 'two persons, at the least, known to be professional actuaries, or *persons skilled in calculation*,'—a definition much too vague to be any sufficient guide. The Committee on Friendly Societies of 1825 reported that 'petty schoolmasters or accountants, whose opinion upon the probability of sickness and the duration of life is not to be depended upon,' had been consulted under this title, and recommended that the actuary of the National Debt Office should be the only recognized authority for the purposes above-mentioned; in which recommendation the Committee of 1827 joined. In the 10 Geo. IV. c. 56, however, no alteration appears in the law on this point. We may further mention that, by the Act of 1819, no Friendly Society can be dissolved, or any division of money made otherwise than in the ordinary course, without the certificate of two actuaries, that the interests of all the members have been consulted in the proposed dissolution or payment.

ACULEUS, or PRICKLE, in Botany, is a hard, conical, often curved, expansion of the bark of some plants, such as the rose, and is intended either for their defence against enemies, or to enable them to hook themselves upon their neighbours, so as to gain a more free access to light and air, or for other purposes unknown to us. The prickle is composed entirely of cellular tissue, which is at first soft and flexible, and only acquires its hardness and rigidity when old. In some respects it may be compared to a hair, from which it chiefly differs in its large size and greater permanence. Care must be taken by the young botanist not to confound the prickle with the spine or thorn, which is of a totally different nature. [See SPINE.] They may be distinguished by the prickle breaking readily from the bark, leaving a clean scar behind; while the spine cannot be torn off without rending through the bark into the wood itself. Leaves are often metamorphosed into spines, but never into aculei. [See METAMORPHOSIS OF PLANTS.]

ACUPUNCTURE, a term used to denote the insertion of a needle into the skin or flesh. Acupuncture is an operation which has been long in use in eastern countries, and which appears to have been adopted there from the notion that several diseases attended with severe pain arise from air or vapor pent up in the body, to which a puncture with a needle affords an outlet, and thereby removes the malady. Europeans travelling in those countries several times witnessed the practice, and were struck with the results; but either their reports were not credited, or the operation appeared to the physicians and surgeons of Europe so unpromising, that upwards of a century elapsed after the knowledge of it was familiar to many European practitioners, before a single trial of it was made. As long back as the year 1679, a medical officer in the East India Company's service states that a guard of the Emperor of Japan, appointed to conduct the English to the palace, was seized with violent pain of the abdomen, attended with vomiting, in consequence of having drank a quantity of iced water when heated. After trying in vain to relieve his complaint by taking wine and ginger, and conceiving that his suffering arose from air or vapor pent up in the walls of the abdomen, to which vapor the insertion of needles into the skin would afford an exit, he underwent the operation of acupuncture in the presence of the narrator, which was performed in the following manner;—He laid himself upon his back, placed the point of a needle upon his abdomen, struck its head with a hammer once or twice to make it pass through the skin, turned it round between the forefinger and thumb till it entered to the depth of an inch, and then, after about thirty respirations, withdrew it, and pressed the punctures with his fingers, to force out the imaginary vapor. After having made four such punctures, he was instantly relieved, and got well. Some years afterwards, a physician, who accompanied a Dutch embassy to Japan, confirmed this account, by the statement that the Japanese are in the constant habit of performing this operation in various disorders attended with acute pain, and that he himself frequently witnessed the instantaneous cessation of the pain as if by enchantment. No further notice appears to have been taken of this mode of treatment in Europe for upwards of a century, when it was alluded to by the celebrated Vicq-d'Azyr, in the Encyclopédie Méthodique, merely for the purpose of congratulating the world that the statements of Ten Rhyne and Kæmpfer, the physicians who had given the first accounts of it, had not induced any European physician or surgeon to practice it. In the year 1810, however, some trials of it were made by Dr. Berlioz, a physician of Paris, who found, or fancied he found, it so efficacious a remedy, that he was induced to employ it very extensively, and many French practitioners imitated his example with the same apparent results. It has been subsequently tried in England, and sufficient experience of it has now been obtained to prove that the operation itself is attended with little or no pain, and that it may be employed at least with safety, if not with advantage.

There are two cases in which it seems likely to be beneficial,—first, in painful local affections unattended with change of structure in the part diseased, and without local inflammation or general fever,—and, secondly, in that species of dropsy termed anasarca, in which the water is accumulated in the cells of the cellular membrane that lies immediately beneath the skin. It is probable that all the cases of the first class consist of disordered states of the nerves of the parts affected, technically termed cases of NEURALGIA. There cannot be a question that this remedy has proved beneficial in cases of this kind sufficiently often to warrant the trial of it, whenever these disorders do not yield to the ordinary modes of treatment, and under these circumstances there is the greater reason for resorting to it, since the operation occasions no pain, and since no evil consequence of any kind has ever been known to result from it. But if the part affected be inflamed, and more especially if there be any degree of febrile action in the system, the acupuncture of the part will certainly do no good, and will very likely produce mischief.

In anasarca a few punctures made with the needle will allow a ready exit to the fluid, which may continue to drain during several days in succession; and when this is the case, it invariably affords relief, and sometimes saves, and oftener prolongs, life. Scarification is a remedy of the same kind in ordinary use, but the inflammation that results from this practice is sometimes severe, and occasionally runs into mortification. Acupuncture is affirmed by many who have made trial of it to be equally effectual, and to be much less apt to be attended with these evil consequences.

The needles employed in oriental countries are always made of the purest gold or silver; those of gold are preferred, and great care is taken to obtain them well tempered. In China their manufacture is a distinct occupation, understood by few, and those few are licensed by the emperor. Some of these needles are fine, about four inches in length, with a spiral handle, for the purpose of more easily turning them, and are kept by means of a ring, or a piece of silk thread, in grooves, each capable of holding one needle: the grooves are formed in each side of a hammer, usually made of the polished horn of the wild ox, ivory, ebony, or some other hard wood; the hammer is rather longer than the needle, and has a roundish head, covered on the side that strikes with a piece of leather, and rendered heavier by a little lead within. The needles employed in Europe are of steel, long and fine, and furnished either with a knob of sealing-wax at their head, or, what is more convenient, a little handle of ivory or wood, screwing into a sheath for the needle. They are best introduced by a slight pressure, and a semi-rotating motion, between the thumb and forefinger, and withdrawn with the same motion. In cases of neuralgic pain the needle should be allowed to remain in from a quarter of an hour to two hours. It would appear, that in cases of this kind, a number of needles introduced, and hastily withdrawn, is not as effectual as the introduction of a single needle that is allowed to remain for the space of a couple of hours. When the only object is to afford an exit to the fluid collected in anasarca, of course the mere puncture is sufficient; there is no use in allowing the needle to remain.

AD LIBITUM (Latin, or *ad lib.* in Music), *at discretion, at pleasure*, denotes that the performer is at liberty to pause, or to introduce any cadence or addition of his own, according to his judgment. An accompaniment is said to be *ad libitum*, when it is not essential, and may be either used or omitted, as circumstances may require, without materially affecting the composition.

ADA'GIO, in Music, an Italian adverb, signifying *slowly, leisurely*, and used to indicate the slowest movement in music: though some writers, and among them Rousseau, have ranked *Largo* as a degree slower; but an examination of the works of those who were the earliest to use both terms, as well as of the practical interpretation of the best and most correct composers, will be sufficient to shew the error.

It is now, and has long been, the custom to point out the quickness or slowness, as also the manner or character, of a piece of music, by some Italian word, placed at the beginning of the composition. These are sometimes very inadequate to the purpose, and much is commonly left to the judgment of the performer, which but too frequently cannot very safely be relied on. The use of the metronome [see METRONOME], or, indeed, of any other kind of pendulum, which is gaining ground in spite of prejudice, fixes the intention of the composer as regards movement, that is to say, quickness or slowness. With respect to style, to the passion meant to be expressed, much must still depend on the taste and intelligence of those to whom the execution of a work is entrusted.

The five principal terms denoting the degrees of motion, beginning from the slowest and proceeding to the quickest, are—

Adagio, very slow.
Largo, slow.
Andante, a moderate time.
Allegro, quick.
Presto, very quick.

Other terms relating to slowness or quickness, are but modifications of the above.

The word *Adagio* is also used substantively: thus we say, an *Adagio* of Haydn.

The real knowledge and taste of a performer is best developed in his mode of treating an *Adagio*. What is commonly called execution, or the rapid motion of the fingers, is purely mechanical, and demands neither sensibility nor discrimination; it is a kind of sleight-of-hand, which any one by dint of animal labour may acquire: but to give true effect to a slow movement, the performer must, in addition to considerable experience and a pretty extensive acquaintance with the best schools of music, possess strong feeling, must play, or sing, with 'the same spirit that the author writ,' or he will find no willing hearers. In a word, he will either charm or disgust his audience; will shew that he either understands his art, or is wholly incapable of attaining its highest object, namely, that of touching the heart.

ADAM, the first man, and progenitor of the human race, whom God formed of the dust of the ground, on the sixth and last day of the creation, as related in the first and second chapters of Genesis. The whole of the authentic history of Adam is contained in the first five chapters of that book. His loss of the state of innocence and felicity which he originally enjoyed, is commonly known by the name of *the Fall*. It was after this event, and his expulsion from the Garden of Eden, or the terrestrial Paradise, that his eldest son Cain was born. His second son was Abel, and his third Seth, or Sheth, who was born when he was a hundred and thirty years old. But he is also stated to have had other sons and daughters, whose names are not given. He died at the age of nine hundred and thirty, and therefore, according to the commonly received computation, in the year 3074 before the birth of Christ. Many fables have been invented, and idle questions raised, by the rabbinical writers and others, respecting Adam, for which there is no warrant whatever in Scripture. The reader who may be curious to see some of these may consult the articles in Bayle, and in Calmet's Dictionary of the Bible. The word *Adam* means 'to be red,' and it is supposed that in allusion to the signification of this Hebrew verb, the earth out of which Adam was made was called 'Adamah;' while others think that the name 'Adam' contains an allusion to the reddish colour of a healthy person. See the use of the word 'adom' in the *Song of Solomon*, v. 10. According to Ludolf, *Adamah*, in the Ethiopic, means 'beautiful, elegant,' &c.; denoting man to be the chief work of God. In the New Testament the expression, the New Adam, is frequently used to designate our Saviour.

ADAM, ALEXANDER, LL.D., a late eminent teacher of Latin, who was born in June 1741, at Coats of Burgie, in the parish of Rafford, Morayshire. The station of his parents was very humble, but the parish school enabled them to obtain for their son the rudiments of a good education, at an expense not beyond their scanty means. After having acquired the ordinary knowledge of Latin here, young Adam proceeded to Aberdeen, in the hope of obtaining one of the small exhibitions, or bursaries, which are open for annual competition at King's College, to persons proposing to become students at that seminary. In this expectation, however, he was disappointed. He then resolved to enter himself at the University of Edinburgh, and to trust to his own exertions and fortitude to enable him to struggle through the usual course. This was in the winter of 1758. His difficulties and privations while attending college were very great; but he was of a character well fitted to contend with the hardships which it was his lot to encounter; and though he was sometimes reduced to such destitution as not to know where to obtain a mouthful of bread, he manfully persevered in hard study till he gained the reputation of being one of the best scholars in the university. His merits were at length rewarded by his appointment, in 1761, to the office of one of the teachers in Watson's Hospital, an institution in Edinburgh for the education and support of the sons of decayed burgesses. This situation he held till 1767, when the ability and success with which he had discharged its duties caused him to be chosen assistant to the Rector of the High School, the chief classical seminary of the city. Finally, in 1771, on the death of the rector, Adam was elected by the magistrates as his successor; and in this honourable post he remained throughout the rest of his life. The first years of his rectorship, however, were somewhat stormy. In 1772 he published a little work, entitled 'The Principles of Latin and English Grammar,' and he introduced it into the school as a substitute for Ruddiman's Grammar, which had been for many years the established manual. The four under-masters resisted this innovation, and at last the dispute grew to such a height, that it became necessary for the magistrates, as patrons of the school, to interfere. The proceedings which took place are very fully detailed in Chalmers' Life of Ruddiman (pp. 91-96, and 390-403). From the statement there given, it appears that the matter was first submitted to the town-council by the Lord Provost, on the 2d of February, 1785, when it was resolved to refer it to the decision of the Principal, and two of the Professors of the University. These learned persons took due time for deliberation, and on the 15th of October drew up a report, recommending that Ruddiman's should be the grammar regularly used in all the classes, but permitting the rector to introduce into his own class such additions from the rival work as he might deem necessary or proper. This decision, however, it would appear, did not settle the dispute. On the 7th of November we find the business again brought before the magistrates by a remonstrance from the under-masters against the decision of the professors, and a petition that the old grammar alone should be tolerated in the school. The magistrates, thus again appealed to, did not pronounce their judgment with precipitation; but at length, on the 23d of August, 1786, they issued an explicit prohibition against the rector's book, in conformity to the under-masters' prayer. Adam now in his turn became the remonstrant; but a letter which he wrote only produced a second order from the town-council, on the 29th of November, repeating and confirming the former. After this he no longer attempted to teach from his own grammar; and although the book has since gone through several editions, it has not supplanted Ruddiman to any great extent in the other schools of Scotland. Dr. Adam also published the following works:—In 1791 a volume entitled 'Roman Antiquities,' which has gone through several editions, and been translated into German, French, and Italian; in 1794, a 'Summary of Geography and History,' also several times reprinted; in 1800 a Dictionary of Classical Biography; and in 1805 a Latin Dictionary, under the title of 'Lexicon Linguæ Latinæ Compendiarium,' being an abridgment of a larger work, on which he had been long engaged. A second edition of this last was published after the author's death, with very considerable alterations, both in the way of addition and of curtailment. Both this dictionary and the Roman Antiquities have been much used in the schools of Scotland. No person filling a public situation was more universally respected and esteemed in Scotland than Dr. Adam in his latter days. His character was one of great manliness; so much so as to make him sometimes perhaps indiscreetly bold in the expression of whatever he felt. His political opinions were of a strongly liberal complexion; and he has been accused of not scrupling sometimes to give them vent with considerable emphasis in the presence of his class. But such was the general regard which was felt for him, that this charge which, especially at the time when it was made, would have seriously injured almost any other schoolmaster, scarcely affected his influence or usefulness. He was carried off by apoplexy on the 18th of December, 1809, in his sixty-ninth year, and was honoured by his fellow-citizens with a public funeral. A memoir of his life was published in 8vo., in 1810.

Of the four works just enumerated, the most valuable and the best known is the treatise on Roman Antiquities. Few books in so small a compass contain so large a mass of useful information, and the matter, multifarious as it is, is in general well digested and arranged. The chief defect perhaps, and it is one which pervades many parts of the work, is an inattention to the effects of time in changing the customs of the Romans. If the habits of one people differ from those of another, no less distinct is the character of the same nation at distant periods of its existence. While the distribution of political power and the signification of political terms vary on the one hand, on the other, the whole face of private life is changed by revolutions equally complete. Thus, though Dr. Adam has collected a large mass of facts connected with the political institutions of Rome, yet, not perceiving how the meaning of terms varied in the different ages, he has often so arranged the passages extracted by him from Latin authors on this subject, as entirely to mislead both himself and his reader. Indeed, when Dr. Adam wrote, the whole of this department of Roman Antiquities was one confused chaos, which has been only reduced again to order by the extraordinary talent and learning of Niebuhr and other writers. Again, some corrections and many additions are required in the section on the Roman year, particularly for the periods prior to the Julian correction. No little caution, also, should be observed in reading the remarks on Roman money, a subject of especial difficulty, in which it is often more prudent to be satisfied with ignorance, than to adopt the ordinary interpretations. The value and names of the Roman coins were constantly changing, and this not consistently. Secondly, the numerical notation employed by the Romans is particularly liable to corruption in the MSS.; and, even where the text is not corrupted, the interpretation is uncertain. Some other defective parts might easily be pointed out. Yet, with all these drawbacks, the work was at the time of great value in reading the history or the literature of Rome, and does great credit to Dr. Adam. It ought not to detract from his reputation, that he did not anticipate the important discoveries made within the last half century, especially by German scholars; and it would be unreasonable to suppose that his work could stand a comparison with the Dictionary of Antiquities, in which Dr. Smith and a band of learned contributors have embodied the results of recent research.

The treatise on Classical Biography was intended chiefly for the illustration of Roman History, and within these limits was, for a considerable time at least, superior perhaps to any similar work in the language; though it never, we believe, possessed a very extensive circulation in England. And we may say the same of Dr. Adam's Latin Dictionary, which was prevented from superseding the octavo edition of Ainsworth's Dictionary, perhaps only by the inconvenient arrangement adopted by Adam, who often neglects the alphabetical order, to bring together words etymologically connected. The summary of History and Geography, published by Dr. Adam, has in parts great merit, but it aims at much more than can be fairly executed within the limits. We need only say that it professes to give—1st, A summary of all history, ancient and modern, Grecian, Roman, Persian, English, French, German, Indian, American, &c., &c., with the manners and customs of these nations; 2dly, The mythology of the Greeks; 3dly, The geography of all ages and all countries, not excluding even the local situations of remarkable cities; 4thly, An account of the progress of astronomy and geography, from the earliest periods to the present time, with a brief account of the planetary system. And not satisfied with all this, the publishers have added an extensive index of geography, and thirteen maps of little value. Bulky as the volume is, there is not, and cannot be, room for information of any value, on so many points. Like a map on a small scale crowded with names, its tendency is to confound rather than inform the understanding. But when we look at all that Dr. Adam did, we can fairly say that no writer in the British islands has ever done more to assist the young student of Latin, or, what is perhaps still more important, to connect that study with the attainment of general knowledge.

ADAM, JAMES, an architect of the last century, who is not at all known but as the partner and associate of his brother Robert, the subject of the following article. He died in 1794.

ADAM, ROBERT, an architect who was extensively employed both in England and Scotland, but more particularly in London, in which city he also engaged in some very considerable building speculations. He was born at Kirkaldy, in Fifeshire, according to some authorities, and, according to others, at Edinburgh, in the year 1728, and was the son of William Adam, Esq., of Maryburgh, near Kirkaldy, who is said to have furnished the designs for Hopetoun House and the Royal Infirmary of Edinburgh; but whether he was himself professionally an architect or not, does not appear. Robert received his literary education at the University of Edinburgh; and, from his father, it seems most likely, he derived instruction in the principles and practice of his future profession. During this period he had the advantage of the society of many distinguished literary and scientific men, who were the friends and companions of his father, and among whom were numbered the great names of Hume, Robertson, and Adam Smith.

When he was in his twenty-sixth year, Mr. R. Adam went to Italy in pursuit of professional knowledge, and remained there several years. His contemporaries, James Stuart and Nicholas Revett, were, at the time of Adam's residence in Italy, engaged in exploring, and preparing for publication, the architectural remains of Athens; but so little was Grecian architecture known and appreciated, that he went, instead, to Spalatro in Dalmatia, to measure and delineate the ruins of the palace of Diocletian there, a structure indicating alike the decline of civilization and the progress of barbarism. In this tour he was accompanied by Clérisseau, a French architect, whose name is connected with a work on the remains of a Roman temple at Nismes, in Languedoc. Mr. Adam returned from the continent about the year 1762, and settled in London, and shortly after published there, in a large folio volume, engraved representations and descriptions, with attempted restorations, of the Dalmatian palace before mentioned. These, like many other attempts of the kind, are not consistent, in the more important particulars of architectural arrangement, with the evidence afforded by the remains themselves, and by the remains of other palatial and domestic edifices of the same and earlier date; some of these, however, were not accessible when Mr. Adam wrote.

About the same time, 1763-4, Mr. R. Adam was appointed architect to the king. This fortunate position made him what is termed fashionable, and he found extensive employment. In the course of a very few years he designed, and, in conjunction with his brother James, executed a great many public and private buildings in England and in Scotland. In 1773 the brothers commenced the publication of their works, in large folio engravings, with letter-press descriptions and critical and explanatory notes, in numbers, which were continued at intervals down to 1778. The principal designs included in these are, the screen fronting the high road, and the extensive internal alterations of Sion House, a seat of the Duke of Northumberland, near Brentford in Middlesex; Lord Mansfield's mansion at Caen-wood, or Kenwood, also in Middlesex; Luton House, in Bedfordshire, erected for Lord Bute; the screen to the Admiralty Office, London; the Register Office, Edinburgh; Shelburne House, now Lansdowne House, Berkeley-square, London; the parish church of Mistley, in Essex, &c. &c. At a later period the Messrs. Adam designed the infirmary at Glasgow, and some extensive new buildings in the University of Edinburgh, though their practice, after the year 1780, lay principally in London, where a great many of their productions still exist, and are easily recognised by any one accustomed to discriminate architectural design. We may mention Portland, Stratford, and Hamilton Places, the south and east sides of Fitzroy Square, and the buildings of the Adelphi as the most extensive of their works. Much of what the Messrs. Adam did, was in the capacity of speculating builders. The Adelphi was a speculation of their's, and is understood to have been an unsuccessful one. The substructions of buildings of such a kind, and in such a situation as those of the Adelphi Terrace, were necessarily so expensive as almost to preclude the possibility of an adequate return. It may be further remarked that their interest in, and connexion with, this last-mentioned expensive undertaking, is intimated by the name 'Adelphi,' which is the Greek term for 'brothers;' and by the application of their own name, 'Adam,' to the principal street leading to the terrace, and of their respective Christian names, 'Robert' and 'James,' to two of the minor streets.

The Messrs. Adam were among the first, if they were not themselves the very first, to make use in London of a stucco in imitation of stone, for external architectural decorations; and that which they employed was an oil cement or composition, invented by Liardet, a Swiss clergyman resident in this country, who had obtained a patent for the preparation of it, which patent they purchased. This was infringed by pretended improvers, and the proprietors were thereby involved in a troublesome and expensive suit to protect their own interests, and were, moreover, involved in disputes with rival builders and surveyors. Most of the works produced by the Messrs. Adam in the course of their practice and business, as architects and builders, where stone is not used, are either faced entirely, or their architectural decorations are formed, with this composition, which has endured, now at the end of half a century, far better than was predicted at the time.

The style of architecture introduced by the Messrs. Adam was peculiar to themselves, and very faulty; but there is nevertheless an air of prettiness, and some good taste in it; and the credit may certainly be claimed for its authors of having done much to improve the street architecture of London, for which species of composition their style was better adapted than for detached and insulated structures. Their taste seems to have been slightly affected, and in that slight degree beneficially, by the Greek style of composition which Messrs. Stuart and Revett were then making known, but they certainly were far from entering into the spirit of it; they departed moreover almost entirely from the laws and usages of the Italo-Vitruvian school, which was then called classical, and introduced many deviations alike inconsistent with the styles of Greece and Rome, with the laws of the schools, and with sound sense and good taste. The entire omission, or contraction, of an architrave in their entablatures, the extravagant breadth of their friezes, the shallowness and almost universal meanness of their cornices, and the still meaner and more tasteless style of the decorative ornament with which they beplastered their friezes and ceilings, are among the most glaring faults of their peculiar manner. In their insulated compositions especially, the worst of these faults are aggravated by varieties of them being introduced, not only into different, but also into the same elevations of the same structures, which should at least harmonize even in their defects. Both Kenwood and Luton Houses are examples of this; they both have mean entablatures, which are differently composed and proportioned, on the same and on different fronts of the respective edifices. In mere street-fronts the style of the Messrs. Adam, as we have before intimated, is not only less offensive, but it is at times made even pleasing. The front of the British Coffee-house, in Cockspur Street, though a mere trifle, is by far the best of their fronts with which we are acquainted; and the Admiralty screen has more beauties and fewer defects than most things of the kind they executed; but this last, it must be confessed, is less after their own manner, and more in conformity with the rules of art.

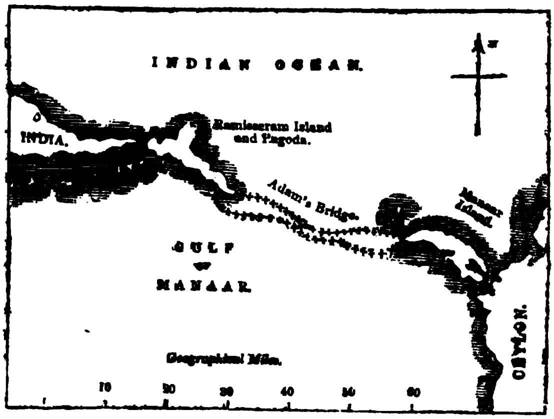
Mr. R. Adam did not retain the appointment of architect to the king more than four or five years, for he resigned it on being returned to parliament for the county of Kinross in 1768. This latter circumstance, however, does not appear to have interrupted his professional avocations, for we find that he continued to be actively engaged in business down to the period of his death, which took place in March, 1792, in the sixty-fourth year of his age, in consequence of internal hemorrhage, occasioned by the rupture of a blood-vessel. He was buried in Westminster Abbey, in the south transept of which is a tablet to his memory.

As an architect Mr. Adam displayed an original and independent mind; for it required, in his day, no small degree both of originality and independence to break through the trammels which had been imposed upon architecture. This Adam did, nevertheless, and though the result was that he became a mannerist, after a very peculiar, and, as we have shown, not very elevated or classical style of his own, the effect on English architecture was, on the whole, good. With Mr. Adam, we believe originated the idea of giving to a number of unimportant private edifices the appearance of one imposing structure, by external architectural arrangements; and he certainly has the credit of having carried this principle extensively into effect in several of the instances we have mentioned.

As a member of society, Mr. Adam enjoys the reputation of a kindly disposition, of great sweetness of manners, and of a high moral character, which assured to him affectionate regard in private life, and confidence and esteem in public.

ADAM, (Sculptors.) There were three brothers of this name, who all enjoyed some reputation as sculptors in France in the early part of the last century. They were the sons of a sculptor named Jacob-Sigisbert Adam, who lived at Nancy. The eldest, Lambert-Sigisbert, was born there on the 10th February, 1700, and made his first appearance at Paris in 1719. After remaining in that city for four years, he gained the first prize in the Academy, and proceeded to Rome on a pension allowed him by the king. Here he spent about ten years, and among other works furnished the design which was adopted by Clement XII., one of sixteen which were presented for the intended fountain of Trevi. The offers of the French government then induced him to return to Paris. On the 25th May, 1737, he was admitted a member of the Academy, and he was afterwards appointed professor in that institution. The two best known of this sculptor's productions are, a group of Neptune and Amphitrite, which he executed for the Basin of Neptune at Versailles, and on which he spent five years; and a figure of St. Jerome, originally intended for the Hospital des Invalides, but now placed in the church of St. Roch, at Paris. They are fair specimens of the French school of that age, which, however, was one of the least brilliant periods in the history of modern art. Adam published, in 1754, a work entitled *Recueil de Sculptures Antiques Grecques et Romaines*. He died of apoplexy on the 13th May, 1759. Nicolas Sebastian, the next brother, was born on the 22d March, 1705. He came to Paris at the age of eighteen, and went to Rome in 1726, where, two years after, he obtained one of the prizes at the Academy of San Luca. Having remained here for nine years, he returned to Paris; and after some time was also, like his elder brother, received into the Academy. Among the designs which he produced was one for the Mausoleum of the Cardinal de Fleury. His two principal works were a tomb for the wife of King Stanislaus of Poland, and his Prometheus chained to a Rock (which has been commonly assigned by mistake to his elder brother). For the latter work he had an offer from the King of Prussia of 30,000 francs; but he declined accepting it, on the ground that the sculpture belonged to his own sovereign, for whom it had been at first intended. He died on the 27th March, 1778. The third brother, François-Gaspard, was born in 1710. He made his way, like his elder brother, to Rome, and also on his return from Italy fixed his residence in Paris. He worked for some years at Berlin, in the service of the King of Prussia, and died at Paris in 1795. [Abridged from the *Biographie Universelle.*]

ADAM'S BRIDGE, a series of sand banks, which, with two small islands, extend from a point in the southern peninsula of India (140 miles north-east of Cape Comorin) to the opposite island of Ceylon. The width of the channel is about 60 geographical miles. Between the islands—of which the one towards the continent is called Ramisseram; the other, towards Ceylon, Manaar—the distance is 30 miles, and the intervening space is filled with sand-banks, between which there are three openings of little depth. There are two passages between the islands and the mainlands—one between Ramisseram and the Indian continent, called the Paumbeen Passage, and the other betwixt Manaar and Ceylon. The former has been deepened by cutting through the rocks, so that large vessels can now pass, which previously were obliged to sail round Ceylon in going from one side of the Indian peninsula to the other. Thus the voyage has been shortened at the least 2000 miles; often, indeed, vessels had to sail 2500 miles before they regained the directer course. Previous to being deepened, the Paumbeen Passage, as also that of Manaar, had not more than 6 feet of depth at highwater.



ADAM'S PEAK, a high mountain in Ceylon, whose elevation is about 7400 feet. It was formerly supposed to be the highest mountain in Ceylon, but it is now ascertained that that distinction belongs to Pedro-talla-galla. It is situated on the borders of the central and western provinces, and is the loftiest of a long ridge of mountains. The form of Adam's Peak is like that of a bell, tapering until the summit is reached. The platform of the summit is of an oval form, and is 70 feet long by 29 broad. It is surrounded by a wall 5 or 6 feet high, and in the centre appears the apex of the mountain, on which is an outline which the natives call Sree-pada, or Sacred Footstep. This is a superficial cavity in the rock, about 5 feet long by 2 feet 5 inches wide, which, according to the Cingalese tradition, is the impress of the feet of the four Buddhas, successively stamped on the top of the mountain. Whether or not it be the imprint of the foot of a god, it certainly bears no resemblance to the foot of a man. Over the Sree-pada is erected a small temple, which is retained in its place by iron chains, fastened at one end to the rock, at the other to the surrounding trees.

The people ascend the mountain periodically to worship at this place. Before ascending the Peak, they bathe in one of the mountain torrents, and attire themselves in clean apparel. After the ceremonies of worship are over, the pilgrims, before descending, offer gifts to the Sree-pada and the god Samen, the tutelary deity of the place; these gifts are appropriated by the chief priest of the Malwatte-wihare. After the offerings are made, the priest blesses the pilgrims, and they proceed to descend the mountain, on which they fear to spend a night, as they suppose they would by so doing incur the displeasure of the gods.

With respect to the impression of the foot, the Buddhists and the Mohammedans have different traditions. The tradition of the Buddhists we have already given. The Mohammedans (some of them) believe that Paradise was in Ceylon, and that Adam, when driven out of it, was compelled to stand on one foot on the top of this peak. It is likely that the Mohammedans of Ceylon have given the name Adam's Peak to the mountain. They call it Baba Adamalei. The Cingalese call the mountain Samenella, from the god Samen.—Knox, *History of Ceylon;* Sirr, *Ceylon and the Cingalese.*

A'DAMANT, a word no longer employed as a scientific term, but used chiefly as a poetical expression synonymous with diamond, or as descriptive of some other hard precious substance, or merely to convey an idea of extreme hardness. Milton, Pope, and Gray, make use of it in these different senses, as well as the adjective *adamantine*. The real and primary meaning of the word adamant, which is derived from the Greek, is *unbroken*, or *what cannot be broken.*

ADAMAN'TINE SPAR, a simple mineral, more commonly denominated Corundum by mineralogists, the name given to it in India, from which country it was first brought to Europe. The first specimens of it were sent by Dr. Anderson, of Madras, to Mr. Berry, a lapidary in Edinburgh, as the substance used in India to polish masses of stone, crystal and all other gems, except the diamond. It was examined by the celebrated Dr. Black, who ascertained its peculiar nature, and from its great hardness, he called it adamantine spar. With the exception of the diamond, it is the hardest substance known. It mainly consists of alumina, coloured by iron or other matter, is usually of a pale grey or greenish colour, but is also found of various tints of red and brown. It is usually met with in rough ill-defined crystals, in granite, and sometimes in primary limestone, and is found in China, many parts of India, and occasionally in different parts of Europe. Emery, the well known substance used in the cutting and polishing of glass, in polishing steel, making rasor-straps, and similar purposes in the arts, is a granular variety of corundum, usually very much mixed with iron ore. It is chiefly imported from the Isle of Naxos, in the Grecian Archipelago, but is also found in Saxony. The Sapphire is a remarkable instance how the mysterious chemistry of nature in the mineral kingdom produces from the same elements substances the most different in external form; this beautiful precious stone yielded by the analysis of Chenevix 94 per cent. of alumina; and Tennant found in emery, when freed from its admixture of iron, 92 per cent. of the same earth. The sapphire is, after the diamond, the most valuable of gems; it is usually dark blue, but also occasionally colourless, and the precious stones called by lapidaries *oriental* ruby, *oriental* topaz, *oriental* amethyst, and *oriental* emerald, are red, yellow, violet, and green *sapphires*, distinguishable from the other gems of the same name which have not the prefix *oriental*, by their greatly superior hardness and greater specific gravity. Sapphires are found in gravel and sand in the island of Ceylon and in Pegu, but they have never been seen in a matrix. They are also occasionally found in gravel in different parts of Europe, and they have been met with of a clear blue colour and crystallized, in the lava of Nieder Mendig, near Andernach on the Rhine.

ADAMS, JOHN, a distinguished American statesman. He was born in the town of Braintree, near Boston, in Massachusetts, on the 19th October, 1735, of a family which had come from England at the first settlement of the colony. At the usual age he was sent to Harvard College, in the neighbouring town of Cambridge; after leaving which, he proceeded to study the law, and was in due time called to the bar. He soon raised himself, in the profession which he had thus chosen, to great reputation, and extensive practice. In 1765 he published anonymously, in the Boston Gazette, a series of papers under the title of an Essay on Canon and Feudal Law, intended to expose the absurd and oppressive character of these systems, which attracted considerable notice, and were, in 1768, collected and reprinted in London. In 1765, when the first opposition of the people of America was excited by the Stamp Act, Mr. Adams took an active part in those measures of constitutional opposition which eventually forced the repeal of that obnoxious statute. An offer of the lucrative office of Advocate-General in the Court of Admiralty, made to him the following year by the Crown, with the view of detaching him from the popular cause, was instantly rejected. He was one of the *select* men, or state-representatives, deputed by the several towns of the province, who in 1770 met in convention at Boston, on the announcement of the intention of the British Government to station a military force in that town, in order to controul the populace, exasperated by the new act imposing duties on glass, paper, tea, &c., which had been passed in 1767, and by the other measures which indicated a determination in the mother country to maintain at least the principle of her late aggression. Soon after this, however, Mr. Adams gave a proof both of his intrepidity, and of the moderation which was associated with his zeal, by undertaking the defence of Captain Preston and his men, who, on the 5th of March, 1770, had killed several of the people of Boston in a riot—a transaction which used to pass under the name of the Boston massacre. He delivered a very powerful speech on this occasion, when the jury acquitted all the prisoners of murder, and only found two of them guilty of manslaughter. To the honour of his countrymen, the part he had thus taken did not diminish his popularity or influence; and he continued, during the remaining first years of the struggle, to exert himself conspicuously in the front rank of the friends and supporters of the colonial cause. In 1773, and again in 1774, he was returned by the House of Assembly a Member of the Council of the State; but on both occasions the governor, General Gage, put his negative on the nomination. The latter year, however, he was elected one of the four representatives from the province of Massachusetts Bay, to the General Congress, which met at Philadelphia on the 26th of October, and which, among other proceedings, entered into a resolution to suspend the importation of British goods; and he was also a member of the second assembly of the same nature, held some time after, which took measures to enrol the people in an armed national militia. In 1775 he was offered the appointment of Chief Justice of his State; but this he declined, feeling that he could better serve his country in another sphere. It had already become evident to many, indeed, that the contest with Great Britain must finally be decided by the sword; and Adams seems to have been one of the first who adopted this conviction. He was accordingly one of the chief promoters of the Declaration of Independence, passed on the memorable 4th of July, 1776. The motion was made by Mr. Lee of Virginia, and seconded by Mr. Adams; who, along with Mr. Jefferson, was appointed the sub-committee to prepare the declaration. It was actually drawn up by Mr. Jefferson. In November, 1777, Mr. Adams proceeded to Paris, as a Commissioner from the United States to that court; and after remaining for a short time in France, returned to America, when he was elected a Member of the Convention for preparing a new constitution for Massachusetts. In 1780 he was sent by the United States as their ambassador to Holland; from which country, about the end of 1782, he proceeded to France, to co-operate with Dr. Franklin and his brother commissioners in the negotiations for peace with the mother country. In 1785 he was appointed the first ambassador from the United States to Great Britain; and he had his first audience with his Majesty in that character on the 2d of June. He remained in England till October, 1787. In 1789, when Washington was elected President of the Union, Mr. Adams was elected Vice-President, and he was re-elected to the same office in 1793. In 1797, on the retirement of Washington, he was chosen President; but he failed to be re-elected on the expiration of his first term of four years, his competitor, Mr. Jefferson, who had also been opposed to him on the former occasion, having a majority of one vote. The general tone of the policy of Adams had been opposed to that of the democratic party, which was represented by Jefferson; but he does not appear to have given complete satisfaction to the other great party whose leading principles he espoused. On failing in being reelected president, he retired from public affairs to the quiet of his country residence at Quincy; declining, although nominated, to stand candidate at the next annual election for the governorship of Massachusetts. The rest of his life he spent in retirement. For some years before his death his health had become extremely feeble, and at last little more remained of the once active and eloquent statesman than the mere breath of life. In this state he was when the morning arrived of the 4th of July, 1826, the fiftieth anniversary of the Declaration of Independence. Awakened from sleep by the ringing of bells and other rejoicings of that grand jubilee, the venerable patriot was asked if he knew the meaning of what he heard. 'Oh, yes,' he replied, the glow of old times seeming to return to him for a moment, 'It is the glorious 4th of July!—God bless it—God bless you all!' Some time after he said,—'It is a great and glorious day,'—adding, after a pause apparently of deep thought, 'Jefferson yet survives.' These were the last words he was heard to utter. About noon he became alarmingly ill, and at six in the evening he expired. The same day also terminated the career of Jefferson, his fellow-labourer in laying the foundations of the independence of their common country, and afterwards his successful rival. Except for a short time, however, these two distinguished men were friends throughout life. Besides the early publication that has been mentioned, and many fugitive pieces, Mr. Adams was also the author of a work first printed in 3 vols. 8vo., in 1787, while he was in this country, under the title of 'A Defence of the Constitution and Government of the United States,' but afterwards remodelled and reprinted in 1794, with the new title of a 'History of the Principal Republics of the World.' It is designed to serve, by an ample induction from history, as a vindication of the federal principles of the American Constitution, an attachment to which, indeed, has always been considered the distinctive characteristic of this statesman and his party. His son, John Quincy Adams, also spent a great part of his life in the service of the United States, and, like him, attained the honour of being once elected to fill the office of chief magistrate of the republic. (See *Encyclopædia Americana.*)

ADAMS, SAMUEL, a conspicuous actor in the American Revolution. He was born at Boston on the 27th of September, 1722, and received his education at Harvard College. After passing through the usual course of instruction at that college, he applied himself to the study of divinity, with the intention of becoming a preacher in the Calvinistic communion, to which his family belonged. Although he abandoned these professional views, probably his early theological studies had considerable influence in forming the character of the man; and he at any rate retained to the end of his life a stern and somewhat intolerant attachment to the religious principles in which he had been educated. He was better fitted, however, for the rude contests of politics than the peaceful ministrations of a Christian clergyman. Accordingly, on the first outbreaking in his native province of the irritation and disturbances occasioned by the Stamp Act in 1765, Adams threw himself with zeal and determination on the popular side. From that moment the forwarding and maintaining of the cause of his country's independence became the business of his life. The same year in which the Stamp Act was passed, he was deputed by his fellow-citizens as one of their representatives in the legislature, of which assembly he was immediately after elected clerk. In 1774 he had the honour of being sent as one of the four members from Massachusetts to the first Congress. His name appears subscribed to the Declaration of Independence in 1776. After the conclusion of the war he was nominated a member of the convention for settling the constitution of Massachusetts; and he afterwards occupied a seat in the senate of that state, and presided over it for some years. In 1789 he was elected to the office of lieutenant-governor, and in 1794 to that of governor, to which he was re-elected annually till 1797, when he retired from public life. He died at Boston on the 2d of October, 1803. Samuel Adams was one of the firmest and most active patriots of the Revolution, and powerfully contributed to the happy termination of the great cause to which he devoted his life. But he was not a politician of very enlarged views; and useful as he proved in the subordinate sphere in which he acted, there can be little doubt, from many parts of his conduct, that the national struggle would hardly have been brought to the successful issue with which it was eventually crowned, if it had not been guided by wiser heads than his. He was actuated in the whole course of his political career almost exclusively by one idea or feeling—jealousy of delegated power, however guarded. 'Samuel Adams,' said one of his friends and admirers, 'would have the State of Massachusetts govern the Union, the town of Boston govern Massachusetts, and that he should govern the town of Boston, and then the whole would not be intentionally ill-governed.' —[Abridged from the *Encyclopædia Americana.*]

ADANSON, MICHAEL, a French naturalist of high reputation, was born at Aix in Provence, April 7, 1727. He was of Scotch extraction, but his family had become exiles in consequence of the troubles that distracted Scotland in the early part of the 18th century. At a very early age he was placed at the University of Paris, under the care of the celebrated Réaumur and of Bernard de Jussieu; and it is supposed that from these preceptors he imbibed that love of the study of Natural History, by which he afterwards became distinguished in so eminent a degree. His success in carrying off the academical prizes from his competitors soon attracted attention, and Needham, the well-known microscopic observer, having upon one occasion been witness to his triumph, presented him with a microscope, accompanied, it is said, by these prophetic words, 'Young man, you have studied books enough; your future path will be among the works of nature, not of man.' At this time great originality of thought and a strong bias for systematic arrangement had already begun to develope itself. Emulous of the reputation of Linnæus, which had already found its way among the French, young Adanson is said, when only fourteen, to have sketched out not less than four methods of classifying plants. His friends had destined him for the church, but a feeling that his pursuits, and perhaps his temper, were but ill-adapted to the duties of the priesthood, induced him to resolve upon seeking some other employment, in case his slender patrimony should prove insufficient for his wants.

The genius of Adanson was much too active to allow him to remain in the walks of quiet life. An opportunity occurring of visiting the country whence ivory, and gums and frankincense were procured, he eagerly embraced the occasion, although at the expense of a considerable portion of his fortune. At that time the natural history of Africa was almost unknown, except from such of its commercial products as were brought to Europe. In 1748 he embarked for Senegal, being then twenty-one. Five years were spent by him in this colony, during which time he succeeded in forming considerable collections in every branch of natural history. Not only were botany and zoology the objects of his attention, but he amassed a large store of meteorological observations; he made himself acquainted with the language of the native tribes, and carefully preserved their respective vocabularies; he traced the river Senegal to a considerable distance in the interior, formed charts of the country, and finally returned to Paris in 1753, rich in knowledge, but impoverished in worldly means. His *Natural History of Senegal*, published at Paris four years afterwards, is a mass of original views, and of valuable practical information. Among other things, it contained the first attempt upon record of classifying shells according to the animals they contain, instead of their external forms alone. The opinions that Adanson had early held of the insufficiency of the classifications in natural history at that time received in Europe, had become confirmed by his discoveries in Africa. He saw that however easy and complete the systems of Linnæus and Tournefort might seem to those acquainted with the European Flora only, they were both essentially defective when applied to vegetation in a more extended manner. He perceived that the sexual system of Linnæus was founded upon incomplete and partial views. To the method of Tournefort the objections appeared fewer, and accordingly he determined to attempt a classification of his own, of which that of Tournefort might serve as the basis. This appeared in 1763, in two volumes 8vo., under the name of *Families of Plants*. In this work Adanson particularly insisted upon the indispensable necessity of a system being so far in accordance with nature, that all those objects which most resemble each other may be classed together;

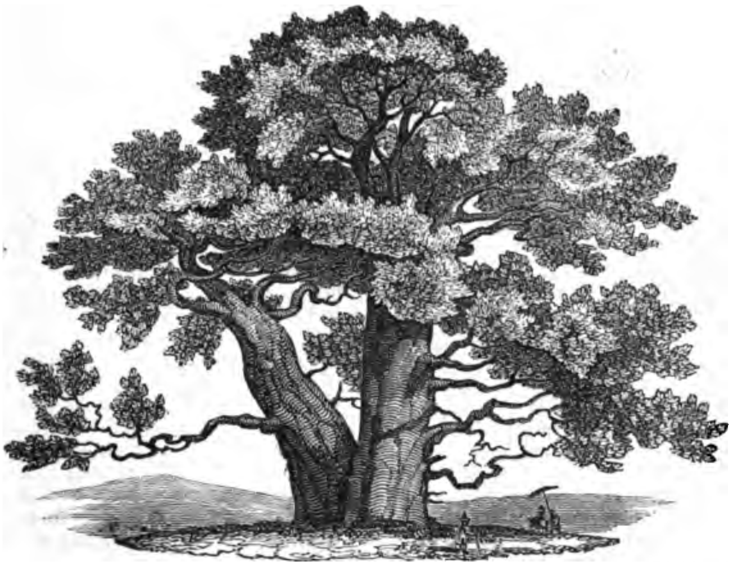
he demonstrated that, to effect this, it is absolutely necessary for a system to be founded upon a consideration of all the parts of the objects which it comprehends, and that it cannot be confined to differences in the nature of a few organs only; the artificial system of Linnæus he for that reason most justly considered inferior to the method of Tournefort. In many respects this work of Adanson's deserves the eulogium passed upon it by one of his historians, who pronounces it a production not more brilliant than profound; it is a collection of a great number of just views of the analogies that exist among plants; it no doubt furnished many important suggestions to Jussieu in the construction of his system; and it is to this day consulted by those who make the philosophy of botany their study. Unfortunately for its author, and still more for science, his views were more advanced than those of his contemporaries; his perceptions of botanical truths, however just, were of a nature not to be valued by those who had less experience or acuteness than himself; he also attempted to introduce a barbarous nomenclature, which, it must be confessed, was at variance with common sense; and what was worse than all, he had unceremoniously rejected that system of Linnæus which had become the basis of the botanical creed of almost all Europe. For these reasons, notwithstanding the high character of Adanson's *Families of Plants*, they have scarcely had any circulation beyond France; and when, in 1789, the *Genera Plantarum* of Jussieu made their appearance, the utility of his work generally ceased.

From this period we have little to record concerning the scientific career of Adanson. A few miscellaneous papers, a chimerical project of a vast Encyclopædia of Natural History to contain 40,000 figures, and a portion of the early part of the botanical division of the Supplement to the French Encyclopædia, are all that he has executed. Up to the period of the French revolution, he appears to have been chiefly occupied in amassing collections for the stupendous work he had in contemplation, and in making experiments upon vegetable physiology. That political catastrophe overwhelmed him in the ruin it brought for a time upon his country; the little that remained of his fortune was annihilated; he had the mortification to see his plantations of mulberry-trees, which had been long the object of his simple care, destroyed by a ferocious rabble; and he fell into so lamentable a state of destitution, that when upon the establishment of the Institute of France some years after, he was invited to become one of the earliest members, he was obliged to refuse the invitation to attend 'because he had no shoes.' In his latter days he enjoyed a small pension from the French government; but his constitution was broken by the calamities he had undergone; a complication of maladies tormented him, a softening of the bones confined him to his bed, and on the 6th August, 1806, he was finally released from his afflictions by the hand of death, in the eightieth year of his age.

While the scientific character of Adanson has been, perhaps, too highly estimated by his own countrymen, it has been most unfairly depreciated by others. That he was a man of a very comprehensive mind, of considerable learning, much experience, great acuteness, and perfect independence of thought, is evident from his writings. This would be clear from his miscellaneous memoirs, if we had not his greater works to judge by. He is, however, a very instructive instance of the folly of eccentricity, and of the evils to which a disregard of established ideas in unimportant matters is sure to lead; his example shows that the value of the most useful discoveries may be altogether destroyed by a capricious affectation of unmeaning singularity. Had he been less absurd in his nomenclature, his popularity would have certainly anticipated that of Jussieu, and might have struck some twenty or thirty years off the reign of the Linnæan school. It would have been impossible for the great Swedish autocrat in science to have resisted the attacks of so active and vigorous an assailant, who had knowledge and truth on his side. Adanson has been charged with being led by pique and wounded pride, to the opinions he held regarding Linnæus and his system; this has been inferred from a few complimentary expressions in a letter dated not more than a year anterior to his first attack upon the Linnean system—expressions which have been thought to prove that the public declarations of Adanson were at variance with his private sentiments: it is, however, far more probable, as it surely is more charitable, to suppose that he was really led by that love of truth and honesty of purpose, which we have ample evidence to prove that he possessed. As a philanthropist, his name will always be respected by every friend of civil liberty; for he was among the first to plead the cause of the slaves, and to insist upon the impolicy, as well as injustice, of forced labour. In 1753, a plan, very like that upon which the new American colony of Liberia has been established, was presented by him to the French government, for the whole of the French provinces in Africa. The ministers of such a sovereign as Louis XV. were not the men to listen favourably to a project of this nature, and it fell to the ground. Such was his love of his country, that although his circumstances do not seem ever to have been very good, he had firmness enough to resist offers from the Emperor of Austria, Catharine of Russia, and the king of Spain, to enter into their service. Under the cruel misfortunes that attended his latter days, he is represented to have exhibited great patriotism and magnanimity; which was the more to be commended, because he was naturally of an impetuous and irascible temper. [See *Bibl. Univ.*, vol. i. *Spreng. Hist. R. herb.* v. ii., *art.* Adanson, *in Rees' Cycl. Suppl.*]

ADANSONIA, so called in honour of Michael Adanson, a French naturalist, the subject of the preceding article, is an extraordinary tree found in Africa within the tropics, particularly in Senegal, where it is called *Baobab*.

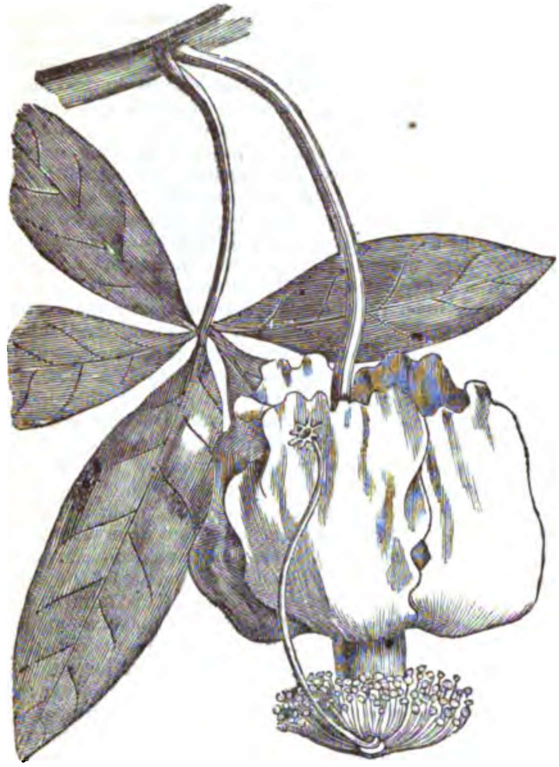
The celebrated traveller Humboldt considers it as the 'oldest organic monument of our planet,' in consequence of the calculations of Adanson that specimens, still found on the north-west coast of Africa, are probably 5000 years old; these calculations are, however, open to many objections. [See AGE OF TREES.] In appearance, *Adansonia* is unlike any other known tree: the enormous dimensions of its trunk bear a striking disproportion to the other parts; it is not unusual to find a trunk not more than twelve or fifteen feet from the root to the branches, with a circumference of seventy-five or seventy-eight feet. The lower branches are very long, and at first horizontal, extending, perhaps, sixty feet; the consequence of which is that they bend down to the ground, entirely hiding the trunk, and giving the tree the appearance of a huge mass of verdure. The wood is very soft, even when in perfection, and is subject to a disease that has been compared to the sad malady of which its celebrated discoverer died,—a sort of softening of all the hard parts, so that the least storm is sufficient to overthrow and dismember its enormous bulk. A curious practice prevails among the negroes of hollowing its trunk out into chambers, and therein depositing the bodies of malefactors, or of persons to whom the usual rites of sepulture are denied. In this situation the bodies become dried up, and soon acquire the state of perfect mummies.



[Adansonia digitata.]

Adansonia belongs to the natural order *Sterculiaceæ*, among which it is at once known by a broad tube of stamens and deciduous calyx, combined with a woody closed-fruit, containing a soft pulp.

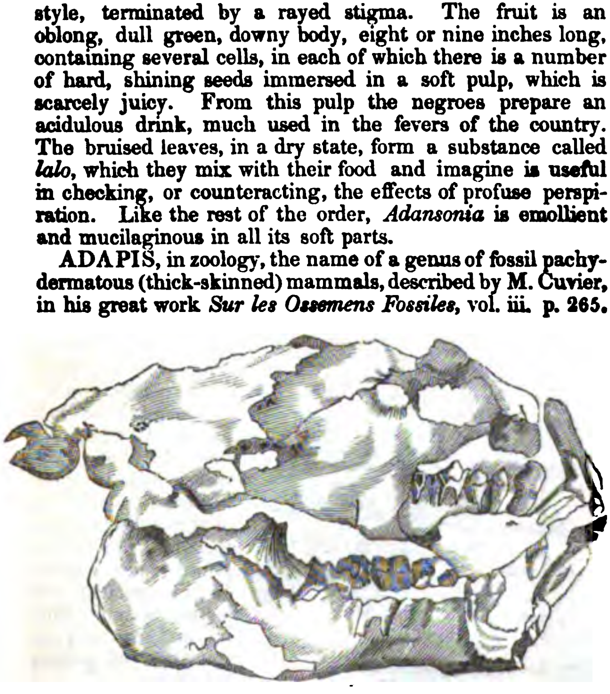
The only species is *Adansonia digitata*, the monkey-bread, sour gourd, lalo plant, &c., of the African negroes.



[Leaf and flower of Adansonia digitata.]

The leaves are deep green, and divided into five unequal parts, each of which is of a narrow, lanceolate figure, and radiates from a common centre, the outermost divisions being the smallest. The flowers grow singly in a pendulous position from the bosom of the leaves, are very large, white, crumpled at the edge, and have the petals very much reflexed. The stamens are very numerous, and are collected into a tube, which spreads at the top into a sort of umbrella-like head, from the midst of which arises a slender curved style, terminated by a rayed stigma. The fruit is an oblong, dull green, downy body, eight or nine inches long, containing several cells, in each of which there is a number of hard, shining seeds immersed in a soft pulp, which is scarcely juicy. From this pulp the negroes prepare an acidulous drink, much used in the fevers of the country. The bruised leaves, in a dry state, form a substance called *lalo*, which they mix with their food and imagine is useful in checking, or counteracting, the effects of profuse perspiration. Like the rest of the order, *Adansonia* is emollient and mucilaginous in all its soft parts.

ADAPIS, in zoology, the name of a genus of fossil pachydermatous (thick-skinned) mammals, described by M. Cuvier, in his great work *Sur les Ossemens Fossiles*, vol. iii. p. 265. The word is found in Gesner, as a synonyme of the common rabbit (not, as stated in the reference just given, of the *hyrax*), and is appropriated to the present genus, from the presumed similarity in size, organization, and habits, which probably existed between the latter animal and the fossil species.



[Skull of the Fossil Adapis.]

The remains, upon which M. Cuvier has founded the genus Adapis, the only specimen which he was able to procure during a period of twenty-five years devoted to researches after fossil bones, consist of three fragments of skulls, found in the plaster quarries of Montmartre, celebrated for the enormous quantity and variety of the remains of extinct animals which they have produced; and which, in the hands of M. Cuvier, have effected such improvements in the kindred sciences of zoology and geology. The first of these fragments is a head, nearly perfect on the side imbedded in the mass of gypsum which contained it; and exhibiting the dentition nearly in a perfect form. The general outline of this skull closely resembled that of the hedgehog, but it was about one-third larger: there were four incisor teeth in each jaw, trenchant or edged and oblique; followed, on each side, by a canine tooth, of a conical form, but in other respects differing little from the molar teeth in length and figure. Of these latter, there appear to have been seven in each side of each jaw. The first of the upper jaw was trenchant; the second and third surrounded by a small ridge; and the remaining four flat crowned, as in ordinary herbivorous animals. In the under jaw the three first molars are pointed and trenchant, and the other four tuberculous, and similar to those which opposed them in the upper. Two other fragments procured by M. Cuvier,—one a portion of a lower, another of an upper jaw,—served to complete this description, by supplying some of the back teeth which were wanting in the more perfect specimen.

The few facts here reported, the only details which we at present possess concerning this extinct genus, are still sufficient to enable us to determine some of its most important affinities, and to assign its probable location in the system of natural beings. In fact, we only require to know the form of its feet and claws, to possess all the data necessary to determine its general conformation, as well as its habits and economy. The facts, already known, show us that this inhabitant of a former world must have belonged to that tribe of animals which M. Cuvier denominates pachydermata, from the great thickness of their skins, and which includes all hoofed quadrupeds that do not ruminate or chew the cud. Among recent, or existing animals, there are scarcely two dozen species appertaining to this group; and only eight different genera, all widely separated from one another, and without any of those intermediate forms and modifications, which, in other natural orders, unite the different genera by an almost imperceptible gradation of characters. The horse, the elephant, the rhinoceros, the hippopotamus, the tapir, the hog, all pachydermatous quadrupeds, have few characters in common; are allied to one another by no intermediate forms among the existing race of animals; and, in fact, appear to be rather the types of so many distinct and separate families, than the genera of one common order. This circumstance, so different from what is presented by all other tribes of animals, it was reserved for M. Cuvier to explain; and it is not a little singular that the fossil remains of animals which have long since ceased to exist, but which this truly great man has restored and characterised, should be precisely those which are wanting to complete the connexion among the existing genera of pachydermata. Of eighty extinct species of mammals discovered by M. Cuvier, and described in the *Ossemens Fossiles*, no fewer than fifty appertain to this order; thirty-eight of which belong to eleven distinct genera, which have no representatives among living animals. These serve to connect the existing genera of pachydermata with one another, and to complete that gradation of characters, which, before their discovery, was so imperfect in this order of animals. This abundance of pachydermata among the fossil remains of extinct animals, compared with the very small proportion which the existing species of this genus bear to the total number of animals actually inhabiting the globe, at the present moment, is a most remarkable and curious fact; whilst the singularity of their forms, and the number of new genera which have been established upon their different modifications, are extremely interesting; more particularly when we are told that, among all the fossil remains of other orders of mammals, no single fragment has been discovered to indicate the former existence of a genus different from those which subsist at the present moment.

ADAR, the twelfth month of the Hebrew year, as appears from Esther iii. 7: 'The twelfth month, that is the month Adar.' The name of this month is Chaldee, and does not occur in the earlier books of the Bible, where the months are usually designated by their numerical order.

In the Jewish Calendar, Adar is the sixth month. In ecclesiastical computations, it is still the last of the year. A year composed of twelve lunar months is shorter by about eleven days than a true year, and, if unaltered in length, would be perpetually changing the season of its commencement. To avoid this inconvenience, all nations using such a year (except the Mohammedans) occasionally insert an additional month, to bring the beginning of the year to the same season. The additional month in the Jewish Calendar immediately follows Adar, and is called Ve-adar. This intercalation occurs seven times in nineteen years.

Adar may begin as early as the 1st of February, or as late as the 3d of March: in 1833, it began on the 20th of February. In years of twelve months there are twenty-nine days in Adar; in those of thirteen months, there are thirty days in the month.

A fast is observed by some Jews in memory of the death of Moses on the 7th day of the month; another on the 9th, for the schism in the schools of Shammai and Hillel. On the 13th day of the month, the fast of Esther is kept by the whole Jewish nation. This fast is said to have been instituted in memory of the intended destruction of the Jews in the Persian empire on that day (Esther, iii. 13). If the 13th day should be a Saturday, the fast of Esther is celebrated on the preceding Thursday; all other fasts (except the Great Fast of Expiation, which is never postponed) are, in similar cases, held on the Sunday following.

The Feast of Purim, which lasts two days, belongs to the 14th and 15th of the month, in memory of the defeat of the plans laid for destroying the Jews. This feast was celebrated in the mode and on the days appointed in the 9th chapter of Esther, verses 15—21. It is made 'a day of gladness and feasting, and a good day, and of sending portions one to another.' Two days were dedicated to this festival because the slaughter of the enemies of the Hebrews ceased on those two days in the different provinces of the empire.

In the years in which the month Ve-adar is inserted, the Purim and the Fast of Esther belong to that month; and the 14th of Adar is called the First or Little Purim. It appears, then, that in the intercalary year, it is the first Adar that is really the intercalary month, as the festivals remain to Ve-adar. [See Ideler, *Lehrbuch der Chronologie, Berlin*, 1831.]

The festival in honour of the dedication of the second Temple, is kept by some Jews on the 16th, and by others on the 23d of this month. There is no exact account of the day of dedication; the Temple was completed on the 3d day of the month. Ezra vi. 15.

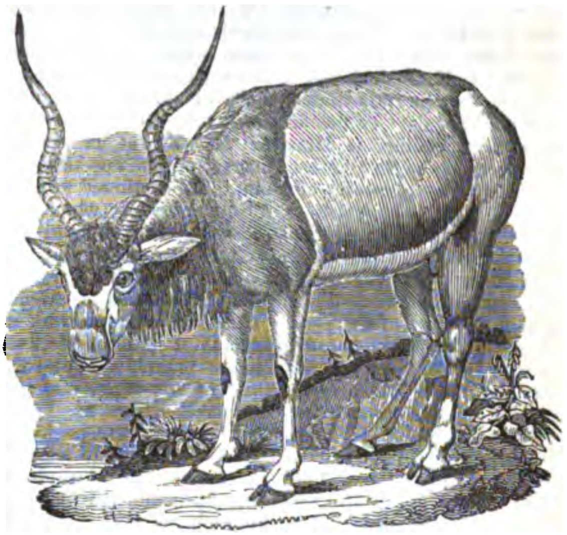
ADAR is the name of the seventh month of the Syro-Macedonian year, which coincides nearly with our March.

ADDA, or EL ADDA, the Arabic name of a small species of lizard, celebrated by the eastern physicians on account of its pretended efficacy in the cure of elephantiasis, leprosy, and other cutaneous diseases, to which the Arabs and inhabitants of Egypt are peculiarly subject; and of which, according to Bruce, they are more afraid than of the plague itself. We are not informed of the manner in which these wonderful cures are effected; whether the living animal is applied externally, as toads have been to cancers, even in our own country, or taken inwardly in the form of a powder; but, in all probability, its reputed virtues, in either case, have no better foundation than those formerly attributed to the bezoars, rhinoceros-horns, and other animal substances, which composed such an important part of the pharmacopœia of the Arabian school of medicine.

The adda, as described by Bruce, is about six inches and a half in length; the body and tail are cylindrical, the latter thick at the base, and ending in a very sharp point; the head is conical, and the mouth provided with two rows of small feeble teeth; the face is covered with five black lines, which cross one another like a net; the body is a light straw colour, crossed with eight equi-distant bands of black, and the scales are so finely polished, that they almost appear as if they had been varnished. The adda is found in Arabia, Egypt, and Nubia; it is particularly abundant in the neighbourhood of the ancient Meroë (near the Nile about N. Lat. 17°); and, in short, throughout every part of the sandy deserts of Asia and Africa, wherever the slightest traces of moisture exist. 'It burrows,' says Bruce, 'in the sand, and performs the operation so quickly, that it is out of sight in an instant, and appears rather to have found a hole than to have made one: yet it often comes out during the heat of the day to bask itself in the sun; and, if not very much frightened, will take refuge behind stones, or in the withered, ragged roots of the absinthium, dried in the sun to nearly its own colour.'

ADDA, the Roman Addua, a river of Lombardy, which has its source in the Rhætian Alps above the town of Bormio; it waters the Valteline in its whole length, then enters the lake of Como, out of the south-eastern branch of which it issues again below the town of Lecco; it then crosses the plain of Lombardy, passing by Cassano, Lodi, and Pizzighettone, and falls into the Po about eight miles above the city of Cremona. It was by forcing the bridge of Lodi over this river, that Bonaparte won a decisive victory over the Austrians, 10th May, 1796. Again, on the 27th April, 1799, the French, under Moreau, were totally defeated at Cassano, on the banks of the Adda, by the Austrian and Russian armies. Before the fall of Venice, the Adda formed the boundary between the territory of that republic and the Duchy of Milan. It is a rapid and wide stream, affording a good military position, in advance of Milan on the east.

ADDAX, in zoology, a species of ruminating animal, called by the ancients Strepsiceros, from the spiral or twisted form of its horns. It was unknown to modern naturalists till the recent journey of the German traveller Rüppel, who discovered it on the barren sands of Nubia and Kordofan, where it still retains its ancient Arabic name of Addas or Abou-Addas. For a more particular account of this interesting animal, see ANTELOPE.



[Addax.]

ADDER, a name of the common viper. See VIPER.

ADDISON, JOSEPH. This eminent writer was the son of the Reverend Lancelot Addison, a clergyman of considerable learning, who eventually obtained the deanery of Litchfield, but was, at the time of the birth of his son, rector of the parish of Milston, near Amesbury, in Wiltshire. Here Addison was born on the 1st of May, 1672. After having been put first to a school in Amesbury, taught by the Rev. Mr. Nash, and then to that of the Rev. Mr. Taylor, at Salisbury, he was sent to the Charter-House, at which seminary he first became acquainted with his afterwards celebrated friend, Steele. From this school he went about the age of fifteen to Queen's College, Oxford, and removed to Magdalen College, upon obtaining a scholarship two years afterwards. He is said already to have obtained considerable facility in the writing of Latin verse; and this talent, which he continued to cultivate and exercise, first brought him into reputation at the university. Several of his Latin poems, most of which were probably produced before he had attained his twenty-sixth year, were afterwards published in the second volume of the collection entitled, *Musarum Anglicanarum Analecta.* The first composition which he gave to the world in his native language was a copy of verses addressed, in 1694, to Dryden, which procured him the acquaintance and patronage of that distinguished poet. He soon after published a translation in verse of part of Virgil's Fourth *Georgic;* and he had also the honour of writing the critical discourse on the *Georgics*, prefixed by Dryden to his translation, which appeared in 1697. But before this, Addison had made himself known to one of the most enlightened and influential patrons of literature in that day, the Lord Keeper Somers, by a poem which he addressed to him, on one of the campaigns of King William. He was also introduced by Congreve to the Chancellor of the Exchequer, Mr. Montague, afterwards Lord Halifax. The advantageous connexions which he had thus formed seem, together with other considerations, to have induced him to abandon his original intention of going into the church. In 1699 Lord Somers procured him a pension of 300*l.* a-year from the crown; and he then set out on a tour to Italy. Here he remained till the death of King William, in the spring of 1702, deprived him of his pension, and also put an end to his expectation of being appointed to a place near the person of Prince Eugene, then commanding the Imperial troops in Italy. Meanwhile he had addressed from that country his well known poetical *Letter* to Lord Halifax, which was greatly admired both in England and Italy, and was translated into Italian by the Abbate Salvini, Greek professor at Florence. Soon after his return home he also published his *Travels*, which he dedicated to Lord Somers. His friends being out of power, he now remained for some time without employment. But at length the victory of Blenheim, in August 1704, excited a wish in the ministers to find some poet who might adequately celebrate its glories; and the Treasurer Godolphin having mentioned the matter to Lord Halifax, the latter recommended his friend Addison as the fittest person to execute the task. He was immediately applied to; and the consequence was the production of his poem, entitled *The Campaign*, which appeared before the close of the year. Godolphin, upon seeing it when little more than half finished, was so much pleased with the performance that he immediately made the author a Commissioner of Appeals. In the following year Addison accompanied Lord Halifax to Hanover; and in 1706 he became under secretary to Sir Charles Hodges, on the appointment of the latter as Secretary of State. He continued to hold the same place under the Earl of Sunderland, by whom Sir Charles was in a few months succeeded. But although he had thus fairly entered upon a political career, he did not desert literature. His next production was his English opera, entitled *Rosamond;* and he also assisted his friend Steele in his play of the *Tender Husband*, not only with a prologue to the piece, but with several of its most effective scenes. In 1707 an able anonymous pamphlet appeared, under the title of *The present State of the War, and the necessity of an Augmentation considered*, which has since been printed among Mr. Addison's works, and was no doubt the production of his pen. In 1709 he went over to Ireland as Secretary to the new Lord Lieutenant, the Marquis of Wharton; the queen also bestowing upon him the office of Keeper of the Records in that kingdom, with an increased salary of 300*l.* He was in Ireland when the first number of the *Tatler* appeared on the 12th of April (o.s.) in that year—the happy idea of Steele, whose connexion with the publication Addison is said to have detected from an observation on Virgil which he had himself communicated to his friend. The active part which he immediately took in the conduct of this periodical work is well known. The change of ministry in 1710, by releasing him from his official duties, and allowing him to return to England, enabled him to make his contributions still more frequent. In the course of this and the following year, he is also understood to have contributed several papers to the political work, *The Whig Examiner*, which was started about this time in opposition to the famous Tory print, *The Examiner*, in which Swift exercised his powerful pen. These papers, which are five in all, are printed among his collected works. The *Tatler* terminated on the 2d of January, 1711; but on the 1st of March following appeared its still more celebrated successor, the *Spectator*, which was continued till the 6th of December, 1712, and of which during the whole of that time Addison was undoubtedly the chief support. The *Spectator* was followed by the *Guardian*, of which the first number was published on the 12th of March, and the 175th and last, on the 1st of October, 1713: and in this also his pen was actively employed. An anonymous pamphlet directed against the commercial policy of the ministry, and bearing the title of *The late Trial and Conviction of Count Tariff*, which appeared this year, is likewise believed to be Addison's, and has been printed among his works. The same year he acquired still greater fame than any of his former productions had brought him by his celebrated tragedy of *Cato*, which was received with extraordinary applause, both on the stage and when it issued from the press. It was played thirty-five nights in succession,—a run of popularity for which it was doubtless in part indebted to its political as well as to its poetical merits; and it was also translated soon after into French, Italian, Latin, and German. On the 18th of June, 1714, appeared the first number of a continuation of the *Spectator*, in which Addison also assisted, till its termination on the 20th of December in the same year. His elegant poetical address to Sir Godfrey Kneller on his picture of the king, also was published about this time. And on the 23d December, 1715, soon after the breaking out of the Rebellion, he commenced a periodical publication in support of the government, under the title of *The Freeholder*, which he continued without assistance at the rate of two papers a-week, till the 29th of June, in the following year. He had now indeed for some time been again engaged in public affairs, having, on the death of Queen Anne, in August 1714, been appointed their secretary by the Lords Justices; and after the coming over of the new king, having again gone to Ireland as secretary to the Lord Lieutenant, the Earl of Sunderland. The earl was soon after recalled, and Addison was then made a Lord of Trade. In 1716 he married the Dowager Countess of Warwick; and in April the following year he was nominated one of his majesty's principal secretaries of state. He soon, however, found it necessary to resign this high employment,—retiring professedly on the ground of ill health, but in reality, as has been generally understood, in consequence of his entire inaptitude both for debate in parliament and for the ordinary business of his office. It is related that his fastidiousness in regard to expression would sometimes so embarrass him in the preparation of an urgent dispatch, that he was obliged to resign the task to one of the clerks, in order that it might be expedited in time. His health, however, had also been for some time impaired by attacks of asthma,—the effects of which were probably in no slight degree aggravated by a habit of over indulgence in wine, to which he had long been addicted, but to which after his marriage he gave himself up more than ever, seeking refuge in its baneful excitement from domestic unhappiness. He left office in March 1718. It was hoped at first that his release from business would have brought about his restoration; and for some time the expected effect seemed to follow. In the course of the year 1719 he was so far recovered as to be able to engage in a somewhat acrimonious controversy with his old friend Steele on the subject of the bill for the limitation of the peerage, then under discussion in parliament, which Steele had attacked in a paper called the *Plebeian*. Addison's defence of the measure appeared in two successive anonymous pamphlets, bearing the title of *The Old Whig*. They are not printed among his collected works; but are undoubtedly his. He again, however, fell ill, and after lingering for some time, at last expired at Holland House, Kensington, on the 17th of June, 1719, when just commencing his forty eighth year. He left a daughter by the Countess of Warwick.

Soon after Addison's death, his works were collected and published in four volumes quarto, by his friend Mr. Tickell, upon whom he had expressly devolved that duty. Besides the compositions already mentioned, and some translations from Ovid and other poetical pieces, this edition contains a treatise on ancient medals in the form of dialogues, which is understood to have been prepared by the author many years before his death; and a portion of a work which he had commenced in defence of the Christian religion, being that which is commonly known by the name of his *Evidences*. The comedy of the *Drummer*, or the *Haunted House*, which had been published anonymously in his lifetime, with a preface by Sir Richard Steele, was also soon after reprinted by Sir Richard, and declared to be Addison's. Two other performances have likewise been since attributed to him on somewhat insufficient evidence; the first, a dissertation in Latin on the most eminent Roman poets, which appeared, with an English translation, in 4to. in 1718; and the other a tract, entitled a *Discourse on Ancient and Modern Learning*, which was printed with his name in 1739, having been found, it was affirmed, among the manuscripts of Lord Somers. This enumeration comprehends all his published productions. Among the literary schemes which he is said to have formed, but did not live to execute, were a tragedy on the death of Socrates, an English Dictionary on the plan of that of the Italian language by the Academy della Crusca, and a metrical translation or paraphrase of the Psalms. It does not appear that any of these undertakings had been even begun.

Addison, however, has been charged with having been the author of a poetical translation of the first book of the *Iliad*, which was published in 1715 by Mr. Tickell, then his private secretary; and by which it has been said he intended to aim a covert blow at the popularity and success of Pope's *Iliad*, the first volume of which had then just issued from the press. The question of Addison's concern in this affair is of more interest in reference to his moral, than to his literary character. A story has been engrafted upon the circumstance to the effect that Pope, with whom he had been for some years in habits of intimacy and professed friendship, was so stung by what he conceived to be the duplicity and baseness of his conduct on this occasion, that he immediately broke off their intercourse: and never would be again reconciled to him. The celebrated character of Atticus, now inserted in the Epistle to Dr. Arbuthnot, is said to have been composed by Pope after this, and sent by him to his former friend. The clearest examination which this story has received will be found in a long and elaborate note in Dr. Kippis's edition of the *Biographia Britannica*, (vol. i., p. 86, &c.) which is known to have been contributed by Sir William Blackstone. The learned judge has undoubtedly sufficiently refuted many points in the common statement; but still it is certain that a coolness did arise between Addison and Pope not long after the appearance of Tickell's book, and there is also reason to believe that their separation was not unconnected with that somewhat injudicious and ill-timed publication. As for the authorship of the translation, however, it was probably Tickell's own.

The literary greatness of Addison in the estimation of his contemporaries probably stood upon somewhat different grounds from those upon which it is now usually placed. In his own day he was looked upon as a dramatist and a poet of a very high order; and appears to have been not so much admired for anything else as for being the author of *Cato*. That stately but frigid tragedy has long ceased to give the same pleasure, by its sonorous declamation and well-expressed common-places, which it seems to have afforded to our ancestors. The taste which then prevailed in poetry was the most artificial which has distinguished any age of English literature. The quality which chiefly drew admiration was a cold and monotonous polish—the warmth of genuine nature was accounted rudeness and barbarism. The return of the public mind to truer principles of judgment in such matters has been fatal both to the dramatic and to the poetical fame generally of Addison; and although his verses are still read with pleasure as the productions of an elegant and accomplished mind, they are not felt to possess any high degree of that power which we now look for in poetry. His glory is now that of one of our greatest writers in prose. Here, with his delicate sense of propriety, his lively fancy, and above all, his most original and exquisite humour, he was in his proper walk. He is the founder of a new school of popular writing; in which, like most other founders of schools, he is still unsurpassed by any who have attempted to imitate him. His *Tatlers*, *Spectators*, and *Guardians*, gave us the first examples of a style possessing all the best qualities of a vehicle of general amusement and instruction; easy and familiar without coarseness, animated without extravagance, polished without unnatural labour, and from its flexibility adapted to all the varieties of the gay and the serious.

ADDITION, from the Latin *addo* to *give to*, is the putting together of two or more magnitudes into one. In Arithmetic and Algebra it also signifies the most convenient method of doing this, so that the sum or collection of added quantities may be counted or reckoned in the same manner as the parts of which it was composed. The sign of this operation is +, which is generally pronounced *plus*, the Latin for *more*. Thus $a+b$ directs us to add the number denoted by b to that denoted by a, and represents the sum of a and b.

Addition of whole numbers in arithmetic is performed partly by memory, partly by the aid of the decimal system of numeration. [See NUMERATION.] The sum of every two numbers, each of which is not greater than 9, must be remembered; from whence the addition of such numbers as 28 and 9, 33 and 6, &c., can be performed in the head. The further process is the same in principle, whether the several quantities to be added together be tens, hundreds, &c., pence, shillings, &c., or any other denomination. Presuming that no reader will be ignorant of the ordinary methods, we will show the general principle for all cases in the following question, in which any line of headings may be taken:—

Hundreds. Shillings. Roods.	Tens. Pence. Perches.	Units. Farthings. Yards.
b	c	d
f	g	h
l	m	n

Add together d, h, and n, and if they be units, convert the sum into tens and units; if farthings, into pence and farthings, &c., meaning thereby, take the greatest number of tens out of all the units, of pence out of all the farthings, &c., in $n+h+d$, and write what is left under n. *Carry* (as it is called) the tens, pence, &c., to the next column on the left, and add successively m, g, and c to them, taking out the hundreds, shillings, &c., as the case may be, from the result, and writing the remainder only under m. Carry the hundreds, &c., to the next line on the left, and so on.

The addition of fractions is, in principle, as follows. We cannot immediately express the sum of one-half of a foot and one-third of a foot otherwise than by writing $\frac{1}{2}+\frac{1}{3}$ of a foot. But if we recollect that *one-half* is *three-sixths*, and one-third is *two-sixths*, it is evident that the sum of one-half and one-third is *five-sixths*. The rule, therefore, is:—reduce the various fractions to others of equal value, and having the same denominator (see DENOMINATOR), add the numerators, retaining the denominator: or, multiply every numerator by every denominator, except its own; add the results, which gives the numerator of the sum: multiply all the denominators together for the denominator of the sum. Thus, for—

$$\frac{2}{3} + \frac{3}{7} + \frac{4}{5} \text{ which is } \frac{199}{105}$$

$$\begin{array}{r}
\left.\begin{array}{r} 2 \times 7 \times 5 = 70 \\ 3 \times 3 \times 5 = 45 \\ 4 \times 3 \times 7 = 84 \end{array}\right\} \text{Add} \\
199 \text{ numerator} \\
3 \times 7 \times 5 = \overline{105} \text{ denominator.}
\end{array}$$

To add decimal fractions, arrange them so that the decimal points shall fall under one another, proceed as in common addition, and let the decimal point in the sum total be placed under the other decimal points:—

$$\begin{array}{r@{\cdot}l} 2&61 \\ &04 \\ &118 \\ \hline 2&768 \end{array} \qquad \begin{array}{r@{\cdot}l} 14&103 \\ 1&04 \\ 118& \\ \hline 133&143 \end{array}$$

To add algebraical quantities, write them all one after another, without changing any sign, and connect the terms, which before had no sign, with the rest, by the sign +. Thus $a+b$ and $a-2b$ added, give $a+b+a-2b$. This is the sum, which may be reduced to a simpler form, by observing that b subtracted twice and added once, is equivalent to b subtracted once, and that a is added to a. The expression then becomes $2a-b$.

When the quantities are fractional, the preceding rule follows the application of another similar to the rule in fractional arithmetic. Thus, for

$$\frac{a}{a+b} + \frac{b}{a-b} \text{ the sum of which is } \frac{a^2+b^2}{a^2-b^2}$$

$$\begin{array}{r}
\left.\begin{array}{r} a \times (a-b) = a^2 - ab \\ b \times (a+b) = ab + b^2 \end{array}\right\} \text{Add} \\
\overline{a^2 - ab + ab + b^2} \\
\text{or} \quad a^2 + b^2 \text{ numerator} \\
(a+b) \times (a-b) = a^2 - b^2 \text{ denominator.}
\end{array}$$

For further information, see *Library of Useful Knowledge, Algebra*, pp. 4, 22; *Study of Mathematics*, pp. 15, 22.

ADDITION of RATIOS. A phrase which may, perhaps, at first, puzzle the mathematical student who reads old books, and which we therefore explain here. Take two ratios or proportions, say 3 to 7 and 5 to 9; the ratio of 3×5 to 7×9, or of 15 to 63 was formerly said to be the *sum* of the ratios of 3 to 7 and 5 to 9. Similarly the ratio of

25 to 4 was said to be *double* of the ratio, or the *duplicate ratio*, of 5 to 2; that of 125 to 8, *triple*, or the *triplicate ratio*, and so on. [See Ratio, Logarithm.] The sum of the first ratios in any more modern work would probably mean $\frac{3}{7}+\frac{4}{5}$; but the term 'sum of the fractions,' would most likely be used in preference.

ADEL or **Adal.** Adal is the Arabic name given to all the countries inhabited by the Danákil tribes. These tribes inhabit the coast from the Bay of Tajurrah to the Strait of Bab-el-Mandeb (to which district the name Adal till lately was exclusively applied), and from thence to Massowah. How far inland they extend is not known, except at the northern and southern extremities. At Massowah they occupy the flat lying along the Red Sea, and the acclivity by which the table-land of Tigré is ascended, which together are about 40 miles broad. Behind Tajurrah Bay the country extends at least 120 miles from the sea. The territory gradually narrows from south to north.

The sea-coast of Adal is above 300 miles in length. It is studded with rocky islands of the coral formation, to which also belongs the adjacent coast. Between the islands and the mainland are several anchorages, few of which are good.

The interior of Adal is known only along the routes followed by European travellers in ascending from the sea to the table-lands of Tigré and Shoa. The ascent to Tigré commonly followed by travellers is that from Massowah to Halaï, a village 8628 feet above the sea, called the road by the Pass of Taranta. The caravan-road to Shoa, on the south, runs from Tajurrah to Ankobar.

Near this road, not far west from the end of the Bay of Tajurrah, called Gubbat-el-Kharab, is Bahr Assal (Salt Lake), which is 570 feet below the level of the sea. It is about 7 miles long and 8 wide. One-third of its surface is covered with a sheet of salt, half a foot thick. It is in the midst of a volcanic district. Near this road is another lake called Abhebbad, into which the Hawáah falls.

The Danákil, or Dankali, resemble the Gallas in appearance [see Abyssinia]; they lead a nomadic life, and are of the Mohammedan religion. Adal does not supply any article for foreign commerce, except salt from Bahr Assal.

ADELUNG, JOHANN CHRISTOPH, the well-known German grammarian and universal linguist, was born at Spantekon, a village near Anklam in Pomerania, on the 8th of August, 1732. He received his first education at the town-school of Anklam, and at Kloster-Berge, near Magdeburg; and afterwards visited the university of Halle. In 1759 he was appointed a professor in the evangelical gymnasium at Erfurt: but he held this situation only till 1761, when, in consequence of a dispute with the Catholic town-magistrates about a point of difference in religion, he found himself under the necessity of leaving Erfurt. Adelung now went to Leipzig, where he continued to reside till 1787. He supported himself by literary labours, and chiefly by translations of valuable works of foreign literature. The number of volumes which he thus prepared for the press, and many of which he enriched with extensive additions of his own, is surprisingly great. Among them, his *Glossarium manuale ad scriptores mediæ et infimæ Latinitatis*, (Halle, 1772-84, 6 vols. 8vo.) founded upon the previous labours of Du Cange and Charpentier, deserves particular notice. Besides these numerous translations and compilations, Adelung found leisure to prepare his critical dictionary of the High-German language. (*Grammatisch-kritisches Wörterbuch der Hochdeutschen Mundart.*) The plan of this work had already been projected by Gottsched, whom death prevented from following it up (1766), and who left but scanty materials for its execution. Adelung now turned his whole attention to the language of his native country, and several valuable works (*Deutsche Sprachlehre für Schulen*, Berlin, 1781, 8vo., *Umständliches Lehrgebäude der Deutschen Sprache*, Leipzig, 1782, 2 vols. 8vo., &c.) were the result of the profound study which he gave to this subject. In 1787 Adelung was called to Dresden and appointed principal librarian to the electoral library there. The important documents for Saxon history and antiquities which were now under his care, attracted his attention, and induced him to publish several works of deep research on the history and ancient institutions of the state which he served. Soon, however, his old predilection for philological and linguistic inquiries returned, and he formed the plan of his *Mithridates*, a work which he intended should contain a succinct historical account of all the known languages of the earth, with a translation of the Lord's Prayer, given as a specimen of as many as could be procured. Death prevented him from carrying this vast project into execution. Adelung died on the 10th of September, 1806, only a few months after the first volume of the *Mithridates*, giving an account of the Asiatic languages, had appeared. The plan of the work was afterwards taken up by Johann Severin Vater, who completed the whole in four volumes.—[See the article 'Adelung,' by Ebert, in Ersch und Gruber's *Encyclopädie*, vol. i.]

ADEN, a town and harbour situated on a promontory at the south-west extremity of Arabia, in 12° 46′ N. lat., and 45° 10′ E. long. Before the British took possession of it in 1839, Aden was a miserable place, consisting of a small number of mud huts, and containing from 600 to 1000 half-starved inhabitants. It has since advanced rapidly in prosperity, and has now a flourishing trade. In 1845, it was stated to have a population of at least 25,000, including the troops, who amounted to 3500.

The town is built on a peninsula, united to the mainland by a low, narrow, sandy isthmus. It stands in a valley, at the eastern base of a mountain mass called Jebel Shamshan, 1776 feet high. The peninsula is doubtless of volcanic origin, and the valley in which the town lies, the crater of an extinct volcano. Aden possesses almost the only safe harbour on that coast.

The place has been long famous for its commerce and its delightful climate. The native name Aden, or Eden (Paradise), and the Greek name Eudaimon (the Prosperous), are expressive of the estimation in which it was held. The Portuguese struggled hard to obtain it in the fifteenth century, as a place of importance on the road to India. The Turks took it in the sixteenth century, but it became subsequently independent of them, and its trade gradually declined till it became insignificant. Since Aden became a chief station for the steamers passing to and from Suez and Bombay, it has been rapidly rising in importance. Though the temperature is often high, sometimes rising to 104°, the station is by no means unhealthy.

ADHESION. This term has generally been employed to denote the property by which two solids, a solid and a fluid, two solids and an interposed fluid, or two fluids, remain attached to each other when their surfaces are brought into contact. Adhesion, in some instances, may be considered as little if at all different from cohesion, and dependant upon the same cause, while, in other cases, it appears to be connected with, and probably to a considerable extent derived from, chemical affinity; when, for example, two surfaces of lead are pressed together, the adhesion resembles mere cohesion, it acts at insensible distances like that power, and no change of properties ensues in the metal. If, however, the surface of a piece of lead is put into contact with mercury, the two metals act upon and combine with each other, and an amalgam is produced by chemical affinity. There are other instances in which the adhesion is not distinctly to be referred to cohesion, and in which it certainly does not depend upon chemical affinity, as when a plate of glass adheres to the surface of mercury, or liquids rise in small tubes by capillary attraction.

Among the earlier attempts to determine the force of adhesion are those of Dr. B. Taylor, in a paper on magnetism (*Phil. Trans.* 1721). He performed various experiments to ascertain the force of adhesion between wood and water, by determining the force in weight required to separate them. He found it to be directly as the surface, and that a square inch of wood required fifty grains to raise it from the water.

M. Achard (*Berlin Memoirs*, 1776) made a vast number of experiments on the force of adhesion between plates of glass of different diameters, and many liquids, and upon the adhesion of twenty different substances with as many liquids. It had been supposed that adhesion was derived from atmospheric pressure, but M. Achard found that by varying the pressure no change occurred in the adhesive force of glass and water; and that the adhesion of fluids to solids was uniformly in the inverse ratio of the temperature. The diminution in the force of adhesion by increase of temperatures was attributed by Guyton de Morveau to the rarefaction of the fluid by heat, and the consequent reduction o points of contact in the same space

As the surfaces of the solids employed by Dr. Taylor an M. Achard must have been wetted by the liquids, it ha been objected to their experiments, and especially by M Dutour in the *Journal de Physique*, that they do not prov any adhesion between the solid and the liquid, but cohesio between the two portions of the liquid which have been separated. If this objection be valid, then those only can be considered as proper cases of adhesion, in which no particle of one substance remains with the other after the separation of their surfaces, as when glass is separated from mercury; M. Dutour found that a disc of glass 11 lines (French) in diameter adhered to mercury with a force of 194 grains.

M. Guyton published in 1777 in his *Elémens de Chymie*, a series of experiments on the force of adhesion between eleven metals and mercury; his method was as follows:—the metals were perfectly pure, circular, and one inch in diameter; they were all of the same thickness and suspended from a ring in the centre at the arm of an assay-balance and counterpoised; the plates were then applied to the surface of the mercury, which was changed in each experiment, and the weights required to detach them were as follows.—

	Grains.		Grains.
Gold	446	Zinc	204
Silver	429	Copper	142
Tin	418	Antimony . . .	126
Lead	397	Iron	115
Bismuth . . .	372	Cobalt	8
Platina	282		

In these experiments the phenomena of adhesion appear to depend upon the degree of chemical affinity existing between the mercury and the metals applied to its surface. If the affinity be weak, the two surfaces will separate by the application of a slight force. Indeed, M. Guyton himself considers that the weight required to separate the different metals from mercury may directly express their affinity for it. It will be evident on a moment's consideration that the degree of adhesion is perfectly independent of the densities of the different metals.

The most important cases of adhesion, perhaps, are those of gases to the surface of solids. All solid bodies attract the particles of gases with greater or less force, so that every body has, as it were, a condensed atmosphere adhering to it which it is difficult to remove. Porous and powdered bodies, presenting the greatest amount of surface, exhibit this property in the most remarkable degree. Heat is developed by the condensation that the gases undergo. Liebig describes this relation of gases to solids as playing an important part in many processes.

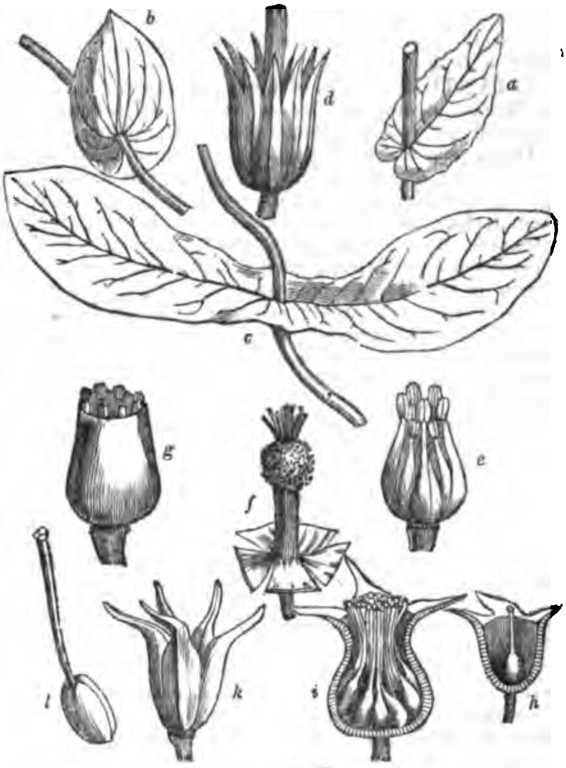
'In this manner every porous body—rocks, stones, the clods of the fields, &c.—imbibe air, and therefore oxygen; the smallest solid molecule is thus surrounded by its own atmosphere of condensed oxygen; and if in their vicinity other bodies exist which have an affinity for oxygen, a combination is effected. When, for instance, carbon and hydrogen are thus present, they are converted into nourishment for vegetables—into carbonic acid and water. The development of heat when air or watery vapour is absorbed, is acknowledged to be the consequence of this condensation by the action of surfaces.

'But the most remarkable and interesting case of this kind of action is the absorption of oxygen by platinum. In the state powder this metal absorbs more than 800 times its volume ygen gas, and this oxygen must be contained within it state of condensation greater than that of liquid water.' Gases, when condensed within the pores, or upon the ce of solid bodies, exhibit a highly intensified chemical n. When hydrogen gas is allowed to flow on the ce of spongy platinum, the pores of which contain nsed oxygen, we see the platinum become red-hot, the jet soon takes fire. The hydrogen gas, which not combine with uncondensed oxygen unless a flame applied, combines immediately and directly with the ed oxygen. Water is thus formed, and the imme- result of this oxidation, or slow combustion of the gen, is a development of heat.'

DHESIONS, Theory of, in Botany, is the basis of of the philosophical part of that science, and forms the most striking points of difference between the es of the present and preceding schools. It shows many of the varied characters, which cause so a diversity of appearance in the vegetable king- originate in the adhesion of a few very simple ; and that what we are accustomed to consider parts emely different nature, only seem so in consequence way in which such adhesion occurs. Thus, the stem is not a homogeneous mass of vegetable matter, d by holes, or filled by little cavities caused by the extrication of air in it when in a soft state, but is produced by the adhesion of certain elementary bodies called Cellular Tissue, Fibrous Tissue, and Vascular Tissue (see ELEMENTARY ORGANS), arranged in a definite manner, which varies with species; neither is a leaf, or a fruit, or a flower a mere mass of pulp, or an expansion, like the horn of an animal, but also consists of these same elementary organs in a state of adhesion. To gardeners it has been long known that the property of adhesion between contiguous parts exists to a certain degree; for the operation of grafting or budding a portion of one plant upon another is dependent upon it. They also know that if two cucumbers, or two apples, or even two hard branches be artificially placed in contact when in a growing state, they will adhere, so as to become what may be called vegetable twins; and that the same phenomenon sometimes occurs constantly in certain cultivated plants, of which an instance is furnished by the cluster golden pippin apple, whose fruit is usually twin.

Guided by these well-known facts, modern botanists have discovered that the property of adhesion explains the true nature of every organ that plants bear, and that there is none so anomalous which cannot be shown to owe its appearance in a great measure to the union of contiguous parts. As it is very important that this should be clearly understood by all who make Botany their study, we shall proceed to give several illustrations of it.

Some leaves are said to be stem-clasping or amplexicaul, when their base partially surrounds the stem (*fig. a*); while some stems are said to be perfoliate, when they seem as if they pierced through the leaf, as in Bupleurum rotundifolium (*fig. b*); but the latter differ from the former only in this, that in the first the lobes at the base of the leaf embrace the stem without adhering, while in the second they not only clasp the stem but grow together where their margins come in contact. Some leaves are hollow, as in the pitcher plant, and these were formerly thought to be special organs with which no analogy could be discovered; they are now known to be leaves which have rolled up so that their opposite margins come in contact and adhere. Other leaves, growing from opposite sides of a stem, adhere in consequence of their bases becoming connate (*fig. c*), as in the honeysuckle; and finally there are others, many of which grow, in what botanists call a whorl, that is to say, all round a stem upon the same plane, and adhere by their margins into a sheath (*fig. d*), as in Casuarina.



[Adhesion.]

In other organs adhesions of a similar nature occur. In the calyx all the sepals, or parts, are often distinct, as in the ranunculus; but they also often adhere by their edges, into a sort of cup, as in the cherry. Botanists used to consider the former as composed of many leaves, and the latter as composed of but one leaf, cut at the edge into a certain number of lobes. In the corolla the petals are either all separate, as in the rose, or they adhere by their edges into a cup or bell, as in the different heaths, Campanula, and the like; while the first was called many-petaled, the second were called one-petaled, it being thought, as in the case of the calyx, that it was a single petal of a special kind, cut into lobes at the margin.

Similar adhesions take place between the stamens. In the rose they are all distinct from each other; in the geranium they slightly adhere at the base (*fig. e*); in the mallow they adhere into a tube, except near the upper extremity, where they are not united, and have their ordinary appearance (*fig. f*); in other plants they grow together into a solid tube in which no trace of separation can be discovered, as in the genus Guarea (*fig. g*).

Finally, in the pistillum there are certain parts called carpella, each of which is a hollow body terminated by a style and stigma. These carpella are hollow, because they are formed of a flat organ doubled up so that its edges come in contact, and adhere to each other. Sometimes only one carpellum is present in a flower, as in the cherry (*fig. h*); sometimes several, as in the rose (*fig. i*). The adhesions in the latter case cause many of the differences we observe in the structure of fruits; for instance, an apple is composed of five such carpella, adhering to each other and to the calyx; an orange is composed of many such carpella, each of its lobes being one. In the nigella, the styles of the carpella are all distinct (*fig. k*), but in the lily and the myrtle (*fig. l*), the styles of the carpella adhere so completely that there seems to be but one. In the apple, the calyx seems to grow from the top of the fruit; this is caused by the carpella having at a very early period adhered to the inside of the calyx, which afterwards grows with their growth, and, finally, leaves its extremities in a withered state near the top of the carpella: in the cherry, on the contrary, no adhesion ever takes place between the carpellum and the calyx; and, consequently, when the fruit is ripe, there is no trace of the latter upon its upper end. In the raspberry, the fruit is enabled to slip like a thimble from off the receptacle, because the carpella all adhere by their sides.

For further information consult Lindley's *Introduction to Botany*; Balfour's *Class Book of Botany*; Schleiden's *Principles of Scientific Botany*; and more particularly a little work, also by the last-named author, entitled *The Plant, a Biography*.

ADIANTUM, a genus of dorsiferous ferns, so called by the Greeks, because the leaves are of such a nature that water will not readily moisten them. The plant described by Hippocrates and his successors under this name, appears to have been the A. Capillus Veneris, or the maiden-hair fern—a rare European species, occasionally met with on moist rocks, and old damp walls, even in this country. From other genera of the same tribe it is known by its size, or masses of reproductive particles, being situated upon the margin of the leaves, and carried over by a thin curved scale which separates from the leaf by its inner edge.

The number of species is very considerable, probably not far from 80 or 90, and, as is the case in all extensive genera of ferns, comprehend every degree of division of the leaves, from perfect simplicity to what botanists call supradecomposition. All those in which the leaves are much divided, are remarkable for the very delicate elastic stalks on which the broad leaflets are attached; it is to this circumstance that the name of maiden's-hair has been given to the European species. The genus is scattered over all the world from Europe to New Zealand, but is not found in any high latitudes in either hemisphere; by far the greater part of the species inhabit damp tropical woods.

A. Capillus Veneris, is a dark green stemless plant, found in damp, sharp, rocky places, by the side of watercourses, and on the edge of wells, where the air is keen and dry. Its leaves, which are from six to fifteen inches high, have a blackish-purple, highly-polished stalk, divided into a great number of very slender ramifications, from the extremities of which proceed the thin, delicate, wedge-shaped leaflets, which are notched irregularly upon their upper edge, and have the most graceful appearance imaginable when growing a little above the eye, and gently agitated by the wind. Wonderful medicinal properties were once ascribed to this species, but they have long since been discovered to have no existence except in the exaggeration of fanciful practitioners. All that can be discovered in it is, a slight but pleasant aromatic flavour; the French occasionally use it in slight coughs. *Capillaire* is prepared by pouring boiling syrup upon the leaves of this species, or of *A. pedatum*, an American plant of larger growth and far less divided leaves; a little flavour is afterwards given with orange-flowers.

ADIGE, the Athesis of the Romans, called by the Germans Etsch, is a considerable river of North Italy, which has its source in the Alps of Tyrol above Brixen; it enters Italy by Bolzano and the valley of Trento, flows in a southern direction by Roveredo, parallel to and for the most part about 6 miles from, the lake of Garda, then turning abruptly towards the east, passes through Verona and Legnago; it afterwards enters the great Delta between the Brenta and the Po, and forming several branches, empties its waters into the Adriatic Sea. Below Verona, it is from 300 to 600 feet wide; and from Legnago, its general course may be considered as parallel to that of the Po. It is a deep and rapid stream, dividing by its course the old Venetian territories from Lombardy Proper. Its entire course is about 240 miles. It is navigable up to Trent; but the navigation is dangerous from its velocity.

ADIPOCIRE. A substance so named from *adeps* fat, and *cera* wax, because it possesses the properties partly of fat and partly of wax; it is a body of a peculiar nature, being intermediate between fat and wax, and bearing a close resemblance to spermaceti. This name was given by M. Fourcroy in 1786, to the substance in question, which he discovered on examining a piece of human liver that had remained for ten years exposed to the air in the laboratory of M. Poultier de la Salle. In the same year Fourcroy had the opportunity of observing an accumulation of adipocire on a scale of prodigious extent, under circumstances of a peculiar nature, which are highly curious. There was in Paris an immense burial-ground, called La Cimetière des Innocens. This place had been the receptacle of the dead for a considerable part of the population of Paris for several centuries. On account of some improvements in the neighbourhood it was determined to remove this cemetery. The number of burials in this place had amounted to some thousands annually. The bodies were deposited in pits or trenches about thirty feet deep; each pit was capable of holding from twelve to fifteen thousand bodies; and as the pits became full they were covered with a few feet of earth. The extent of the whole area was about seven thousand square yards, and this space became at last occupied by a mass which consisted almost entirely of animal matter, rising several feet above the natural level of the soil. Scientific men were specially charged by the government to direct the precautions requisite for securing the health of the workmen in removing this immense mass of putrefying animal matter; among whom were Fourcroy and Thouret, the latter of whom has given a most interesting account of the circumstances attending the opening of the ground, and the former an analysis of the new and singular object that presented itself for investigation. The most remarkable change was found in the bodies that had been heaped together in the trenches. The first of these trenches opened in the presence of Fourcroy, had been closed for fifteen years The coffins were in good preservation; the covers being removed, the bodies were observed at the bottom, leaving a considerable distance between their surface and the cover, and flattened, as if they had suffered a strong compression; the linen which had covered them was slightly adherent to the bodies; beneath the linen was found nothing but irregular masses of a soft ductile matter of a grey-white colour, resembling common white cheese, the resemblance being more striking from the print which the threads of the linen had made upon its surface. The bones, which were surrounded by this matter, had no solidity, but were readily broken by sudden pressure. The head was environed with this peculiar matter; the face was no longer distinguishable; the mouth was disorganized; no trace remained of the viscera of the thorax and abdomen, which were all confused together, and converted into this fatty matter; and this was also invariably the case with the brain. None of this matter was found in bodies isolated from each other, but only in those accumulated in the common graves. From various observations it was found that this fatty matter was capable of enduring in these burying-places for thirty or forty years, but that ultimately it became corroded and was dissipated.

This substance, thus presented for examination under such remarkable circumstances, is considered by M. Fourcroy as an ammoniacal soap, formed of a peculiar oil combined with ammonia. Its properties are, that it melts at about 130° Fahrenheit; by a strong heat it is decomposed with the solution of ammonia. Alcohol acts but slightly upon it at common temperatures, but when boiling dissolves about one-fourth of its weight, the greater part of which separates on cooling in small acicular crystals. Lime, potash, and soda decompose adipocire with the solution of ammonia. It is decomposed by nitric acid with the production of nitric oxide, and by sulphuric acid with the development of charcoal. M. Chevreul (*Recherches sur les Corps gras*) finds that adipocire consists of a large quantity of margaric acid, and a small quantity of oleic acid, combined with a little ammonia, potash, and lime.

Different opinions have been entertained as to the nature of the operation by which adipocire is produced. From the experiments of Dr. Gibbes (*Phil. Trans.* 1794), it would appear that muscular flesh, when buried in moist earth, is, by a peculiar kind of decomposition, scarcely to be considered as putrefaction, converted into adipocire; and this change he found was expedited by exposure to running water.

M. Gay-Lussac has stated it as the opinion both of himself and M. Chevreul, that the apparent conversion of flesh into adipocire is merely a deception; and is nothing more than the wasting of the muscular fibres, while the fat remains. The experiments on which this conclusion are founded (*Ann. de Chim. et de Phys.* iv. 71) are these:—fibrin of blood was kept in water, renewed once every two or three days for three months; it all wasted way, and no fat whatever remained. Muscle of beef and liver being treated in the same way, some fatty matter remained. Dr. Thomson states that a body which had lain in a moss in Scotland for more than a century, was examined a few years since, and found to be entirely converted into a hard saponaceous matter; a portion cut from the thigh was chiefly adipocire; and the quantity of fatty matter was much too large to suppose it to have pre-existed in the living body. To this may be added another similar case observed by Sir E. Home and Mr. Brande, and published in the *Philosophical Transactions* for 1813.

By the action of dilute nitric acid upon lean flesh, Dr. Gibbes obtained a substance which he considered as exactly similar to the adipocire produced in the mode already described. Dr. Bostock (*Nicholson's Journal*, 8vo., vol. iv. p. 135) also formed adipocire by the agency of nitric acid; it is, however, most probable that the result of the action of the acid is essentially different from the true adipocire.

ADIPOSE SUBSTANCE, *adeps*, fat. **ADIPOSE TISSUE,** *Tela adiposa*, Latin; *Tissu graisseux*, Fr.

Adipose substance, or fat, is an animal oil, which resembles, in its essential properties, the vegetable oils. It is wholly inorganic, though contained in an organized tissue. It varies in its consistence, or rather in the temperature at which it becomes solid. In general, it forms a pretty firm solid, constituting suet, which, when divested of the membrane in which it is contained, is called tallow; but there are animals in which, at the ordinary temperature of the atmosphere, it always remains fluid, as in the cetacea. At the temperature of the human body, it is fluid. It is therefore conceived, that during life it must exist in a fluid or semi-fluid state; though, when observed in the living body, as when incisions are made through the adipose membrane, either in the human subject or in animals, it appears as a soft, yielding, compressible substance, with a slight degree of translucence. There is reason, however, to conclude that this degree of firmness, as well as the general appearance which it exhibits in the living subject, is wholly derived from the organized membrane in which it is contained.

Human fat, when separated from the tissue in which it is deposited, is of a whitish-yellow colour, and the colouring matter, being soluble in water, is capable of being removed by washing. It is white and transparent in proportion to the youthfulness of the subject, the yellow colour increasing with age. When purified, it is perfectly white, inodorous, and of a mild, insipid taste. It is lighter than water, and burns with rapidity. By exposure to air and light it becomes rancid, and gives off a volatile acid, which has a strong odour. It is one of the few animal substances which does not contain azote; its ultimate elements are carbon, hydrogen, and oxygen. Bérard has succeeded in producing, artificially, a substance very analogous to animal fat. On mixing together one measure of carbonic acid, ten measures of carburetted hydrogen, and twenty of hydrogen, and transmitting the mixture through a red-hot tube, several white crystals were obtained, which were insoluble in water, soluble in alcohol, and fusible by heat into an oily fluid.

Until recently, it was conceived that fat is a simple principle, constituting one of the elements of the animal organization: but M. Chevreul, who has examined this substance with extraordinary diligence, has demonstrated that it is not a simple principle; but that it consists of two substances which are capable of being separated from each other, and obtained in a distinct form. Of these substances, one, at the ordinary temperature of the atmosphere, is solid; the other fluid. To the solid substance he gives the name of *stearine*, from στέαρ, fat or suet, and to the fluid substance *elaïne*, from ἔλαιον, oil. Stearine, the solid portion of fat, is a substance colourless, tasteless, nearly inodorous, soluble in alcohol, separable from this solution in the form of small, silky needles, and preserving its solidity at a temperature of 99° Fahrenheit. Elaïne, the oily principle of fat, is fluid at the temperature of 60° Fahrenheit; it is of a yellow colour, without odour, lighter than water, its specific gravity being 0·913, and easily soluble in alcohol. The difference in the fluidity, or the melting point of the fat of different animals, depends on the proportions in which these two substances are combined; in the more solid the stearine, in the less consistent the elaïne, being in excess.

The chemical processes by which these substances are obtained are simple. Adeps, tallow, or fixed oil, is dissolvable in very pure, hot alcohol; the stearine separates from the solution by crystallization, assuming the form, as has been already stated, of fine silky needles, while the elaïne is procured by the evaporation of the spirit. There is a still simpler process. Fixed oil is congealed by a low temperature; the mass is then pressed between folds of bibulous paper; the elaïne soaks into the bibulous paper, and the stearine remains in a separate form; when the bibulous paper is pressed under water, the oily matter which escapes is pure elaïne. The changes that take place when the constituent principles of fat combine with an alkali, as potash, will be explained in the article Soap.

Animal fat is contained in a distinct membrane, termed the adipose tissue. The structure of adipose tissue has been of late years very accurately investigated by histological observers. By the aid of the microscope, it has been ascertained that the fat is always enclosed in distinct membraneous vesicles or bags, technically termed 'fat-cells;' these cells, when in an isolated condition, or in a young state, are either oval or round; but when they occur in groups, or are aggregated together—as is seen, for example, in the human *mesentery*—then they assume, from mutual pressure, a polyhedral character, and are most frequently of an hexagonal form. The cell-wall, or external fatty envelope, is exceedingly fine and transparent, and the cell-contents do not always occupy the entire cavity of the vesicles; when, as is frequently seen, the oily accumulation within the cells is very great, if they be viewed under the microscope with transmitted light, then the rays are very powerfully refracted, and there appears at the circumference of each cell a dark broad rim or margin; this is a character so striking, that it has been considered as a characteristic appearance of the true fat-cell. There is also frequently observed a radiate or star-like appearance beneath the cell-wall; this is owing to the presence of crystals of margaric acid, which are *precipitated* by the fat. The size of the fat-vesicles is extremely variable. Chemically considered, fat consists of three substances—namely, oleine, stearine, and margarine; which, again, consist severally of carbon, oxygen, and hydrogen, in different proportions. These fatty matters are found in a fluid condition in the living animal, but deprived of the temperature so afforded, two of the compounds—that is, stearine and margarine—are then resolved into a solid condition.

There are still many discrepancies of opinion concerning the origin of fat. According to Dumas, it is conveyed directly into the body; but Liebig, on the other hand, asserts that it is formed within the body. This latter view is supported by the observations of Boussingault and others, who believe it to be assimilated from the non-nitrogenised substances, such as starch, sugar, and gum; but it is probable that the nitrogenised compounds, albumen, fibrin, and caseine, also contribute largely in its formation. Whatever chemical changes take place, there can be little doubt that the *immediate* cause of its accumulation is owing to a vital or selective principle residing in the cell-wall or cell-nucleus, which may be regarded in the light of a peculiar *individuality*, possessing an *appetite* or *property*, in virtue of which it attracts to itself, or lays hold of, the ready-formed pabulum within its reach, and which is, in the present instance, in the blood. By chemical analysis, the materials of fat, like those of all the other secretions, are found to be contained in the blood; but in what mode the fat is separated from the blood we are wholly ignorant. There can be no doubt, however, that the blood receives the oily principle of fat from the chyle, which is the nutritive matter formed by the process of digestion, in which it is ascertained to be present in large quantity.

The relative quantity of fat contained in the bodies of different individuals varies more than does that of any other tissue; it is enormously developed in some, and as deficient in others. As diffused over the body, the adipose membrane consists of masses which vary considerably in their magnitude and shape. In some places they are rounded, in others pear-shaped, and in the median line of the abdomen, egg-shaped. The distribution of the membrane is exceedingly unequal. There is, in general, a considerable layer immediately beneath the skin; and especially between the skin and the abdominal muscles, where it occasionally accumulates in enormous masses. Between the folds of the membranes which form the OMENTUM and MESENTERY, there is usually a large quantity; also around the heart and the kidneys; on the face, and especially on the cheeks, and in the orbits of the eyes; in the palms of the hands, the soles of the feet; the pulp of the fingers and toes, the flexures of the joints, the fibres of muscles, and the sheath of vessels. In most of these organs it never entirely disappears, whatever be the degree of leanness to which the body may be reduced; while in the cranium, the brain, the eye, the ear, the nose, and several other organs, there is none, whatever be the degree of corpulency.

The function which the adipose substance performs in the animal economy is thus far apparent. Being a bad conductor of caloric, it cannot have much influence (though the fat immediately beneath the skin may have some) in maintaining the heat of the body, since the chief portion of it is situated deep in the system, and is placed around the internal viscera. Yet, it certainly accomplishes more than one purpose of no slight importance. 1. In the first place, it is probable that its accumulation in the system serves as a reservoir of inflammable matter for the generation of animal heat, and that it often actually maintains a process of combustion no less than the oil of the lamp. The phenomena of life present nothing more curious and interesting than the provisions which are made for the production and support of animal heat, as will be fully shown hereafter. (See HEAT, ANIMAL.) Animal heat is generated by the union of the carbon of the blood with the oxygen of the air, and the consequent formation of carbonic acid, the evolution of heat invariably attending the formation of this acid. By the process of digestion chyle is formed; chyle contains a large portion of carbon: this carbon is poured into the great venous trunks of the system, and, in a mode which will be explained hereafter, is immediately carried to the lungs by the great vessel that springs from the right heart. In the lung it is consumed, in the formation of carbonic acid gas, for the production of animal heat; and the large supply required for the continual maintenance of this process is, under ordinary circumstances, afforded by the chyle. But suppose this supply to fail; then immediately the absorbent vessels take up, from its various receptacles, the adipose matter accumulated in the system, and convey it to the veins; the veins transmit it to the lung, and thus the lung is supplied with the necessary quantity of carbon for the generation of carbonic acid, and the consequent production of animal heat. 2. In the second place, it serves a most important use in obviating the effects of excessive nutrition. When too much food is taken, or when the secretions and excretions are suppressed, grievous evils would arise, and often death would ensue, if there were no provision for the removal of this superfluous matter. One of the most important of these provisions is the deposition of fat, by which the system is lightened of a burthen; and the circulating system especially is relieved of a fulness and tension of its vessels, which might induce in them a fatal state of action. The secretion of fat from the blood, and the deposition of it in its various receptacles, is thus one of the safety valves of the constitution. The generation of it under circumstances favourable to its formation, that is, under circumstances which put the system in danger, either from the quantity or the quality of the blood, is extremely rapid. In man, no other solid is ever formed as quickly as this sometimes is; but in some animals, in certain states of the atmosphere, a prodigious accumulation of it is said to take place in the course of a few hours. Bichat states that during a fog of twenty-four hours continuance, thrushes, wheat-ears, ortolans, and red-breasts, are sometimes observed to become so fat that they are unable to fly from the sportsman.

A certain quantity of fat is a sign and an effect of health; an excessive accumulation of it is a sign and a cause of disease. The quantity actually generated is influenced by a great variety of circumstances. 1. By age. At the two extremes of human life the quantity is always small. Before birth, it is less than at any other period. During the first half of fœtal existence, there is no appearance of it whatever. About the fifth month it begins to appear in isolated grains under the skin. At the period of birth, it is sometimes accumulated in considerable quantity; but even then, it is in distinct masses in no part of the body excepting beneath the skin; in the internal organs, and in every other part of the body, it is found only in small and separate grains. As the period of maturity passes into that of declining age, it is sometimes very abundant; but as old age advances, the quantity invariably diminishes; and in extreme old age it is very minute: this is one of the chief causes of the thinness so characteristic of this stage of existence. It is remarkable, too, that the situation of the fat in the aged is exactly the reverse of that in the infant. In the infant, as we have seen, there is scarcely any of this substance in the interior of the body, but almost all of it is accumulated immediately beneath the skin; and this is the cause of the plumpness and roundness of the external surface of the infant: in the old, on the contrary, whatever portion of fat remains in the system is almost all deposited in the very substance of the organs, while there is scarcely any on the external surface. 2. The quantity of fat is materially influenced by sex. In general, it is more abundant in the female than in the male. 3. By constitution. There are persons who never become fat at any period of life, however sound the health, however good the appetite, however favourable the circumstances for the formation of this substance. And this habit is often hereditary, being received from the parent and transmitted to the offspring for many successive generations. 4. By diet. Nutritious and abundant diet, consisting especially of animal food and malt liquors, conduces to its formation in large quantities; while high seasoned, spiced, or acid aliments, together with the immoderate use of spirituous liquors, check its production. 5. By the condition of the function of assimilation. If the power of assimilation (that is, the power of converting chyle into blood) be diminished, while the appetite remains unimpaired, a large quantity of chyle is flowing in the circulating stream which cannot be transformed into proper nutriment: this unassimilated, and therefore useless and pernicious chyle, is deposited in the adipose tissue, in the form of fat, and in this manner the circulation is relieved of its load. An excessive accumulation of fat in persons otherwise in sound health should therefore always excite attention; it is often the earliest indication of a diminution of the vital energy, and not, as is often supposed, a sign of vigorous health. 6. By the state of the secretions and excretions. Suppression of the ordinary secretions and excretions leads, in a way which can now be readily understood, to a corresponding and a compensating deposition of fat; while a preternatural increase of the natural evacuations, as in cholera, diarrhœa, diabetes, &c., and a preternatural increase of the discharge from the mucous surfaces, especially from those of the lungs and intestines, will prevent the deposition, and even cause the absorption of the adipose substance. 7. Active and long-continued physical exercise. Walking, running, riding, whatever species of exertion promotes the secretions and excretions, prevents the deposition of fat, as is exemplified in boxers, jockeys, and all who go through a regular system of training, of which vigorous exercise always forms a part. 8. Long-continued and intense mental exercise. Persons whose minds are acute, active, and vigorous, are seldom fat. There is no more certain or powerful means of becoming and keeping thin than hard and continuous mental labour. Among the conditions observable in all the remarkable instances on record of persons who have changed rapidly from a state of enormous obesity to a state of moderate thinness, vigorous mental exertion is one. Persons oppressed with an accumulation of fat, and accustomed to lead an indolent and luxurious life, when placed under circumstances which require great mental exertion, are invariably found to lose many pounds of their weight in a short time, and to undergo a sensible change in their general aspect; and this is owing chiefly to the absorption of the adipose substance. 9. But the accumulation of fat is influenced still more by the character than by the mere activity of the mental state. Cheerfulness and serenity of mind are highly conducive to the deposition of fat, while anxiety of mind not only suspends all further deposition, but causes an active absorption of it. The immediate cause of a sudden change from fatness to leanness is the absorption of the adipose substance. Thinness, too, is usually and justly thought to be the general accompaniment of a sour, fretful, and irritable temper. 10. Excessive sleep, together with the absence of physical and intellectual exertion, and still more, of mental anxiety, is highly conducive to the accumulation of fat. 11. Organic diseases, especially those which impede the formation of chyle, or which impede the conversion of it into blood, diminish the secretion of fat; hence persons who labour under organic diseases of the stomach and of the small intestines are invariably thin, and generally emaciated. This is also the case with those who are afflicted with diseases of the respiratory organs, such as the deposition of tuberculous matter in the lungs, by which the air-cells are choked up, and the air is prevented from coming into contact with the venous blood, and with the chyle contained in it. As the tubercles enlarge, the respiratory portion of the lung diminishes, and part after part of the organ being thus successively obliterated, the emaciation at length becomes extreme. 12. But even long-continued disorder of the system, without any organic disease, generally occasions wasting of the body, from the absorption of the adipose substance; because, in this state of the system, the processes of waste are more active than those of supply. 13. Long and intense heat, whether natural, as during hot summers, or artificial, as the heated temperature produced about furnaces, hot-houses, &c. and, lastly, long-continued abstinence, tend to diminish the quantity of fat.

Sometimes the accumulation of fat is enormous. The average weight of the human body, when well nourished, and of a medium size, is about 160 pounds, or between eleven and twelve stone; yet instances are on record of its attaining, by the deposition of fat, the weight of from thirty-five to forty stone. Dr. Cheyne mentions a case in which the weight was 448 pounds, equal to thirty-two stone. In the Philosophical Transactions are recorded two cases, in one of which the weight was 480 pounds, and in the other 500 pounds. The Breslau Collections contain two other cases, in one of which the weight was 580, and in the other 600 pounds. The inconveniences produced in the system by these enormous accumulations of fat, and the means to be adopted for preventing and removing them (for they can be prevented, and even removed, with absolute certainty, provided the health be in other respects sound), will be treated of under the term OBESITY.

ADIT. [See MINING.]

ADJECTIVE, in Grammar, the name of one of the parts of speech, or one of those great classes into which, for the sake of convenience, grammarians have distributed the words of a language. The term *adjective*, which is of Latin formation, signifies something that *adds to* the meaning of the simple name of any object of which we are speaking. An adjective, in our language, is most commonly prefixed to the name of some thing, in order to mark some quality by which it is distinguished from other things belonging to the same class; thus, a *bad* man, a *good* man, a *fat* man, a *troublesome* man, &c.; a *black* horse, a *white* horse, &c. Here the terms *man* and *horse* are the most general or abstract (see ABSTRACTION) terms by which we can express the idea of man or horse; but, by prefixing to them such adjectives as *bad*, *good*, &c., we limit, in some degree, the class of which we are speaking. Thus, when we speak of a *white* man, we exclude the consideration of black men, or men of any other colour. In like manner, when we say an *English* man, we limit the signification still further; and in this way we may descend to a Cheshire man, a Chester man, until we come to individuals indicated by a common name, such as Thomson, Smith, &c. By the aid of other words prefixed, such as John, William, &c., we at last come to some certain individual. It appears, then, that in the expressions John Page, William Smith, &c., John and William may have the names of adjectives as well as the words *black*, *white*, &c. And this leads us to observe that frequently *nouns* or names of things can be used like adjectives; thus we can say, a *silver ring*, a *gold stick*, *salt water*, *sea water*. Many words in English are, in fact, used both as nouns and adjectives. In the expression 'John's book,' *John's* may be considered as an adjective for the reasons just given. Some grammarians have wished to introduce the term *adnoun* instead of *adjective*, but though the word *adjective* is not a very good name, *adnoun* is no better.

There are two ways in which an adjective can stand in a proposition: we can say 'the horse is bad,' or 'a bad horse.' In the first example, *horse* is called the 'subject,' *is* the 'copula,' or connecting link, and 'bad' is the 'predicate' or qualifying term. According to the true idiom of our language, the adjective form can often be used for the adverbial, especially at the end of any simple proposition; as—he walks *slow*, he speaks *loud*. It is true that usage is now beginning to be opposed to this mode of expression, and the adverb in *-ly* is gaining ground; yet there are cases where it is not possible to use the termination in *-ly* without making the spoken language at least very stiff and formal.

Many adjectives are simple *roots*, such as *good*, *bad*, *hot*, &c., while others are formed by adding an affix or suffix to a noun.

The following list of adjectives formed by affixes, or by adding a complete word, belong to the Saxon part of our language:—

glad-some
play-ful
weight-y
wood-en
care-less
child-ish
fore-most
fork-ed
for-ward
god-like
man-ly
out-er

The following terminations are of Latin and Greek origin

act-ive
passion-ate
adamant-ine
sulphur-ic
angul-ar
duc-tile
coher-ent
attend-ant
habit-able
aud-ible
luc-id
autumn-al
period-ical
station-ary
transit-ory
Belgi-an
humor-ous
verb-ose

There are other terminations of less importance, such as *ether-eal*, *advent-itious*, &c., which agree with the examples already given, as to the *last* syllable, but differ in having an additional syllable or syllables between the first part of the word and the termination.

ADJUSTMENT, in marine insurance, is the settling and ascertaining the exact amount of indemnity which the party insured is entitled to receive under the policy, after all proper allowances and deductions have been made; and fixing the proportion of that indemnity which each underwriter is liable to bear. The contract of insurance is an agreement to indemnify the insured against such losses as he may sustain by the occurrence of any of the events which are expressly, or by implication of law, contained in the policy. Thus, when a ship is lost, or any of those contingencies arise against which the insurance provides, the owner of the ship or of the goods insured, as the case may be, or an authorized agent, reports the circumstance to the insurers or underwriters. In London, this notice is given by an insertion in a book kept at Lloyd's Coffee-House in the subscription-rooms, where the greater part of marine insurances are effected.

Before any adjustment is made, the underwriters require to be informed of all particulars, that they may be satisfied the loss has occurred through circumstances against which the insurance was effected. In ordinary cases the task of ascertaining these facts, and of examining the correctness of the demand made by the assured, rests with the underwriter who has first subscribed the policy. In complicated cases of partial, or average losses, the papers are usually referred to some disinterested party, who makes a profession of such references, to calculate and adjust the per centage rate of loss. Where the ship is wholly lost, of course little difficulty occurs in this part of the inquiry; but in cases of partial losses, where the insured has not exercised his right of abandonment (see Abandonment), very minute and careful examination often becomes necessary. The quantity of damage being ascertained, the amount which each underwriter has made himself liable to by subscribing the policy is settled: and this being done, it is usual for one of the underwriters, or their agent, to indorse on the policy, 'adjusted a partial loss on this policy of so much per cent.' To this indorsement the signature of each underwriter must be affixed, and this process is called the adjustment of the loss.

After an adjustment has been made, it is not usual in mercantile practice for the underwriter to require any further proof, but at once to pay the loss; and it has been said that the reason for which adjustments have been introduced into the business of maritime insurance is, that upon the underwriter signing an adjustment, and thereby declaring his liability, and admitting that the whole transaction is adjusted, time should be given him to pay the money. An adjustment in London is usually made by endorsing on the policy, 'Adjusted this loss' at so much per cent., or other note to the same effect, which is signed by the underwriter; or it is written opposite to the underwriter's signature. In some countries there is no particular form; such is the case in the United States. An adjustment made in writing, with the full knowledge of the circumstances, and intended by the parties to be absolute and final, is binding. A payment of the amount of the adjustment gives it the character of an absolutely final one, however it may have been before; and the money can be recovered only on the ground of fraud. Generally, the underwriter is bound by the adjustment, unless it was made under a mistake.—[See Selwyn's *Nisi Prius*, title *Insurance*; Park on the *Law of Marine Insurance*, and a note to Campbell's *Nisi Prius Reports*, vol. i. p. 276. See also Phillips on *Insurance*, vol. ii. pp. 495 and 678.]

ADJUTANT,, a military officer, attached to every battalion of a regiment. The office does not confer a separate rank, but is usually given to one of the subaltern officers. The duties of an adjutant are to superintend (under the major of the regiment, and the adjutant-general of the army) all matters relating to the ordinary routine of discipline in the regiment; to receive and promulgate to the battalion all general, garrison, and regimental orders, signing them in the orderly-book on the part of the commanding-officer; to select detachments from the different companies, when ordered; to regulate the placing of guards, distribution of ammunition, &c.

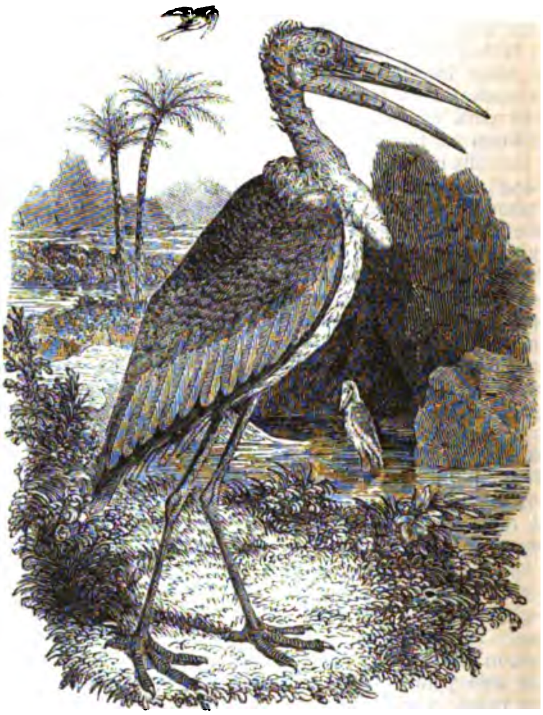
ADJUTANT-GENERAL, a staff-officer, one of those next in rank to the commander-in-chief. He is to the army what the adjutant is to a regiment; he superintends the details of all the dispositions ordered by the commander-in-chief, communicates general orders to the different brigades, and receives and registers the reports of the state of each, as to numbers, discipline, equipments, &c. Though in a large army, the adjutant-general is usually a general officer, yet this rank is not necessary; and in smaller detachments acting independently, the duties are frequently entrusted to an officer of lower rank.

ADJUTANT-GENERAL. Among the Jesuits, this title was given to certain fathers who resided with the general of the order. It was their duty to furnish him with information as to what was going on in the different countries of Europe, which was effected by means of emissaries employed for that purpose. Each country had one of these officers attached to it.

ADJUTANT, or GIGANTIC CRANE, (*Ciconia argala*, Temminck, *Mycteria argala*, Vieillot.) A singular bird, not uncommon in travelling menageries, being easily tamed, and hardy, though a native of the warmer parts of India and found near Calcutta. Its size may be inferred from the fact of its wings, from tip to tip, measuring about fourteen or fifteen feet when stretched out; from the tip of the bill to the extremity of the claws it is seven feet and a half, while it is five feet high when standing erect. Its upper parts are ash-grey, the feathers there being stiff and hard; the under parts are white, and there the plumes are long; the head and neck are without feathers, but the red callous skin there is furnished with hairs; a long slightly downy conical bag or pouch, like 'a large sausage,' (to use the comparison of Baron Cuvier) hangs from the middle of the neck. The beak is very large, thick at the base, and the gape is very wide.

Though this does not rank in systematic classifications as a bird of prey, being properly placed with wading birds (*Grallatores*, Illiger), it is one of the most voracious and carnivorous birds known. The structure of its digestive organs corresponds with this voracious habit; though what comparative anatomists term the solvent or gastric glands are differently formed from those of any other bird. Their usual position in other birds is round the upper portion of the stomach; but in the adjutant they form two circular figures, about an inch and a half in diameter on the fore and back part of it, each gland being composed of five or six cells, and these opening into one common pipe (*ductus*). The gizzard and digastric muscle are nearly of the same strength with those of the crow, the gizzard being lined with a similar horny membrane.

The adjutant is not only capable of digesting bones, but it seems to be fond of them, swallowing every bone which it can get down its gullet,—a circumstance which has led to its being called the *bone-eater*, or *bone-taker*. It has been stated by Sir Everard Home, that there was found in the craw or stomach of a gigantic crane a land tortoise ten inches long, and a large male black cat entire. [*Ives' Voyage*, p. 184. *Phil. Trans.* 1813, p. 77.] Its great voracity, however, is extremely useful in the countries which it inhabits, as it collects vermin from every quarter, such as snakes, lizards, frogs, and other reptiles, devouring such immense numbers of these as to prevent them from annoying the inhabitants, who, on that account, hold the bird in as great estimation as the Hollanders do the stork.



[Adjutant, Ardea Gigantea. From a specimen in the Zoological Gardens.]

Mr. Smeathman furnished Dr. Latham with an interesting account of the adjutants from personal observations in India. 'They are,' says Dr L., 'met in companies; and when seen at a distance, near the mouths of rivers, coming towards an observer, which they often do with their wings extended, may well be taken for canoes upon the surface of a smooth sea—when on the sand-banks, for men and women picking up shell-fish or other things on the beach. One of these, a young bird about five feet high, was brought up tame, and presented to the chief of the Bananas, where Mr. Smeathman lived; and, being accustomed to be fed in the great hall, soon became familiar, duly attending that place at dinner-time, placing itself behind its master's chair frequently before the guests entered. The servants were obliged to watch narrowly and to defend the provisions with switches; but, notwithstanding, it would frequently seize something or other, and once purloined a whole boiled fowl, which it swallowed in an instant. Its courage is not equal to its voracity, for a child of eight or ten years old soon puts it to flight with a switch, though at first it seems to stand on its defence, by threatening with its enormous bill widely extended, and roaring with a loud voice like a bear or tiger. It is an enemy to small quadrupeds, as well as birds and reptiles, and slily destroys fowls or chickens, though it dares not attack a hen openly with her young. Every thing is swallowed whole; and so accommodating is its throat, that not only an animal as big as a cat is gulped down, but a shin of beef broken asunder serves it but for two morsels. It is known to swallow a leg of mutton of five or six pounds, a hare, a small fox, &c. After a time the bones are rejected from the stomach, which seems to be voluntary, for it has been known that an ounce or two of emetic tartar given to one of these birds produced no effect.' [*Gen. Hist. of Birds*, ix. 40, 41.]

Lord Valentia (now Lord Mountnorris), after mentioning the amazing flocks of kites and crows which abound on the house tops and in the gardens at Calcutta, and subsist on the remains of the great profusion of food there dressed, which the prejudices of the natives forbid them to touch, adds, that in the office of scavengers the kites and crows are assisted during the day by the adjutant bird, and at night by the foxes, jackals, and hyænas from the jungles in the vicinity. [*Trav.* i. 519.]

Ives calls the bird a monster; but says the natives reverence it so much that they were rejoiced when he was unsuccessful in shooting one. They believe, according to the strange doctrine of transmigration, that the souls of the Brahms possess the birds, and render them invulnerable. [*Ives' Voyage*, London, 1773, p. 183.]

ADMINISTRATION and ADMINISTRATOR. An administrator is a person appointed by the ordinary or bishop of the diocese to make administration of, or to distribute the goods of a person who dies without having made a will. It is said that, in very early times, the king was entitled in such a case to seize upon the goods in his character of general trustee of the kingdom, in order that they might be applied to the burial of the deceased, the payment of his debts, and to making a provision for his family. It would appear that this power of the crown over the effects of intestates was greatly abused, for, by Magna Charta, King John granted that 'if a freeman should die intestate, his chattels should be distributed by the hands of his near relations and friends, under the inspection of the church.' This, probably, formed the foundation upon which the prelates afterwards built their right to administer by their own hands the goods of an intestate. There is, at all events, no doubt of the fact, that the power of seizing the goods of an intestate was, at a later period, transferred from the crown to the bishops. The whole property was, in the first instance, placed in the custody of the ordinary, or bishop of the diocese in which the intestate died; and after the deduction of what were technically called '*partes rationabiles*,' that is, two-thirds of the whole, which the law gave to the widow and children, the remaining third part vested in the bishop upon trust to distribute that proportion in charity to the poor, or in what were then termed 'pious uses,' for the benefit of the soul of the deceased. This trust was greatly abused by the prelates, who unscrupulously converted the whole residue of the property to the use of their order, without even paying the just debts of the deceased. To remedy this injustice, the statute called 'the Statute of Westminster the Second,' which was passed in the reign of Edward I., provided that the debts of the deceased should be paid by the ordinary in the same manner as if he had been an executor appointed by a will. The remainder, after payment of debts, still continued applicable to the same uses as before. To prevent the abuses of the power thus retained by the ordinary, and to take the administration entirely out of his hands, the legislature again interposed, and by the statute of 31st Edward III., cap. 2, the ordinary was directed, in case of intestacy, to depute 'the nearest and most lawful friends' of the deceased to administer his goods; and these *administrators* are put upon the same footing with regard to suits and to accounting, as executors appointed by will. This is the origin of administrators; they are merely the officers of the ordinary, appointed by him in pursuance of the statute, which selects the nearest and most lawful friend of the deceased; these words being interpreted to denote the nearest relation by blood who is not under any legal disability. The subsequent statute of 21st Henry VIII., c. 5, enlarges a little more the power of the ecclesiastical judge, and permits him to grant administration *either* to the *widow*, or the next of kin, or to both of them; and, where several persons are equally near of kin, empowers him to select one of them at his discretion.

If none of the kindred are willing to take out administration, a creditor is permitted to do so; and in the absence of *any* person entitled to demand letters of administration, the ordinary may appoint whomsoever he may think proper, to collect the goods of the deceased, for the benefit of such as may by law be entitled to them.

Administrators may be nominated even in a case where a will has been made, if by the will no executors are appointed, or if the persons named refuse, or if they are not legally qualified to act; and in any of these cases the administrator only differs from an executor in the name of his office and mode of his appointment. In practice, when the executor *refuses* to act, it is usual to grant administration to the residuary legatee, *i. e.* to the person to whom, by the will, the remainder of the property, after payment of debts and legacies, is given.

In the case of a complete intestacy, it was formerly much doubted whether an administrator, when appointed by virtue of 31st Edward III., could be compelled to make any distribution of the effects of the intestate which remained in his hands after payment of debts; for though the administration had been transferred from the ordinary to the next of kin of the deceased, the latter stood in much the same position as the former had occupied, and was consequently not legally bound to administer. The spiritual courts endeavoured to enforce distribution by taking bonds from the administrator for that purpose, but these bonds were declared void by the common law courts. These controversies are now at an end, for the statute, commonly called the 'Statute of Distributions,' 22 and 23 Charles II., cap. 10, explained by 29 Car. II., cap. 8, enacts that the surplus effects, after payment of debts, shall, after the expiration of one year from the death of the intestate, be distributed in the following manner;—one-third shall go to the widow, and the remainder in equal proportions to the children of the intestate, or, if dead, to their legal representatives, *i. e.* their lineal descendants: or, if there be no children, or children's legal representatives, then one moiety shall go to the widow, and the other moiety to the next of kindred in equal degrees of relationship, or to their representatives: if no widow, the whole shall go to the children or their representatives in equal portions: if neither widow nor children, the whole shall be distributed amongst the next of kin or their representatives; but no representatives are admitted, among collaterals, further than the children of the intestate's brothers and sisters.

By the same statute, it is directed that no child of the intestate (except it be his heir-at-law) on whom he settled in his lifetime any estate in lands or pecuniary portion, equal to the distributive share of the other children, shall have any part of the surplus to be administered; but if the estates thus given him by way of advancement are not equivalent to the other shares, the child so advanced shall have enough to put him on an equality with his brothers and sisters. This is a very reasonable provision; for in the absence of all expression of the father's intention by will, it may be presumed that he had no intention of giving more to one child than to another, unless it be his heir; and as he had advanced to one child his portion, it would not be fair for that child, at the death of his father without leaving a will, to obtain a share of the property equal to that obtained by the other children who had received no advances in their father's lifetime.

The statute of distributions expressly excepts and reserves the customs of the city of London, of the province of York, and of all other places having peculiar customs of distributing intestates' effects. These customs, resembling in some degree the provisions of the statute, though differing in certain particulars, approximate very nearly to the corresponding Scotch law of personal succession. [See Executors.]

ADMIRAL, the title of the highest class of naval officers. Various fanciful etymologies of the word have been given; but there can be no doubt that it is merely a corruption of the Arabic *Amir* or *Emir*, a lord or chieftain. The *al* is nothing more than the Arabic definite article *al*, *the*, without the noun to which it belongs. Eutychius, Patriarch of Alexandria, writing in the tenth century, calls the Caliph Omar *Amirol Mumenim*, which he translates into Latin—*Imperator Fidelium* (the Commander of the Faithful). To form the word admiral, the two first terms of some title similar to this have been adopted, and the third has been dropped. From this it appears that the word ought properly to be written, or rather ought at first to have been written, Amiral, or Ammiral, as we find it in Milton's expression:—

'The mast
Of some great Ammiral.'

Milton, holding to this principle of orthography, wrote in Latin *Ammiralatûs Curia* (the Court of Admiralty). The French say *Amiral*, and the Italians *Ammiraglio*. The *d* seems to have got into the English word from a notion that Admiral was an abridgment of *Admirable*. The Latin writers of the middle ages sometimes, apparently from this conceit, style the commander of a fleet *Admirabilis*, and also *Admiratus*. The Spaniards say *Admirante* or *Almirante*.

Under the Greek empire, the term *Emir* or *Amir* (in Greek characters Αμηρ) was used most commonly to designate the governor of a province or district, which was itself called Αμηραδιας. Gibbon states that the emir of the fleet was the third in rank of the officers of state presiding over the navy; the first being entitled the *Great Duke*, and the second the *Great Drungaire*. [*Decline and Fall*, chap. liii.] The holy wars of the twelfth and thirteenth centuries seem to have first introduced the term Admiral into Europe. The Admiral of Sicily is reckoned among the great officers of state in that kingdom in the twelfth century; and the Genoese had also their admiral very soon after this time. In France and England the title appears to have been unknown till the latter part of the thirteenth century; the year 1284 being commonly assigned as the date of the appointment of the first French admiral, and the *Amiral de la Mer du Roy d'Angleterre* being first mentioned in records of the year 1297. The person to whom the title is given in this instance is named William de Leybourne. Yet at this time England, although she had an admiral, had, properly speaking, no fleet; the custom being for the king, when he engaged in a naval expedition, to press into his service the merchant-vessels from all ports of the kingdom, just as it is still the prerogative of the crown to seize the men serving on board such vessels. This circumstance is especially deserving of notice, as illustrating what an admiral originally was. The King of England's admiral of the sea was not necessarily the actual commander of the fleet; he was rather the great officer of state, who presided generally over maritime affairs. Sometimes he was not a professional person at all; at other times he was one of the king's sons, or other near kinsman yet in his nonage, on whom the office was bestowed, as being one of great dignity and emolument; its duties were performed by persons who acted in his name. But these duties were usually, not to command ships in battle, but merely to superintend and direct the naval strength of the kingdom, and to administer justice in all causes arising on the seas. The former of these duties is now executed by the department of government called the *Admiralty*, and the latter by the legal tribunal called the *High Court of Admiralty*.

Anciently, two or more admirals used often to be appointed to exercise their powers along different parts of the coast. Thus, in 1326, mention is made of the Admiral of the King's Fleet, from the mouth of the Thames northward, and of another officer with the same title, commanding from the mouth of the Thames westward. Besides these, there were also Admirals of the Cinque Ports. It is the opinion of some writers that the first admiral of all England was appointed in the year 1387. Even the officer bearing this title, however, was not then the person possessing the highest maritime jurisdiction. Above him there was the King's Lieutenant on the Sea (*Locum tenens super Mare.*) Also before the term Admiral was used at all, there was an officer designated the *Custos Maris*, or Guardian of the Sea.

From the year 1405 (the 6th of Henry IV.) there is an uninterrupted series of Lord High Admirals of England, the office being always held by an individual, till the 20th November, 1632, when it was for the first time put in commission. All the great officers of state were the commissioners. During the Commonwealth, the affairs of the navy were managed by a Committee of Parliament, till Cromwell took the direction of them himself. On the Restoration, the king's brother, the Duke of York, was appointed Lord High Admiral; and he retained the place till the 22d of May, 1684, when Charles took it into his own hands. On the duke's accession to the throne, in the beginning of the following year, he declared himself Lord High Admiral. On the Revolution, the office was again put in commission; and it continued to be held in this form till 1707, when Prince George of Denmark was appointed Lord High Admiral, with a council of four persons to assist him. On his death in November, 1708, the Earl of Pembroke was appointed his successor, with a similar council. The earl resigned the office in 1709, since which time, till now, it has always been in commission, with the exception of the period of about sixteen months, (from May, 1827, till September, 1828,) during which it was held by the Duke of Clarence, afterwards king. The commissioners, styled the Lords Commissioners of the Admiralty, were formerly seven, and are now six in number; and the First Lord is always a member of the cabinet. It is the First Lord, indeed, who principally exercises the powers of the office.

Till the reign of Queen Anne, the salary of the Lord High Admiral was only 300 marks, the emoluments of the place, which were very large, arising chiefly from perquisites, or droits, as they were called, of various descriptions. Prince George of Denmark resigned all these droits into the hands of the crown, receiving in their stead a salary of 7000*l.* a year. The salary of the First Lord of the Admiralty is at present 4,500*l.* per ann., and that of each of the others 1000*l.*

The title of admiral is also given in modern times to naval officers of the highest rank; of which we have in England three classes, namely, Admirals of the Red, of the White, and of the Blue. Admirals of the Red bear their flag at the main-top-gallant-mast-head; those of the White, at the fore-top-gallant-mast-head; and those of the Blue, at the mizen-top-gallant-mast-head. After the union with Scotland in 1707, the use of the red flag was discontinued, the union jack being substituted for it; but it was resumed at the naval promotion which took place in 1805, after the battle of Trafalgar. There are also vice-admirals and rear-admirals of each flag, the former ranking with lieutenant-generals, and the latter with major-generals in the army. A full admiral ranks with a general. The title of flag-officer belongs to all the three grades. That of admiral of the fleet is merely a honorary distinction, with sea-pay of 6*l.* a day. According to the Navy List for July 1854, there were on full-pay 21 admirals, 27 vice-admirals, and 51 rear-admirals; the numbers on reserved half-pay were respectively 6, 14, and 33, besides 10 flag-officers on reserved half-pay with service-pensions. There were also 132 retired rear-admirals, 33 on the usual half-pay, and 99 on that of captain. The full-pay of an admiral is 5*l.* a day; of a vice-admiral, 4*l.*; and of a rear-admiral, 3*l.* An allowance of 3*l.* a day for table-money is made while commanding-in-chief, or while their flag is flying within the limits of their station.

ADMIRALTY COURTS, in Law, are courts having jurisdiction over maritime causes, whether of a civil or criminal nature. In England, the Court of Admiralty is held before the Lord High Admiral or his deputy, who is called the judge of the court: when there was a Lord High Admiral, the judge of the Admiralty usually held his place by patent from him; but when the office of admiral is executed by commissioners, he holds his place by direct commission from the crown under the great seal. The jurisdiction of the Court of Admiralty, generally, is now regulated by the Statutes 3 and 4 Vict. c. 65, and 13 and 14 Vict. c. 26, as to which, and the Salvage Act, see Stephen's *Commentaries*, vol. iv. pp. 22, 23, 24, and 25.

The Court of Admiralty is twofold: the Instance Court and the Prize Court; the commissions to hold these courts are perfectly distinct, but are usually given to the same person. Neither of them is a COURT OF RECORD.

The civil jurisdiction of the *Instance Court* extends generally to marine contracts—that is, to such contracts as are made upon the sea, and are founded in maritime service or consideration—as where the vessel is pledged during the voyage for necessary repairs; and to some few others, which, though entered into on land, are executed entirely upon the sea—such as agreements for mariners' wages. Between the highwater-mark and the lowwater-mark, where the sea ebbs and flows, the common law and the Admiralty have an alternate jurisdiction—one upon the water when it is full sea; the other upon the land when it is an ebb. But if part of a cause of action arises on the sea and part upon the land, the Courts of Common Law exclude the Admiralty Court from its jurisdiction; and even in contracts made abroad they exercise in most cases a concurrent jurisdiction. The Admiralty Court has no cognizance of contracts under seal, except where, from the nature of the subject-matter, it has exclusive jurisdiction—as in the case of an hypothecation bond, under which a ship is given in pledge for necessaries furnished to the master and mariners. The Instance Court likewise regulates many other points of maritime right—such as disputes between part-owners of vessels, and questions relating to salvage; that is, the allowance made to those who have saved or recovered ships or goods from dangers of the sea. It has also power to inquire into certain wrongs or injuries committed on the high seas—such as collision, or the running foul of one ship against another, and in such cases to assess the damages to be paid to the party injured.

This court is usually held at DOCTORS-COMMONS, like the ecclesiastical courts, to which, in its general constitution, it bears a great resemblance. The law by which its proceedings are governed is composed of such parts of the civil law as treat of maritime affairs, together with the laws of Oleron and other maritime laws, with such corrections, alterations, or amendments, as have been introduced by acts of parliament or common usage. [Blackstone's *Commentaries*, vol. iii. pp. 68, 106.]

In criminal matters the Court of Admiralty has, partly by common law, partly by a variety of statutes, cognizance of piracy and all other indictable offences, committed either upon the sea or on the coasts, when beyond the limits of any English county; and this (at least since the time of Edward III.) to the exclusion of the jurisdiction of courts of common law. With respect to certain felonies, committed in the main stream of great rivers below the bridges, the common law and the Admiralty have a concurrent jurisdiction.

The mode of proceeding in the Admiralty Courts in criminal trials, like that in all other suits there, was anciently according to the course of the civil and marine laws; until, in the reign of Henry VIII., a statute was passed which enacted that these offences should be tried by commissioners of oyer and terminer under the king's great seal, and that the proceedings should be according to the law of the land. In pursuance of this and some later statutes, sessions of oyer and terminer, and gaol delivery, called the Admiralty Sessions, are held twice a year—namely, in March and October—at the Old Bailey. The acting commissioners are the judge of the Admiralty (who, in point of form, is the presiding judge), together with two common-law judges and one or two civilians. [Blackstone's *Commentaries*, vol. iv. p. 268. Hale's *Pleas of the Crown*, vol. ii. p. 16.] By several recent statutes, it is declared that offences committed within the jurisdiction of the Court of Admiralty shall be liable to the same punishment as if committed on land; and offences committed at sea, or within the Admiralty jurisdiction, provided by 4 and 5 Will. IV. cap. 36, and 7 and 8 Vict. cap. 2, may be inquired of and determined in the Courts of Assize oyer and terminer, and gaol delivery.

The Prize Court is the only tribunal for deciding what is, and what is not, lawful prize, and for adjudicating upon all matters, civil and criminal, relating to prize. The property in the thing captured is held by English jurists, agreeably to the general practice of the law of nations, not to be absolutely taken from the original owners, until, by the sentence of a properly authorised court, it has been condemned as lawful prize. We have, as it should appear, no court authorised to adjudicate on property captured by land-forces, or *booty*, as it is commonly termed by writers on the law of nations; but when occasion requires (as, for instance, of late years, when property to an immense amount was captured by the British army in the conquest of the Deccan), commissioners are specially appointed for the purpose. But property captured by the naval force forms the peculiar province of the Prize Court of the Admiralty. 'The end of a prize-court,' says Lord Mansfield, 'is to suspend the property till condemnation; to punish every sort of misbehaviour in the captors; to restore instantly, if upon the most summary examination there does not appear sufficient ground; to condemn finally, if the goods really are prize, against everybody, giving everybody a fair opportunity of being heard.' [See Douglas's *Reports*, p. 572, &c.]

The Cinque Ports have an exclusive Admiralty jurisdiction of their own. In Ireland, there has been an Instance Court from time immemorial; and there was an Admiralty Court in Scotland, with very extensive civil jurisdiction. The latter, however, is now abolished; its civil jurisdiction having been transferred to the Court of Session, the supreme civil court in Scotland, and its criminal jurisdiction being now vested in the High Court of Justiciary, the supreme criminal tribunal there. The jurisdiction of the Scotch Admiralty Court, in regard to prizes, captures, and the condemnation of vessels, is now transferred to the English Admiralty Court. In several of our colonies there are courts of Vice-Admiralty, which not only have authority both as Instance Courts and Prize Courts, but have also, in certain revenue cases, concurrent jurisdiction with the colonial courts of record. [Stokes *On the Colonies*, p. 357.] From the Vice-Admiralty Courts of the colonies an appeal lies, in instance causes, to the Court of Admiralty in England; and from the Court of Admiralty in England an appeal lies, in instance causes (whether originating in that court, or coming before it by appeal), to the king in council. [See statute 2 and 3 Will. IV. c. 92.] From prize causes, whether in the Vice-Admiralty Courts, or in the Court of Admiralty in England, the appeal lies directly to certain commissioners of appeal in prize causes, who are appointed by the king under the great seal, and are usually members of his privy council, and whose appointment is generally regulated or recognised by treaties with foreign nations.

ADMIRALTY ISLANDS. A group of islands, consisting of one larger and about 40 smaller, which are generally classed in the division of Australia. They lie south of the equator between the second and third degree of latitude, and between 146° 18′, and 147° 46′ E. long.; and were discovered by the Dutch in 1616. Captain Carteret visited them in 1767, and the Spanish navigator Morello in 1781. d'Entrecasteaux, who was despatched to see if any trace of La Perouse's crew could be found, visited these islands in 1793. The soil and climate are said to be good, but the landing is rendered difficult by reason of reefs and breakers. A number of small islands and reefs form a cordon round the large one, which is difficult of approach, and no landing was made on it by d'Entrecasteaux. Only those islands seemed to be inhabited which had cocoa-nut trees on them. As they are very little elevated above the level of the sea, water must necessarily be scarce. The largest island is about 45 miles long, and like most of them, principally covered with cocoa-nut trees; the inhabitants are of a dark colour with frizzled hair, and they go naked. They are described as good looking and well made. To the French navigator they seemed a tolerably well-disposed people, though Carteret's account of them is unfavourable. They point their lances with a species of hard stone. When the French visited the island, the people showed the greatest eagerness to possess iron, which it is conjectured they first obtained from the Spaniards. [See *d'Entrecasteaux's Voyage*, Paris, 1808, 2 vols. 4to.]

ADMIRALTY ISLAND, on the N.W. coast of North America, in the Archipelago of George III., and within that part of the continent which, since the treaty of 1825, belongs to what we call Russian America. Admiralty Island is about 80 miles long, and, in some parts, 20 wide: it lies between 57° 2′, and 58° 24′ N. lat., and 134° 52′, and 135° 30′ W. long. The island was completely circumnavigated by Vancouver, who considers it to be about 60 leagues in circuit. With the exception particularly of the S.E. coast, the shores are bold, and afford many convenient bays with fine streams of fresh water running into them. The island is moderately elevated and rocky, but covered with forests, especially pine. The natives of the island carry on some little trade with Europeans. [See *Vancouver's Voyage*, vol. iii. p. 277.]

ADO'NIS, a river of ancient Syria, which rises in the mountains of Lebanon. It has the same name with a personage of considerable importance in Pagan mythology, of whose story the following is a brief sketch:—'Adonis, son of Myrrha, daughter of Cinyras, King of Cyprus, was born in Arabia, whither his mother had fled in consequence of certain transactions which it is not necessary to relate. Before the birth of her son she was transformed into the tree which produces the fragrant gum called by her name; this, however, did not hinder his being brought into the world in due season: he grew up a model of manly beauty, and was passionately beloved by Aphrodite (Venus), who quitted Olympus to dwell with him. Hunting was his favorite pursuit, until, having gone to the chase against the entreaties of his mistress, he was mortally wounded in the thigh by a wild boar. After death he was said to stand as high in the favour of Persephone (Proserpine), as before in that of Aphrodite; but the latter being inconsolable, her rival generously consented that Adonis should spend half the year with his celestial, half with his infernal mistress. The fable has been variously interpreted. One explanation makes the alternate abode of Adonis above and under the earth, typical of the burial of seed, which in due season rises above ground for the propagation of its species; another, of the annual passage of the sun from the northern to the southern hemisphere.—In the time of Pausanias, in the second century of our æra, there existed an ancient temple of Adonis and Aphrodite, at Amathus, in Cyprus.

The story of Adonis appears to have been introduced into Greece from Syria. According to Pausanias, Sappho sung of Adonis; and his name, with allusion to his rites, occurs in a fragment of Alcæus. But it is by the Greek poets of later date, and their Latin imitators, Theocritus, Bion, Ovid, that his story has been probably expanded, and invested with the elegance which is the peculiar character of Grecian mythology. The Adonia are mentioned by Aristophanes among the Athenian festivals, and this is (we believe) the earliest mention of them, except some notice in the poems attributed to Orpheus, (the epoch of which is, however, too doubtful to be received as authority,) and the songs attributed to Sappho and Alcæus. The rites began with mourning for the death of Adonis—(thus Ezekiel, viii. 13, 'He brought me to the door of the Lord's house . . . . and behold, there sat women weeping for Thammuz'); then changed into rejoicing for his return to life and to Aphrodite; and concluded with a procession, in which the images of Adonis and Aphrodite were carried, with rich offerings, in separate couches; after which the former appears to have been thrown into the sea. See Theocr. Idyll. xv. In the time of Pausanias, the women of Argos, in the Peloponnesus, lamented Adonis.

In Syria we know the worship of Adonis (if, according to the received notion, he be the same personage as Thammuz) to be probably of much older date. We know, from the passage in Ezekiel already quoted, that the adoration of the latter was one of the abominations of Judah six centuries before Christ. Whatever resemblance there may have been between the early Syrian and Grecian rites, the former were far more deeply polluted by the atrocities of a brutish superstition, to which the natives of Syria were unusually prone. Byblos, a town near the river Adonis, was one of the chief seats of this worship, which was intimately connected with a peculiarity incident to the river. Its waters, at a certain period of the year, assume a deep red, and were said to be discoloured by the blood of Adonis.

> ....'Thammuz came next behind.
> Whose annual wound in Lebanon allured
> The Syrian damsels to lament his fate
> In amorous ditties all a summer's day,
> While smooth Adonis, from his native rock,
> Ran purple to the sea, supposed with blood
> Of Thammuz, yearly wounded.'
>
> *Paradise Lost*, i. 446.

The phenomenon has been observed by modern travellers, and is attributed to the rains, which bring a quantity of red earth into the stream. [See Maundrell's *Travels*.] This, which probably is the true solution, was suggested even in the time of Lucian.—[*De Dea Syria*, § 8.]

ADO'NIS, in Botany, is a genus of plants belonging to the natural order ranunculaceæ, and containing many species of very great beauty. The name is merely poetical. Adonis is distinguished from ranunculus by the want of a little scale at the base of the petals, and from other genera of the order by the numerous hard, dry, sharp-pointed grains of which its fruit consists.

Botanists divide the genus into two sections, the first of which comprehends all the annual kinds, the second all the perennials. Ten species are spoken of as belonging to the first section, inhabiting corn-fields and similar dry exposed places, chiefly in the south of Europe and north of Africa. Some of them have deep crimson flowers, as *A. autumnalis*, the common pheasant's-eye of our gardens; in others the blossoms are yellow; it is not improbable that they are all varieties of the same species.

Of the perennial kinds, *A. vernalis*, which is common in gardens in England, is found in a wild state abundantly on all the mountains of middle Europe. Its flowers have from ten to twelve petals of a yellow colour, and of a brilliancy which is rendered the more dazzling by the deep green tuft of finely divided leaves among which they expand. It is only a few inches high, and is one of the early harbingers of spring. Three others are described, all mountain plants, resembling *A. vernalis* in general appearance, but perhaps still more beautiful. They seem to have been occasionally brought to this country, but to have been soon lost again.

According to Pallas, the Adonises possess emmenagogue virtues, and they doubtless partake of the acridity so prevalent in their tribe.

ADOPTION, (from *adoptare*, Latin,) means taking by choice. By the Roman law if a person had no children of his own he might appoint any other person's, whether related to him or not, to be his children *by adoption*. In order to understand the ordinary mode of adoption and its legal effects, it will be necessary to remember that at Rome the relation of father and son was but little different from that of master and slave, either in the rights and duties attached to it, or in the manner in which it was dissolved. Hence, if a person wished to adopt the son of another, the natural father sold the boy to him by a regular sale before a magistrate, and, in order that he might be so completely emancipated from his father's authority, as never to be liable to fall under it again, it was requisite that this sale should be formally repeated three several times. (See EMANCIPATION.) The father thus conveyed away all his paternal rights, and the child, from that moment, became, to all intents and purposes, a member of the family of his adopter. If the person to be adopted was his own master, the mode of proceeding was by a bill (analogous to our private acts of parliament), proposed to the people in the comitia curiata. This was called ARROGATION, from *rogare*, to propose a bill. In either case the adopted child became subject to the authority of his new father; passed into his family, name, and sacred rites, and succeeded to his property. Clodius, the enemy of Cicero, passed, by this ceremony of a bill, from the patrician to the plebeian rank, in order to qualify him to be tribune. [Cic. *Att.* ii. 7. Suet. *Aug.* 20.]

The history of Rome abounds with instances of adoption. Thus one of the sons of Paulus Æmilius, the conqueror of Macedonia, was adopted by the son of Scipio Africanus the Elder, and thus acquired the name of *Publius Cornelius Scipio;* he was also called *Æmilianus*, to point out the family of his birth; and when he had destroyed Carthage in the third Punic War, he received, like his adoptive grandfather, the appellation of *Africanus*, and is usually spoken of in history as Scipio Africanus the Younger.

Under the emperors the mode of adoption became the subject of legal reform; and that which for so many ages could be effected only by a circuitous course of arbitrary forms, founded upon legal fictions, was allowed to be done by a short and simple process before a magistrate.

There was also a custom in ancient Rome of adopting children by will: thus it was that Julius Cæsar adopted his great nephew Octavius, who was thenceforth called Caius Julius Cæsar Octavianus; but is most generally known under the more pompous appellation of AUGUSTUS, which he afterwards assumed.—[Heineccius, *Antiquitates Romanæ*, lib. i., tit. xi.] In like manner, several of the Roman emperors adopted their successors; for instance, Augustus adopted his step-sons, Tiberius, Nero, and Claudius Drusus, the former of whom afterwards succeeded to the empire. [Tacit. *Ann.* i. 3. Suet. *Aug.* 101.] So also Tiberius, by the order, and during the life-time of Augustus, adopted his nephew Germanicus, who died in the lifetime of Tiberius; and on the death of Tiberius, Caligula, the son of Germanicus, became emperor. At a subsequent period, the emperor Claudius went so far as to adopt his step-son Domitius, afterwards the emperor Nero, to the exclusion of his own son Britannicus. Tacitus remarks, that Nero was the first stranger in blood ever adopted into the Claudian family.—[Tacit. *Annal.* xii. 25.] At various periods of the Roman history, great inconvenience was experienced in consequence of the general disinclination to marriage among the citizens. Before the times of the emperors, it is clear that, in order to remove this inconvenience, rewards were held out for the encouragement of marriage, and penalties imposed upon celibacy. Immunities and exemptions from state burthens were also given to those who possessed many children; and in order to obtain these, the adoption of children became a great abuse. Aulus Gellius complains of the mischievous custom prevalent in his time, that 'an adoptive son should entitle his adoptive father to privileges in the state.'—[Aul. Gel. *Noct. Att.* v. 19.] Under Julius Cæsar, after the wars, laws for the encouragement of population were proposed, but not carried into effect: but in the time of Augustus, the Julian law was proposed, A.U.C. 736, which contained heavy penalties upon celibacy, and proportionate rewards for the possession of children. This law was so extremely unpopular, that, Suetonius says, it could not be executed, on account of the tumultuous opposition raised to it.—[Sueton. *Aug.* 34.] Afterwards, however, a law passed, called from the Consuls who introduced it, 'Lex Papia Poppæa;' by which many privileges were given to those who possessed children; and amongst others, it was declared that, of candidates for prætorships and other offices, those should have the preference who had the greatest number of children. This occasioned an intolerable abuse in the adoption of children. Tacitus says, that in the time of Nero, a 'pestilent abuse was practised by childless men; who, whenever the election of magistrates or the allotment of provinces was at hand, provided themselves with sons by fraudulent adoptions; and then when, in common with real fathers, they had obtained prætorships and provincial governments, they instantly released themselves from their adopted sons. Hence the genuine fathers betook themselves with mighty indignation to the senate,' and petitioned for relief. This produced a decree that in the pursuit of any public employment whatever, no feigned adoptions should be of any avail, nor in taking estate by will.—[See Tacit. *Annal.* xv. 19.]

The eleventh title of the first book of Justinian's *Institutes* is concerning Adoption. By this law it is declared that there are two kinds of adoption, one called *arrogatio*, when by a rescript of the emperor, (*principali rescripto,*) a person adopts another who is independent of parents; the other, when by the authority of the magistrate (*imperio magistratûs*), he who is under the control of his parent is made over by that parent to another person, and adopted by him either as his son, his grandson, or a relation in any inferior degree. Females also might be adopted in the same manner. But when a man gave his child to be adopted by a stranger, none of the parental authority passed from the natural to the adoptive father; the only effect was, that the child succeeded to the inheritance of the latter if he died intestate. It was only when the adopter was the child's paternal or maternal grandfather, or otherwise so related to him as that the right of nature concurred with that of adoption, that the new connection became, in all respects, the same with the original one. It was also ordained that the adopter should in all cases be at least eighteen years older than the person he adopted. Women, according to the Justinian code, were not legally entitled to adopt; but after having lost children of their own by death, they might by the indulgence of the emperor be permitted to receive those of others in their place. A slave, on being named a son by his master before a magistrate, became free, but acquired no filial right.

The German system of adoption is derived from the Roman law, though it cannot be said, according to the proper meaning of the word, to have been in force before the fifteenth or sixteenth century. Any adoption, in order to be strictly and properly a *legal* process, must take place before a court, or be confirmed by the proper authorities. The adopted son retains his family name, and prefixes or adds to it that of his adoptive father; but in case a nobleman adopts a commoner, the son does not succeed to the rank, unless it is confirmed by the sovereign. The more modern German institutes still keep to the *principles* of the Roman system of adoption, though the whole is modified so as to be more in harmony with German usages. The Prussian law does away with all distinction between *adoption* and *arrogation;* and allows the adopted son who is of age to manage his *own* property. The Austrian law does the same. Both also agree in requiring the age of the adoptive father to be fifty at least. The Prussian law, with respect to the adopted son, merely requires him to be younger than the father; while the Austrian code requires him to be eighteen years younger than the adoptive father. [Ersch and Gruber's *Encyclopädie*, Art. *Adoption.*]

The French law of adoption is to be found in the eighth title of the first book of the *Code Civil.* The following are its principal provisions. Adoption is only permitted to persons above the age of fifty, having neither children nor other legitimate descendants, and being at least fifteen years older than the individual adopted. It can only be exercised in favour of one who has been an object of the adopter's constant care for at least six years during minority, or of one who has saved the life of the adopter in battle, from fire, or from drowning. In the latter cases, the only restriction respecting the age of the parties is, that the adopter shall be older than the adopted, and shall have attained his majority, or his twenty-first year. In every case the party adopted must be of this age. The form is for the two parties to present themselves before the justice of the peace (*juge de paix*) for the place where the adopter resides, and in his presence to pass an act of mutual consent; after which the transaction, before being accounted valid, must be approved of by the tribunal of *first instance,* within whose jurisdiction the domicile of the adopter is. The adopted takes the name of the adopter in addition to his own; and no marriage can take place between the adopter and either the adopted or his descendants, or between two adopted children of the same individual, or between the adopted and any child who may be afterwards born to the adopter, or between the one party and the wife of the other. The adopted acquires no right of succession to the property of any relations of the adopter; but in regard to the property of the adopter himself, it is declared that he shall have precisely the same rights with a child born in wedlock, and that, even although there should be other children of the latter description born after his adoption.

Adoption is still practised both among the Turks and among other eastern nations. It is common for a rich Turk, who has no children of his own, to adopt as his heir the child of persons even of the poorest class. The bargain is ratified by the parties going together before the Cadi, and getting their mutual consent recorded; after which the child cannot be disinherited by his adoptive father. D'Herbelot states, that, according to the law of Mohammed, a person becomes the adopted son of another by undergoing the ceremony of passing through his shirt; whence the expression to draw another through one's shirt, signifies to adopt him for a son. In India the same thing is said to be frequently done by the two parties merely exchanging girdles. In the Code of Gentoo Laws published by Mr. Halhed, the 9th section of the 21st chapter is entitled 'Of Adoption.' The law permits a child under five years of age to be given up for adoption by its father for a payment of gold or rice, if he have other sons, on the parties going before a magistrate and having a *jugg*, or sacrifice, performed. A woman, however, it is added, may not adopt a child without having her husband's consent; and there is even some doubt if she may with that. 'He,' concludes the law, 'who has no son, or grandson, or grandson's son, or brother's son, shall' (may?) 'adopt a son; and while he has one adopted son, he shall not adopt a second.'

ADOU'R, called by the Roman writers Atur, Aturis, and Aturus, a river in France, which rises in the department of Hautes Pyrenées (the Upper Pyrenees). Its course is first in a northerly direction, past the town of Bagnères de Bigorre (just above which there is a fall of one hundred feet), then towards the west, and finally towards the south-west, passing the towns of Tarbes, Aire, St. Sever (where it becomes navigable), Dax, and Bayonne, and describing in its whole course a semicircle, whose diameter, of about 100 miles, lies nearly N.N.W. and S.S.E. The whole length of the river is estimated at about 170 miles, 70 of which are navigable. Its basin is bounded by the Pyrenees on the south, and on the east by a range of hills, extending from these mountains towards the sandy plains of the department of Gironde. Many streams from the Pyrenees—as the Gabas, Luy de France, Luy de Bearn, Gave de Pau, which receives the Gave d'Oléron and the Bidouze—fall into the Adour on the left bank, the Midouze and Arros on the right. The current is usually rapid; and the melting of the snows on the Pyrenees causes desolating inundations. The Adour falls into the Bay of Biscay, about three miles below the strong and flourishing town of Bayonne, having a bar at the mouth, upon which, at ebb tide, there is sometimes less than three feet water.

ADO'WA, one of the chief places in Abyssinia in the kingdom of Tigré, and in the district of Adowa, which is a part of Tigré proper (N. lat. 14° 12′ 30″, E. long. 39° 5′). It is partly on the side, and partly at the foot of a hill, an uncommon occurrence in Tigré, where most of the towns are on eminences. The houses are all of a conical form, and arranged pretty regularly in streets. The town is well supplied with water from those rivulets which fall into the Mareb, and grapes grow well in the gardens. Adowa from its position is the great mart between the coast and the interior provinces, and carries on a considerable trade, which is mostly in the hands of Mohammedan merchants. The population is probably not under eight thousand. Mr. Bruce informs us that the Jews have the sole privilege of thatching houses at Adowa, which, when rightly interpreted, may mean that they are the only persons who can do it well.

The chief manufactures of Adowa are coarse and fine cotton cloths, made both of native cotton from the low lands on the Tacazzé, and from cotton imported through Massowa on the coast of the Red Sea. Mr. Salt mentions the following as the chief imports which pass through Adowa for the Gondar market: a small quantity of lead, block tin, copper, and gold foil; small and cheap Persian carpets, raw silk from China, some velvets, French broad cloths, and coloured skins from Egypt; Venetian glass ware and beads, and such other small commodities as in various ways happen to be taken to Jidda, the port of Mecca. The commodities which mostly pass through the hands of the Adowa merchants for export, are ivory, gold, and slaves. A large part of the ivory comes from the province of Walkayt, which lies on the Tacazzé, and from the low lands north of Shiré, on the Mareb river, which abound in elephants. The gold is collected in the interior, but as to the amount that passes through Adowa, Mr. Salt is unable to state it with accuracy, owing to this branch of commerce being carried on with great secrecy. He computes the slaves exported at about a thousand annually. (Salt's *Abyssinia*, p. 424, &c.) Mr. Bruce says that the word 'Adowa' signifies 'pass or passage,' which therefore, we presume, he means to assert is the correct interpretation of 'Adowa' in the Tigré language. [See Abyssinia.]

ADO'XA *Moschatellina*, is a little inconspicuous plant found in woods and groves in all parts of Europe. It is common in Charlton and Hampstead woods, near London, and in many other spots in England, and in Scotland.

From a granular root, which when dry is white as snow, arise, early every spring, a few leaves about four or five inches high, divided into three principal divisions, each of which is also three-leaved, with every lobe deeply cut into roundish segments. The stem that supports the flowers has two opposite leaves, like those of the root, only they have a short stalk, and consist of but three leaflets. The flowers have a musky smell, are pale green, and are collected in little round heads. Each one consists of a superior calyx of five lobes; there are no petals; the stamens are ten; the styles five; and the ovarium contains five cells. This last changes to a succulent berry, having five compressed seeds.

In English this is called moschatel; it is a pretty, interesting plant, much sought after by the curious for the sake of its delicate, modest appearance. No known properties belong to it: but it is remarkable as the only European plant which can be compared to the celebrated ginseng of the Chinese, that potent root, which is fabled to possess the power of even restoring youth to old age.

A'DRIA, formerly Hadria or Atria, an ancient city, situated between the mouths of the Po and the Adige, first belonging to the Etrusci, afterwards a confederate city of the Romans, and a municipium. It was a sea-port town, carried on an extensive trade on the Adriatic, and was a station for the Roman fleet under the emperors. After the fall of the empire, the inundations of the Po and the Adige, in consequence of the neglect of the dykes and the mischief caused by the barbarians, rendered the country around marshy and uninhabitable. The alluvial soil in the course of ages gradually encroached upon the sea along this coast, and thus Adria became first joined to the main land, from which it was previously detached; and the sea receding from it gradually more and more, the town is now fourteen miles inland. The same causes continuing to operate, the ground was raised by the alluvions many feet above the former level, so as gradually to cover the old forests. Adria, however, although in a state of decay, was never totally destroyed. In 430 it was subject to the Greek empire, having its own magistrates. It made part of the Exarchate of Ravenna, and afterwards came with it under the dominion of the Roman See. In the ninth century we find it governed by its own bishops, under the joint protection of the popes and the emperors. It afterwards formed part of the Marquisate of Este and Ferrara. In the war between Hercules, Duke of Ferrara, and the Venetians, in 1482, Adria was besieged and taken by the latter, and then pillaged and burnt. The citizens who had escaped, having made their submission to the Venetian senate, were restored to their lands and houses, which they began to repair or rebuild. After the war of the league of Cambrai, Adria was, by the peace of Bologna in 1529, definitively given up to Venice. The new town of Adria by degrees arose out of the ruins of the old city, a great part of which had been long before buried under the successive alluvions. Its remains lie to the south of the present town towards Ravegnano, where the old massive walls, and the ruins of an amphitheatre, of baths, aqueducts and mosaic pavements, and other Etruscan and Roman antiquities, are found many feet below the surface of the ground. An interesting collection of antiquities has been made, dug up from the ruins of the ancient city. The present town of Adria is crossed by the Castagnaro, a branch of the Adige; it has about 10,000 inhabitants, and is a bishop's see, although of late the bishops reside mostly at Rovigo, which is fifteen miles to the westward of it. The territory of Adria borders on the Roman Legation of Ferrara, the town itself being only three miles north of the Po. Pliny the Elder speaks of the wines of Adria with praise. The country still produces some tolerable wine; and the town trades in cattle, grain, silk, flax, firewood, leather, and earthenware. Under the republic of Venice, Adria was annexed to the Dogado, or province of Venice Proper, and was governed by a patrician with the title of Podestà, having its own municipal councils and statutes, which were printed in 1707. It now forms part of the Lombardo-Venetian kingdom under the crown of Austria. Adria lies 80 miles S.S.W. of Venice, N. lat. 45° 3′, E. long. 11° 1′. There was another Adria in Picenum, probably an Etruscan colony originally, afterwards a Roman colony. It is now called Atri.

ADRIAN. [See Hadrian.]

ADRIAN I., Pope, born at Rome, succeeded Stephen III. in 772. Like his predecessor, he had to struggle against the power of the Longobards, who had invaded the Exarchate and other provinces bestowed by Pepin, king of the Franks, on the Roman see. Devastating with fire and sword Sinigaglia, Urbino, and other cities, they advanced as far as Otricoli, on the Tiber, and threatened Rome with the same fate. Desiderius, king of the Longobards, had taken under his protection the two sons of Carloman, the deceased brother of Charlemagne, and he wished Adrian to consecrate them as kings of the Franks, in opposition to their uncle. Adrian refused to do this; and hence arose the bitter enmity of Desiderius. Adrian applied to Charlemagne for assistance. The king of the Franks crossed the Alps by the way of Susa, defeated Desiderius, and overthrew the kingdom of the Longobards in Italy, in 774. Charlemagne then went to Rome, where he arrived on Easter eve, and was received by Adrian with great honours. They repaired together to the Basilica of St. Peter, where Adrian acknowledged Charles as king of Italy, and "Patrician of Rome," and the latter renewed the grant of the provinces bestowed on the Roman see by Pepin. The temporal authority of the popes, however, was far from being permanently established for a long time after; and there are repeated letters from Adrian to Charles, complaining that Bologna, the Romagna, and even Sabina, had not been restored to the jurisdiction of St. Peter. Charlemagne paid another visit to Adrian at Rome in 787, when his son Pepin was christened by the pope. In 787, the seventh general council of the church was held at Nicæa, in Bithynia, where Adrian sent his legates, and in which the worship of images was confirmed, and the iconoclasts were excommunicated. In 791, there was a dreadful inundation at Rome, caused by the overflowing of the Tiber, and Adrian exerted himself in supplying with provisions the inhabitants, by means of boats, which plied to the various parts of the city. He also rebuilt the walls and towers of Rome, and was liberal to the poor. He died after a long pontificate of nearly twenty-four years, on Christmas-day, 795. Charlemagne was much grieved at the news of his death, and wrote his epitaph in Latin verses, in which he affectionately calls him "father." Adrian was a man of talent and dexterity; he succeeded in gaining and preserving the friendship of the greatest sovereign of his time, and he used his influence for the security and prosperity of the people of Rome, and its duchy or territory, without at the same time neglecting the temporal interests of his see. Under him Rome began to breathe again after the continual alarms caused by the Longobards, the last of the barbarian invaders of the Western Empire.—[See Anastasius in Muratori's *Rerum Italicarum Scriptores*, tom. iii.]

ADRIAN II., born at Rome, succeeded Nicholas I. in the papal chair, in 867. He had been married, and had a daughter by his wife Stephania, from whom he afterwards separated in order to live in celibacy. After his election, his wife and daughter continued to live at Rome in a separate house, when an unprincipled man, called Eleutherius, carried off the girl by violence, and on the pontiff retaking his child, the ravisher forced his way into the house and murdered both mother and daughter. For this crime he was tried and sentenced to death by the imperial commissioners, who still exercised the high judicature at Rome. During the pontificate of Adrian, the emperor Ludovicus II. was in Southern Italy, warring against the Saracens, who had invaded part of Calabria and Puglia; he defeated them and took the town of Bari, in 871. It was also during Adrian's pontificate, that Photius, patriarch of Constantinople, withdrew from the Church of Rome, from which time the schism between the Greek and Latin churches dates, which continues to this day. Adrian died in 872, and was succeeded by John VIII.

ADRIAN III., born at Rome, succeeded Marinus in 884, and died the following year on his journey to attend the imperial diet at Worms, after a pontificate of only fifteen months.

ADRIAN IV., an Englishman, whose name was Nicholas Breakspeare, succeeded Anastasius IV. in 1154. He had been a monk, and was made bishop of Albano by Eugenius III., who sent him as his legate, or apostle, as it was then called, to Denmark and Norway. On his return he was elected pope much against his inclination. Rome was then in a very disturbed state. Arnaldo of Brescia, a monk and a disciple of Abelard, had begun to preach a reform in the church as early as 1139, but being driven out of Rome by Pope Innocent II., had taken refuge at Zürich. In 1143, however, he was recalled by the Roman people, who had revolted against Innocent, and had proclaimed a Roman republic, which Arnaldo contributed to constitute. The new government consisted of a senate of fifty-six members, who were annually chosen by an electoral body composed of delegates, ten from each of the thirteen districts of the city. This constitution lasted about fifty years. Arnaldo, who was an eloquent man, strongly condemned the temporalities of the church, and wished to restrict the pope's office to mere spiritual matters. Although he preached no dogma in opposition to the canons, he was condemned by the second council of Lateran, his opinions being styled *political heresy*. Arnaldo partook largely of the newly revived classical fanaticism of those times, which mistook recollections for realities; and he seriously maintained that Rome ought to be, and would again become, the mistress of the world. Several successive popes, Celestin II., Lucius II., and Eugenius III. kept up a sort of desultory struggle against this popular reformer. Lucius in an affray was pelted with stones, and died of the injury received. His successor, Eugenius, was obliged to leave Rome and retire into Sabina. During the confusion that prevailed in the city, the populace plundered and afterwards pulled down the houses of many nobles, cardinals, and citizens, and committed other acts of violence. Adrian IV., after his election, placed Rome under interdict on account of these disorders, and caused all religious services to cease; which measure led the citizens to banish Arnaldo, who took refuge with some barons of Campania: and Adrian then came to reside in the Lateran palace. Frederic of Hohenstauffen, known in Italian history by the name of Barbarossa, had lately been elected emperor by the German Diet, and was on his way to Rome to be crowned. The pope's legates met him on the road, and among other remonstrances, requested that the heretic Arnaldo should be given up by the Viscount of Campania, in order to be tried. Frederic assented to this, and issued orders in consequence; others say that Cardinal Gerard took Arnaldo prisoner, after an obstinate resistance. He was brought to Rome, and delivered to the prefect of the city, by whose sentence he was hanged, his body burnt, and the ashes scattered to the winds, in the year 1155. Meantime Frederic approached Rome with his army, and Adrian went to meet him near Sutri, where, on the latter dismounting, Frederic refused to hold his stirrup, a ceremony on which the popes always insisted, as a mark of respect for their spiritual supremacy. The pope, on his side, refused to salute the emperor with the "kiss of peace," upon which the cardinals were terrified and ran away to Cività Castellana. The question of the ceremonial was debated for two days, when Frederic, having ascertained that such had been the practice with his predecessors, agreed to conform to it. They met, therefore, again at Nepi, and Frederic having held the stirrup, Adrian gave him the *osculum pacis*, and both proceeded towards Rome. The senate and Roman people had on their part sent orators to Frederic, offering him, with their allegiance, the imperial crown, but demanding at the same time five thousand lbs. of silver for the expenses of the coronation, and that the temporal government of the city should be left to them, to the exclusion of the pope. Frederic answered, that he came to give and not to receive laws, and with his army he took possession of the Leonine city on the north bank of the Tiber, and of St. Peter's church, where he was crowned by the pope on the following day. The Romans, however, took no part in the ceremony, but after having held a council in the Capitol, sallied out and attacked the German soldiers unawares. A general battle took place, and continued with great slaughter on both sides, till night separated the combatants. The city continuing in a disturbed state, both the pope and emperor withdrew to Tivoli, whence Frederic returned towards Lombardy. Adrian went afterwards to Benevento, where he made peace with William I., king of Sicily, whom he had excommunicated; and upon their reconciliation he agreed to give him the investiture of Sicily, Calabria, and Apulia, in 1156, on condition of the latter paying a yearly tribute to the see of Rome. The pope returned loaded with rich presents of silks, gold, and silver, and passing through Rome, went to reside at Orvieto, which was subject to the Roman see. Frederic now complained that the pope had violated his faith, by receiving ambassadors and entering into treaties with the king of Sicily and the Greek emperor, without his participation. He also resented the pretensions of the pope and his legates, who seemed to assume that the imperial crown was granted as a *beneficium*, or fee of the see of Rome. Adrian, on his part, complained of the exactions of the imperial commissioners who were sent to administer justice at Rome without his participation; he maintained that the patrimony of the church should be exempt from paying *foderum*, or feudal tribute to the emperor; and, lastly, he claimed the restitution of the lands and revenues of Countess Matilda, of the duchy of Spoleti, and even of Corsica and Sardinia. Thus arose that spirit of bitter hostility between the popes and the house of Hohenstauffen, which lasted until the utter extinction of the latter. But the seeds only were sown in Adrian's time. He died in the beginning of September, 1159, in the town of Anagni, and was succeeded by Alexander III. From the above sketch it may be seen that Adrian IV. stretched the papal prerogatives as far as any of his predecessors had done, Gregory VII. not excepted. [See Fleury, *Histoire Ecclésiastique*, and Raumer, *Geschichte der Hohenstauffen und ihrer Zeit*.]

ADRIAN V., a Genoese, succeeded Innocent in 1276, and died five weeks after his election. He was succeeded by John XX.

ADRIAN VI., born at Utrecht in the Netherlands, of an obscure family, advanced himself by his talents to the post of vice-chancellor of the University of Louvain. The Emperor Maximilian chose him as preceptor to his grandson, afterwards Charles V. Ferdinand of Spain gave him the bishopric of Tortosa. After Ferdinand's death he was co-regent of Spain with Cardinal Ximenes. He was elected pope in 1522, after the death of Leo X., chiefly through the influence of Charles V. whose authority was then spreading over Italy. Adrian was a virtuous and austere clergyman; he endeavoured to reform the numerous abuses of the court and clergy of Rome; he practised a severe economy, and lived frugally. By so doing he displeased the Romans, who had been accustomed to the luxury and prodigality of Leo; and when he died, in September, 1523, after a short pontificate, the people could not conceal their joy. They styled his physician 'the saviour of his country.' He was succeeded by Clement VII. Adrian appears to have been an honest, conscientious man, who fell upon evil times, and was unequal to the difficulties which he had to encounter. He was desirous of maintaining peace, and of stopping, if possible, the schism of the Lutherans by reforming the church, but he did not live long enough to effect any thing essential. Burmann published his life at Utrecht, in 1727.

ADRIANO'PLE, called Edreneh by the Turks, the second city in European Turkey, is in the province of Romania or Rumelia, and on the river Maritza, the ancient Hebrus, which is here joined by the Toonja and the Arda, N. lat. 41° 44′, E. long. 26° 34′, and 135 miles N. W. of Constantinople. It takes its name from the Roman Emperor Adrian (properly written Hadrian) who restored and embellished it, as he did so many other cities of his dominions. Adrianople rises gently on the side of a small hill from the banks of the Hebrus and Tunsa, and is about five miles in circumference. At the present day it has an appearance of desolation; the streets are grass-grown, and the houses look as if deserted. It still retains its old walls and towers. The population is estimated at 100,000, of whom about one-half are Turks, and the remainder mostly consists of Greeks and Bulgarians in equal parts. The streets of the town are narrow and irregular; but it is well provided with mosques and with baths. The great boast of the town is the mosque of Selim II., built chiefly of materials brought from the ruins of Famagosta, in Cyprus. It consists of one great apartment, like a theatre, terminating in a cupola, and has four regular minarets, to the highest balcony of which there is an ascent by 377 steps. One of the most important constructions in Adrianople is the bazaar of Ali Pacha, near the mosque of Sultan Selim. It is a brick building, vaulted with arches, composed of alternate red and white bricks. The entrance is by a gate at each end, and four lateral ones, and its length is 300 paces. The *coup d'œil* offered by the entire length of this bazaar is more striking than anything at the Bezesteins at Constantinople. Only the more precious commodities, such as jewellery, shawls, muslins, are sold in it. —*Murray's Handbook for Turkey*. The river Maritza being navigable as far as Adrianople for small craft, contributes to the commercial prosperity of the town. The port is Enos, which stands on one side of the bay, into which the Hebrus flows. The manufactures of Adrianople are silk, woollen and cotton stuffs; it has also establishments for dyeing and distilling rose-water and other perfumes, and for tanning leather. Among its chief exports are fine wool, leather, wax, &c.

From 1360, when Amurath I. subdued the whole province of Thrace, to 1453, the year in which Constantinople was taken, Adrianople was the capital of the Turkish Empire. It ceased to be the capital after the capture of Constantinople, but still was frequently chosen as the seat of government by succeeding sultans, and was the favourite residence of Ahmed III., Mahomed IV., and Mustafa. In the campaign of 1829, the Russians under Diebitsch took the town, and compelled the sultan to sign the *Treaty of Adrianople*, so injurious to the independence of Turkey. The treaty was obtained by fraud, as the miserable condition of the Russian army, reduced to 13,000 men, was kept concealed. The probable result of the present war will be the annulling of that and other existing treaties, which place Turkey at the mercy of her too powerful neighbour.

ADRIAN'S WALL. [See ROMAN WALL.]

ADRIATIC SEA, that gulf of the Mediterranean which separates Italy from Illyria, Dalmatia, and Albania. It is connected with the Ionian Sea by the Strait of Otranto; its direction being from S.E. to N.W. The length of the Adriatic from this strait to the most northern point is upwards of 480 miles; its average breadth is about 140 miles.

The north end of the Adriatic is called the Gulf of Venice, which name is sometimes given to the whole sea; the north-eastern extremity forms the Gulf of Trieste; south of the peninsula of Istria, on the eastern coast, lies the Gulf of Fiume or Quarnero. Between Trieste and Ragusa, the east coast is studded with islands, possessing well-sheltered bays and harbours. On the west, the coast forms the two open bays of Ravenna and Tremiti, and the Monte Gargano, which projects into the sea, separates them from the Gulf of Manfredonia on the south. The rivers which drain the basin of the Adriatic on the west, with the exception of the Po and the Adige, are merely mountain torrents. So also are those on the eastern coast: the principal are the Narenta, the Drino, and the Vojussa. The name Adriatic or Adrias was applied by the Greeks to the northern part only of this sea; the southern part they called the Ionian Sea. The name Adriatic was derived from the city Adria, and probably originally belonged only to the sea around it. The common name of this sea among the Romans was Mare Superum—that is, the Upper Sea—to distinguish it from the Tuscan Sea, which they called Mare Inferum.

ADULA'RIA is the name given by mineralogists to the ornamental stone called by lapidaries *moonstone*, on account of the play of light exhibited by the arrangement of its crystalline structure. The term is derived from Mount Adula, in the country of the Grisons, in Switzerland. It is a very pure limpid variety of the common mineral *felspar*, and is composed of 64 per cent. of silica, 20 of alumine, 2 of lime, and 14 of potash, according to the analysis of Vauquelin. It is found abundantly on the Alps, and on Mount St. Gothard; but the best are from Ceylon, and a very fine specimen has been sold for as much as 30*l*.

ADU'LE corresponds to the modern Zulla, on the west coast of the Red Sea [see ABYSSINIA]. Zulla is in the recess of a small bay, named Annesley's Bay, and in N. lat. 15° 35′. It is a matter of some curiosity to determine with precision what spot corresponds to the Adule of Cosmas, who was a merchant of the sixth century of the Christian era, and has preserved in his book, entitled *Christian Topography*, a copy of a Greek inscription which he found at this place. Adule at this period was the port of Axum, where merchants traded for ivory and slaves, just as they now do at Massowa, on the same coast—so little are things changed, in many parts of the world, after the lapse of centuries. When Mr. Salt was in Abyssinia he was prevented from visiting Zulla; a friend of his who went there was also prevented by the jealousy of the natives from visiting the remains. All however agreed in saying that there were remains at this place. The name Zulla is sometimes pronounced Thulla, and Adule may readily be admitted to correspond so far as to strengthen the probability of their both designating the same place. Mr. Salt adds, that some of the natives pronounced the name Azoole, which is clearly the same as Adule. D'Anville, in his map of the Red Sea, places Adule at Arkeeko on the same coast, and about 22′ farther north than Zulla. The inscription was found, according to Cosmas, partly on a throne of white marble, and also on a tablet which stood behind the chair, and, as far as we can collect, was a different kind of stone. Till Mr. Salt discovered the inscription at Axum, and compared it with the latter part of the inscription of Adule, it had been supposed that the *entire* inscription on the latter monument referred to one and the same personage, whereas it is now pretty certain that Cosmas has made two inscriptions into one, and caused no little difficulty to the learned world. These inscriptions are really curious, considering the *place* where they were found and the language in which they are written: they may be seen in Montfaucon's *Collectio Nova Patrum*, Paris, 1706, folio, vol. ii., p. 141, in Fabricius' *Bibliotheca Græca*, tom. ii., and Chishull's *Antiquitates Asiaticæ*.

The first part of the inscription refers to the third Ptolemy, called Euergetes or the *good doer*, King of Egypt, who, according to the testimony of the stone, was supplied 'with elephants from the Troglodytæ and the Ethiopians, which his father (Ptolemy II.) and himself first hunted in these regions, and having taken down to Egypt, adapted to the use of war.' This Ptolemy reigned from B.C. 247 to 222. The second part of the inscription is in the first person (the first part being in the third), and appears to record the triumphs of some Ethiopian king, whose name does not appear, over many of the people of Ethiopia, and as far as the borders of Egypt. This passage alone is sufficient to show that the second part of the inscription cannot refer to the same person as the first part; for Ptolemy's conquests extended from Egypt to Ethiopia, and not from Ethiopia to Egypt. The second part commemorates also the conquests of this Ethiopian king over some of the nations of Arabia; and we find (which tends to confirm the general accuracy of the facts) that several names are mentioned which we can still recognize in Africa. Among others, the stone speaks of the *Semenæ* or Samene, the people of *Samen* [see ABYSSINIA], 'a nation dwelling beyond the Nile, in mountains difficult of access, and snow-covered, wherein all through the year there is ice and very deep snow, so that a man will sink up to the knees—these, having crossed the river (says the Ethiopian king), I subdued.' The mountains are clearly the Samen, and the river is the Tacazzé. [See Clinton's *Fasti*, part ii., p. 382.]

ADULT-SCHOOLS are establishments for instructing in reading and other branches of knowledge those persons who have not been educated in their youth. They are designed to meet the wishes of people who are no longer contented to remain uninstructed, and who do not think that the privation of an early education should necessarily entail upon them the evil of perpetual ignorance.

It has generally been found that those who are desirous of acquiring knowledge, and of attaining to a higher state of mental improvement, will better understand and practise the duties of the social system. The results of actual experience on an extended scale have shown the advantages of adult-schools to be even greater than could have been anticipated. They have uniformly worked good, by improving the intellectual and moral condition of persons under their influence.

The first school avowedly established for the purpose of instructing adults was formed in 1811, through the exertions of the Rev. T. Charles, a clergyman in Merionethshire. Some grown-up persons had previously attended his parish sunday-school, but they showed a disinclination to learn with children, and this circumstance led to the adoption of more extended views for their benefit. Considerable success both in the number and progress of the pupils, and their improved conduct and character, caused the establishment of other adult-schools throughout Wales.

About the same time, and without any concert or connexion with the schools in Wales, a school was established at Bristol through the instrumentality of W. Smith. This person, 'who collected the learners, engaged the teachers, and opened the two first schools in England for instructing adults exclusively, in borrowed rooms, and with borrowed books[*],' was the door-keeper to a dissenting chapel. He devoted three out of eighteen shillings, his weekly earnings, to defray the expense of giving to his brethren the means of studying the Scriptures, and of obtaining knowledge from other sources. A short time after these first efforts were made, a society was formed for the furtherance of his benevolent views. In the first report of this society, dated April, 1813, it was stated, that 222 men and 231 women were already receiving education. Adult-schools were soon afterwards established in different parts of the kingdom, at Uxbridge, Norwich, Ipswich, Sheffield, Salisbury, Plymouth, and other places.

It has been found that many of the uneducated are unwilling to attend the public schools, in consequence of a dislike to expose their ignorance. To meet this difficulty, the plan of *private* schools has been adopted in some cases. A few individuals living near to each other meet at their own dwellings, or at some more suitable place, where they are instructed by their benevolent teachers. The following account, written in 1833, of an experiment in adult education, tried with success by Dr. Johnstone, at Edgbaston Hall, near Birmingham, will give an idea of what may be done in the way of mutual and self-improvement by grown-up persons. This school was established about 1815; and the only expense incurred by the individual with whom the plan originated, is that of providing a room once a week, with fire and candle. There are now forty members—more than half the labouring population of the parish—of all ages from eighteen to seventy. The teaching is confined to reading and writing; but there is a prosperous and well-conducted benefit society connected with the institution. The management of the school and the benefit society is in the hands of the men themselves. This point has always been a great object with the founder of the school. The men teach each other; and the affairs of the benefit society are directed by a committee chosen by the members generally. The school assembles once a week, on Sunday evening, for two hours; but the men often go on with their lessons at home in the week-days. It is found that a man who is quite ignorant of reading will generally acquire sufficient knowledge to enable him to read with pleasure to himself in the course of six months. It may appear somewhat strange that the men are fonder of writing than of reading. In truth, they show wonderful perseverance in plodding through endless copies, from the large text down to the small-hand. In many instances the members of the school have been able to turn their acquirements, small as they are, to very good account. A man who has had the office of standing overseer of Edgbaston parish for seven years was qualified in the adult school. When he entered it, he could neither read nor write. The moral effect of the school has been most satisfactory. A man who has been a leading member for several years, was an habitual tippler before he entered the school; he is now always sober.

Schools for teaching the elements of reading and writing to adults, whose education in youth has been altogether neglected, can be looked upon only as temporary expedients to alleviate a pressing evil arising from previous neglect. They are indications of an abnormal condition or social derangement, which must find its effectual remedy, or rather preventive, in another quarter—namely, in a well-organised system of national juvenile education. But in a wider and more general sense, adult schools form an essential part of a complete system of educational machinery, especially for the working-classes. Evening-schools for adults are the necessary supplement of the elementary day-school. On this subject Horace Mann, in his Report on the Census of Education for 1851, remarks: 'The assertion may perhaps be safely made, that more than half the time and labour spent on primary instruction in the elementary day-school will be spent in vain, unless the educational process there commenced shall be continued afterwards. In fact, by far the greater portion of the usual school-time, more especially of the working-classes, is devoted to the acquisition of mere instruments for gaining knowledge, not to the acquisition of knowledge itself. If, therefore, no facilities be offered for the future *application* of these instruments—if, reading and writing having been acquired, no opportunities present themselves for putting into useful exercise these means of information—it can scarcely be a matter of surprise that multitudes, in spite of an accessible supply of elementary schools, should still remain uneducated. The immense importance, then, of *secondary* education, cannot but be recognised.' The object of Mechanics' Institutions, and other similar establishments, is to carry on this adult or secondary instruction; and the schools established by the 'Department of Practical Science and Art,' are intended for the same purpose in special branches.

The census of 1851 exhibits some interesting statistics respecting evening-schools for adults. The number from which returns were obtained in England and Wales was 1545, containing 39,783 students, of whom 27,529 were males, and 11,954 were females. In regard to the occupation of the scholars, the artisans are the most numerous, being 14,405; of agricultural labourers, there are 6709; factory hands, 4418; domestic servants, 1317; soldiers, 386, &c. The statistics of 'subjects taught,' show writing to be in greatest demand. The returns for Scotland show a far higher proportional number of evening-schools for adults. Returns were received from 438, containing 15,071 scholars.

ADULTERY (formerly termed *advowtry, quasi ad alterius thorum*) is the offence of incontinence between two married persons, or between two persons, one of whom is married. In the latter case it is called single, in the former, double adultery.

This crime was punished by the Jewish law with death: but it must be remembered that the kind of adultery which by the Mosaic law constituted a capital crime, was not every violation of chastity of which a married person, whether husband or *wife*, may be guilty; but only the sexual connexion of a wife with any other man than her husband. This distinction was analogous to the whole system of the Jewish marriage-law; by which the husband and wife had not an equal right to restrain each other from infidelity; for the former might marry other wives, or take concubines and slaves to his bed, without giving his first wife a legal right to complain of any infringement of her matrimonial rights. The punishment, however, of incontinence in a married *woman* with a stranger was, by the Levitical law, death by stoning, both in the case of the stranger and the adulteress. (Levit. xx. 10, and Michaelis' *Mosäisches Recht.*) By the Athenian law, the husband might kill the adulterer, if he detected him in the act of dishonouring him (Lysias's *Oration on the Death of Eratosthenes*). Under such circumstances, the Code Napoleon expressly authorizes the husband to kill both the offenders.

The Roman law corresponds with the Hebrew law respecting the distinction between the infidelity of the husband and the wife. The civilians define adultery to be the violation of another man's bed (*violatio tori alieni*); so that it appears from the definition itself, that the infidelity of the husband could not constitute the offence. The more ancient laws of Rome, which were extremely severe against the offence of the wife, were silent as to that of the husband. By an old law, an adulteress was to be slain by her husband and his relations (*adulterii convictam vir et cognati uti volent, necanto*). At a later period, by the Lex Julia, adultery in the wife was punishable by her banishment or transportation into some remote island; she also forfeited half her dowry and a third part of her goods; and the adulterer forfeited half his goods to the public use. But although by the Julian law adultery was not punishable with death by a legal sentence, the father of the adulteress was permitted to kill both her and her paramour; and in some cases, the husband had the same power. In the reign of Constantine, adultery in the wife became, by the Roman law, a capital offence; and continued to be so until the time of Justinian, who introduced some mitigation of the punishment.

By the canonical law, however, which is now more or less interwoven into the municipal laws of most Christian countries, adultery is defined to be the violation of conjugal fidelity; and, consequently, the incontinency of the wife and husband stand upon the same foundation. Hence arises the distinction above alluded to between a single and double adultery.

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[*] Pole's History and Origin of Adult Schools.

Double and single adultery are punishable with various degrees of severity in most of the countries of modern Europe; but it is believed that in none of them, at the present day, is either of these offenses capital.

There are some faint traces of the punishment of adultery as a crime in very early periods of the history of English law. Lord Coke says, that in ancient times it was within the jurisdiction of the sheriffs' tourns and courts-leet, and was punished by fine and imprisonment (3 Inst. 306): but at the present day, adultery is not the subject of a criminal prosecution; and in the temporal courts, this offence is exclusively confined to the cognizance of the Ecclesiastical Court, according to the rules of the canon law. Instances of criminal prosecutions in the spiritual courts for adultery are extremely rare; and if instituted to the conviction of the parties, the infliction of a slight fine or penance 'for the benefit of the offender's soul' (*in salutem animæ*), as it was termed, would be the only result. In the year 1604 (2 James I.) a bill was brought into parliament 'for the better repressing the detestable crime of adultery.' This bill went through a committee in the House of Lords; but, upon being reported, it was suggested to the House that the object contemplated by the measure was the private interest of some individuals, and not the public good; whereupon the bill was dropped. [See *Parl. History*, vol. v. p. 88.] During the Commonwealth, adultery, in either sex, was made a capital felony [see Scobel's *Acts*, part ii. p. 121]; but at the Restoration, this law was discontinued.

Adultery, however, comes under the cognizance of the temporal courts in England as a private injury to the husband, though not as a public wrong. The ecclesiastical courts take cognizance of it as a ground of divorce. The Scotch law regards it in the same light, although in that system it is not the only ground of divorce; for the Scotch law gives the same effect to wilful desertion for at least four years. Yet such desertion in the Scotch law constitutes no defence to an action of divorce on the ground of adultery. [See DIVORCE.]

ADVENT—literally, the approach or coming—is the space of four weeks preceding Christmas, appointed in the English and other Christian churches to be kept holy in celebration of the approach of our Saviour's nativity or manifestation. The first Sunday in Advent, commonly called Advent Sunday, is now the Sunday, whether before or after, which falls nearest to St Andrew's Day (the 30th of November). In the ancient ecclesiastical law of England, it would appear that marriages were not allowed to be solemnised from the commencement of Advent to the end of the octaves of Epiphany—that is, the 14th of January—except by special licence; and such is the canon of the Roman Catholic Church.—[See Tomlin's *Law Dictionary*, title ADVENT.]

ADVENTURE BAY, is situated on the east coast of Brune island, which lies to the south of Van Diemen's Land; S. lat. 43° 21′, E. long. 147° 29′. This bay was first discovered by Captain Furneaux in 1773, and was named by him after the ship which he commanded, and which formed part of the expedition under the orders of Captain Cook. The anchoring-ground is good and well sheltered, and the neighbouring shore furnishes abundance of wood and water, which are easily procured. At the head of the bay is a beautiful sandy beach, two miles long, formed by particles continually washed by the sea from a very fine white sandstone that bounds the shore. Behind this beach is a level plain, containing a lake with brackish water, where abundance of bream and trout are found. The shores of the bay in other parts are hilly, and the whole district is very thickly wooded, presenting to view in every direction a perfect forest of tall trees, with thickets of shrubs beneath, which render it almost impassable. The soil is not deep, but rich, consisting of black vegetable mould. No considerable stream has been discovered in the neighbourhood of the bay. Several small rivulets trickle between the hills, and uniting together form brooks. The spot is occasionally visited by some of the wandering aborigines of the island, who never remain long in one place, but move about in quest of food, having not yet adopted the arts of cultivation or of domesticating animals. The animal principally found in these wilds is the kangaroo, in hunting which the natives show considerable activity. Brown hawks, crows, paroquets, pigeons, and a variety of small birds, frequent the woods, which are also infested by large black snakes and lizards. Insects are very numerous and troublesome; among these are musquitoes and a large black ant, the pain of whose bite is intolerable for a short time. The bay is visited periodically by an abundance of fish of various kinds. Adventure Bay was visited by Captain Cook in 1777, and subsequently (in 1788 and 1792) by Captain Bligh, for the purpose of obtaining wood and water (see *Cook's Third Voyage*, vol. i., p. 93—117. *Flinder's Voyage*, vol. i., introduction. *Bligh's Voyage to the South Seas*, p. 45—54. *Voyage D'Entrecasteaux*, redigé par M. de Rossel, tom. i., p. 48.

ADVENTURE, JOINT, or Joint Trade, is a limited partnership, confined to a particular adventure, in which the partners use no firm or social name, and incur no responsibility beyond the limits of the adventure. It may be established by the same evidence as partnership; but joint-adventure is not inferred from joint-ownership of a ship, unless there has been participation in the mercantile employment of the ship in which the joint-adventure is said to have consisted.

ADVERB, in grammar, the name given to a class of words employed with verbs, adjectives, &c., for the purpose of qualifying their meaning, just as the adjective itself is attached to substantives. In the English language a very large majority of adverbs are distinguished by the termination *ly*, which in the Anglo-Saxon has the fuller form *lice*, and in German, *lich*. Our own language possesses the same suffix in the form *like*, as *godlike*, *gentlemanlike*. These, however, and many other words in *ly* are adjectives, as *manly*, *ugly*; and it is difficult to draw the line between these two classes, many words, especially in the older writers, being used indifferently for both [see ADJECTIVE]. The word to which the adverbial suffix *ly* is added is generally an adjective, but occasionally the adjective has become obsolete in the present form of our language, and must be sought in the Anglo-Saxon. Thus *early* is derived from the Anglo-Saxon *aer*, which indeed still appears in the now poetical forms *ere*, and the superlative *erst*. But though the termination *ly* is derived from the Teutonic portion of our language, it has been applied most freely to adjectives of Latin origin, as *publicly*, *privately*; and with these may be classed the adverbs from adjectives in *ble*, as *horribly*, *agreeably*, in which the liquid belongs at once to the adjective and the suffix. An important class of adverbs are formed by prefixing the old Saxon preposition *an* or *on* to nouns, in which a careless pronunciation afterwards left nothing but the vowel *a*, as *on fote*, now *a-foot*. Lastly, we have an interesting though ludicrous formation depending upon alliteration, *helter-shelter*, *hurry-skurry*, *pell-mell*, *higgledy-piggledy*, &c. The same love of alliteration, which is said to have formed an important element in Anglo-Saxon versification, has also given rise to some adjectives and substantives, as *hum-drum*, *slip-slop*, *tip-top*, *tittle-tattle*, *hurly-burly*.

ADVERTISEMENT. In the English, Scotch, and Irish newspapers, and other periodical works, there are annually published a multitude of announcements, now amounting to several millions, which, whatever be their peculiar character, are known by the general name of Advertisement. The first English advertisement that can be found is in the *Impartial Intelligencer* for 1649, and relates to stolen horses. In the few papers published from the time of the Restoration to the imposition of the Stamp Duty in 1712, the price of a short advertisement appears seldom to have exceeded a shilling, and to have been sometimes as low as sixpence. The duty, which previously to 1833 was 3s. 6d., whether the advertisement was long or short, increased the cost of advertising in most cases 100 per cent. The duty was then reduced to 1s. 6d., and continued so till 1853, when it was altogether abolished. This has allowed a great expansion of the practice of advertising, which was previously on the increase. In 1833, the average daily advertisements in the *Times* were about 100; in 1843, they had risen to 600; and in 1853, to 1400. The cost of advertising varies, of course, with the circulation of the paper or periodical; for a notice not exceeding three or four lines, the charge is from 1s. to 2s. 6d., with from 3d. to 6d. per line after. Newspapers are mostly supported by the revenue from advertisements, the price of the paper itself hardly paying the outlay.

The habit of advertising is a great feature of the Anglo-

Saxon race. Though the practice exists in France and Germany, it is on a comparatively small scale. In America, owing to the absence of duty all along, and to the cheapness of newspapers, it has assumed a far greater development than in the mother-country—upwards of 10,000,000 of announcements annually, it is said. Advertising forms no inconsiderable item in the expenditure of most branches of business; and the sums laid out in this way are sometimes truly astounding. An amusing volume might be written on the statistics, the strange forms, and other curiosities of advertising. The subject is not without its dark side. The immense sums spent in advertising quack medicines (and the outlay must be found to pay, or it would not be continued) show the extent to which ignorance and gullibility prevail among large masses of society.

ADVICE, in its legal signification, has reference only to bills of exchange. The propriety of inserting the words 'as per advice,' depends on the question whether or not the person on whom the bill is drawn, is to expect further directions from the drawer. Bills are sometimes made payable 'as per advice;' at other times 'without further advice;' and generally without any of these words. In the former case if the drawer pays before he has received the 'advice,' he does so at his own risk.

Advice, in commercial language, means information given by one merchant or banker to another by letter, in which the party to whom it is addressed is informed of the bills or drafts which have been drawn upon him, with the particulars of date, &c., to whom payable, &c., and where.

ADVOCATE, from the Latin *advocare*, to call in aid. Among the ancient Romans, an advocate was a person skilled in the laws. The origin of advocates in Rome was derived from an early institution, by which every head of a patrician house had a number of dependants, who looked up to him as a protector, and in return owed him certain obligations. This law established the relation of *advocate*, or patron, and client. As it was one of the principal and most ordinary duties of the patron to explain the law to his client, and to assist him in his lawsuits, the relation was gradually contracted to this extent.

In early periods of the Roman republic, the profession of an advocate was held in high estimation. It was then the practice of advocates to plead gratuitously; those who aspired to honours and offices in the state taking this course to render themselves distinguished amongst the people. As the simplicity of ancient manners gradually disappeared, the services of Roman advocates became venal. At first it appears that presents of various kinds were given as voluntary acknowledgments of the gratitude of clients for services rendered. These payments, however, gradually assumed the character of debts; and at length became a kind of stipend periodically payable by clients to those of the patrician order who devoted themselves to pleading. In this form, it became a heavy oppression, and was always considered to be an abuse. At length the Tribune Cincius, about 200 years before Christ, procured a law to be passed called from him Lex Cincia, prohibiting advocates from taking money or gifts for pleading the causes of their clients. At the time of Augustus, this intended prohibition seems to have become inefficient and obsolete; and a decree of the senate was then passed by which the Cincian law was revived, and advocates were commanded to plead gratuitously, under a penalty of four times the amount of the fee they received. Notwithstanding these restrictions, it clearly appeared that the constant tendency was to recur to a pecuniary remuneration; for in the time of Claudius we find a law restraining advocates from taking exorbitant fees, and fixing as a *maximum* the sum of 10,000 sesterces for each cause pleaded, which would be equivalent to about 80*l*. sterling. [Tacit. *Ann.* xi. 5.] Some years afterwards, Pliny mentions a decree passed in his time, that all litigants in courts of justice, previously to the hearing of their causes, should take an oath that they had neither given, promised, nor secured any reward or money to any person employed as their advocate.

In later periods, as the Roman law diffused itself over great part of Europe, these restrictions upon the pecuniary remuneration of advocates, which must always have been liable to evasion, entirely disappeared in practice; and the payment of pleaders for conducting causes in courts of justice resembled in substance the payment of any other services by those who derived benefit from them. In form, however, the fee was merely an honorary consideration (*quiddam honorarium*), and was generally, but not necessarily, *prenumerated*, or paid into the hands of the advocate before the cause was pleaded. It was a rule, that, if once paid, the fee could never be recovered, even though the advocate was prevented by death or accident from pleading the cause; and where an advocate was retained by his client at an annual salary (which was lawful and usual), the whole yearly payment was due from the moment of the retainer, though the advocate died before the expiration of the year. [See Heineccii *Elementa Juris Civilis*, p. 132.] Manifest traces of this practice are still to be found in all countries into which the civil or Roman law has been introduced; and are also clearly discernible in the rules and forms respecting fees to counsel at the present day in England.

In countries where the Roman law prevails, the pleaders in courts of justice are still called Advocates. In Scotland, the Bar, or the Faculty of Advocates, consists of pleaders or counsel, admitted, upon an examination, who besides the right to practise in all the courts of that country, superior and inferior, are also entitled to plead in the House of Lords in England, and before the Privy Council. They have also a right of audience at all trials for treason in England.

Advocates in English courts are termed *barristers;* but in the ecclesiastical courts and others in England, where the authority of the Roman law is recognised, the pleaders are also called Advocates. [See COUNSEL, and DOCTORS' COMMONS.]

The *Lord Advocate*, or *King's Advocate*, is the principal crown-lawyer in Scotland. Previously to the Union, he sat in parliament by virtue of his office, without election. He was then, as he still is, one of the great officers of state. His duty is to act as a public prosecutor, and to plead in all causes in which the crown is interested, and particularly in criminal cases.

ADVOCATES' LIBRARY. The idea of establishing a library for the use of the Faculty of Advocates in Scotland seems to have been first entertained a few years before the Revolution. The first notice regarding it in the Minute-book of the Faculty is dated 28th July 1680; but the year 1682 may be considered as the epoch of its establishment. We find from the minutes, that in 1684 the library had already attained what was considered a respectable footing. The author and active promoter of the plan was Sir George Mackenzie of Rosehaugh, who pronounced a Latin inaugural oration when the library was first opened. In this oration, he speaks of the views of the Faculty as being, 'from gifts of benefactors, and from subscriptions of candidates, to found and establish a library, consisting merely of the works of lawyers, and such other works as tended to the advancement of jurisprudence.'

At first, the Advocates' Library had no fixed fund, but subsisted and increased by means of donations, not from advocates only, but also from other individuals, and from such sums as the Faculty, from time to time, placed at the disposal of the curators. Thus then it happened, that although the Advocates' Library, strictly speaking, belonged to the Faculty of Advocates as an exclusive body, it still was early considered as a public library, and was open to the public. This characteristic has rendered the institution very popular, and at the same time promoted its increase. In the year 1700, the greater part of the collection was consumed by fire. During the first nine years after its restoration, the library must have increased considerably, since, in the eighth year of Queen Anne's reign, it obtained the privilege of receiving a copy of every new book which, by chapter nineteen of the Acts of Parliament of that year, was conferred on it, with eight other libraries. Of these, five were Scotch libraries; and the disproportionate privilege may have originated in the desire of the legislature to grant some benefit to Scotland at the time of the Union. Shortly after the Union with Ireland, the same privilege was granted to two Irish libraries.

The whole number of volumes now contained in the library is estimated at 160,000. The Advocates' Library is consequently by far the largest in Scotland—perhaps twice as large as any other. In Great Britain there are probably only two libraries—viz., the British Museum and the Bodleian—that outnumber it. As might be expected, the collection of law-books is very large; this is particularly the case with regard to the civilians and canonists, and to American and foreign law, in which departments the library is said to be unequalled. The department of Scottish history and antiquities is perhaps the most complete and valuable of all;

it comprehends MSS. and pamphlets not to be found elsewhere. The library is also rich in the works of the fathers and of the schoolmen, and in theological learning generally. Swedish, Danish, and Icelandic literature is well represented; and the Spanish department is particularly valuable. The library of the Marquis of Astorga, consisting of between 3000 and 4000 volumes of Spanish literature, was procured, in 1826, at a cost of 3000*l*. The collection of MSS. is not remarkable. In the year 1825, about 100 volumes of Icelandic MSS. were purchased from Professor Magnuson, of Copenhagen, and a few valuable Persian and Sanscrit MSS. were presented about the same time by Mr. Erskine, of Bombay. There is also a beautiful MS. of the Hebrew Bible, in two large folio volumes; the Pentateuch has, besides the original, also the Chaldaic paraphrase. A very valuable collection of German dissertations, amounting to upwards of 100,000, for the most part productions of distinguished scholars, was purchased for the library by Sir William Hamilton.

The library must be considered deficient in works of foreign literature and science—especially the more recent, as compared with home publications. The privilege of receiving publications from Stationers' Hall has been the main cause of the complete character of the collection in British books. This privilege is still continued to the Advocates' Library, although withdrawn from the other Scottish libraries. It was considered by the government to be desirable that a copy of every new work should be deposited in some one library in Scotland, and that of the Faculty of Advocates was chosen. The Faculty have no other funds at their disposal than the fees derived from 'Intrants,' and the sum they are able to devote to the maintenance of the library is quite inadequate. After defraying the necessary expenses of management, little is left for the purchase of books; and this accounts for the comparative deficiency of the collection in point of foreign works.

At one time the library was kept in Milne's Square; it was removed to its present site in 1702. The building which now contains the Advocates' Library is not only very confined, but also dark and inconvenient. Most of the rooms are only vaults below the Parliament House, where the Court of Session sits; and some of them are completely dark, and have to be lighted with gas. In 1830, the Faculty resolved to erect a new library on the adjoining ground belonging to them. Only a small portion of it has been completed; and the funds of the Faculty being the reverse of flourishing, there appears no prospect at present of its being finished.

The Advocates' Library is governed by six curators, two of whom go out of office by rotation every year. Under the curators, there are a keeper of the library and three assistants. Of the librarians, or, as they are called in Scotland, 'Keepers of the Advocates' Library,' the two first deserve to be mentioned as men of literary attainments—viz., Thomas Ruddiman and David Hume. Ruddiman was appointed assistant-keeper in 1702, with a salary of a hundred pounds Scots (8*l*. 6*s*. 8*d*). He became principal-keeper in 1730; and his services to the library, during the fifty years he was connected with it, were such that he has been styled by some its second founder. The great philosopher and historian succeeded Ruddiman in the year 1752, but resigned in 1757, and seems to have been but indifferently pleased with his situation. The place of assistant-keeper of the Advocates' Library was, in the year 1825, offered to the eminent philologist, the late Professor Rask, of Copenhagen. This offer was declined. It was likewise offered to several other persons, amongst whom was Professor Benecke, of Göttingen.

The first catalogue of the library was printed in 1692. It is a thin small quarto, of 158 pages—the law-books occupying more than half of the volume. In 1735, a catalogue was begun by Ruddiman, which was carried through the press in 1742, but from the date of the preface seems not to have been published till 1772. In 1776, a supplement was completed by Mr. Alexander Brown; and in 1807, a third volume was published, containing the additions made to the library down to that date. Since then, with the exception of a catalogue of law-books (1831), and a supplement (1839), they have been continued in MS. A new catalogue of the entire collection is now in progress, and is expected to be ready for the press in the course of 1855. It will extend to at least six thick quarto volumes.

As to *ease of access*, there is no public institution in Grea Britain, and very few in Europe, managed with greater liberality than the Advocates' Library, though we ought in candour to admit that this is a somewhat equivocal compliment. Any stranger arriving in Edinburgh is admitted without introduction; but some introduction is required for habitually resorting to, and reading in the library. Even borrowing of books is subject to very slight restriction. Each advocate enjoys the privilege of borrowing twenty volumes (formerly twenty-five) at a time; if he wishes to favour an individual who is not a member of the Faculty of Advocates with the loan of a book, he has only to sign the initials of his name in the journal or receipt-book as a security. As there commonly are about two hundred advocates residing in Edinburgh, and as they are, almost without exception, remarkably liberal in lending books, it is in that city by no means difficult to obtain a free use of a very extensive library.

While the Court of Session sits, the Advocates' Library opens at nine o'clock in the morning, and shuts at four o'clock P. M.: during vacation it is open from ten till four.

ADVOWSON. The right of presenting a fit person to the bishop, to be by him instituted to a certain benefice within the diocese which has become vacant. The person enjoying this right, is called the *patron* of the church, and the right is termed an advowson (*advocatio*), because he is bound to advocate or protect the rights of the church, and of the incumbent whom he has presented.

As this patronage may be the property of laymen, and is subject to alienation, transmission, and most of the changes incidental to other kinds of property, it is obvious that it would be liable to be misused by the intrusion of improper persons into the church, if the law had not provided a check upon abuse, by giving to the bishop a power of rejecting the individual presented, for just cause. The ground of his rejection is, however, not purely discretionary, but is examinable at the instance, either of the clergyman presented, or of the patron, by process in the ecclesiastical and temporal courts. [See DUPLEX QUERELA. QUARE IMPEDIT.]

According to the best authorities, the appointment of the religious instructors of the people within any diocese formerly belonged to the bishop: but when the lord of a manor, or other considerable landowner, was willing to erect a church, and to set apart from his possessions a sufficient portion of land or tithe for a perpetual endowment of it, it was the practice to give to the founder and his heirs, in acknowledgment of his beneficence, the right of nominating a person in holy orders to be the officiating minister, as often as a vacancy should occur, while the right of judging of the spiritual and canonical qualification of the nominee was reserved, as before, to the bishop.

This seems to be the most satisfactory account of the origin of *advowsons* and *benefices*, and it corresponds with many historical records still extant, of which examples may be seen in Selden's *History of Tithes*. It also serves to explain some circumstances of frequent occurrence in the division of parishes, which might otherwise appear anomalous or unaccountable. Thus the existence of detached portions of parishes, and of extra-parochial precincts, and the variable extent and capricious boundaries of parishes in general, all indicate that they owe their origin rather to accidental and private dotation, than to any regular legislative scheme for the ecclesiastical subdivision of the country. Hence, too, it is frequently observable, that the boundaries of a parish either coincide with, or have a manifest relation to, manorial limits. The same connexion may, perhaps, have suggested itself to those who have had opportunities of noticing the numerous instances to be seen in different parts of England, in which the parochial place of worship is closely contiguous to the ancient mansion of its founder and patron, and within the immediate inclosure of his demesne.

As an illustration of the respect inculcated in early ages to the patron of a church, we find that the canons of the church permitted him alone to occupy a seat within the chancel or choir, at a time when that part of the building was partitioned off from the nave, and reserved for the exclusive use of the clergy. [See Kennett's *Paroch. Antiq Glossary*, tit. "Patronus."]

An advowson which has been immemorially annexed t a manor, or to other land, is called an *advowson appendant* and is transmissible by any conveyance which is sufficient to pass the property in the manor or land itself. It may, however, be detached from the manor, and is then termed an *advowson in gross*, after which it can never be re-annexed, so as to become appendant again.

An advowson is regarded by the law in the double light of a temporal property, and a spiritual trust. In the former view, it is a subject of lawful transfer by sale, by will, or otherwise, and is available to creditors in satisfaction of the debts of the patron. It may be aliened for ever, or for life, or for a certain term of years; or the owner may grant one, two, or any number of successive rights of presentation on future vacancies, subject always to certain restrictions imposed by the law, for the prevention of corrupt and simoniacal transactions.

On the other hand, the spiritual trust which is attached to this species of property is guarded and enforced by very jealous provisions. We have already seen, that the appointment of a duly qualified incumbent is secured, as far as the law can secure it, by requiring the sanction of the bishop to his admission; and although this sanction is, in fact, very rarely withheld, yet it cannot be doubted that the existence of such a check is essential to the well-being of the church. In order more effectually to guard against the danger of a corrupt presentation, the immediate right to present is absolutely inalienable, as soon as a vacancy has actually occurred; and on a similar principle, a purchase of it during the mortal sickness of the incumbent is equally prohibited. [See SIMONY.]

We have seen, that when the proprietor of an advowson exercises his patronage, three persons are immediately concerned: the proprietor, the clergyman who is presented, and the bishop in whose diocese the living is situate; or (in the language of lawyers) the *patron*, the *clerk*, and the *ordinary*. The presentation is usually a writing addressed to the bishop, alleging that the party presenting is the patron of a church which has become vacant, and requesting the bishop to admit, institute, and induct a certain individual into that church, with all its rights and appurtenances. A period of time, limited to twenty-eight days, is then allowed to the bishop for examining the qualification and competency of the candidate, and at the expiration of that time, he is admitted and instituted to the benefice by formal words of institution read to him by the bishop, from an instrument to which the episcopal seal is appended. A mandate is then issued to the archdeacon or other officer to *induct*, *i. e.*, to put the new incumbent into the actual possession of the church and its appurtenant rights; and then, and not before, his title as legal *parson* becomes complete.

It sometimes happens, that two of the three characters of patron, clerk, and bishop, (or ordinary,) are united in one person. Thus the bishop may himself be the patron; in which case it is evident, that presentation is superfluous, and institution alone is necessary. The bishop is then technically said to *collate* the clergyman to the benefice, and the advowson under these circumstances is said to be *collative*.

So the clerk may be the patron, in which case, though he cannot regularly present himself, yet he may pray to be admitted by the bishop; or he may transfer to another the right of presentation, *pro hâc vice*, before the vacancy occurs, and then procure himself to be presented.

Another instance in which the patronage and the parsonage are often found united is in *appropriations*, where, by the concurrence of all parties interested, the advowson, together with the church, its revenues and appurtenances, have in former times been conveyed to some ecclesiastical body, who thus became both the patrons and perpetual incumbents of the living, and by whom the immediate duties of cure are devolved on a *vicar*, or a stipendiary *curate*. The nature and different sorts of appropriations are treated of under that title.

There are instances of advowsons, the patrons of which have power to appoint an incumbent without any previous resort to the bishop for his aid or approbation. These are called *donative* advowsons, because the patron exercises a direct and unqualified privilege of *giving* his church to a clerk selected by himself. The only check upon the conduct of the incumbent in such cases is the power of the patron to visit, and even to deprive him, when the occasion demands it; and the right still residing in the bishop to proceed against him in the spiritual court for any ecclesiastical misdemeanour. It is the opinion of the most eminent lawyers, that donatives had their origin in the king, who has authority himself to found any church or chapel exempt from the episcopal jurisdiction, and may also, by special licence, enable a subject to do the same.

Sometimes the *nomination* is distinct from the right to present: thus, the owner of an advowson may grant to another the right to nominate a clergyman, whom the grantor and his heirs shall be thereupon bound to present. Here it is obvious that the person to whom the right of nomination is given is substantially the patron, and the person who presents is merely the instrument of his will. So, where an advowson is under mortgage, the mortgage creditor is bound to present any person who shall be nominated by the mortgagor.

It is sufficiently apparent that this species of property is coupled with a trust, in the faithful performance of which the public are deeply interested. If, therefore, upon the vacancy of a living, no successor, or an insufficient one, shall be presented, it is put under *sequestration* by the bishop, whose care it then becomes to provide for the spiritual wants of the parish by a temporary appointment, and to secure the profits of the benefice, after deducting expenses, until another incumbent shall be duly inducted. After a vacancy of six months, occasioned by the default of the patron, the right to present *lapses* to the bishop himself. On a similar default by him, it devolves to the archbishop, and from him again to the king as paramount patron; the period of six calendar months being allowed to pass in each case before the right is forfeited to the superior. A donative advowson, however, is excepted from the general rule; for there the right never lapses by reason of a continued vacancy, but the patron is compellable to fill it up by the censures of the ecclesiastical court.

When the incumbent of a living is promoted to a bishopric, it is thereby vacated, and the king, in virtue of his prerogative, has a right to present to it in lieu of the proprietor of the advowson. This singular claim on the part of the crown appears to have grown up since the Reformation, and was the subject of complaint and discussion down to as late a period as the reign of William and Mary. It is difficult to reconcile it to any rational principle, although it has been urged by way of apology, that the patron has no ground to complain, because the king might, if he pleased, enable the bishop to retain the benefice, notwithstanding his promotion, by the grant of a *commendam:* so that the patron sustains no other injury than what may result from the substitution of one life for another. It is, however, certain that, by successive promotions, the crown may, in fact, deprive the patron of his right for an indefinite time, and an instance is known to have actually occurred wherein the patron of the metropolitan parish of St. Andrew was prevented by several such exertions of the royal prerogative, from presenting to his own living more than once in 100 years. [See the arguments in the case of the vicarage of St. Martin's, reported by Sir B. Shower, vol. i. p. 468.] So that, as was truly observed by the counsel in that case, the safest course that could be adopted by an unconscientious patron, with a view to retain in his own hands the future enjoyment of his right, would be to present a clergyman whose qualities are not likely to recommend him to higher preferment.

The following cases may be selected as best illustrating the peculiar nature of this sort of property.

If a man marries a female patron, and a vacancy happens, he may present in the name of himself and wife.

Joint tenants and tenants in common of an advowson must agree in presenting the same person; and the bishop is not bound to admit on the separate presentation of either. Co-heiresses may also join in presenting a clergyman; and if they cannot agree in their choice, then they shall present in turn, and the eldest shall have the first turn.

When the patron dies during a vacancy, the right to present devolves to his executors and not to his heir: but where the patron happens also to be the incumbent, his heir, and not his executor, is entitled to present.

Where the patron is a lunatic, the lord chancellor presents in his stead; and he usually exercises his right in favour of some member of the lunatic's family, where it can with propriety be done.

An infant of the tenderest age may present to a living in his patronage, and his hand may be guided in signing the requisite instrument. In such a case it is needless to say that the guardian or other person who dictates the choice or directs the pen is the real patron; but the court of chancery would doubtless interfere to prevent any undue practice.

It is believed that the following table presents a tolerably accurate synopsis of the distribution of ecclesiastical patronage in this country.

Rectories and Vicarages in the patronage of	
Crown and Lord Chancellor	1048
Bishops	1301
Deans and Chapters	982
Universities	597
Other Colleges	146
Private Persons	6619
Chapels in private patronage	649
Total number of benefices in England and Wales	11,342

[See further, Burn's *Eccles. Law*, tit. *Advowson, Benefice, Donative*. Selden's *History of Tithes*. Gibson's *Codex*, vol. ii.]

ADVOWSONS, VALUE OF. The following plain rules for estimating the value of advowsons may be of use. The bargains which are usually made with respect to advowsons are, either for the advowson itself, *i.e.*, the right of presentation for ever, or for the right of presenting the next incumbent, *i.e.*, the next presentation. In both these cases there may be circumstances peculiar to the living itself, which fall under no general rule, but which must be considered and allowed for in valuing the advowson as a property. For example, a curate may be necessary; the parsonage-house may be in a state which will entail expenses on the next incumbent; and so on. Again, the property itself is of a nature more likely to be altered in value by the act of the legislature than the fee-simple of an estate. The following rules, therefore, give the *very highest value* of the advowson, and any purchaser should think twice before he gives as much as is found by them.

To find the value of the perpetual advowson of a living producing 1000*l.* a year, the present incumbent being forty-five years of age, and money making four per cent., we must first find how many years' purchase the incumbent's life is worth, and here we should recommend the use of the government, or Carlisle tables, (see ANNUITIES,) in preference to any other. Taking the latter, we find the annuity on a life of forty-five at four per cent., to be worth fourteen and one-tenth years' purchase; but at four per cent. any sum to be continued annually for ever is worth twenty-five years' purchase. The difference is ten and nine-tenths years' purchase, or for 1000*l.* a year, 10,900*l.*, which is the value of the advowson.

In finding the value of the next presentation only, other things remaining the same, the seller will presume that the buyer means to make the best of his bargain by putting in the youngest life that the laws will allow, that is, one aged twenty-four. The value of an annuity on such a life at four per cent. according to the Carlisle tables, is seventeen and eight-tenths years' purchase. And as we are giving the highest possible value of the advowson, omitting no circumstance which can increase it, we will suppose the next incumbent to come into a year's profits of the living immediately on his taking possession. The present value of the next presentation is the value of an annuity for 17·8 years, beginning from the present year. The rule is this: take four per cent. of the value of the present incumbent's life, or 14·1 × ·04, which gives ·564; subtract this from 1, which gives ·436; divide by 1 increased by the rate per cent., or 1·04, which gives ·419; add one year's purchase to the presumed value of the next incumbent's life, (17·8,) which gives 18·8, multiply this by the last result, ·419, which gives 18·8 × ·419, or 7·88 nearly—the number of years' purchase which the next presentation is now worth—which, if the living be 1000*l.* a year, is 7880*l.*

For the Carlisle Table of Annuities, see Milne *On Annuities*, vol. ii. p. 595. For the Government Tables, see Mr. Finlaison's *Report to the House of Commons*, ordered to be printed 31 March, 1829, page 58, column 6.

A'DYTUM, a Greek term signifying a place that may not be entered, and applied to the innermost and secret chamber of a temple.

In the ancient Egyptian temple, the Adytum is placed at the end of a series of propylæa, porticoes, and vestibules, and surrounded by galleries and chambers, which afforded every facility for concealing the mysteries of the interior. In the temples of the Greeks there is nothing corresponding to the Adytum of the Egyptian temples, unless it be the chamber which, in the Parthenon at Athens, has been called the Treasury, but which is not commonly found in other structures of the same character. The temples of the Romans also, are without obvious adyta, though the exhumation of Pompeii has discovered to us, in the temple of Isis there, a small chamber behind and under the altar and statue of the goddess, with means of secret access, from which probably the oracular responses were delivered. We may fairly conclude that something of the same kind existed wherever oracles were delivered and the deity was not supposed to speak through an inspired representative, as in the case of the Pythia at Delphi; but no discoveries have been made in the ordinary temples of the Greeks and Romans to confirm the opinion, beyond the instance we have just mentioned.

The 'most holy place,' or the Sanctum Sanctorum, the holy of holies, was the adytum of the temple of Solomon at Jerusalem, which may reasonably be believed to have been built in the form and after the manner of the temples of the Egyptians.

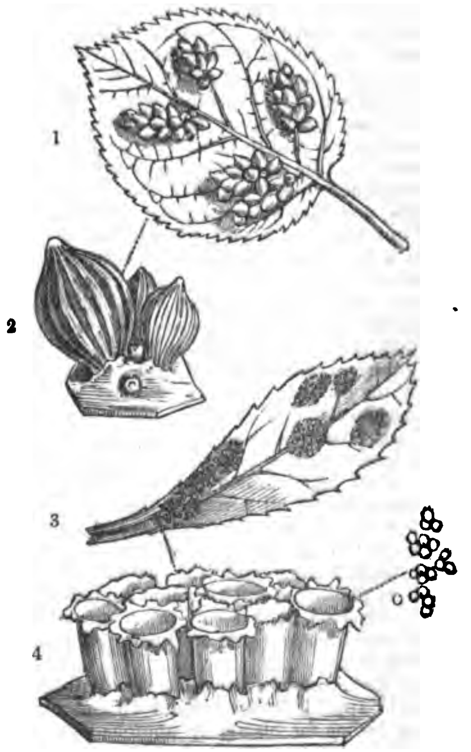
ÆCI'DIUM, a genus of minute parasitic plants belonging to the natural order Fungi, found in great abundance in this and other northern countries. By some modern writers it has been combined with Uredo and others; but it appears distinctly characterized by its peridium, or enveloping membrane, having a tubular form, and being altogether distinct from the cuticle of the plant on which it grows.

The species are universally parasitic upon the leaves, or flowers, or bark of living plants, where they are generated beneath the cuticle. Their structure is of the most simple kind; consisting of nothing more than a little mass of excessively minute sporules, or reproductive particles, much smaller than the finest sand, inclosed in a thin bag, of either a fibrous or reticulated structure, which in time pierces the cuticle under which it lies, gradually assumes a tubular appearance, and finally bursts at the apex for the purpose of enabling the sporules to escape.

A great many species are found upon the weeds and trees of Europe, varying in colour, size, and form. Of these the two following are among the most common.

Æcidium cancellatum, the Pear Æcidium (*Pers. Synops.* 205). This plant is often very common, in the latter months of autumn, on the back of the leaves of the cultivated pear-tree, to which it gives a singularly warted aspect. It makes its appearance crowded in little patches of a pale brown colour, which, when examined with a microscope, are seen to consist of numerous oval bodies, about a line long, rather the broadest towards the upper end. These bodies are, when young, slightly furrowed, but at a more advanced

Æcidium cancellatum.]



[Æcidium Berberidis.]

period they divide into tough parallel fibres, which open at the sides, but do not separate at the apex. Through the passages thus formed between the fibres fall the sporules, or seed-like particles.

To inaccurate observers this species would appear an aggregation of the nests of some minute insect, for which we know it to be often mistaken. It probably does not produce any injurious effect upon the plants it attacks, for it generally makes its appearance late in the season, when the leaves have nearly completed their office for the year.

Fig. 1. in the accompanying wood-cut, represents the appearance of this species, of the natural size. Fig. 2. exhibits four of the peridia in different states of growth, and very highly magnified.

Æcidium Berberidis, the Barberry Blight (*Pers. Synops.* 209. *Greville, Scott. Crypt. Fl.* t. 97). The bright orange powder that collects upon the leaves and flowers of the common barberry consists of the sporules of this species, which are discharged from thousands of little tubular apertures, that spread in patches over all the tender parts. These apertures are the open ends of the peridia in a state of maturity, and are bordered at first by a ragged toothed membrane, which finally falls away. Among the many beautiful objects that are to be met with in the lower and more imperfect tribes of plants, it is difficult to find one more worth an attentive examination than this, which has been well illustrated by Dr. Greville in his *Scottish Cryptogamic Flora;* in that work we find the following remarks upon the popular opinion, that barberry bushes blight corn.

'This minute gastromycus has given rise to the vulgar opinion that the neighbourhood of barberry bushes is extremely detrimental to fields of wheat. It is well known that the disease called the *rust* in corn is highly injurious; but the colour of the rust and that of the present plant constitutes the only similarity between them. They belong, in fact, to two different genera, and of course cannot propagate each other. I have, nevertheless, heard creditable people affirm that they have seen the corn fail for a considerable distance round a barberry bush, while it was strong and fertile in the rest of the field. If this is in reality owing to the barberry (which I do not think), it must be attributed to some other cause than this parasitic plant.' For an account of the species which really infests corn, see PUCCINIA *graminis*.

Fig. 3. is the appearance of Æcidium Berberidis to the naked eye. Fig. 4. is a patch of the peridia very highly magnified; Fig. 5. shows the sporules still more magnified.

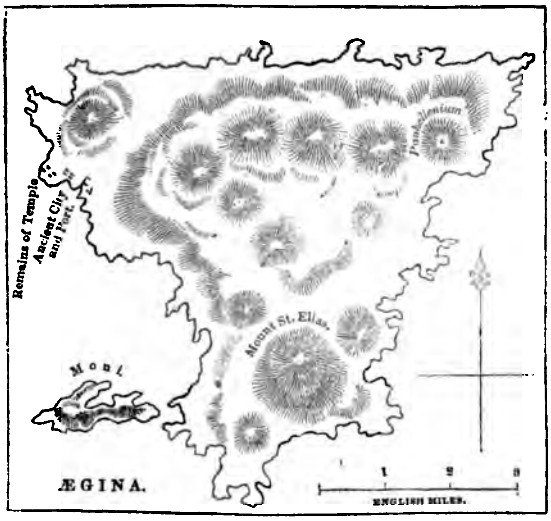
ÆDI'LES, from *ædes*, a building; the name given to certain magistrates in ancient Rome. They were four in number, two entitled *curule* ædiles, and two *plebeian*. It is difficult to mark the limit between the duties of these magistrates. The curule ædiles were of later origin than the plebeian, and were originally elected from the patrician order. Their insignia of office were the same as those of the kings had been—namely, the purple robe called the *toga prætexta*, and the chair ornamented with ivory, or *sella curulis*. They had the care of the temples, baths, porticoes, aqueducts, sewers, and roads of the city. They presided at the religious celebrations, of which theatrical exhibitions formed an important part; and, in performing this duty, the ædiles, under the republic, were often guilty of the most lavish expenditure with the view of acquiring popularity, and thus paving their way to the higher offices of the state. The plebeian ædiles were, as their name imports, specially magistrates of the *plebes* or commonalty. They were subordinate to the tribunes of the *plebes*, and acted as judges in such causes as were referred to them by their superiors. The temple of *Ceres*, which constituted the treasury of the commonalty, was under their peculiar guardianship. They here received the fines paid for offences against the plebeian magistrates, and made a distribution of bread among the poor of their order. In the same temple, too, they preserved the public records connected with their own body, and the decrees of the senate. The care of the public buildings and streets on Mount Aventine and in the immediate neighbourhood, which in early times formed the chief residence of the commonalty, and was without the limits of the city, must have been, we may infer from their title, entrusted to the plebeian ædiles. Their persons, like those of the tribunes, were inviolable. There were other duties connected with the office of ædile, whether curule or plebeian, such as the inspection of the markets, and the superintendence of the corn trade, the examination of weights and measures, the registration of courtesans, and perhaps the general management of all matters of police in Rome and the suburbs: they had, of course, their courts for inquiring into and punishing offences connected with their office. The curule ædileship was the second in the series of honours through which the Roman candidate proceeded to the consulship; and the laws required an interval of a whole year after the close of the quæstorship, before any one could be a candidate for the ædileship. The title of ædile was known also in the municipal towns of Italy.

ÆGA'GRE (CAPRA AEGAGRA), a wild species of Ibex, called Paseng by the Persians, and believed, with great probability, to be the original source of at least one variety of the domestic goat. In the stomach and intestines of this animal are found those peculiar concretions or calculi called Bezoar stones, to which European physicians of the middle ages, the disciples of the Arabic school of medicine, imputed such wonderful properties; and which still enjoy a high reputation throughout the east, on account of their supposed medicinal virtues. For an explanation of the nature and composition of these concretions, as well as the history and description of the animal which produces them, we must refer to the articles BEZOAR and GOAT.

ÆGE'AN SEA is the name given by the Greek and Roman writers to that part of the Mediterranean now called the ARCHIPELAGO. We shall here speak of it with reference to the terms used by the classical writers when they allude either to the sea itself, the coasts that bound it, or the islands that it contains. The Ægean Sea was bounded on the north by Macedonia and Thrace, on the west by Greece, on the east by Asia Minor, and comprised between the 41st and 86th degrees of latitude. The origin of the name is doubtful. Geographers derive it from different islands, or places on its shores, as Ægæ, Æga, Ægæa; or, more fabulously, from Ægæa, Queen of the Amazons, who perished there; or from Ægeus, the father of Theseus, who threw himself into it; or it may be derived, according to some, from the Greek word *αἰγὶς*, a squall, from the violent and sudden storms which render it dangerous to sailors even in the present improved state of nautical science. But the true origin of the name is unknown, and we should rather refer it to old King Ægeus than to any one else. It contains numerous islands, many of which are undoubtedly of volcanic origin. Of these the more southern are divided into two groups; one called the Sporades, or scattered islands, lying along the coast of Caria and Ionia; the other called the Cyclades, or circling islands, lying off the coasts of Attica and Peloponnesus, from which they were separated by the Myrtoan Sea, and occupying a large part of the southern Ægean. Another portion of the Ægean, lying about Icaria, one of the Sporades, was also called the Icarian Sea. The northern part of the Ægean Sea was called the Thracian Sea. It contains fewer, but larger islands, of which the principal were called Chios, Lesbos, Lemnos, Samothrace, Thasos, and Eubœa. It communicates with the Propontis (Sea of Marmora) by the narrow strait called the Hellespont, now the Dardanelles. The most southern part of the Ægean Sea was called the Cretan Sea. The Turks call the Ægean Sea the White Sea. [ARCHIPELAGO.]

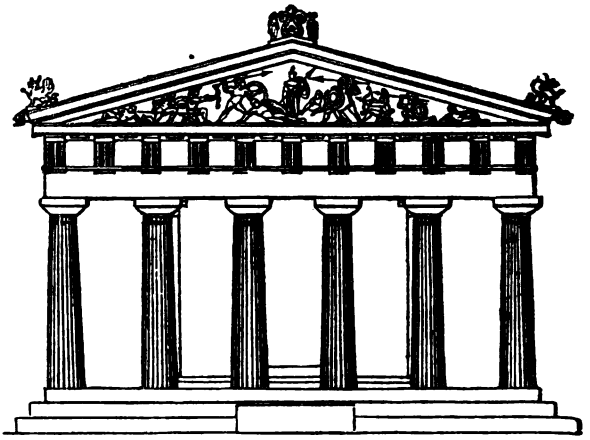
ÆGI'NA, an island in the Gulf of E'ghina, which retains its ancient name, with a very slight alteration. The 37° 47′ of latitude passes through the northern extremity of the island; its extent may be estimated by the scale attached to the accompanying plan, taken from the survey of Captain Copeland.

Strabo reckons Ægina to be 180 stadia in circumference, which, allowing nine stadia to a mile, will fall considerably short of the truth, if we reckon the numerous windings of the coast. The western part of the island is a plain, which, though stony, produces corn. A hill, called Mount St. Elias, or Oros, with its offsets, occupies the southern part of the island, and in the north-eastern we find a ridge, which, on one of its eminences, has the remains of the ancient temple of Jupiter Panhellenius, as it is commonly called. In the north-west part of the island there stand two columns, one of which is entire, marking the site of an ancient temple, with whose name we are unacquainted. To the south of these columns the site of the ancient town is distinctly shown by the remains of two artificial harbours, which have been formed, as was usual with the Greeks, by projecting moles, with a narrow entrance between them. The walls on the land side, which were about ten feet thick, can be traced through their whole extent. There were probably three principal gates, the central one leading to the eminence in the eastern part of the island, on which the remains of the ancient temple stand. This temple is situated amidst pine trees, on the summit of a mountain, and separated by a narrow valley from the hill on which the modern town of Eghina stands. The position of this edifice is striking. Placed in the middle of the gulf of Eghina, it offers a panoramic prospect of the whole bay. Athens and its Acropolis are eighteen miles distant N.N.E., and the towering Acropolis of Corinth thirty-seven miles to the N.W. (Leake's *Morea*, 3 vols. 8vo. 1830.)



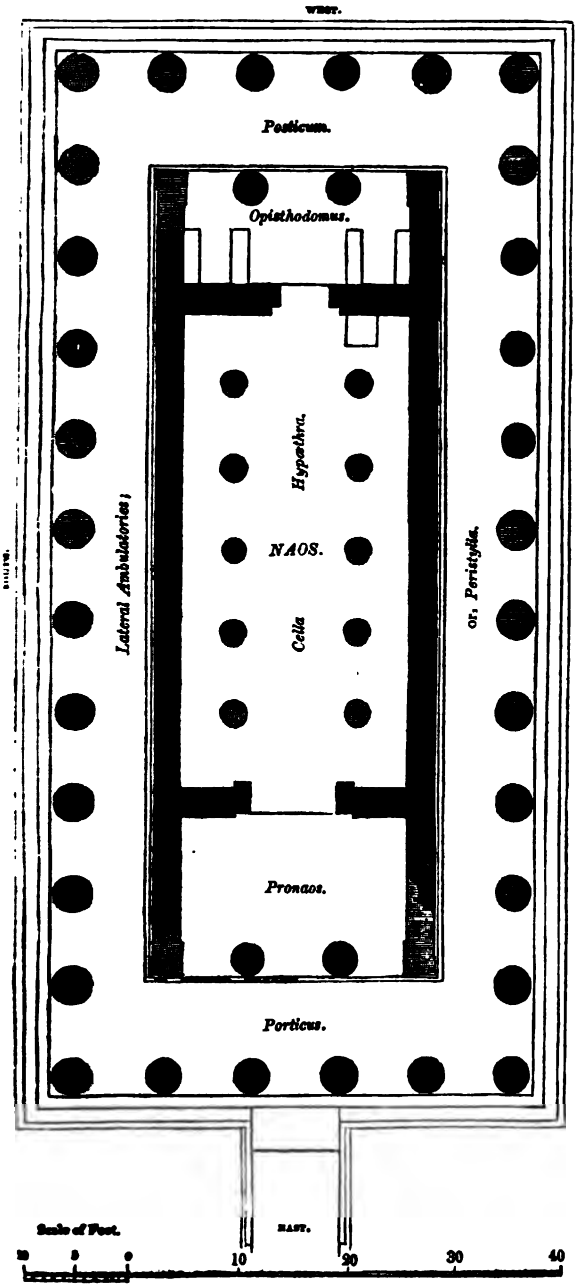
On casting our eyes on this little island, we should almost doubt the stories of its ancient importance, if they were not as well authenticated as any part of remoter history. We know nothing worth mentioning here of its inhabitants before it was occupied by the Achæi (*Homer's Iliad*, ii. 562), and afterwards by some Dorians from Argos—a nation that spread over a large part of the Peloponnesus, and sent out colonies to Italy and Sicily, and formed in fact one of the chief component parts of that people known to general history under the name of the Greeks. Like some small republics of modern times, such as Genoa and Venice, Ægina owed its importance entirely to its naval superiority. It would however be difficult to see how so small an island could become a formidable naval power, if we did not know that its approach was rendered difficult by numerous rocks, and that at an early period it became a place of security for persons and their property. It is impossible that a place like Ægina could ever rise to importance except as an emporium or mart, which offered the advantages of security and a central position. Wealth being once introduced, would, by industry and perseverance, be increased, and a navy once established, would perpetuate itself by the profit derived from a carrying trade. As early as B.C. 563, in the reign of Amasis, before any town of European Greece had acquired great commercial wealth, we find that Ægina had a factory established in Lower Egypt for its merchants, which is exactly the same kind of thing that we have seen so often repeated in modern times, where the commercial towns of Europe have, by force or fraud, succeeded in establishing themselves in remote countries. In that century, according to the testimony of Aristotle, this little spot contained 470,000 slaves. This number is certainly extravagant; but we may consider it as indicating a very large population. Ægina was then one of the great centres of the Mediterranean commerce, and in all probability a considerable slave market.

When Xerxes was on the banks of the Dardanelles in the year B.C. 480, with his enormous army, previous to crossing over into Europe, he saw, says Herodotus, the corn-fleet sailing by, carrying the harvests of the fertile regions on the Black Sea to the Peloponnesus and Ægina. Pheidon, king of Argos, coined silver and copper in Ægina about 747 B.C. He first established a scale of weights and measures, which became adopted ultimately in all the Dorian states. There arose subsequently a rival scale, called the Euboic, which was used in Athens and the Ionic cities generally, as well as in Eubœa. This scale was, both in regard to money and weights, to the Æginetan, in the proportion of 5 to 6. [See Grote's *History of Greece*, vol. ii. pp. 425–433.] But the Æginetans first appear prominently on the stage of Greek history in the war between Thebes and Athens. The Thebans, in distress because of their defeats, had applied to the Delphian oracle for advice, and received for answer: 'Solicit aid from those nearest you.' An ingenious Theban interpreted the response as pointing to Ægina, because Thêbê (the eponym of Thebes) and Ægina (the eponym of that island) were sisters. The Thebans accordingly applied to the Æginetans, who ravaged Attica with their fleet, commencing the war without a declaration. This occurred in about B.C. 500. When Xerxes invaded Greece B.C. 480, the people of Ægina took a brilliant part in the great sea-fight of Salamis. They sent thirty ships, besides those which guarded their own island, and were allowed to have acquitted themselves better than any other Greeks; which tended to wipe off the disgraceful imputation of previous treachery to the common cause, of which they were apparently not altogether guiltless. This event may be fixed as the latest period of their great prosperity, which had probably lasted for more than a century; and we must, therefore, assign the building of the great temple of Jupiter Panhellenius to some period in the sixth century before our era. We may indeed almost with certainty fix it before B.C. 563, when the Æginetans built a temple to their great national god Jupiter, in Egypt; which they would scarcely have done before they had erected one at home. After the Persian wars, the old jealousies of Athens and Ægina again broke out. In B.C. 460, the Athenians, with their allies, defeated the Æginetans with their allies in a great naval battle, which ruined irrecoverably the maritime power of Ægina. The Athenians captured seventy ships of war, and landed a large force on the island, with which they besieged the city by land, as they did also with ships by sea. After a lengthened and brave defence, the town surrendered. On the breaking out of the Peloponnesian war, the Athenians took possession of the island, expelled the Æginetans, and peopled it with Athenian colonists. A remnant of them was restored by Lysander at the close of the Peloponnesian war, B.C. 404; but Ægina never after recovered its importance. Sulpicius, one of Cicero's friends, when consoling the illustrious orator for the loss of his daughter, enumerates Ægina among the instances of the vicissitudes of fortune, and as an example of fallen greatness.—[Cicero's *Letters to Various Persons*, iv. 5.]



[Front Elevation of the Temple of Ægina, as restored.]

Ægina Temple. The temple of Jupiter Panhellenius, before referred to, or the Panhellenium of Ægina, as it is often called, was of the Greek Doric style or order, and of the arrangement which is technically termed hexastyle, peripteral, and hypæthral; that is, it had a portico of six columns at each end, and ranges of twelve columns along each side, the columns on the angles being counted both in flank and in front; and internally it was divided into what may be termed nave and aisles, by two ranges of columns, the space between which was uncovered. The cell or body of the temple was a regular parallelogram, inclosed by four walls: access was given to the interior by doors in the cross-walls, from inner porticoes formed by the longitudinal extension of the flank walls, the projecting shoulders of which are termed antæ, and between which two columns stand, thus forming what are distinguished as the pronaos and opisthodomus. The columns of the peristyle on the sides stand nearly as far from the walls as they do from each other; and on the fronts, the space intervening between the outer columns of the porticus and posticum (to use the technical terms by which the front and rear-front porticoes are respectively distinguished), and the inner ones and their antæ, of the pronaos and opisthodomus respectively, is somewhat more than a single intercolumniation. Thus, a kind of gallery was formed on the floor of the peristyle around the body of the temple, and this was raised by three deep steps from a nearly level platform called a *peribolus*, in the midst of which the temple stood; this was partly hewn out of the native rock, and partly constructed, and a low wall or parapet girded it on all sides. The temple fronted east and west, the east being the entrance front before which the peribolus extended itself more than 100 feet, while on the west it was not more than 50 feet wide. The extreme length of the temple in front, measured on the face of the lowest step of the regular stylobate, is 49 feet 10·2 inches, and in flank 100 feet 7·7 inches; and on the floor of the peristyle, that is, at the edge of the upper step on which the columns rest, the corresponding dimensions are, 45 feet 2·2 inches, and 96 feet. The columns of the peristyle are a very small fraction less than 3 feet 2·9 inches in diameter, and including their capital, they are 17 feet 9·4 inches in height; the entablature, without the crowning moulding of the pediments, is rather more than two diameters of a column in height, and the stylobate is 3 feet 7·7 inches high, or an eighth more than one diameter. The height of the tympana of the pediments to the soffit of the corona was, as nearly as it can be determined, one diameter and four-fifths, and that of the pediments to their apices, two diameters and two-sixths; making the whole height, from the floor of the peribolus to the summit of the pediments, 35 feet 8 inches, above which the acroterium rose nearly one diameter, or about three feet more. Both the tympana were highly enriched with sculptures, but it does not appear that there were any in the metopes of the outer entablature, or on any part of that of the inner ordinance of the pronaos and opisthodomus, as in the cases of the Parthenon and the temple of Theseus at Athens. It is true that Dr. Chandler discovered a sculptured fragment among the ruins, which, from some indications, he fancied to have belonged to one of the friezes; but later examinations make it probable that what he found belonged rather to the sculptures of the eastern pediment.



[Ground plan of the Temple of Ægina.]

The columns of the Panhellenium are within a small fraction of five diameters and a half in height, and they diminish, with an imperceptible entasis, in the length of the shaft, considerably more than one-fourth,—from 3 feet 2·9 inches to 2 feet 4·6 inches. In the peristyle, and in the pronaos and opisthodomus, the columns have twenty flutes, while those of the inner hypæthral ranges had but sixteen.

The annexed plan and elevation will convey a clear idea of the arrangement of the structure. The darker tint on the plan indicates the portions of the walls which remain, or whose places are not obliterated, and also the sites of the still remaining columns; the lighter tint shows the restorations. The ends of the walls forming the antæ are restored from analogy, and from displaced fragments discovered among the ruins;—the places of the deficient columns of the peristyle admit of no doubt, and those of the internal ranges are tolerably certain. Only *one* column remains of the internal ranges, but this determines the diameter and the distance from the walls of all the rest, and consequently the breadth of the hypæthral part or nave; but the number of columns in each range, and therefore their distances from each other, cannot be determined with certainty. However, the authority of the second volume of the Antiquities of Ionia would decide this, as its authors profess to have ascertained the position of five of the columns of these inner ranges, of which three were in continuous succession. The principal front of the temple would be sufficiently indicated by the greater depth of the inner portico or pronaos, even if the greater extent of the peribolus, and the superior merit of the sculptures at the east end, did not determine it. The meaning of the rectangular blocks of stone in the opisthodomus, and of that within the cella in the hypæthral range by the western door, is not obvious; nor does any reason offer itself for the place of that door being out of the middle, though its narrowness may mark its inferiority. Possibly, however, these irregularities and discrepancies may have been occasioned at some period during the middle ages, when, according to the belief of some writers, the old ruined temple was used as a church. A more graduated ascent than the regular gradus to the floor of the peristyle has been made, for more convenient access to the eastern portico; for it may be noticed that the steps of the stylobate are so deep as to make them inconvenient for use; probably, however, this too was the work of the later period before referred to. The elevation here given is applicable to either of the two fronts, though the sculptures indicated are those of the western pediment. The structure was built of the fine white limestone of the island, but through long exposure it has assumed a rich brown colour; the tiles used in covering were of the same material, but the sculptures appear to be of Parian marble. It may be remarked, too, that the surfaces of the tympana were painted of a light-blue colour to give the statues greater relief; and the statues themselves were also partially painted for the same purpose. The mouldings also appear to have been painted.

The style of the architecture of the Æginetan Panhellenium would of itself indicate an earlier date than that of the Athenian temples of the age of Pericles, but it would hardly lead us so far back as the early part of the sixth century before Christ; though it is not at all inconsistent with that period, which for another reason has been assumed for it. Some antiquaries have referred the execution of the sculptures which belonged to the Panhellenium to the latter part of the same century; but there is nothing in the reasoning by which they come to that conclusion that will not admit of these sculptures being referred to a remoter period. The great diminution of the columns; the great comparative depth of the capital, and its peculiar boldness of character; the greater comparative heights also of the stylobate and entablature, carry it back from the date of the Parthenon and the style of that period; while the height of the columns in proportion to their diameter, and the beauty of contour of the mouldings, and of other details, sufficiently remove it from the time of the heavy proportions and comparative rudeness of the older remains of Corinth. It differs too from all the Grecian temples of later date in the number of columns on its flanks.

It is unknown when the Panhellenium fell into ruins. Becoming neglected, and being exposed to the ravages of time and the shocks of earthquakes, one part after another must have fallen away until its dislocated joints offered to view portions of metal cramps, which would induce barbarian spoilers to rack it into pieces, till at length it became the ruin it now presents.

The subjoined sketch is a view of the temple in its present state. It is taken on the west front, looking eastward and northward; the walls are thrown down, though their site is not obliterated. A reference to the plan will show that the two columns in the foreground are the only remaining of the west portico, and that the two couples which appear within the external peristyle are those of the opisthodomus and pronaos. In the distance the view embraces the Saronic Gulph and the mountains of Attica.

[Ruins of the Temple of Ægina.]

This sketch, with the foregoing plan and elevation, were kindly furnished by Mr. W. Jenkins, Jun., architect, who made the original drawings and actual measurements of the remains on the spot, in October, 1820.

The sculptures which occupied the tympana of the pediments of the Panhellenium were discovered in May 1811, by a party of English and German travellers, among whom were Messrs. J. Foster, of Liverpool, and C. R. Cockerell, of London, who were pursuing their studies as architects. They were found buried under the ruins of the building and accumulations of rubbish, nearly as they had fallen from their places, especially those of the western front, the whole of which were recovered; but unfortunately not more than half of those of the eastern front could be determined. They are at present at Münich, having been allowed by the English government at that time to fall into the hands of Louis, ex-king of Bavaria (then the Prince Royal), who had them transported to the capital of Bavaria. Thorwaldsen was engaged to restore the statues. The Æginetan, added to the Athenian and Phigaleian marbles which we possess in the British Museum, would have formed a complete specimen of Grecian sculpture, as applied to the decoration of temples. There are, however, casts of them in the Museum.

The island of Ægina was one of the few places which escaped the calamities of the war of the Revolution. It was chosen, on account of its security, as the seat of the Greek government for some time in 1828-29. Many families from the Peloponnesus bought land, and settled in the island; it was likewise the resort of the refugees from Scio and Para. It thus, during that period, was the home of a mixed population of 10,000 Greeks. Its present inhabitants do not exceed 7000.—[Murray's *Handbook for Greece.*]

ÆGINETAN STYLE OF ART. Several ancient writers, particularly Pliny and Pausanias, make frequent mention of Æginetan works of art; and in such a manner, as to show that the productions of the school of Ægina, to use a modern and well-understood phrase, were highly esteemed. Many names of Æginetan sculptors had thus come down to us as almost synonymous with excellence in their art, but the works of none of these could be recognized among those which had escaped the ravages of time and the desolation of barbarism; so that their merits and reputation rested on report alone. The discovery of the sculptures which adorned the tympana of the Panhellenium, the national temple of the Æginetans, has furnished us with undoubted specimens of Æginetan art, and of that period too, as some suppose, in which the most celebrated Æginetan sculptors flourished. The latter conclusion has, we think, been too hastily adopted. That the sculptures of the Panhellenium are of great beauty and merit, and are for many reasons highly interesting, will be admitted by all; but that they are of the class and date from which the school of Ægina derived its celebrity, may fairly be doubted.

These principally consist of perfect statues, or statues in the round as they are termed, somewhat smaller than life, of men armed with spears, swords, shields, and bows; the bowmen have quivers of arrows suspended from their waists; most of the figures are helmed or bonneted, some with greaves on the legs, and two or three with armour on the body, or close-fitting garments on the body and limbs; but for the most part they are naked, except the head, and all are either engaged in active combat or have fallen from the effect of wounds. Besides the male combatants, one helmed and draped female figure, with a spear and a shield in her hands, and the helmed head of another, evidently belonged to the groups. These were all so distributed on the ground with reference to the temple, and are of such peculiar attitudes with respect to one another, and to the places they occupied, that there appears to have been no great difficulty in determining their original arrangement in groups, after the fragments into which many of the figures were broken, were once brought together; especially as the frames which inclosed the pictures they formed, were otherwise determinable, and thus assisted materially in fixing the relative positions of the parts composing the groups. Thus, the perfect female figure, evidently a statue of Minerva, standing upright and in full face, occupied the central position under the highest part of the tympanum of the western pediment; and the combating warriors of that end arranged themselves on her right and left, in attitudes upright and advancing, kneeling, stooping and falling, until the inner acute angles terminated in the wounded and recumbent. The goddess stands in quiet dignity, prepared, nevertheless, for action, while the battle, of which she appears to be the umpire, rages around her. Of this picture or group, the arrangement is so fitting and complete, and the action so perfect, that there is no reason to think, that any essential portion of it is undiscovered. But unfortunately it is not so with the group of the eastern or principal front; a few only of these figures can be restored, and it is only from the analogy afforded by the western group, that their arrangement can be aptly determined. As far as the figures can be made out, the persons seem to be nearly, if not quite, identical, and another period of the same action appears to be represented. The helmed female head is that of Minerva again, and Mr. Cockerell restores her figure as in the act of raising her spear and extending her vest, as if to stop the contest, or to protect the fallen. The exact subject, or subjects intended by these groups, is not known; though all the critics who have offered opinions seem to agree that they represent some actions of the distinguished Æginetan family of heroes, the Æacidæ, or descendants of Æacus, the mythological founder of the nation. Colonel Leake's opinion, as given by Mr Cockerell, *Journal of Science and the Arts*, [No. 12, p. 334—Note] is that they represent two periods in the contest over the body of Patroclus, from the Iliad, in which Ajax (one of the Æacidæ) and Hector were the principal combatants. That something connected with the Trojan war is intended, seems very evident, from the Phrygian bonnet worn by one of the warriors; and the greaves on the legs of those who may be supposed to be Greeks, in the eastern group, especially, and the absence of this covering on the figures of the opposite party, seem to intimate clearly that some national difference is intended. Thiersch's opinion is, that the group on the eastern pediment represents the expedition of Telamon, the son of Æacus, and Hercules, against Laomedon, king of Troy. The archer he considers to be the representation of

Hercules. The other group, he thinks, may represent the death of Achilles, and the struggles of Ajax to save his body from the Trojans. (See Thiersch's *History of Greek Sculpture*, p. 249, note.)

There is nothing in the combination of sculpture and architecture more admirable than the manner in which the various actions and attitudes, in the more perfect group of the figures, have been adapted to the situations which they occupied; and this too, without the slightest appearance of constraint; they are all natural and graceful, and in perfect keeping with the design of the subject, and the character of the architecture. The energy of action, the grace of attitude, and the truth of proportion displayed in these works, are also admirable, and the expression of many of the figures is excellent. Nevertheless, there is a degree of dryness and rigidity observable in the bodies and limbs, which give the works an archaic character, whilst the countenances, the hair, and the draperies, clearly betoken their near approach to, if not absolute connexion with, the archaic period. The faces are entirely devoid of expression, the hair is formally laid in tiers with convoluted ends, and the draperies, though not devoid of grace, are heavy and monotonous: to use the words of the writer before referred to in the *Journal of Science and the Arts*, p. 340, describing the sculptures,—'A smile is seen on all the mouths, the cheeks are rather hollowed, the lips are thick, the nose is short but angular and prominent; the eyes are protruded, the forehead is flat and retiring, and the chin is remarkably long and rather pointed; the hair and drapery are arranged with the greatest precision.' Now these are peculiarities which could not have existed in the works of men whose names are mentioned with those of Phidias and his compeers and immediate successors; but they clearly mark a more remote period. Nevertheless the comparative fulness of form, and freedom of action of the bodies and limbs, equally indicate a date not far removed from excellence.

To the period when the archaic era was passing into that which succeeded it, and not to the perfection of the latter, we must then refer the Panhellenian sculptures; they are to the more advanced works of the Grecian schools what the works of Giotto, Cimabue, Ghirlandaio, Pietro Perugino, Giovanni Bellino, and others, are to the perfection of the art of painting under Michael Angelo, Raphael, and Titian. No one in describing the schools of Florence, Rome, and Venice, would make reference to the simple and beautiful, but still imperfect works of the earlier, but to the almost perfect productions of the latter masters; nor would Pliny and Pausanias refer to the archaic sculptures of the Panhellenium as the best specimens of the school of Ægina, but to such works as could be classed with the sculptures of the Parthenon, and many of the statues and busts which now adorn the galleries of the Vatican and the Capitol, or are distributed among the various European capitals.

ÆLFRIC, an eminent Saxon prelate. He is said to have been the son of an Earl of Kent, but at an early age he embraced a devotional life, and assumed the habit of the Benedictines, in the monastery of Abingdon. In 963, when Athelwold, the abbot of that house, became Bishop of Winchester, he took Ælfric along with him, and made him one of the priests of his cathedral. Here he remained till 987, when he removed to Cerne Abbey. Next year he was made Abbot of St. Alban's, and soon after was promoted to the Bishopric of Wilton. Finally, in 994, he was translated to the Archbishopric of Canterbury, over which see he presided with great ability till his death, on the 16th of November, 1005. Ælfric was one of the most learned ecclesiastics of that age, and distinguished himself, throughout his life, by a very praiseworthy zeal and activity in the diffusion of knowledge. The following are the principal works which have been attributed to him: 1. A Latin and Saxon Glossary, printed by Somner at Oxford, in 1659: 2. A Saxon translation of most of the historical books of the Old Testament, part of which was printed at Oxford, in 1698: 3. A charge to his clergy, in articles, commonly called his Canons, which was published, by Spelman, in the first volume of his *English Councils*: 4. Two volumes of Saxon Homilies, translated from the Latin fathers: and 5. A Saxon Grammar in Latin. There were, however, other Saxon ecclesiastics of his name, and it has been doubted if all the works enumerated were the productions of the Archbishop of Canterbury.

ÆGINHARD. [See Eginhard.]

ÆGYPT. [See Egypt.]

ÆLIA CAPITOLI'NA, a name given to Jerusalem in the time of the Emperor Hadrian, who, finding the Jews very restless and unruly subjects, treated them as revolted people, and took possession of the capital, Jerusalem, from which the Jews were excluded under pain of death. Some Roman colonists were sent to Jerusalem, which received the name of Ælia Capitolina; Ælia, from Ælius, one of the names of Hadrian; and Capitolina, from the temple of Jupiter Capitolinus, which was built on, or near, the Holy Mount.

The history of all this transaction is very obscure. It would seem, according to some opinions, that the attempt to establish a Roman colony in Jerusalem, and the introduction of heathen rites into the city, was the *cause* of the disturbances which led the emperor to treat Jerusalem as a conquered city. The founding of a new town, and the desecration of the holy places, led, probably, to the wars in which Barchochebas headed the Jews, and which were as destructive to the nation as their former resistance to Titus. The name of Ælia Capitolina continued in common use among the Greeks and Romans till the time of the Christian Emperors. [See Mannert, *Syrien*. p. 216. Schlosser, *Universal History*, vol. iii. part 1.] Several coins of Hadrian still exist, which refer to the colony established by the Emperor. They bear on one side the head of Hadrian, and on the other, a Jupiter seated between two figures, or an eagle perched upon a thunder-bolt, with an inscription, Col. Ael. Cap. (See Vaillant's *Numismata.*)

ÆLIA'NUS, CLAU'DIUS, a Roman citizen and a native of Præneste (Palestrina), probably lived about the middle of the third century of the Christian era. Like Cicero, Atticus, and many other Romans, he made himself so completely master of the Greek language, as to write it with ease and correctness. There is extant a work of his in fourteen books, entitled, *Various or Miscellaneous History*, which is a compilation or collection of extracts made by the author in his extensive reading. This work may be considered as one of the earliest collections of Ana. The value of it does not consist in what the compiler has written, but in the passages of lost writers that he has been the means of preserving. An edition of this work was published at Paris in 1805, 8vo. with Heraclides of Pontus and Nicolaus of Damascus, by the learned Greek *Coray*. There is a French translation of Ælian's work, by M. B. T. Dacier, Paris, 1772, 8vo. with notes.

Another work of Ælian's, in sixteen books, also written in Greek, is entitled *On the Peculiarities of Animals*. Though the author cannot claim the merit of being a scientific naturalist, like Aristotle, he has preserved to us in this work a number of curious facts, which he had collected from such works as he had read. Each of the sixteen books is subdivided into small chapters or sections, like the Miscellaneous History. Some critics are of opinion that the two works belong to different authors. [Schoell, vol. ii. *Greek Lit.*] J. G. Schneider published an edition of the work on animals in 1784; but the latest edition of the Greek text is by F. Jacobs, *Jena*. We are not aware that there is any English translation of this work. There are also twenty Greek letters extant attributed to a person of the name of Ælian.

ÆLIA'NUS, another person of this name, wrote a book on Tactics, which he dedicated to the Emperor Hadrian. There are several editions and translations of this work. A German translation, by A. H. Baumgärtner, appeared in his complete collection of the Greek writers on military tactics, *Frankenthal* and *Mannheim*, 1779, 4to. There is a French translation by B. de Bussy, Paris, 1757, 2 vols. 12mo. [*Schoell.*]

ÆMI'LII, the name of a patrician gens or clan in ancient Rome, who pretended to derive their origin from Mamercus, the son of Pythagoras. Of the different families included in this gens, the most distinguished were the Pauli, or Paulli, the Lepidi, and the Scauri. [For the two latter, see Lepidus and Scaurus.] Among the Paulli, the most worthy of notice was Lucius Æmilius Paullus, the son of the consul bearing the same name, who fell in the battle near Cannæ (B.C. 216), after using his utmost efforts to check the rashness of his colleague. Young Æmilius was a mere boy at the death of his father, yet by his personal merits, and the powerful influence of his friends, he eventually attained to the highest honours in his country. His sister Æmilia was married to Publius Cornelius Scipio, the conqueror of Hannibal, who was consul for the second time, B.C. 194; and this very year Æmilius, though he had held no public office, was appointed one of three commissioners to conduct a colony to Croton, in the south of Italy, a city with which he might claim some connexion on the ground of his descent from the Pythagoreans. Two years after, at the age of about thirty-six, he was elected a curule ædile in preference, if we may believe Plutarch, to twelve candidates of such merit that every one of them became afterwards consuls. His ædileship was distinguished by many improvements in the city and neighbourhood of Rome. The following year (191 B.C.) he held the office of prætor, and, in that capacity, was governor of the south-western part of the Spanish peninsula, with a considerable force under his command. The appointment was renewed the following year, but with enlarged powers, for he now bore the title of proconsul, and was accompanied by double the usual number of lictors. In an engagement, however, with the Lusitani, 6000 of his men were cut to pieces, and the rest only saved behind the works of the camp. But this disgrace was retrieved in the third year of his government by a signal defeat of the enemy, in which 18,000 of their men were left upon the field. For this success a public thanksgiving was voted by the senate in honour of Æmilius. Soon after, he returned to Rome, and found that he had been appointed, in his absence, one of the ten commissioners for regulating affairs in that part of western Asia which had lately been wrested by the two Scipios from Antiochus the Great. Æmilius was a member also of the college of augurs from an early age, but we do not find any means of fixing the period of his election. As a candidate for the consulship he met with repeated repulses, and only attained that honour in 182 B.C., nine years after holding the office of prætor. During this and the following year he commanded an army in Liguria, and succeeded in the complete reduction of a powerful people called the Ingauni (who have left their name in the maritime town of Albenga, formerly Albium Ingaunum). A public thanksgiving of three days was immediately voted, and, on his return to Rome, he had the honour of a triumph. For the next ten years we lose sight of Æmilius, and at the end of this period he is only mentioned as being selected by the inhabitants of Farther Spain to protect their interests at Rome, an honour which at once proved and added to his influence. It was at this period (171) that the last Macedonian war commenced, and though the Romans could scarcely have anticipated a struggle from Perseus, who inherited from his father only the shattered remains of the great Macedonian monarchy, yet three consuls, in three successive years, were more than baffled by his arms. In 168 a second consulship, and with it the command against Perseus, was entrusted to Æmilius. He was now at least sixty years years of age, but he was supported by two sons and two sons-in-law, who possessed both vigour and ability. By Papiria, a lady belonging to one of the first families in Rome, he had two sons and three daughters. Of the sons, the elder had been adopted into the house of the Fabii by the celebrated opponent of Hannibal, and, consequently, bore the name of Quintus Fabius Maximus, with the addition of Æmilianus, to mark his original connexion with the house of the Æmilii. The younger, only seventeen years of age at this period, had been adopted by his own cousin, the son of Scipio Africanus, and was now called by the same name as his grandfather by adoption, viz., P. Cornelius Scipio, with the addition of Æmilianus, as in his brother's case. The careless reader of Roman history often confounds these two persons, and the more so, as the younger also eventually acquired the same title of Africanus. By the marriage of his daughters again, Æmilius was father-in-law to Marcus Porcius Cato, son of the censor, and to Ælius Tubero. These four young men accompanied Æmilius to the war in Macedonia, and all contributed in a marked manner to his success. Perseus was strongly posted in the range of Olympus to defend the passes from Perrhæbia into Macedonia, but he allowed himself to be outmanœuvred. Æmilius made good his passage through the mountains, and the two armies were soon in view of each other near Pydna. On the evening before the battle, an officer in the Roman army, named Sulpicius, obtained the consul's permission to address the troops upon a point which was of no little importance in those ages. An eclipse of the moon, it was known to Sulpicius, would occur that night, and he thought prudent to prepare the soldiers for it. When the eventful moment arrived, the soldiers went out indeed to assist the moon in her labours with the usual clamour of their kettles and pans, nor omitted to offer her the light of their torches; but the scene was one of amusement rather than fear. In the Macedonian camp, on the other hand, superstition produced the usual effect of horror and alarm; and on the following day the result of the battle corresponded to the feelings of the night. In a single hour the hopes of Perseus were destroyed for ever. The monarch fled with scarcely a companion, and on the third day reached Amphipolis. Thence he proceeded to Samothrace, where he soon after fell into the hands of the conqueror. The date of the battle of Pydna has been fixed by the eclipse to the 22d of June. Livy, indeed, assigns it to a day in the early part of September; but it is not impossible that the difference may be owing to some irregularity in the Roman calendar, which, prior to the Julian correction, must often have differed widely from the present distribution of the year. The Romans were careful in recording the day of every important battle. After reducing Macedonia to the form of a Roman province, Æmilius proceeded on his return to Epirus. Here, under the order of the senate, he treacherously surprised seventy towns, and delivered up to his army 150,000 of the inhabitants as slaves, and all their property as plunder. On his arrival in Rome, however, he found in this army, with whom he was far from popular, the chief opponents of his claim to a triumph. This honour he at last obtained, and Perseus with his young children, some of them too young to be sensible of their situation, were paraded for three successive days through the streets of Rome. But the triumphant general had a severe lesson from affliction in the midst of his honour. Of two sons by a second wife, (he had long divorced Papiria,) one aged twelve died five days before the triumph, the other, aged fourteen, a few days after; so that he had now no son to hand down his name to posterity. Æmilius lived eight years after his victory over Perseus, in which period we need only mention his censorship, B.C. 164. At his death, 160 B.C., his two sons, who had been adopted into other families, Fabius and Scipio, honoured his memory in the Roman fashion by the exhibition of funeral games; and the Adelphi of Terence, the last comedy the poet wrote, was first presented to the Roman public on this occasion. The fact is attested by the inscription still prefixed to the play. Æmilius found in his grateful friend Polybius one willing and able to commemorate, perhaps to exaggerate, his virtues. Few Romans have received so favourable a character from history. (See Polybius, Livy, Plutarch.)

ÆNE'AS, a Trojan prince of the royal blood, son of Anchises and Venus. According to Homer he commanded the Dardanians; and his name occurs frequently in the Iliad, but not in the first rank of heroes. He owes his celebrity to those stories which make him the reputed founder of the Roman empire in Italy, and to his being the hero of Virgil's poem. According to the Latin poets, on the night when Troy was taken, or, as others say, before its capture, Æneas quitted the city, bearing on his shoulders his aged father, and the images of his household gods; accompanied by his wife Creusa, who perished by the way, and his son Iulus, also called Ascanius. The older authors do not speak of the multitude or followers and number of ships with which Virgil has adorned his narrative. According to them he quitted the Trojan shores in a single ship to seek his fortune in the unknown regions of the west. After many wanderings he reached the coast of Latium with one hundred followers, and was favourably received by Latinus, king of the country, who assigned a small tract of ground as a settlement for the Trojans. But war soon broke out between the strangers and the natives. Turnus, prince of the Rutuli, joined Latinus to expel the foreigners; but the allied princes were defeated, and Latinus was slain in the first battle. Lavinia, his daughter, became the bride of the victor, and the citadel of Laurentum fell into his hands. Æneas now built the city of Lavinium, which was hardly completed, when Turnus again appeare in arms, assisted by Mezentius, king of Cære. Anothe battle ensued, in which Turnus fell; but the Latins wer defeated, and Æneas was drowned, or at least disappeared, i the river Numicius. He was afterwards adored as Jupite Indiges: a temple was raised to him on the bank of the river; and the Latins, and in later ages, the consuls of Rome offered yearly sacrifices to him under that name. Iulu his son by Creusa, succeeded to the throne, and founded city, celebrated in the history of Latium, called Alba Long He was succeeded by Sylvius, son of Æneas and Lavini from whom a long line of Latin kings descended. Iulu however, left progeny, though their claims seem to hav been set aside in consequence of the maternal title of Sylviu since the Julian family, and among them the imperial house of Cæsar, boasted their descent from the former. Such is a sketch of the chief traditions about this reputed Trojan prince and his settlement in Italy. [See Niebuhr's *Roman History*, vol. i., p. 176. Hare and Thirlwall's translation.]

The only allusion in Homer to the history of Æneas after the Trojan war is, a prediction that he and his children shall reign for centuries over the Trojans: nothing is said of the place of their settlement. Some have supposed that he remained in the Troad, and that the story of his emigrating to Italy is entirely destitute of foundation.

Æ'NEID. The most celebrated epic poem of antiquity, after the Iliad and Odyssey. It was written by Virgil in the time of Augustus Cæsar; and relates the wanderings of Æneas after the siege of Troy; his arrival in Italy, and his adventures previous to his marriage with Lavinia, with his final establishment in Latium. The poem, however, does not carry its hero so far as this, but closes with a single combat between Æneas and Turnus, and the death of the latter. In some respects Virgil has deviated from the legend related in the article Æneas. He has multiplied the Trojan ships and increased the number of the Trojans; he has carried his hero to Carthage, though we do not know whether Carthage existed at the supposed date of Æneas' wanderings; he has made the death of Turnus precede the marriage of Æneas and the foundation of Lavinium, and has allowed Latinus to survive, instead of making his daughter wed the author of her father's death. The poem consists of twelve books, of which the six first are occupied in relating the wanderings of Æneas, and seem to be modelled on the Odyssey; the six last contain his descent into Italy, and the war which ensued between the Trojans and the natives, and seem to be modelled on the Iliad. In the minute details of ornament as well as in the general notions of his work, Virgil has borrowed largely from Homer. This poem was written later than his other works, the Eclogues and Georgics. It was commenced about the year A.U.C. 724, or B.C. 30; and the author continued to labour on it till his death, in B.C. 20; at which time he was so little satisfied with the state of his production that, it is said, he gave earnest injunctions on his death-bed that it should be burnt, as too imperfect to advance his fame. The order was not fulfilled, at the desire of Augustus, who intrusted the publication to two learned friends of the author, Tucca and Varus. Many lines are left imperfect; some suppose this to be one proof that the finishing hand of the master was never applied; but we doubt whether it is, and think it possible that they were purposely left so. It called forth the enthusiastic admiration of his contemporaries. Propertius wrote—

> Yield, Roman poets; lords of Greece, give way;
> The Iliad soon shall own a greater lay;

and some writers, even in modern times, have expressed the same opinion. The merits of these poets will be better discussed under their respective names. It is enough to say that, compared with the Iliad, the Æneid is wanting in originality and power: it is evidently the laboured performance of a learned man, possessed of an elegant mind, who has availed himself freely of the labours of those who have preceded him. Virgil is characterized by Niebuhr as possessing 'a genius barren for creating, great as was his talent for embellishing.' The characters of the Æneid are deficient in the individuality and freshness which mark the descriptions of those who have mingled in scenes, and been familiar with characters such as they portray. The brave Gyas, and the brave Cloanthus are hardly distinguishable, except by name: Achates, the friend of Æneas, is a mere shadow, always attending on his chief; and, indeed, with the exception of Dido, no character is well defined. Æneas himself, though the hero of the poem, neither excites any strong interest nor leaves any powerful impression. In this respect Virgil is immeasurably inferior to Homer. The former, from his own imagination, or from the writings of older authors, had to create characters and describe manners such as he had never seen; the latter was familiar with men and actions such as he described them, or at least he embodied the vivid traditions of an early and poetical age. The strength of Virgil lay in the pathetic rather than in the sublime; and many passages of the Æneid, which admitted of the former quality, are exquisitely beautiful.

The Æneid has been frequently translated into most European languages. In our own, we may notice one peculiarly interesting to the literary antiquary; a translation, by Gawin Douglas, bishop of Dunkeld, of the whole Æneid into the old Scottish dialect, about 1512; and said by Mr. Warton to be the first translation of a classic into the language of Britain. The Earl of Surrey translated the second and fourth books, printed in 1577. There are complete translations by Ogilby, Pitt, &c., but the energetic version of Dryden has nearly superseded all others.

ÆNI'GMA, a Greek term for what is commonly called a riddle. It is the description of a thing by certain of its qualities selected and disposed, with the object of hiding what the thing is, and of occasioning its discovery to come as a surprise.

An ænigma differs from a definition or other direct statement, not in being false, but only in being obscure and misleading. The one is an instance of the application of language to make known our thoughts, and the other of its application to the purpose of concealing them; but the words of a good ænigma, when properly understood, are as true as those of a good definition. It is also an indispensable quality of the latter, as well as of the former, that it shall be intelligible, in its whole import, only in one sense.

The object of a direct statement is to convey information; that of an ænigma is to exercise the ingenuity. The former, in its simplest and most legitimate form, has only to be *received* by the mind; the latter demands to be *solved*. An ænigma, therefore, may be regarded as one of the complex or ornamented modes of composition, that is to say, one of those which do not merely appeal to the apprehension, but excite and gratify other intellectual faculties.

In very ancient times, accordingly, the ænigma was a common and favourite medium for the conveyance even of truths of the highest importance. Formal composition in the earliest state of society, that it might be the better distinguished from ordinary speech, naturally affected an elaborately artificial character; and the ænigma or riddle presented itself among other devices for that end. It had, besides, the peculiar recommendation of giving an air of mystery to the sentiment which it involved, and so making it seem to be something still more remote than it might really be from common experience and speculation. The term ænigma, indeed, was probably used originally to describe any short composition, such as an apologue, or fable, or other portable sample of wisdom or entertainment. Ænigma is something *dark* and *obscure*, and the corresponding verb (αἰνίττεσθαι) always means to speak *ænigmatically*, according to our meaning of the word, or to speak with a certain degree of mystery and obscurity.

In the progress of civilization and literature, it came to be felt that obscurity and difficulty were qualities, which, whatever pleasure they might convey to those who tried to master them, were inconsistent with all the higher and more appropriate objects of speaking and writing. Whether the purpose be simply to communicate information, or whether it be to appeal also to the imagination and the passions, a style is good exactly in proportion as it is expressive, that is to say, as it conveys directly and completely the thoughts of the writer or speaker. The ænigma, therefore, the very end and nature of which is the reverse of this, instead of being an ornament, must be regarded as one of the worst faults of style. Whatever *approaches* towards the ænigmatical, is, for the same reason, a fault in writing—whatever figure, for example, is introduced in poetry or rhetoric more in order to surprise the reader by its ingenuity than for any other purpose. Amongst those writers who have vitiated their works by what may be called an ænigmatic turn of phraseology, Young is an instance, in his *Night Thoughts*.

ÆO'LIAN HARP, a musical instrument, the sounds of which are drawn from it by a current of air acting on the strings; hence it is named after *Æolus*, to whom in the heathen mythology is given the command of the winds.

Rather before the middle of the last century, the Æolian Harp was brought forward in London as a newly-invented instrument; and Dr. Anderson, in a note to Thomson's *Ode on Æolus's Harp*, ascribes the invention of it to Mr. Oswald, (the composer of Scottish songs, we presume,) adding, 'its properties are fully described in *The Castle of Indolence*.' However, it is possible that an instrument of the kind was very anciently known, for the Talmudists say that the *Kinnor*, or harp of David, sounded of itself when the north wind blew on it. But the merit of the invention in the form it now takes, is due to Athanasius Kircher, who, in his *Musurgia Universalis*, (lib. ix. 352,) thus describes it: 'As the instrument is new, so also is it pleasant and easy to construct, and is heard in my museum to the admiration of every one. It is silent as long as the window in which it is placed remains closed, but when this is opened, a sudden harmonious sound breaks forth which astonishes the hearers, for they neither perceive whence it proceeds, nor what kind of instrument is before them, for the sounds do not resemble those of a stringed or of a pneumatic instrument, but partake of both. The instrument is made of pine wood, is five palms long, (fifteen inches,) two broad, and one deep: it may contain fifteen or more strings, all equal, and of catgut. The method of tuning it is not, as in other instruments, by 3ds, 4ths, 5ths, &c., but all the strings are to be in unison or in octaves, and it is wonderful that such different harmony should be produced from strings thus tuned.'

A modern writer gives the following more detailed directions for the construction of the Æolian harp, and such as we know, from experiment, are better calculated to produce the intended effects. Let a box be made of as thin deal as possible, of a length exactly answering to the window in which it is intended to be placed, four or five inches in depth, and five or six in width. Glue on it, at the extremities of the top, two pieces of wainscot, about half an inch high and a quarter of an inch thick, to serve as bridges for the strings; and withinside, at each end, glue two pieces of beech about an inch square, and of length equal to the width of the box, which is to hold the pegs. Into one of these bridges fix as many pegs, such as are used in a pianoforte, though not so large, as there are to be strings; and into the other, fasten as many small brass pins, to which attach one end of the strings. Then string the instrument with small catgut, or *first* fiddle-strings, fixing one end of them, and twisting the other round the opposite peg. These strings, which should not be drawn tight, must be tuned in unison. To procure a proper passage for the wind, a thin board, supported by four pegs, is placed over the strings, at about three inches distance from the sounding-board. The instrument must be exposed to the wind at a window partly open; and to increase the force of the current of air, either the door of the room, or an opposite window, should be opened. When the wind blows, the strings begin to sound in unison; but as the force of the current increases, the sound changes into a pleasing admixture of all the notes of the diatonic scale, ascending and descending, and these often unite in the most delightful harmonic combinations, producing

> "A certain music, never known before,"

says Thomson, in his *Castle of Indolence*, who goes on describing the instrument as one

> "From which, with airy fingers light,
> Beyond each mortal touch the most refined,
> The God of Winds *draws* sounds of deep delight;
> Whence, with just cause, the harp of Æolus it hight.
> Ah me! what hand can touch the string so fine?
> Who up the lofty diapason roll
> Such sweet, such sad, such solemn airs divine,
> Then let them down into the soul?
>
> • • • • •
>
> Wild-warbling nature all, above the reach of art!"

The learned Matthew Young, B.D., formerly of Trinity College, Dublin, has entered deeply into the nature of the Æolian harp, in his *Enquiry into the principal Phænomena of Sounds*, &c., and as his work is rare, we shall here avail ourselves of his remarks on this subject:—

'The phænomena of the Æolian lyre may be accounted for on principles analogous to those by which the phænomena of sympathetic tones are explained.' [See Sympathetic Sounds.] 'To remove all uncertainty in the order of the notes in the lyre, I took off all the strings but one, and on placing the instrument in a due position, was surprised to hear a great variety of notes, and frequently such as were not produced by any aliquot part of the strings: often, too, I heard a chord of two or three notes from this single string. From observing these phænomena, they appeared to me so very complex and extraordinary, that I despaired of being able to account for them on the principle of aliquot parts. However, on a more minute enquiry, they all appear to flow from it naturally and with ease.

'But let us consider what will be the effect of a current of air rushing against a stretched elastic fibre. The particles which strike against the middle point of the string will move the whole string from its rectilineal position; and as no blast continues exactly of the same strength for any considerable time, although it be able to remove the string from its rectilineal position, yet, unless it be too rapid and violent, it will not be able to keep it bent: the fibre will, therefore, by its elasticity, return to its former position; and, by its increased velocity, pass it on to the other side, and so continue to vibrate and excite pulses in the air, which will produce the tone of the entire string. But if the current of air be too strong and rapid, when the string is bent from the rectilineal position, it will not be able to recover it, but will continue bent and bellying like the cordage of a ship in a brisk gale. However, though the whole string cannot perform its vibrations, the subordinate aliquot parts may, which will be of different lengths in different cases, according to the rapidity of the blast. Thus when the velocity of the current of air increases, so as to prevent the vibration of the whole string, those particles which strike against the middle points of the halves of the string, agitate those halves as in the case of sympathetic and secondary tones; and as these halves vibrate in half the time of the whole string, though the blast may be too rapid to admit of the vibration of the whole, yet it can have no more effect in preventing the motion of the halves, than it would have on the whole string were its tension quadruple; for the times of vibration in strings of different lengths, and agreeing in other circumstances, are directly as the lengths; and in strings differing in tensions, and agreeing in other circumstances, inversely as the square roots of the tensions: and, therefore, their vibrations may become strong enough to excite such pulses as will affect the drum of the ear; and the like may be said of other aliquot divisions of the string. In the same manner as standing corn is bent by a blast of wind, and if the wind be sufficiently rapid, it will have repeated its blast before the stem of corn can recover its perpendicular position, and therefore will keep it bent. But if it decays in rapidity or strength, the stem of corn will have time to perform a vibration before it is again impelled; and thus it will appear to wave backwards and forwards by the impulse of the wind. Those particles which strike against such points of the string as are not in the middle of the aliquot parts, will interrupt and counteract each other's vibrations, as in the case of sympathetic and secondary tones, and, therefore, will not produce a sensible effect.' With regard to those notes which cannot be produced by any exact submultiple of the string, but which, notwithstanding, are sometimes heard on the Æolian harp, Mr. Young observed that they were always transitory, gradually rising or falling to such notes, above or below them, as would be produced by exact aliquot parts of the whole string.

Mr. Young follows the principles here laid down, by a series of experiments, which are of a very satisfactory nature; but for these we must refer the reader to the work itself.

ÆO'LIAN ISLANDS, the ancient name of the eleven small islands north of Sicily, now generally called the Lipari Islands.

ÆO'LIAN MODE, in ancient music, one of the five principal modes of the Greeks, which derived its name, not from the Æolian isles, but from Æolia, a country of Asia Minor. What this mode was, it is now difficult, if not impossible, to determine. Writers of all times and kinds differ most essentially from each other on the subject. Rousseau says it was grave: the Abbé Feytou contradicts him. Sir F. Stiles tells us that this mode was the same as our E flat: Dr. Burney makes it F minor; and Rousseau says F, meaning, of course, F major. See Mode.

ÆO'LIANS, the name of one of those various peoples, whom we are accustomed to class under the general appellation of Greeks. We trace the name of Æolians to Thessaly, their primitive abode, as far as we know, where they appear to have been closely related to the Phthiotic Achæans of the same country. What was the nature of their relationship to the Dorians who dwelt successively in Phthia, Olympus, Pindus, Dryopis and the Peloponnesus, we cannot determine; but undoubtedly their languages were very closely allied. The Achæi of the Peloponnesus (the Achæi of Homer) were also kinsmen, and, in fact, part of the Æolians; and the great emigration, commonly called the Æolian, was an emigration of Achæan people. It seems probable that the emigration from the Peloponnesus commenced before the Dorian invasion, or return of the Heraclidæ, as it is often called, which caused so great a revolution in the Peninsula; but it cannot be doubted that this event contributed still further to the Achæan or Æolian emigration under Penthilus the son of Orestes, and others of Agamemnon's descendants. This great revolution in the Peloponnesus, caused by an invasion of hardy mountaineers and conquerors from Northern Greece, took place, as the best-informed Greek historians believed, eighty years after the war of Troy, or B.C. 1104; and apparently caused a retrogression in the condition of southern Greece, and drove out a more civilized race. Strabo says that the Æolian settlements in Asia were four generations prior to those called the Ionian. The Æolian colonies on the Asiatic main land were widely spread, extending at least from Cyzicus along the shores of the Hellespont and the Ægean to the river Caicus, and even the Hermus. Many positions in the interior were also occupied by them, as well as the fine island of Lesbos, with Tenedos, and others of smaller importance. Homer mentions all these parts as possessed by a different people; which would be a proof, if any were wanting, that the race of new settlers came after his time. There were twelve cities or states included in the older settlements in that tract of Asia Minor on the Ægean, which was known in Greek geography by the name of Æolis, and formed a part of the subsequent larger division of Mysia. Smyrna, one of them, which early fell into the hands of the Ionians, the neighbours of the Æolians, still exists nearly on the old spot, with exactly the same name, thus adding one to the many instances of the durable impression made by Greek colonists wherever they settled.

But besides these twelve states, to which we have alluded, (most of which were near the coast,) there were many Æolian towns founded by the new comers along the Hellespont, the range of the Ida mountains, and on the coast of Thrace.

The name Æolic is often applied to a branch or dialect of the Greek language; but as we do not possess any entire work written in this dialect, we cannot satisfactorily compare it with the Attic, or that variety of the Greek language in which the tragedies of Æschylus, Sophocles, and Euripides, the histories of Thucydides and Xenophon, and the orations of Æschines and Demosthenes are written. There is no doubt, however, that it approached nearest to the Doric dialect of the Greek language, such as it was spoken in most parts of the Peloponnesus after the great Dorian invasion already mentioned.

ÆOLIPILE, a philosophical toy, described as early as B.C. 130 by Hero, of Alexandria. It was, in fact, the first *steam-engine*. The steam was generated in a boiler, and conveyed by a tube into a hollow sphere, so arranged as to rotate, the tube being one of its pivots. Two pipes issued from the sphere at right angles to the axis; and the steam issuing from their bent extremities, made the sphere revolve on the principle of Barker's Mill. The steam-engines of Avery in America, and of Ruthven in Edinburgh, were on the principle of the Æolipile.

ÆRA, a point of time from which *subsequent* years are counted, and in some instances *preceding* years, as in the Christian æra. The origin of the word *æra* is very doubtful.

All nations who have any history to record have fixed their æra at some remote period, in order to embrace in their annals as large an extent of time as practicable. The creation of the world would most naturally present itself to those who might have any means of ascertaining the time of its occurrence, and the Bible would be the source from whence the information might be obtained. But, unfortunately for chronology, the Bible is not sufficiently explicit on this subject; and, although the Jews and some Christian nations do date from the Creation, their computations of the period at which this event took place differ to the extent of nearly two thousand years. Those whom this uncertainty has deterred, or who have had no knowledge of the Scriptures, have contented themselves with more recent periods. The ancient Romans adopted the epoch of their first supposed political existence, and the Greeks that of the first celebration or revival of the Olympic Games, which were with them an important national festival. Many nations have assumed some event closely connected with their religious faith: thus, the early Christians of the East dated from the persecution under the Emperor Diocletian, and those of Europe and America, at the present day, from the birth of Christ. All the followers of Mohammed have adopted, as an æra, the retreat of their prophet from Mecca to Medina, which they call the Hegira.

Many of these æras are arbitrarily and incorrectly fixed, and even our own is erroneous by four years. But an error at the commencement will not invalidate the dates of events recorded subsequently, as any æra once assumed will be sufficient to show the succession of time, however incorrectly assigned to the period whose name it bears.

With one or two exceptions, all nations have reckoned time in accordance with the course of the seasons; they have always begun their year at the same season, sometimes perhaps a little earlier, and sometimes later, but invariably keeping near the original commencement.

Here follows a list of the æras which have been or are most in use among the civilized nations of the world, with the year of the Christian æra in which they began:—

1. The year of the world according to the reckoning of Constantinople, which was used in Russia until the beginning of the eighteenth century, and is still employed by the Greek church - - - - - - - - - - - - - - B.C. 5509
2. The year of the world as reckoned at Antioch, now used in the Abyssinian church - - - B.C. 5492

[The church of Alexandria originally assumed the year B.C. 5502 as the year of the Creation, but in the year 285 A.D. they discarded ten years, and thus acceded to the computation of Antioch.]

3. The year of the world used by the Jews - - B.C. 3761
4. The Caliyuga, employed by the learned throughout India, may be called an æra of the Creation, being considered by the Hindoos as the commencement of the present state of the world, or 'Iron Age' - - - - - - - - B.C. 3102
5. The Olympiads; the æra of the victory of Corœbus at the Olympic games, used chiefly by the Greek historians after the age of Alexander - - - - - - - - - - - - - B.C. 776

[N.B. An Olympiad is a period of four years.]

6. The building of Rome: this is generally called the Varronian æra - - - - - - - - - B.C. 753
7. The Catonian æra of the building of Rome is* B.C. 752
8. The æra of Vicramaditya, in common use throughout India - - - - - - - - - - B.C. 57
9. The Spanish æra, from the conquest of Spain by Augustus, was employed in Spain, Portugal, Africa, and the South of France. In some provinces this æra was in use until the middle of the fifteenth century - - - - - B.C. 38
10. The æra of Salivahana, in common use through the southern and western states of India - - A.D. 78
11. The æra of Martyrs, or of Diocletian, so called from the persecution of the Christians in the reign of that emperor, was much used by the early Christians, and is still employed in the churches of the East - - - - - - - - A.D. 284
12. The Hegira, used by all Mohammedans, dates from the flight of Mohammed to Medina - - A.D. 622
13. The Christian æra dates from the birth of Christ; the year in which he was (erroneously) supposed to be born is called 1 B.C., the following year 1 A.D. Many authors call the year of our Lord's birth 0, and consequently make the dates of all preceding events one year less than by the common practice.

The following rules will serve to show the year of the Christian æra corresponding with that of any given æra:—

1. When the commencement of the given æra precedes the birth of Christ, subtract from the given year the number affixed to the æra in the above list, and the remainder will be the year of Christ in which the given year began.

If the given year be less than the affixed number, subtract it from that number, adding one; the result will be the date before Christ.

Examples.—Required the Christian date answering to the year of Rome 1754.

From 1754
Deduct 753

The year 1001 A.D. corresponds with the year 1754 A.U.C.

Required the year B.C. answering to 707 A.U.C.

From 753
Deduct 707

46
Add 1

The year 47 B.C. coincides with 707 A.U.C.

The reason is this: A.U.C. 707 means that an event took place *in* that year; and therefore 753—706 or 47 years B.C. remain, and as all the years B.C. *before* B.C. 47 have expired, the event must take place *in* the year B.C. 47.

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* See Ideler's *Chronology*, p. 334.

Required the year of Christ in which the year of the Jews 5591 began.

From 5591
Deduct 3761
——
Answer A.D. 1830

2. When the commencement of the given æra follows the birth of Christ, add to the given year the number affixed to the æra in the list, less one. The sum will be the year of Christ in which the given year began.

Example.—Required the Christian year in which 1031 of Martyrs began.

To the given year 1031
Add the number in the list less one } 283
——
The year A.D. 1314 answers to the year 1031.

All the above dates may be reduced to the Christian æra by the same formula, except that of the Hegira, as the Mohammedans allow only 354 days to the year. Mohammedan reckoning is thus at variance with the course of the seasons; in a period of 33 years, the beginning of the year runs through all the seasons, and thus gains at the rate of a little more than three years in a century. It will, therefore, be necessary to prepare any given date from the Hegira by subtracting three years for every hundred, before reducing it to the Christian æra.

Required the year of the Hegira } 1245
Subtract 3 years for every hundred } 37
——
1208
Add the number in the list less one } 621
——
1829

The year of the Hegira 1245 began in the year 1829 A.D.

3. The computation by Olympiads may be thus explained: for instance, Ol. lx.3 means that an event took place *in* the *third* year of the *sixtieth* Olympiad, and consequently *in* the year that followed the expiration of 59 Olympiads (or 59 periods of 4 years each), and 2 more years belonging to the sixtieth Olympiad; or after the expiration of 238 years, and therefore *in* the year B.C. 538.

AERIAL PERSPECTIVE, a term in painting, implies, in its simple definition, the receding of objects into distance, as seen through the medium of air. In its general application, however, it is to be understood in a more enlarged sense. Linear perspective may be considered the material guide of the artist, originating in, and governed by, mathematical science; but aërial perspective is, in whatever relates to *effect*, amenable to no positive law or established rule, and depends for its application on the perceptions and capacity of the artist. Although entering into every variety of subject, in graphic representation, it is in open scenery that aërial perspective is exhibited in its proper sphere. To feel this, it will only be necessary to recollect in how different an aspect the same scenery may present itself under different modifications of the atmosphere. A prospect, which at noon day, or in a clear and bleak morning, appears tame and uninteresting, shall assume an ideal character, and start into combinations of beauty, if seen at sunrise or at sunset, or under any temperature of the sky favourable to the development of picturesque effect.

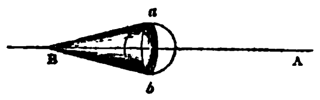
It is, of course, in those schools of painting, wherein the study of external nature, especially of landscape, has been most cultivated, that we are to look for the finest examples of aërial perspective. The Roman and Florentine masters, whose object, almost exclusively, was human form and character, seem to have felt or understood but little of it. The Dutch and Flemish painters exhibit high excellence in this particular, as is shown in the works of Rubens, Rembrandt, Teniers, Ostade, Cuyp, Ruysdael, Wouvermans, Vanderveldt, &c. France, however, has the glory of having produced the artist Claude Lorraine, who, in this great quality of art, has borne off the palm from all competitors. He rarely painted any other effects than those of the rising or the setting sun, well knowing their picturesque superiority; but whatever be his subject, an ancient port, or ruins, or temples, the great and presiding charm of Claude is his consummate skill in aërial perspective. If there be any artist who, in the treatment of aërial perspective, can compete with Claude, that competitor, perhaps, is Cuyp. His pictures are direct portraits of the scene before him,—the willowy lake, the marsh, the meadow, the drowsy shepherd, and the ruminating cow. But, in spite of the simplicity of these materials, and an horizon, in general, perfectly flat, he communicates to his works an effect of air and distance, and consequently of reality, which must rank them among the most astonishing efforts of art. To these may be added a third, the English Wilson, whose breadth and brilliancy of style, and whose conspicuous mastery in the practice of aërial perspective, give him a right to rank with Claude and with Cuyp in this quality.

AERO-DYNAMICS, signifies the science which treats of the motion of the air, or of the mechanical effects of air put in motion. In its widest sense, it might be taken to include the effects of the motion of any gaseous substance or vapour; and even the properties of steam might be considered as a part of the science. We shall, however, confine ourselves to the explanation of the few general principles which can be relied upon; the applications of which will be found in the articles WIND, WINDMILL, AIR-GUN, SAIL, BELLOWS, RESISTANCE, GUNNERY, &c.

The air is an elastic fluid,—that is, any portion of it can be confined in a smaller, or expanded into a larger space, than it would naturally occupy. In either case a force or pressure is to be overcome; the air itself resists compression; and the pressure of the superincumbent air is to be overcome before any expansion can take place. The natural state of the air to which we have alluded, varies, as indicated by the rise or fall of the BAROMETER, which, at the level of the sea, is usually between twenty-eight and thirty-one inches in height, that is, the flat bottom of any vessel is pressed by a weight, arising from the air, such as would be obtained by filling it with mercury to a height of from twenty-eight to thirty-one inches. This pressure is estimated at from fourteen to fifteen pounds avoirdupois on every square inch. [See AIR.]

As soon as we begin to move, we feel, more or less, the resistance of the air. At an ordinary rate of motion, this is not very perceptible; but the jockey, who rides at the rate of from thirty to forty miles an hour, feels it sensibly, and is obliged to wear a cap which may *cut* the wind, as the bow of a ship *cuts* the water, or otherwise it would be blown off his head, though, in the common sense of the word, there might be no *wind* stirring at the time. Whenever we attempt to put any matter in motion, we feel what is denominated pressure or resistance, which is the greater the greater the quantity of matter we attempt to move, and the velocity we attempt to communicate to it. Thus, two violent pressures, of equal force, applied for an instant to weights of ten and twenty pounds, will make the weight of ten pounds move twice as fast as that of twenty; or, if we would have the two move equally fast, we must apply twice as much pressure to the twenty pounds weight as we do to that of ten pounds. If we now conceive a number of equal balls placed in a line, along which we move the hand uniformly, so as to set them all in motion one after the other, we might at first imagine that if we move the hand at the rate of two feet in a second, and afterwards at the rate of four feet in a second, that we exert twice as much force, and encounter twice as much resistance, in the second case, as in the first. Because, we say, we move each ball in the second case twice as fast as in the first. But there is another consideration: we not only move each ball twice as fast, but we meet with twice as many balls in a second, so that not only the velocity we communicate in a second is doubled, but also the quantity of matter to which we communicate that velocity is doubled, or, there is four times as much resistance to twice the velocity, as there was to the single velocity. Similarly, at three times the rate of motion, we meet with three times as much matter, and communicate to each portion three times the velocity: whence we meet with three times three, or nine times the quantity of resistance. If we transfer this reasoning to the case of a body moving through the air, we should infer, that the resistance is, to speak mathematically, as the SQUARE of the velocity: that is, if the velocity be suddenly made ten times as great, the resistance is made ten times ten, or a hundred times as great. And this, which was the first theory proposed on the subject, is sufficiently near the truth for practical purposes, when the velocities are not very great; for example, up to eight or nine hundred feet in a second.

But one circumstance has been neglected. The successive particles of air which the moving body strikes, instead of being moved out of the way completely, are forced upon those in front, so that there is a condensation of air before the moving body; which condensation, as we have seen in Acoustics, is propagated onwards at the rate of about 1125 feet in a second. In the meanwhile, the space through which the body moves, or has moved, is, or has been, entirely cleared of air; and though the air is forced with great rapidity into the vacant space, yet this is not done instantaneously, as we shall presently see from experiment. Therefore though, when at rest, the atmospheric pressures before and behind the body counterbalance each other, yet when in motion, there is an increase of the pressure before the body, and a diminution of that behind it; both which circumstances increase the resistance.



From theory, tolerably well confirmed by experiment, it appears, that if air of the ordinary pressure be allowed to rush into a *vacuum*, or space entirely devoid of air, it will be driven in at first with a velocity of about 1340 feet per second; or, to avoid an appearance of accuracy of which we are not actually in possession, we may say between 1300 and 1400 feet per second. If now, instead of rushing into a vacuum, the air which comes through the orifice meets with other air of a less density, say one-fourth of its own density, the velocity above-mentioned will be diminished in the proportion of 1 to the square root of $1-\frac{1}{4}$, or of 1 to $\sqrt{\frac{3}{4}}$, or of 2 to $\sqrt{3}$, or of 100 to 87, very nearly. By a similar process any other case may be computed. Let us now imagine a ball, *a b*, made to move forward in the direction B A, with an initial velocity less than 1000 feet per second. Let B be the last point of its track at which the air has completely recovered its former state. The air in the cone B*a b* will not have entirely recovered its state, but will all be more or less rarefied; so that in addition to the loss of motion arising from communication to the particles of air, there is a part of the atmospheric pressure on the front of A B, uncounterbalanced from behind. The condensation in front of A B is propagated, as in Acoustics, quicker than the ball moves; so that the air in front continues, if not entirely, at least very nearly, in its natural state. We cannot say that the cases of air rushing through an orifice into a vacuum, and filling up the space left by a ball, have any decided similarity; nor can we say the contrary, owing to the very imperfect state of the mathematical analysis of this part of the subject. We may, however, conjecture that when the ball moves with a velocity greater than that of sound, thereby condensing the air before it, and leaving a perfect vacuum behind it, or nearly so, the resistance will be much greater than the theory in the first part of this article would lead us to expect. And this proves to be the case at even less velocities than the one just specified; for though up to 1000 feet per second, or thereabouts, the resistance increases very nearly with the square of the velocity, yet from that point it increases in a much quicker ratio; so that to a ball moving at the rate of 1700 feet per second, it is three times as great as we should obtain from our first hypothesis. The resistance to an iron ball of twelve pounds weight, moving at the rate of twenty-five feet per second, is equivalent to a pressure of half an ounce avoirdupois; if we increase twenty-five feet per second to 1700 feet per second, or multiply the first sixty-eight times, the square of which is 68 × 68 or 4624, we might, from the first part of this article, expect a resistance of 4624 half ounces, or 144½ pounds; instead of which, it is found to be 433½ pounds; about three times the preceding, as we said. At a velocity of 1600 feet per second, the resistance was found to be more than twice that given by the theory. Without entering further into details, for which the reader may consult the article Gunnery, to which they particularly apply—and also without considering the effect which the different forms of bodies have upon the Resistance, (to which refer)—we give some of the conclusions to which Dr. Hutton was led by a long and careful repetition of the experiments of Mr. Robins, his celebrated predecessor in the same track. For the method of conducting these experiments, see Whirling Machine, Ballistic Pendulum.

1. The resistance is nearly in the same proportion as the surface exposed, but a little greater than this proportion on the larger surface. That is, if we take two bodies of the same figure and material, (two iron spheres for example,) the surface of the second being twice that of the first, the resistance to the larger sphere is a little more than twice that of the smaller, the velocities being the same in both.

2. The round ends and sharp ends of solids suffer less resistance than the flat ends of the same. Thus, the sharp end or vertex of a cone is less resisted than the flat end or base.

3. Two solids, having the parts presented to, or which push the air, the same, are not equally resisted unless the hinder parts are also the same.

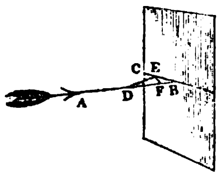
Though we have hitherto considered the resistance offered to a body moving against still air, and the pressure which is necessary to maintain it at a given velocity, yet the problem is exactly the same, if we suppose the body to remain still and the air, or as we now call it, the wind, to move against it with the same velocity. Suppose the body to move 100 feet in a second, and that the spectator is carried along without his knowledge at the same rate. He will, therefore, always be in the same place with respect to the body, and will at the same time imagine that the air or wind is coming towards him at the rate of 100 feet per second. The force which, when he imagined the body moving, he called the pressure necessary to maintain its velocity, he will now say is the pressure necessary to steady it against the wind.

If we suppose both the wind and the body in motion, the resistance is variously modified, according to the direction of the motions of the two. If the wind and the body move in the same direction, with the same velocity, there is no resistance, for no air is displaced by the body. If the wind move 50 feet per second, and the body 100 feet, the pressure on the body is the same as if it were at rest, with a *contrary* wind of 50 feet per second blowing on it. If the wind and the body move in contrary directions, with velocities of 100 feet, the resistance is that of a wind of 200 feet per second; and so on. If the spectator move with the body unknowingly, the magnitude and direction which he will assign to the wind is that which will produce such a pressure on the body *at rest*, as it really sustains when in motion. [See Apparent Motion.]

The following well-known table, first given by Mr. Smeaton in the *Philosophical Transactions* for 1759, and confirmed by the experiments of Dr. Hutton, shows, in pounds avoirdupois, the pressure which different winds will exert upon a square foot of surface exposed directly against them. The first column is a rough representation of the second.

Velocity of Wind.		Force on one square foot in pounds avoirdupois.	Character of the Wind.
Miles per Hour.	Feet per second.		
1	1·47	·005	Hardly perceptible.
2	2·93	·020	Just perceptible.
3	4·40	·044	
4	5·87	·079	Gentle, pleasant wind.
5	7.33	·123	
10	14·67	·492	Pleasant, brisk gale.
15	22·00	1·107	
20	29·34	1·968	Very brisk.
25	36·67	3·075	
30	44·01	4·429	High winds.
35	51·34	6·027	
40	58·68	7·873	Very high.
45	66·01	9·963	
50	73·35	12·300	Storm or tempest.
60	88·02	17·715	Great storm.
80	117·36	31·490	Hurricane.
100	146·70	49·200	Destructive hurricane.

For the method of obtaining these results see Anemometer.



Let us suppose the square foot of surface placed obliquely, so as to make an angle A B C, with the direction A B of the wind. Let D B represent the velocity of the wind per second. Then, if D E be drawn perpendicular to B C (see Composition of Velocities) the wind which strikes the plane at B does not strike it directly with its whole velocity, but only with the velocity D E; it being the same thing as if we supposed the wind to be carried direct against the plane with the velocity D E, and at the same time shifted on the surface from C towards B with the velocity E B. This last will only make different particles of air strike the point B, but not with different forces. This line D E is in trigonometry proportional to the *sine* of the angle D B E. Again, if we draw E F perpendicular to D B, the whole of the velocity D E is not in the direction of the wind, A B, but only the part of it D F; the other component, F E, being employed in moving the plane in a direction perpendicular to that of the wind. This line, D F, which represents the *effective* velocity of the wind in the direction A B, is, as the square of the sine of the angle A B C. The line, D F, is a third proportional to D B and D E, so that if we suppose the wind to move at the rate of 100 feet in a second, and the plane to be so inclined that it strikes the plane directly with only eighty feet of velocity, we have, for the real effective velocity 100 : 80 :: 80 : 64, or we must consider this plane as resisting a wind of only 64 feet of velocity. This theory is liable to the objections of the former one, as it does not allow for any condensation, but supposes the particles to disappear after they have struck the plane. Nevertheless, it is found in practice to answer well enough when the plane is not very oblique to the wind. For the mathematician, we may state that the following empirical formula is found from Smeaton's experiments to be much nearer the truth, which, as he will see, is nearly equivalent to the square of the sine of the angle of inclination, when the latter is nearly a right angle. Let the angle of inclination of the surface be θ, and the velocity of the wind V, then the effective velocity is

$$V \sin \theta^{1\cdot842 \cos \theta} \text{ nearly.}$$

For further information, we should recommend the treatise on Pneumatics, written for the *Encyclopædia Metropolitana*, by Professor Barlow, in which the experiments referred to in this article will be found clearly detailed: and also to the articles Resistance, Wind, Anemometer, in Dr. Hutton's *Mathematical Dictionary*.

AEROLITES or Meteoric Stones, Fireballs, and Shooting-stars. These bodies are now considered as all belonging to one class, and as being of a *cosmical* character. 'Shooting-stars, fireballs, and meteoric stones,' says Humboldt (*Cosmos*, vol. i. p. 98), 'are with great probability regarded as small bodies moving with planetary velocity, and revolving, in obedience to the laws of general gravity, in conic sections round the sun. When these masses meet the earth in their course, and are attracted by it, they enter within the limits of our atmosphere in a luminous condition, and frequently let fall more or less strongly heated stony fragments, covered with a shining black crust.' Such is a concise statement of the cosmical theory of meteors, that has been gaining ground of late years. As it was the interest awakened by the subject of stones falling to the earth that first directed modern scientific research and observation to meteors generally, aërolites may be spoken of first.

Aërolites are bodies which have fallen on the earth from the atmosphere, and are named from ἀὴρ (*aer*), atmosphere, and λίθος (*lithos*), a stone. We possess historical records from very remote antiquity, and numerous writers in all ages have mentioned instances, of the remarkable phenomenon of stony bodies having been seen to fall from the sky; yet, till within the last fifty years, all such accounts were treated as tales of the ignorant and superstitious. The history of aërolites affords a most useful lesson how cautious we ought to be not to reject too hastily the narratives either of early authors or of living witnesses, however extraordinary they may be, solely on the ground that they are inconsistent with our experience of the laws of nature. When the official notice from the local authorities of the shower of stones at L'Aigle, in Normandy in 1803, was received at Paris, it afforded a subject of merriment to the wits of that day; and the newspapers expressed their compassion for the good people of L'Aigle, who were governed by a mayor so silly as to give credit to such nonsense as that stones had fallen from the clouds. The first man of science who directed attention to the subject of aërolites was Chladni, a German philosopher, who, in a tract published at Riga and Leipzig in 1794, upon the mass of native iron found by Pallas in Siberia, maintained the credibility of the traditions of that and other stony bodies having fallen from the air. His sagacious inductions, although they failed at the time to make any great impression, prepared philosophers for a more willing reception of the evidence as to two instances of the same extraordinary event, which were shortly afterwards brought under their notice. In 1796, a stone was exhibited in London, weighing 56 lbs., which was said to have fallen in Yorkshire in December of the preceding year; but although the fact was attested by several credible witnesses, the possibility of such an occurrence was still doubted. It was remarked, however, by Sir Joseph Banks, that there was a great resemblance between the Yorkshire stone and one in his possession, sent to him from Italy, with an account of its having fallen from the clouds, along with many others of a similar nature, near Sienna, in July 1794. In the year 1799, Sir Joseph Banks received a circumstantial account, accompanied by specimens, of a fall of stones from the atmosphere, which was said to have taken place near Benares, in the East Indies, in the preceding December; and as these specimens were also nearly identical with the Yorkshire stone, incredulity began to give way. It was not, however, until the appearance of the celebrated paper of Howard, in the *Philosophical Transactions* for 1802, giving an account of his analysis of the Benares stone, that men of science declared their belief in the phenomenon, supported, as the evidence then was, by the researches and opinion of so cautious and accurate an inquirer; and the fall of stones at L'Aigle, above alluded to, which took place in the following year, at the time the memoir of Howard was in the hands of the public, removed all doubt. The Institute of France deputed the celebrated Biot to examine on the spot the whole circumstances attending this remarkable event; and the result of his labours will be found in his report, in the seventh volume of the *Mémoires de l'Institut*. He satisfied himself of the authenticity of the facts which had been narrated; and the specimens he collected on the ground being analysed by Vauquelin and Thenard, yielded the same result as the analysis of the Benares stone by Howard. Thus was the ingenious induction of Chladni in 1794 confirmed beyond dispute; and Cuvier, in his Report in 1809 of the Progress of Science during the preceding ten years, states 'that the phenomenon of stones fallen from the atmosphere, known both in antiquity and during the middle ages, had only been established as truths in physical science during that period by the conjectures of Chladni, the analyses of Howard, Vauquelin, and Laugier, and the researches of Biot.'

In recording this class of phenomena, as in many things else, the Chinese anticipated the rest of the world by thousands of years. It is stated (*Quarterly Review*, vol. xcii. p. 82), that 'there exist in China authentic catalogues of the remarkable meteors of all classes, aërolites included, which have appeared there during a period of 2400 years. To give an idea of the minuteness of these records—the translation of which we owe to the lamented Ed. Biot—it is enough to mention, that in the three centuries from 960 to 1270 A.D., not fewer than 1479 meteors are registered by the Chinese observers, who seem to have been officially employed for this purpose.' The first record of the kind attempted in Europe, was that published by Chladni in 1819, which formed an epoch in the study of meteors. It contained a copious catalogue of all recorded instances of the fall of aërolites from the earliest times, of which 27 were previous to the Christian era, and 165 from the commencement of that era to 1818. This catalogue has been much enlarged since, but was very valuable at the time. Since the attention of observers has been directed to the subject, the recorded occurrence of aërolites has become much more frequent. Taking into account how numerous the chances are that a stone falling on the earth will escape observation, and also that the ocean covers about three-fourths of the globe, the estimate of Schrieber, that 700 meteoric stones may fall annually upon our globe, is not considered extravagant. It had been remarked as a curious fact, that, contrary to what we should expect, no meteoric stones had ever been found imbedded in secondary or tertiary strata. 'Masses of native iron containing *nickel* have, however, been discovered in Northern Asia in an auriferous deposit, at a depth of 40 feet, and also in the Carpathian Mountains; and these masses are very like undoubted meteoric stones.' (Mantell, *Wonders of Geology*, 6th ed., p. 472.)

Among the more remarkable instances to be met with in ancient authors, the following may be mentioned:—Livy states, that in the reign of Tullus Hostilius (about 654 years B.C.), a shower of stones fell on the Alban Mount, not far distant from Rome. Plutarch, in the Life of Lysander, describes a stone that fell at Ægos Potami, in the Hellespont, near the modern Gallipoli, about 405 B.C., which is also mentioned by the elder Pliny (Book II.), who says that it was to be seen in his time—that is, five hundred years afterwards—and that it was as large as a waggon, of a burnt colour, and its fall was accompanied by a meteor. It is also recorded in the Parian Chronicle. The mother of the gods was worshipped at Pessinus, in Galatia, under the form of a stone, which was said to have fallen from heaven; and that stone, in consequence of a treaty with Attalus, king of Pergamus, was solemnly brought to Rome by Publius Scipio Nasica, about 204 years B.C., and placed in the Temple of Cybele. The sun was worshipped at Emesa, in Syria, under the form of a large, conical, *black* stone, which, as the people about the temple reported, fell upon the earth. The holy Kaaba of Mecca, and the great stone of the pyramid of Cholula, in Mexico, have all the same history.

In the beginning of the tenth century, a huge aërolite fell into the river Narni, near Rome, which projected several feet above the surface of the water. One of the cases of more modern date is that of the stone which fell at Ensisheim, in Alsace, in 1492. The Emperor Maximilian, being there at the time, ordered an account of the event to be drawn up. It weighed 270 lbs.; a part of it now stands near the great altar in the church.

When the fall is observed by night, the heavy masses proceed from fireballs. This was the case at Benares, where the accompanying meteor appeared in a cloudless sky, and was so bright as to cast shadows from the bars of a window. Most of the stones that fell had buried themselves to the depth of six inches, and some of them weighed 2 lbs. During day, they are generally thrown from a small dark cloud, suddenly formed in a clear sky. A case occurred on the 16th of September 1843 at Kleinwenden, near Mühlhausen, where a large aërolite fell with a thundering crash, while the sky was clear and cloudless. The phenomenon is always accompanied by loud noise, compared to thunder, cannon, and musketry; and the fragments that fall are heated, though not in a state of actual incandescence. The fall at L'Aigle was by day, and from a cloud. The vapour of which the cloud consisted was sent out at each explosion in all directions. On this occasion, stones fell to the number of 2000 or 3000. Biot, who investigated the matter on the spot, ascertained that the direction of the meteors from which the stones fell must have been oblique to the horizon. This was inferred from the fact, that the space on which they fell formed an ellipse, and not a circle, as would have been the case if they had dropped vertically.

The fact of aërolites once admitted, led to assigning a meteoric character to strange ferruginous masses found in different countries, and which had no history, or only vague tradition. Of this kind is the immense mass seen by Pallas in Siberia, now in the Imperial Museum at St Petersburg. The largest known is one in Brazil, estimated at 14,000 lbs.

Aërolites, though differing from one another in many points, have all a characteristic physiognomy or external aspect, which was early observed, and which distinguishes them from terrestrial bodies. They are generally angular, as if broken off from larger masses, the angles being rounded. One constant characteristic is the fused black crust, like varnish, with which the surface is coated. From the circumstance of this crust being very thin, and separated from the inner mass by a sharply defined line, it is thought to indicate some rapid action of heat which has not had time to penetrate into the substance of the stone. Humboldt sets down the mean specific gravity of aërolites as three, water being one. This seems too little. According to the writer in the *Quarterly Review* above quoted, their gravity ranges from two to seven, or even eight times that of water; the mean being above that of the mineral masses on the earth's surface, though much below 5·5, or the mean of the whole earth.

The chemical composition of these extraneous bodies is one of the points of greatest interest respecting them, as it bears on the theory of their origin. The predominating element is iron, in a native or metallic state, generally combined with a small proportion of nickel. According to Humboldt, the aërolites that fell in the neighbourhood of Agram, in Croatia, in 1751, the Siberian stone, and specimens brought by that philosopher from Mexico, contain 96 per cent. of iron; while in those of Sienna the iron scarcely amounts to 2 per cent., and in some rare instances metallic iron is altogether wanting. The writer in the *Quarterly Review* thus sums up the result of all the chemical analysis hitherto made: 'We find the actual number of recognised elements discovered in aërolites to be nineteen or twenty—that is, about one-third of the whole number of elementary substances (or what we are yet forced to regard as such) discovered on the earth. Further, all these aërolitic elements actually exist in the earth, though never similarly combined there. No new substance has hitherto come to us from without; and the most abundant of our terrestrial metals, iron, is that which is largely predominant in aërolites, forming frequently, as in some of the instances just mentioned, upwards of 90 parts in 100 of the mass. Seven other metals—copper, tin, nickel, cobalt, chrome, manganese, and molybdena—enter variously into the composition of these stones. Cobalt and nickel are the most invariably present; but the proportion of all is trifling compared with that of iron. Further, there have been found in different aërolites six alkalies and earths—namely, soda, potash, magnesia, lime, silica, and alumina; and in addition to these, carbon, sulphur, phosphorus, and hydrogen. Finally, oxygen must also be named as a constituent of many aërolites, entering into the composition of several of the substances just mentioned. As respects the manner of conjunction of these elements, it is exceedingly various in different aërolites. A few there are, especially examined by Berzelius and Rose, containing olivine, augite, hornblende, and other earthy minerals; and closely resembling certain crystalline compounds which we find on the surface of the earth.'

Besides those solid masses of considerable size, numerous instances are on record of showers of dust over large tracts of land; and it is remarkable that such dust has generally been found to contain small hard angular grains resembling augite. Stories of the fall of cosmical gelatinous vesicles are ranked by Humboldt among the mythical fables of meteorology.

The connection of aërolites with fireballs, is established by the fact, that the former have been observed to be projected from the latter. Fireballs, again, cannot be separated from shooting-stars, the two phenomena being sometimes blended, and also being found to merge into one another, both with respect to the size of their disks, the emanation of sparks, and the velocities of their motion. They may, therefore, be considered together.

From the height and apparent diameter, the actual diameter of the largest fireballs is estimated by Humboldt to vary from 500 to 2800 feet; others allow a diameter of about a mile. Shooting-stars are thought to have diameters varying from 80 to 120 feet. It is probable that the dark clouds, from which aërolites have been seen to fall during day, would have been luminous at night. Smoking exploding fireballs have been sometimes seen luminous even in the brightness of tropical daylight. In most cases of luminous meteors, a train of light many miles in length is left behind. One or two instances are on record where the train of the fireball continued shining for an hour after the body disappeared. The *heights* of shooting-stars were first determined by Benzenberg and Brandes, by simultaneous observations and determination of the parallax at the extremities of a base-line of many miles in length. They are found to range from 15 to 150 miles in height, at the points at which they begin and cease to be visible. Their *velocities* vary from 18 to 36 miles in a second. When it is remembered that the velocity of Mercury in its orbit is 26·4 miles in a second, of Venus 19·2, and of the Earth 16·4, we have in this fact a strong confirmation of the planetary nature of meteorites.

One of the most remarkable facts connected with shooting-stars is, that certain appearances of them are *periodic*. On most occasions they are *sporadic*—that is, they appear singly, and traverse the sky in all directions. At other times, they appear in swarms of thousands, moving parallel; and these swarms are periodic, or recur on the same days of the year. Attention was first directed to this fact on occasion of the prodigious swarm which appeared in North America between the 12th and 13th of November 1833, described by Professor Olmsted of Newhaven. The stars fell on this occasion like flakes of snow, to the number, as was estimated, of 240,000 in the space of nine hours, and varying in size from a moving point or phosphorescent line to globes of the moon's diameter. The most important observation made was, that they all appeared to proceed from the same quarter of the heavens—the vicinity, namely, of the star γ, in the constellation Leo; and although that star had changed greatly its height and azimuth during the time that the phenomenon lasted, they continued to issue from the same point. It was afterwards computed by Encke, that this point was the very direction in which the earth was moving in her orbit at the time. Attention being directed to recorded appearances of the same kind, it was observed with surprise that several of the most remarkable had occurred on the same day of November, especially that seen by Humboldt at Cumana in 1799, and by other observers over a great extent of the earth. The November stream was again observed in the United States in 1834, between the 13th and 14th, though less intense. Though often vague, and in some years altogether absent, this phenomenon has recurred with such regularity, both in America and Europe, as to establish its periodic character.

Another periodic swarm of considerable regularity, is that appearing between the 9th and the 14th of August, and noticed in ancient legends as the 'fiery tears' of St. Lawrence, whose festival is on the 10th of that month. There are other periodic appearances; and Humboldt gives the following epochs as especially worthy of remark:—22d to 25th of April; 17th of July; 10th of August; 12th to 14th of November; 27th to 29th of November; 6th to 12th of December.

It remains to notice briefly the various opinions that have been advanced as to the origin of aërolites, and the theory of meteors in general. The hypotheses that have been formed in answer to the question—Whence come those solid masses that fall upon the earth?—are of two kinds; some ascribing to them a telluric origin, and others making them alien to the earth. Of the first kind, is the conjecture that they may be stones ejected from terrestrial volcanoes, revolving for a time along with the earth, and at last returning to it. Another theory, which at one time found considerable favour, supposed that the matter of which aërolites are composed existed in the atmosphere in the form of vapour, and was by some unknown cause suddenly aggregated and precipitated to the earth. These conjectures are untenable in the face of the facts of the phenomena stated above, and are now completely given up.

In seeking a source beyond the earth, the moon readily presented itself. Olbers was the first to investigate, 1795, the initial velocity necessary to bring to the earth masses projected from the moon. This 'ballistic problem,' as Humboldt calls it, occupied during ten or twelve years the geometricians Laplace, Biot, Brandes, and Poisson. It was calculated that, setting aside the resistance of air, an initial velocity of about 8000 feet in a second, which is about five or six times that of a cannon-ball, would suffice to bring the stones to the earth with a velocity of 35,000 feet. But Olbers has shown, that to account for the actual measured velocity of meteoric stones, the original velocity of projection must be fourteen times greater than the above. It is against this lunar theory, that we have no proof of active volcanoes now existing in the moon; and with the improvement of the telescope, the probability of the contrary is increasing. It is, accordingly, giving place to the planetary theory, which we noticed at the outset—a theory which harmonises better with the tendency of physical research and of speculation generally.

The discussion of hypotheses as to the genesis of the recognised planets out of portions of the gradually contracting vaporous mass of the sun; the continued discovery of hitherto unobserved planets between the orbits of Mars and Jupiter; the countless multitudes of comets that are observed traversing our system in all directions, and undergoing appreciable alteration both of consistency and orbit; all prepare us for the idea, that matter may exist in the interplanetary spaces, in every variety of form and condition. To account for the phenomena of meteors as above described, we must suppose that there are both detached masses, each revolving in an independent orbit, and giving rise to *sporadic* meteors; and also connected systems, forming rings or zones round the sun. The intersection of the earth's orbit by such zones or streams, would account for the periodic swarms of meteors; and if we suppose the asteroids composing it to be irregularly grouped, we see a reason why the same stream should not be always of equal intensity. There may even be periodicity in this respect too. Between 1799 and 1833—the two most brilliant manifestations of the November stream on record—there elapsed 34 years; and Olbers has predicted that the next brilliant appearance will be in 1867.

We have not space to enter upon such questions as—What causes the luminous and ignited condition of aërolites? The height at which many meteors are seen, puts the action of the atmosphere in causing ignition out of the question, and the terrestrial magnetism has been suggested as the exciting cause. As to those meteors unattended by aërolites, we may suppose that they are merely deflected from their path by the proximity of the earth, are rendered luminous through a short arc, and continue their course with altered orbit. But we are not to assume, that where no precipitation of matter from meteors is visible, none takes place; it may escape observation, or may be dissipated in impalpable powder.

An accumulation of accurate observations is necessary for the positive solution of these and many other questions on the subject; and much has in recent times been done in this way. Formal catalogues of remarkable meteors have been made by M. Quetelet, and others; a series of continuations of M. Quetelet's catalogue, by Professor Baden Powell, is contained in the Reports of the British Association for the years 1847–51. The series of observations on shooting-stars made by MM. Coulvier-Gravier and Saigey between 1841 and 1845, presents some remarkable facts. The result of 1054 hours of observation, gives 6 as the mean number of meteors visible in an hour. The number gradually increases as the night advances: from six to seven o'clock, it is 3·3; from two to three o'clock in the morning, it is 7·1; and from five to six o'clock, it is 8·2. There is also a singular disparity between the first six months of the year and the last; the mean number in the former being 3·4 an hour, and in the latter 8.

Chladni, *Uber Feuer-Meteore*, Vienna, 1819; Humboldt's *Cosmos;* The *Annuaire* for 1836; *Recherches sur les Etoiles Filantes*, par MM. Coulvier-Gravier et Saigey, Paris, 1847; *Quarterly Review*, No. clxxxiii.

AERONAUTICS. From two Greek words, signifying *sailing in air*. [See Balloon.]

AEROSTATICS, AEROSTATION, derived from two Greek words signifying, *standing in air*, is the science which teaches the equilibrium of bodies supported in air, gas, or vapour. For every essential point not explained in Hydrostatics, refer to Barometer, and Balloon.

ÆSCHINES, commonly called the *Orator*, to distinguish him from another of the same name, was born at Athens B.C. 389. At this period of Athenian history, orator and statesman may be considered as almost synonymous terms, for, without some superiority in the art of speaking, it was impossible to attain any great eminence in political life. In all communities of a democratic character, the power of public speaking, which too often includes the power of deceiving large numbers, has been to the adventurer one of the surest passports to political eminence, and to a people one of the causes of national misfortune: sophistry and words have often had the victory over honesty and wisdom. These remarks are suggested by reflecting on the history of Æschines and his rival Demosthenes, both of whom elevated themselves by their oratorical talents to the most prominent stations in the Athenian democracy; and though they have, by mutual recrimination, cast grievous imputations on the character of each other neither of them has been so fortunate as to free himself from the well-grounded suspicion of political, if not private, dishonesty.

The name of Æschines' father was Atrometus. According to the account of his enemies, he had been a slave, and had obtained his freedom, but his son asserts that he was a true-born Athenian. However this may be, he was poor enough to be a schoolmaster, with which Demosthenes upbraids his rival as if it were a low and sordid profession. 'While a boy,' says Demosthenes, 'thou wast brought up in great poverty, attending thy father in the school, making ink, cleaning the benches, and sweeping the school,—occupations such as befit a slave, and not a free-born youth.' The imputations which this great proficient in the art of abuse cast on the mother of Æschines were of a still less equivocal character. Æschines, when he was a little older, if we trust the testimony of Demosthenes, became a kind of clerk to some of the inferior magistrates, an occupation perhaps not unlike that of a clerk to a country justice. His next step was somewhat bolder: having a good voice and a fine person, he tried his fortune on the stage, though his success was probably not great. Whether he stepped from the stage direct into the more busy theatre of public life, we do not know; but he did finally come forward, though not at an early age, as a public man. Æschines had two brothers, one of whom, Philochares, like himself, had been a clerk or secretary; the other, Aphobetus, is said by Demosthenes to have got his living by painting alabaster vases or vessels; but Æschines denies this too. Demosthenes asserts that Æschines and Philochares served also as *public* clerks for two years. By having discharged his functions as a clerk, and having been in the service of the orators Aristophon and Eubulus in some similar capacity, he had acquired some knowledge of the laws of his country. In short, he was a bold adventurer, gifted with many of those qualities that are calculated to ensure success in the dubious game of political warfare.

Only three orations of Æschines are extant, all of which relate to important events in his public life. He was accused by Demosthenes, one of his fellow ambassadors, of malversation and corruption in his second embassy to King Philip, the object of which was to obtain Philip's ratification of the treaty of peace, and to this attack he replied in his oration entitled 'On Malversation in his Embassy.' Timarchus, a friend of Demosthenes, had joined in the attack on Æschines; but the orator speedily rid himself of this adversary by prosecuting him for a disreputable course of life. Æschines gained his cause, and Timarchus, according to some accounts, concluded the affair by hanging himself. The oration on this subject is called 'Against Timarchus.' The delay caused by the prosecution of Timarchus deferred the prosecution of Æschines till about three years after his return from the second embassy, which was no doubt favourable to the accused, as it tended to destroy the popular feeling against Æschines, who finally escaped from a verdict against him. The third oration is entitled 'Against Ctesiphon,' but is, in fact, an attack on Demosthenes, who replied in his famous oration called 'The Crown.' The pretext on which Æschines attacked Ctesiphon was this:—For some public services which Demosthenes had rendered to the state, it was proposed by Ctesiphon that he should receive a golden crown, but this proposition was considered by Æschines to contain clauses contrary to existing laws. He also denied the claim of Demosthenes on the ground of public services. As early as B.C. 338, Æschines had declared his intention to prosecute Ctesiphon, but the cause was not tried till B.C. 330, after the death of Philip, while Alexander was in the midst of his Asiatic conquests. Æschines lost his cause, and not having obtained one-fifth part of the votes of the jury, he was compelled to leave Athens, being unable to pay the penalty in that case required by the law. He retreated to the island of Rhodes, where, it is said, he resumed the profession of his earlier days, by opening classes for instruction in elocution, and became the founder of a school of eloquence. He is said to have died at Samos, B.C. 314.—[See DEMOSTHENES.]

To convey by description any exact idea of the style of this or any other great orator, we feel to be almost impossible; and, instead of a number of general remarks, which might only mislead, we must refer our English readers to the translations of Æschines, inadequate as they are, and as all translation must be, to reflect a faithful image of a language no longer spoken in its purity, and of a train of events belonging to a different system of social life. The Greek and Roman critics considered the Rhodian school of eloquence, of which Æschines was the reputed founder, to be characterized by a happy mean between the florid Asiatic and the dry and more sententious Athenian style. To us, of the present day, the style of Æschines appears distinguished by great perspicuity and correctness of language. His narrative and descriptive powers deserve high praise, nor are we disposed to undervalue his powers of abuse, though in this he falls far below his great rival. We have the strongest testimony to his *personal* qualifications as an orator, in the reluctant, but unambiguous manner in which Demosthenes acknowledges his own inferiority.

There are numerous editions of Æschines: the latest and best, as far as the mere text is concerned, is included in Bekker's edition of the *Attic Orators*, Oxford, 1822. One of the best editions of Æschines alone is by J. H. Bremius, 1824, 2 vols. 8vo. The Abbé Auger translated the orations and letters of Æschines into French, and inserted them in the second volume of his *Demosthenes*. The oration of Æschines against Ctesiphon, or rather against Demosthenes, together with the reply of Demosthenes, was translated into Latin by Cicero; there is an English translation of Æschines's oration by Portal and Leland.

There are twelve letters extant attributed to Æschines, the genuineness of which, we fear, would not stand the test of a thorough examination. It was usual, in the latter ages of Greek literature, for rhetoric masters to employ themselves on fictions of this kind.

ÆSCHINES the *Philosopher* was one of the scholars of Socrates, and, as the story goes, the son of a sausage-maker. Three dialogues, still extant, that have usually gone under his name, after passing through the furnace of modern criticism, have been declared not to be written by him. The language of these dialogues proves them, however, to belong to an age when Greek was still written with great purity.

Æ'SCHYLUS, the son of Euphorion, and a native of Eleusis in Attica, was born about B.C. 525, and died in Sicily probably about B.C. 456. As the great father of the Athenian drama, Æschylus occupies one of the most prominent places in the history of the literature of his country Like most of the great writers of antiquity, however, the particulars of his life that have come down to us are few and unimportant, with the exception that the warrior-poet fought bravely in the great struggles against the power of Persia, in the battles of Marathon and Salamis. In the later years of his life he visited the court of Hiero, king of Syracuse in Sicily, who, being a patron of poets and learned men, had collected around him the most illustrious writers of that day, such as Pindar and Simonides. An odd story is told of the cause of the poet's death: an eagle that was carrying off a tortoise let it fall on the great dramatist's head, mistaking the bald pate, as the story rather humourously concludes, for a stone.

Seven tragedies of Æschylus, out of a very large number that he wrote, still remain, entitled, respectively, *The Prometheus Bound; The Seven against Thebes; The Persians; The Female Suppliants; The Agamemnon; Choëphori* (libation-bearers); and *Eumenides*, or *Furies*. The three last form a continuous drama or *action*, which contains (1) the return of Agamemnon from Troy, and his murder by his wife Clytemnestra; (2) the revenge of Orestes, the son of Agamemnon, who kills his mother and the adulterer Ægisthus; and (3) the persecution of Orestes by the Furies, and his release therefrom by the sentence of the high court of Areopagus at Athens, and the casting vote of Minerva. It was usual with the candidates for the dramatic prize at Athens to write three tragedies on some connected subject, to which they added a fourth, called a satiric drama, on some subject treated in a tragi-comic style. The *Prometheus Bound* of Æschylus belongs to a set of this description, for we know that there was a play entitled *Prometheus the Fire-stealer*, and a third named *Prometheus Loosed*.

The Greek drama, in its origin, consisted simply of a chorus or company, who celebrated the festivals of some deity or hero by appropriate songs and dances. The introduction of a personage to tell some story or history was an innovation, and the connecting this narrator more closely with the chorus was a still further step towards the *drama*, a Greek word which signifies *an action*, or, in its more technical sense, *the representation of a series of events ending in some striking catastrophe*. But Æschylus carried improvement still further, by introducing a second speaker, and thus making the *dialogue*, as it really is, the *essential* part of tragedy. To the chorus, however, Æschylus still allowed a great degree of importance, as we may see from his extant plays, in which the choral songs occupy a large part. He added also to stage effect by improving the dress of the actors, and giving them masks: in this latter respect our notion of good acting, which requires the expression of the countenance to be seen, is at variance with the usage of the Athenian stage. Our practice of painting faces comes nearer to that for which the invention of Æschylus was a substitute; for we are told that Thespis, his predecessor, went about the country in a waggon, and daubed the faces of his company with lees of wine.

It is difficult to convey an exact idea of the character of Æschylus as a dramatist, to those who have not read the original. The plot or plan of his plays is exceedingly simple; the personages are few in number, and the events follow one another without any complexity or occasioning any great surprise. His language is always forcible, and the dialogue clear where the Greek text has escaped damage; but unfortunately, in the frequent copyings to which the works of ancient writers have been subjected, they have often suffered serious injury, and few have sustained more corruption than the plays of Æschylus. In consequence of this, the choral parts are often exceedingly obscure, and this obscurity is increased by the wild, unrestrained, and gigantic conceptions of the poet, which seem as if they often strove with the imperfections of language, and endeavoured to find utterance by a superfluity of expression, a heaping together of strong epithets, and the use of long compound words. In spite of these defects, which often make the poetry of Æschylus border on bombast, and afforded a fair subject of ridicule to Aristophanes in his play called the *Frogs*, we may often admire in this noble writer a real sublimity of conception, a boldness of imagination, and a power to paint what is grand and terrific in language, that for force, simplicity, and truth, we can venture to say, has never been surpassed. The English reader will get a very good idea of the poetry of Æschylus from Professor Blackie's translation of the trilogy beginning with the *Agamemnon*.

The play of the *Persians* derives a peculiar interest from being the only extant Greek tragedy which treats of a subject contemporaneous with the age of the writer. It was written or acted probably about eight years after the battle of Salamis, and may be considered as the most durable monument, created by Grecian genius, to commemorate the defeat of the Asiatic invader. The poet writes as he fought, with a noble spirit of patriotism, such as animates every brave man's bosom when he sees an invader dare to tread on the hearth of his beloved home. Æschylus is one of those brilliant examples from antiquity, in modern times but rarely seen, of a man whose greatness in *action* was accompanied by an equal greatness of *intellectual* powers.

There are numerous editions of the works of Æschylus. The first was printed at Venice in 1518, 8vo., in the press of Aldus, after his death; but the *Agamemnon* and *Choëphori* are both incomplete in this edition, and what there is of the *Agamemnon* is oddly enough tagged to the *Choëphori*, which has lost its beginning; consequently this edition contains only *six* plays. Perhaps the best edition of the text of Æschylus is by Wellauer, 2 vols. 8vo. 1823. An English metrical version of Æschylus, by Potter, was published in 1777. There are several other English translations, either whole or partial. Among German translators may be mentioned Voss and Droysen. William Humboldt's translation of the *Agamemnon* is highly spoken of.

ÆSCULA'PIUS, or more properly, according to the Greek form of his name, ASCLE'PIUS, was the god of medicine in ancient mythology. Agreeably to the intricacy and confusion which prevails on that subject, several Æsculapii are said to have existed; and it would not be easy to determine whether tradition really pointed to so many distinct persons, or had merely handed down different versions of the parentage of the same man. Cicero mentions three: the first, son of Apollo, invented the probe, and the art of bandaging wounds; the second, son of Mercury, was struck dead by lightning; the third was of mortal parentage, son of Arsippus and Arsinoe, and first practised purging and tooth-drawing. The Egyptians also had their Æsculapius (as the Greeks call him), the son of Hermes. Of these the son of Apollo was by far the most celebrated. It is he who was worshipped in splendid temples at Epidaurus, Cos, &c.; and it is to him that the tales current among the poets and mythologists refer. Of the most important of these we proceed to give a brief sketch.

Asclepius was the son of Apollo by Coronis, daughter of Phlegyas. His mother, having succeeded in concealing her pregnancy, exposed the child upon Mount Myrtium, afterwards called Titthium, in Argolis, near Epidaurus. A shepherd, missing his dog and one of his goats, sought the wanderers throughout the country; and at last found them, the dog keeping watch over a child enveloped in flames, which the goat was suckling. The herdsman, 'thinking that it was something divine,' and being frightened, went away; but he spread the marvel abroad, and it was soon noised over all the globe, that Asclepius could heal every disease, and, besides, bring the dead to life.

Another version of the story says, that Apollo, in a fit of jealousy, having caused the mother's death, the unborn child was snatched by Mercury (or, according to Pindar, by Apollo himself) from her funeral pile. This circumstance may be connected with the other story, which assigns the parentage of Æsculapius to Mercury.

According to Pindar, Apollo sent the child to be educated by the Centaur Chiron, who instructed him in medicine, as at an after-period he did Achilles. Having reached manhood, he went with Castor and Pollux on the Argonautic expedition. Returning to Greece he practised with eminent success, not merely curing all diseases, but recalling the dead to life. Among others, he did this service to Hippolytus, son of Theseus. The gods regarded this as an invasion of their privileges, and at last Zeus (or Jupiter) struck the bold practitioner dead with lightning, in consequence of a complaint lodged by Pluto, that the infernal regions were entirely depopulated by these new proceedings. Apollo revenged the death of his son by killing all the Cyclopes who forged thunderbolts for Zeus. Finally Asclepius was raised to heaven, and made a constellation, under the name of Ophiuchus, the serpent-holder; though some say that Ophiuchus is Hercules.

In the later ages of paganism, when scepticism was very prevalent, and it was the fashion to see allegory in every mythological story, the whole was thus explained: Æsculapius signified the air, the medium of health and life. The sun was his father, because the sun, shaping his course agreeably to the changes of the seasons, produces a healthy state of the atmosphere. The same spirit is visible in the names given to his daughters, which all but one bear reference to the father's art: Hygieia, health; Panakeia, universal remedy; Iaso, healing; Aigle, splendour.

In Greece, the original seat of Asclepius's worship was in the neighbourhood of his birth-place, at Epidaurus; where a splendid temple was erected to his honour, adorned with a *chryselephantine* (gold and ivory) statue, half the size of the statue of Olympian Jupiter at Athens. He was represented sitting; one hand holding a staff, the other resting on a serpent's head; a dog couched at his feet. In coins and other ancient remains, he is commonly seen with a long beard, holding a staff with a serpent twined about it. Often, he is accompanied by a cock; sometimes by an owl. The cock was commonly sacrificed to him, as is familiarly known from the last words of Socrates, as reported by Plato, 'Criton, we owe a cock to Asclepius.' These animals seem meant to typify the qualities which a physician should possess; the owl being emblematic of wisdom, the cock of vigilance, the serpent of sagacity, and, besides, of long life. The latter was especially sacred to Asclepius. At Epidaurus there was a peculiar breed of yellowish-brown snakes, of large size, harmless, and easily tamed, which frequented the temple, and in the form of which the god was supposed to manifest himself. In this shape he was conveyed to Sicyon, and at a later period, B.C. about 400, to Rome, when that city, being afflicted by pestilence, sent an embassy, at the command of an oracle, to fetch Asclepius to their help, with due respect. On the ambassadors being introduced into the temple, a serpent came from under the statue, and glided through the city, and on board their ship. This, of course, was the god, who, in this bodily shape, signified his willingness to accompany them. Arriving in the Tiber, he swam ashore to the island upon which his temple afterwards was built. A few inscriptions have been found in this island relating cures, and the means employed. The means are of such a nature that the cures must have been impostures, or have been wrought by the force of imagination: most likely the former. It was customary to place similar inscriptions in all temples of Asclepius. At Epidaurus, there were stones in the sacred precinct, erected in commemoration of cures performed by the god, recording, in the Doric dialect, the names and diseases of the patients, and detailing the method of cures employed. Six of these remained when Pausanias visited the place; and, besides, an ancient pillar, commemorating the gift of twenty horses by Hippolytus, in gratitude for his restoration to life. Similar testimonials of superstition may still be seen even in our own country. At least such did exist, a few years ago, at the well of Holywell, in Flintshire.

Of the extent of Asclepius's knowledge, and of his method of practice, or rather of that which prevailed in the early ages before the Trojan war, we know little. His sons, Machaon and Podalirius, who fought before Troy, and are often mentioned in Homer, seem only to have meddled with external injuries. Pindar, in a passage of rather doubtful meaning, seems to confine the father's skill within the same limits, when he speaks of him as healing those afflicted with self-produced ulcers, wounds from brass or stone, or injuries from summer heat, or cold. His remedies, on the same authority, were incantations, soothing drinks, external applications, and the knife. There is a remarkable passage in which Plato (Rep. iii. § 14), inveighing against the effeminacy of his own times, contrasts the attention of physicians to diet, exercise, &c., with the negligence of the sons of Asclepius in these respects; quoting a passage from Homer, in which Machaon, returning from battle severely wounded, partakes immediately of a mess of meal and cheese, mixed up in strong Pramnian wine (Il. Λ. 639.) He continues, that it is not to be supposed Asclepius failed through ignorance to teach his sons *gymnastic medicine*, by which he means diet, exercise, and every sort of care by which a weak constitution can be strengthened; but rather that the god meant medicine to profit those only who had some accidental ailment, but sound constitutions. This was the reason that Machaon and Podalirius paid no attention to their patients, except to dress their wounds; if the men were sound, wine and cheese would not hurt them; if not, let them die, and make room for better men. The argument is well suited to the general tenor of Plato's book: a simpler inference is, that Asclepius did not give precepts relative to diet, and the treatment of internal diseases, because he knew nothing about the matter. The passage is, at least, good evidence as to what the Asclepian practice was supposed to be in Plato's age. Gymnastic medicine was introduced by Herodicus, B.C. about 440.

For some centuries after the Trojan war, medical science, if it deserves that name, seems to have been confined to the temples of Asclepius, in which his descendants, the Asclepiadæ, who formed the priesthood, were alone allowed to practise until, in later times, pupils were admitted into the brotherhood, having been solemnly initiated, and sworn to conform to its rules. Probably they made a large profit of the credulity of their patients. Their presumed impostures have been roughly handled by the Athenian comic poet Aristophanes in his play of the Plutus. The most celebrated temples, besides that at Epidaurus, were those of Rhodes, Cnidos, and Cos, where Hippocrates, a native of the island, is said to have profited by the records preserved in the temple. Croton and Cyrene also possessed schools of medicine. The practice seems to have been intended chiefly to work on the imagination. The god often gave his own prescriptions in dreams and visions, and the patients were to be prepared by religious rites for this divine intercourse. Bathing, abstinence, and tranquillity, assisted by a confident hope of benefit, may often have produced very beneficial effects; and, in a long course of experience, it is more than probable that some valuable knowledge of symptoms and remedies must have been collected. Of the progress which the Asclepiadæ appear to have made, we shall speak more fully under the article Hippocrates.

Æ'SCULUS, or the HORSE-CHESTNUT, is a genus of plants belonging to the natural order Sapindaceæ. It consists of trees found in the temperate parts of America and Asia, remarkable for the beauty of their flowers and leaves, and for their forming in some sort a type of tropical vegetation in northern latitudes. It must not be confounded with the Æsculus of the Romans, which was a kind of oak. See Quercus. The best known species is the *common horse-chestnut*, Æsculus Hippocastanum, a very handsome timber tree, formerly much used for avenues, and still extensively planted wherever round masses of wood, or gay flowering trees, are required. Its bark and its nuts are also among the more useful products that the hardy trees of this climate afford. It is very singular that the native country of this species should be unknown. One writer says it inhabits the northern parts of Asia; another, that it is found in the cold provinces of India; and a third assigns it to the mountain chains of Asia Minor; while all the positive information that books really afford is, that it was brought to Vienna from Constantinople in the beginning of the sixteenth century, and was thence dispersed through all Europe. No trace of it has been met with by the botanists who have explored Nepal and the Himalaya mountains; so that India may be considered as certainly not producing it, although plants resembling the horse-chestnut (see Pavia) have been detected by Dr. Wallich, Mr. Royle, and others, among the noble vegetation of that Indo-Siberian region. It is more likely that some of the almost unknown provinces, lying between Casbin in Persia and Balk, will prove to be the native country of the species in question. The popular name of *horse*-chestnut has arisen from the custom among the Turks of grinding the nuts and mixing them with the provender given to horses that are broken-winded. Starch is also yielded in very considerable quantity by the nuts; but they are not used in the preparation of the starch of commerce. They contain, moreover, so large a quantity of potash as to be a useful substitute for soap; on the latter account, they were formerly employed extensively in the process of bleaching yarn, but are now seldom used. The powder of the dried nut excites sneezing; the bark, which contains a great deal of tannin, is not a bad substitute for Peruvian bark in fevers; and, finally, the starch of the nuts, deprived of its bitterness by maceration in weak ley, has been recommended as excellent nutritious food for horses, goats, oxen, and sheep. The general characters of the horse-chestnut are too well known to require description. As a forest tree, it is well adapted to light lands, upon which it will thrive, although they may be very sterile; in tenacious clay, it is always stunted and unhealthy, as in the Regent's Park; in rich alluvial soil, it acquires its greatest beauty. The timber is soft and spongy, and therefore of little value. There are no very old specimens in this country, the species having been introduced, as it is said, only in 1629; one of the most ancient is yet growing opposite the Roebuck Inn, in the village of Lewisham, in Kent, of which the following is a view.

[Æsculus, or the Horse-Chestnut.]

Many varieties of the horse-chestnut are cultivated by gardeners, such as the gold-striped and the silver-striped; but they are not worth culture.

A second species, the *Æsculus Ohiotensis*, is found wild in North America, on the banks of the Ohio, between Pittsburg and Marietta. In stature it varies from ten to thirty-five feet; and differs from the common kind in having larger and much more undulated leaves. In America, it flowers very early in the spring, producing large bunches of blossoms of a pure white. [Loudon does not agree with Dr. Lindley in considering this as a distinct species.]

Besides these, a third species, *Æsculus carnea*—or, as it is sometimes called, *Æsculus rubicunda*, or *rosea*—is occasionally met with in gardens. Its origin is doubtful; it differs from the common horse-chestnut in not attaining so large a size, and in having deep rose-coloured blossoms of striking beauty. For all purposes of ornament, this is much superior to the common kind.

Under the genus Æsculus it is customary to include the *buck's-eye chestnuts* of North America; but, as these species have a peculiar habit, and a fruit the surface of which is destitute of the spines with which the shell of the horse-chestnuts is armed, they are now distinguished by the generic name of Pavia, which see.

The two first species of horse-chestnut are propagated by sowing their seeds either in the autumn at such a depth below the surface as to be secure from the attacks of mice, or else in the spring; but in the latter case they must be preserved during the winter in heaps of sand. The seeds should not be placed less than six inches apart in the beds, because the leaves are so large as to require more than usual space to expose themselves to light. The last species, and the varieties of the first, not yielding seeds, are multiplied by budding upon the common horse-chestnut.

ÆSO'PUS, now commonly called Æsop, a Grecian author, who lived about the middle of the sixth century

B. C., contemporary with Solon and Pisistratus. He is usually acknowledged as the inventor of those short moral fictions to which we especially appropriate the name of fables. The popular stories of him are derived from a Life, written and prefixed to a collection of Fables, bearing the name of Æsop, by Maximus Planudes, a Constantinopolitan monk, about the middle of the fourteenth century. This contains a distorted view of the few incidents in his history which can be said to be known, mixed with a long series of dull buffoonery, and improbable or impossible adventures, and represents Æsop himself as a monster of personal deformity, apparently for the sake of contrasting his wit and acuteness with his bodily defects. This life is now given up, by general consent, as totally unworthy of credit; yet Æsop's ugliness is still commemorated in almost every account of him, although it depends for its acceptation solely, as we believe, on the justly-contemned authority of Planudes, and probably was devised to attract readers by a strong dose of the marvellous. There is no allusion to these personal peculiarities in any classical author, and strong negative reasons have been urged for believing that none such existed. See *Bentley's Dissertation upon Æsop*, subjoined to that upon Phalaris.

Rejecting these idle and vulgar fictions, if we seek for information in elder writers, there is little to be found relating to the personal history of Æsop. The place of his birth, like that of Homer's, is matter of question; Samos, Sardis, Cotiæum in Phrygia, and Mesembria in Thrace, laying claim alike to that honour. The early part of his life was spent in slavery, and the names of three of his masters have been preserved: Dinarchus, an Athenian, in whose service he is said to have acquired a correct and pure knowledge of Greek; Xanthus, a Samian, who figures in Planudes as a philosopher, in order that the capacity of the slave may be set off by the incapacity of the master; and Iadmon, or Idmon, another Samian, by whom he was enfranchised. He acquired a high reputation in Greece for that species of composition which, after him, was called Æsopian, and, in consequence, was solicited by Crœsus to take up his abode at the Lydian court. Here he is said to have met Solon, and to have rebuked the sage for his uncourtly way of inculcating moral lessons.

He is said to have visited Athens during the usurpation of Pisistratus, and to have composed the fable of Jupiter and the Frogs for the instruction of the citizens (Phædrus, 1. 2). Being charged by Crœsus with an embassy to Delphi, in the course of which he was to distribute a sum of money to every Delphian, a quarrel arose between him and the citizens, in consequence of which he returned the money to his patron, alleging that those for whom it was meant were unworthy of it. The disappointed party, in return, got up a charge of sacrilege, upon which they put him to death. A pestilence which ensued was attributed to this crime, and in consequence they made proclamation at all the public assemblies of the Grecian nation, of their willingness to make compensation for Æsop's death, to any one who should appear to claim it. A grandson of his master Iadmon at length claimed and received it, no person more closely connected with the sufferer having appeared. This singular tale rests on the authority of Herodotus, and as it must have taken place, if not within his own knowledge, at least within the memory of many with whom he might have conversed, we cannot doubt the truth of the relation.

The time of Æsop's death is uncertain. Some place it as early as the 53d Olympiad, about 565 B.C. If, however, there be any truth in the scattered notices which we have combined, he was at Athens during the usurpation of Pisistratus, and met with his death in the service of Crœsus, and, therefore, before the capture of Sardis and fall of the Lydian kingdom. This, according to Newton's chronology, would fix his death in the 57th or 58th Olympiad, between the years 550 and 544 B.C. The Athenians erected a statue in his honour, from the hand of the celebrated sculptor Lysippus.

There is abundant proof that fables, passing under the name of Æsop, were current and popular in Athens during the most brilliant period of its literary history, and not much more than a century after the death of the supposed author. The 'drolleries of Æsop' (*Αἰσωπικὰ γελοῖα*) are mentioned by Aristophanes in terms which lead us to suppose that they were commonly repeated at convivial parties. Socrates, in prison, turned into verse 'those that he knew;' and Plato, who banishes the fictions of Homer from his ideal republic, speaks with high praise of the tendency of those of Æsop. Demetrius Phalereus made a collection of Æsopean fables; and we hear of two metrical versions of them, of still later date, one by an anonymous author, the other by Babrius. Phædrus published a collection of fables in Latin verse, in the time of Tiberius, the materials of which he professes to have taken from Æsop; and it is not improbable that the nearest approach to the substance of the original apologues may there be found. There is another collection, written in elegiac verse, in the fourth century, by Avienus.

There is no ground whatever for believing that the Greek prose fables, which pass under the name of Æsop, are really of his composition, at least that they came from his hands in their present state. Those which are substantially the same with the fables of Phædrus, the oldest to which we can assign a certain date, may be believed, for the reasons already assigned, to have originally emanated from the Grecian author. The total number of them is about 290 or 300, and they may be divided into two principal parcels: those published by Planudes, in number 144, which contain internal evidence that, as far as composition is concerned, they are of late date, and probably written by Planudes himself; and a second collection, of 136, first published in 1610 by Neveletus from manuscripts at Heidelberg. It is to be observed that not one of these MSS. contains the fables published by Planudes; and that the editor expresses his belief that they are the work of different hands. Some he attributes to the monks, because they contain allusions to the monastic life; which is, at least, sufficient evidence of their late date. This edition, which is a sort of *corpus fabularum*, contains 297 fables ascribed to Æsop, and 40 of the rhetorician Aphthonius, who lived in the third century; besides various metrical versions in Greek and Latin.

The eastern philosopher and fabulist Lokman is supposed by many to have been the same person as Æsop. The former, by the Mohammedan authorities, is made contemporary with David and Solomon; but his history is too uncertain for us to speculate upon it. It is, at least, certain that the same fables are to be found current under the names of each, and that the correspondence between their personal histories, as commonly told, is too close to be entirely accidental. [See BABRIUS, LOKMAN.]

ÆSTHE'TICS (*Æsthetik*) is the designation given by German writers to a branch of philosophical inquiry, the object of which is a philosophical theory of the beautiful, or, more definitely expressed, a philosophy of poetry and the fine arts, and which has by them been raised to the rank of a separate science. The word *Æsthetik* is derived from the Greek verb *αἰσϑάνομαι*, (I feel, or I am sensible,) and was first used as a scientific term by Alexander Baumgarten, a disciple of Christian Wolf, who in his *Æsthetica* (Frankfort, 1750-58, 2 vols. 8vo.) considered beauty as a given property of objects, of which we are *becoming sensible*. We perceive beauty, says Baumgarten, wherever we meet with perfection manifested in reality, and a thing is perfect if it is adequate to its notion: beauty, accordingly, is the perfectness of an object manifested in its appearance. The impulse to a deeper research into the essence of beauty was given by Winkelmann, who, without embodying his views in a regular system, developed them chiefly in reviewing and appreciating the remains of ancient sculpture. He adopted neither Baumgarten's 'adequateness of an object to its notion,' nor the sensual principle which had been proposed by Edmund Burke as the criterion of beauty; but considered the idea of beauty as dwelling in the divine mind, and as passing over from that source into individual objects. Kant denied the possibility of a strict science of beauty, inasmuch as beauty, according to him, is not a property of objects, but has its origin in the disposition of our mental faculties. We presuppose, says he, that some notion is contained in the apparent object, though we are unable abstractedly to express that notion; we assume that a tendency towards some purpose has presided over the formation of the manifold variety displayed before us, though we cannot precisely define that purpose,—and this supposition or assumption forms the basis of our perception of beauty. Schelling's view of beauty and art it is difficult to state concisely. His 'System of transcendental idealism' establishes the principle, that mind and nature, or conscious and unconscious existence, are primarily identical; that the laws discoverable in nature must accordingly be traceable to the laws of consciousness, whilst, *vice versâ*, the laws of consciousness must admit of being recognized as being likewise the laws of nature: in the divine mind both exist in absolute identity. The artist is to produce in his mind an intellectual intuition analogous to this identity, and the expression which he gives to the identity thus arrived at is the work of art. Beauty, according to Schelling, is that manifestation of the principle of art where the infinite appears contained in, or represented by the finite, or where, in the very object, the difference between the conscious and the unconscious (mind and nature) is annulled.

Hegel was the first to carry out this principle into a complete system. With him, as with Schelling, the beautiful is the ideal in the form of a finite phenomenon. The first manifestation of the beautiful, therefore, is the beautiful in nature and history. This beauty in nature is casual, transient, and mixed with what is ugly; a defect arising from its being unconscious. The beautiful in a conscious state exists in the sensuous mind or fancy. But fancy is merely inward; it must therefore embody itself, and this embodiment or realisation is art. The various arts are progressive stages, by which the mind works itself free of matter; architecture, sculpture, and painting are thoroughly material arts; music, less so; and poetry is the transition of the mind to pure thought. From this point of view, æsthetics is really a science of the whole kingdom of the beautiful, of which art is only a province.

The above meagre definitions may serve to characterise the points from which some of the principal German philosophers have started in their systems of æsthetics.

The following are some of the most popular German works on æsthetics:—Jean Paul's (F. Richter's) *Vorschule der Æsthetik*, 2d ed.; Stutgart, 1813. Bouterwek's *Æsthetik*, 2d ed.; Leipzig, 1815. Solger's *Erwin: vier Gespräche über das Schöne und die Kunst;* Berlin, 1815: and his *Vorlesungen über Æsthetik, herausgegeben von K. W. L. Heyse;* Leipzig, 1829. Hegel's *Æsthetik*, 2d ed. 3 vols., Berlin, 1843. Weisse's *System der Æsthetik;* Leipzig, 1830. Vischer's *Æsthetik;* Reutl., 1846. Ruge's *Neue Vorschule der Æsthetik;* Halle, 1837.

ÆSTUARY, a term sometimes used in geographical description, and generally in the sense of 'a wide opening at the mouth of a river, in which the tide rises and falls.' Thus, the outlet of the Mersey at Liverpool, that of the Humber at Hull, and the Solway Frith, may be called æstuaries. The name has been derived from a Latin word, *æstus*, which sometimes signifies 'a violent motion of the sea-water.'—[See Bay and Gulf.]

ÆTHER, or Ether, a term derived from the Greek, and used to signify a highly volatile, penetrating, and combustible fluid, several kinds of which may be produced by the action, directly and indirectly, of different acids upon alcohol (spirit of wine). The ether which was first known, and which is still most largely prepared, is the sulphuric ether, procured by distilling a mixture of sulphuric acid and alcohol. Although its name would imply the presence of sulphur or sulphuric acid, yet it contains neither of these substances, and therein differs from several of the other ethers, such as nitric ether, which retain a portion of the acid employed in their preparation as one of their essential constituents.

Till recently, sulphuric ether was obtained by simply distilling together alcohol and sulphuric acid. The process was as follows:—16 ounces of alcohol were placed in a retort, and an equal weight of sulphuric acid cautiously added, the mixture being at the same time occasionally shaken. A cooled receiver having been attached to the neck of the retort, the mixture contained in the latter was quickly raised in temperature. The operation was continued till about 10 ounces had distilled over, after which an additional 8 ounces of alcohol were poured into the retort, and the heat continued till the mixture began to froth, by which time about 9 ounces more ether had passed over. The product of distillation was a mixture of ether, alcohol, and water, and was treated with potash so long as that substance continued to be dissolved by it. A dense liquid was thus formed by the solution of the potash in the alcohol and water, and upon which the ether floated. The latter was poured into a retort, and about nine-tenths of it distilled.

The new process takes advantage of the fact, that whilst during the etherification of the alcohol the sulphuric acid plays an active part, yet when the final stage is reached, the acid remains comparatively unaltered. Five parts of alcohol, of at least 90 per cent., are placed in a glass or leaden still, and are mixed with 9 parts of sulphuric acid. The mixture is raised to the boiling-point, and kept at that temperature; whilst by means of a bent tube passing to the lower part of the still, more alcohol is allowed to flow into it in proportion to the volume of ether escaping from it by distillation. In short, for every drop of ether which escapes from the heated vessel, a drop of alcohol flows in to take its place, and thus the same level of liquid is kept up. It is necessary that the heated mixture be kept in a state of brisk ebullition, at a temperature about 300° F., and the additions of alcohol be made cautiously, so as not to lower the temperature; for should the boiling-point be reduced below 260° F., the alcohol distils over very nearly as pure as it flows in. If, on the other hand, the alcohol be not added in sufficient quantity, the acid will soon preponderate, and the result will be, that the temperature will rise to at least 320° F., and the alcohol, instead of passing over as ether, will escape principally as olefiant gas. Great care must therefore be taken that the conditions requisite to keep up a normal temperature of about 300° F. are fulfilled.

The ready passage of alcohol into ether appears at first sight a more simple matter than the recognised theory will allow us to believe. Both substances agree in so far as they are composed of—

Carbon . .	(symbol C), . . .	4 atoms,
Hydrogen .	(symbol H), . .	5 atoms,
Oxygen . .	(symbol O), . . .	1 atom;

and differ in the alcohol possessing over and above these an atom of water (symbol HO) chemically combined with them. This will be more apparent when they are represented symbolically:

Ether, . . .	C_4H_5O,
Alcohol, ...	C_4H_5O, HO.

Considering the very great affinity which sulphuric acid has for water, and the power which it has of robbing substances of any water which they may contain, it was natural to suppose, as the earlier chemists did, that in the process of etherification, the sulphuric acid converted the alcohol into ether, by *directly* withdrawing and retaining the atom of water; but although this is one of the final steps in the process, yet there are events of prior occurrence, which are necessary to a proper understanding of what takes place.

When alcohol and sulphuric acid are mixed in equal weights, raised to the boiling-point, and then cooled, an acid is produced, called the *sulphovinic*. If to the cold solution there be added chalk, a quantity of sulphate of lime precipitates, and on being filtered, a clear solution is obtained, which on evaporation and cooling deposits crystals of sulphovinate of lime. From this sulphuric acid can separate the lime, and thereby leave pure sulphovinic acid in the liquid. It is upon the formation, and thereafter the breaking up of this acid, that the modern theory of the formation of ether is based.

The process consists of two stages: the *first* is the formation of sulphovinic acid, which consists of ether, water, and sulphuric acid chemically combined, and expressed by the formula C_4H_5O, HO, $2SO_3$; and the *second* is the decomposition of this substance into ether, C_4H_5O, and hydrated sulphuric acid, HO, $2SO_3$. These changes, so very dissimilar, occur at almost precisely the same temperature; and when steady ebullition is kept up, they happen nearly simultaneously. The alcohol of commerce which is employed contains water as a dilutant, as well as that present in chemical combination; and during the first stage of the operation this water is detached, at the same time a portion of water which accompanies the sulphuric acid of commerce (HO, SO_3) is detached also. There is thus water in a free state present in the mixture, and as an atom of ether is evolved during the second stage, and rises through the liquid, it carries along with it an atom of water, although the ether and the water thus pass over together they are not chemically combined.

The *old* process involved a great loss of both alcohol and sulphuric acid, either from the temperature being too high or too low; but in the *new* method, the loss is reduced to a minimum. The latter has received the name of the *continuous* process, from the same quantity of sulphuric acid being, theoretically speaking, of service for an indefinite period.

The crude ether, as thus obtained, contains some alcohol, a little acid, and is much diluted by the presence of water. It is mixed with an alcoholic solution of potash, to neutralise the acid, and distilled in a vapour bath. Quicklime, or chloride of calcium, is then added, and after digestion for some days, the final distillation is performed. The product is sulphuric ether, still containing, however, a minute quantity of alcohol.

Ether is a colourless, transparent, limpid liquid, of a pungent, cooling, and sweetish taste, and a penetrating and pleasant odour; it is extremely exhilarating, and when its vapour mixed with air is inhaled by the nostrils, a remarkable kind of intoxication is produced. Its continued inhalation renders a patient insensible to pain; and this led to its being extensively used some years ago in surgical operations, for which chloroform is now preferred. [See CHLOROFORM in *Suppl.*] Ether is extremely volatile, and when poured from one vessel into another, a considerable portion of it evaporates. During evaporation much cold is produced, as may be experienced by letting some fall on the hand. This property may be better seen by dipping a small glass vessel containing water, and surrounded by cloth, repeatedly into ether, and allowing the ether to evaporate after each immersion, when the water in the glass will become frozen by the cold produced. In the open air, ether boils at 76° F., and in a vacuum at 20° below zero; were it not therefore for the pressure of the atmosphere, ether would always exist in the gaseous state. Its specific gravity at 60° is 0·725, water at the same temperature being taken as 1·000. The density of the vapour of ether is to that of atmospheric air about as 2·586 is to 1·000, consequently it is more than two and a half times heavier than ordinary air. Ether remains liquid even when exposed to a cold of 58° below zero, or 90° below the freezing-point of water. It is neither acid nor alkaline, is a non-conductor of electricity, and has a high refractive index. It combines sparingly with water, nine parts of the latter being only able to take up one of ether, but with alcohol it unites in all proportions. Ether and its vapour are very inflammable; and during combustion, water and carbonic acid are formed by the union of its carbon and hydrogen with the oxygen of the air. When allowed to diffuse itself through a jar containing oxygen or air, a gaseous mixture is formed, which explodes violently when an electric spark is passed through, or a light is brought near. For this reason, great care is taken in the manufactories where ether is prepared on the large scale, that no naked light is brought into the room where the ether is condensed; and to guard as much as possible against accidents, the still is heated by high-pressure steam.

Ether dissolves many of the resins, caoutchouc, several forms of extractive matter, the alkaloids, and the fixed and volatile oils. It likewise takes up minute quantities of iodine, bromine, sulphur, and phosphorus. The two latter may be obtained in small crystals by evaporating down the ethereal solutions. The solution of phosphorus becomes luminous in a dark room when poured on the hands or on hot water. The fixed alkalies, potash and soda, are insoluble in ether, but readily soluble in alcohol; and upon this difference of power depends the process of separating these fluids as already described. When ether is added to a solution of gold or platinum in an acid, the metals are dissolved by the ether, and the greater part of the acid is separated. These solutions have been employed for coating steel instruments, so as to protect them from rust. Ether is of great use to the analytical chemist when he is manipulating with many of the above-named substances, as it affords him a medium wherein these matters may be obtained in a state of solution. This remark applies more particularly to the analysis of oily or fatty substances, and to the detection of the alkaloids in cases of poisoning by them. Ether is also used as a medicine—internally, as a stimulant and antispasmodic; and externally, to produce cold by its evaporation.

It has been already stated, that the chemical composition of ether may be represented by the formula C_4H_5O. According to the more recent views, ether is regarded as a compound of an organic radical, called ethyle, C_4H_5, and oxygen. This ethyle, in all its relations, plays the part of a metal, and the several compounds which it forms part of, are in all respects analogous to those which every metal can in similar circumstances produce. Besides being known by the formula C_4H_5, ethyle has the arbitrary symbol of Ae given to it; so that its oxide, ether, is represented by the symbol AeO. The latter corresponds to the oxide of a metal, by exhibiting the characters of a base and neutralising acids, although it cannot directly combine with them, nor produce compounds subject to the laws of double decomposition, like salts of inorganic bases. These salts are generally fragrant aromatic ethers, some of which are liquid at ordinary temperatures, and others solid. The following table contains the best known ethyle compounds:—

Ethyle, ...	C_4H_5.
Oxide of Ethyle, or *Ether*, . . .	C_4H_5O.
Hydrated Oxide of Ethyle, or *Alcohol*,	C_4H_5O, HO.
Chloride of Ethyle, or *Chloric Ether*,	C_4H_5Cl.
Nitrate of the Oxide of Ether, or *Nitric Ether*, ...	C_4H_5O, NO_5.
Acetate of the Oxide of Ether, or *Acetic Ether*, ...	C_4H_5O, $C_4H_3O_3$.

Ethyle, the radical of the series, may be obtained by acting on iodide of ethyle with zinc. It is of interest as the starting-point of the above class of substances, but is not put to any practical use.

Chloric ether is prepared by distilling a mixture of strong hydrochloric acid (HCl) (muriatic acid) and alcohol. It is a colourless liquid, of an agreeable odour and taste. Its specific gravity is 0·874, and it boils at 52° F. When treated with hydrosulphuret of sulphuret of potassium, it yields a substance called *mercaptan* (C_4H_5S, HS), which is analogous to alcohol, with all its oxygen replaced by sulphur. There is a bromide of ethyle or bromic ether, C_4H_5Br, and an iodide of ethyle or iodic ether, C_4H_5I; both of which are used in chemical research.

Nitric ether is procured when 2 parts of alcohol and 1 part of nitric acid are distilled, with the addition of a few grains of urea. The distilled liquid contains water, alcohol, and nitric ether. The latter is a dense oily substance, very soluble in alcohol, but insoluble in water, has an agreeable odour, and a sweet taste. This ether is quite colourless, has a specific gravity of 1·112, boils at 185° F., and burns with a bright white flame.

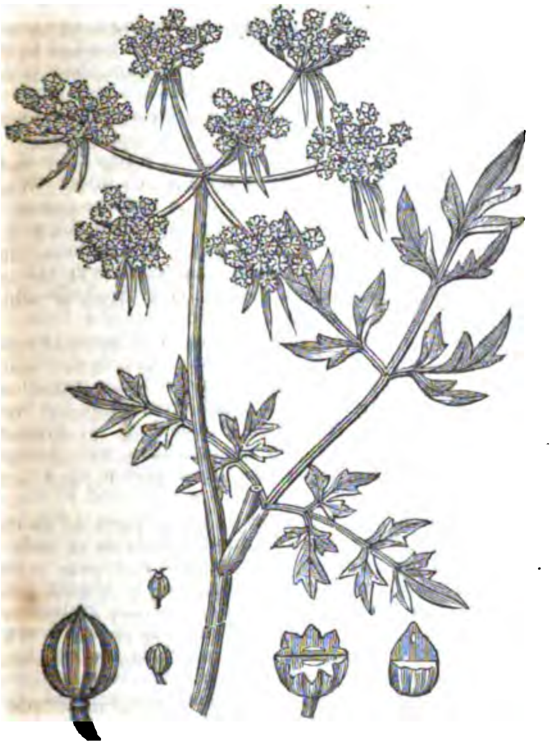
Acetic ether is prepared by distilling 6 parts of alcohol, 16 of sulphuric acid, and 10 of either acetate of soda or acetate of potash. The product is rectified over caustic lime and chloride of calcium. Acetic ether is a colourless fluid, with a most pleasant odour, and is very combustible. Its specific gravity is 0·89, and it boils at 165° F. When acted on by alkalies, it is decomposed, forming an acetate and alcohol.

Besides the ethers referred to, there are a multitude of others of less common occurrence, but many of which serve a purpose in the economy of nature. When wood is distilled in covered vessels, a spirit is obtained which, on distillation with sulphuric acid, yields an ether called *wood ether*, or methylic ether. From potatoes a spirit is obtained which, on distillation with sulphuric acid, gives *potato ether*, or amylic ether. When this ether is combined with acetic acid, a new ether is formed, having the very flavour which is given off by jargonelle pears, and is hence sold by druggists, and used by confectioners, under the name of *jargonelle-pear essence*, although this fruit is not at all used in the preparation of the ether. An acid called *butyric*, present in rancid butter, gives, on distillation with ordinary ether, a new ether, with a flavour in all respects resembling that of pine-apples, and accordingly it has been christened *pine-apple essence*. The flavour which accompanies the more esteemed wines and brandies, owes its existence to one or more etherial compounds being present; and there is no doubt that shortly it will be no difficult matter for the wine-manufacturer to impart to what are now called *inferior* wines that peculiar bouquet, which is so much esteemed in the older and richer ones.

ÆTHIOPIA. [See ETHIOPIA.]

ÆTHU'SA is a genus belonging to the natural order Umbelliferæ, which includes among its species one of the most poisonous plants known in Europe. As many fatal accidents have occurred from the incautious use of its leaves, we shall give a minute description of it, for the purpose of enabling our readers to recognise it with certainty.

Æthusa Cynapium is a little annual plant, found commonly in gardens and fields, resembling the Common Parsley so much, that it has acquired the vulgar name of *Fool's Parsley*. From a taper whitish root arises an erect branchy stem, about a foot high, generally stained with purple near the ground. This is covered by finely cut shining leaves of a deep green, much resembling those of Garden Parsley, from which they are known thus: in the *true Parsley*, the leaves are twice pinnated or divided, and the leaflets are broad, and cut into three wedge-shaped toothed lobes; in the *Fool's Parsley*, on the other hand, the leaves are thrice pinnated, and the leaflets are narrow, sharper, and jagged; besides which, the leaves of Fool's Parsley have a disagreeable nauseous smell, instead of the fine aromatic odour of Common Parsley. When in flower, Æthusa has its principal umbels destitute of involucra, while the partial umbels are furnished with an involucrum, consisting of four or five narrow, sharp leaves, hanging down *from one side only* of the common stalk; this last circumstance will distinguish it when in flower, not only from parsley, but from all other British umbelliferous plants.



[Æthusa Cynapium.]

Many dangerous accidents have occurred from mistaking this plant for parsley. In one case, a person, who had eaten with salad, died in little less than an hour; and in another instance on record, the patient, although the stomach was emptied at a very early period, sank gradually, and died at the end of a few days. The symptoms attendant upon poisoning by Æthusa are, swimming of the head, nausea, cold perspiration, and chilliness at the extremities. To counteract its effects, emetics are recommended, and the immediate use of weak vegetable acids, such as lemon-juice, vinegar, or sour wine.

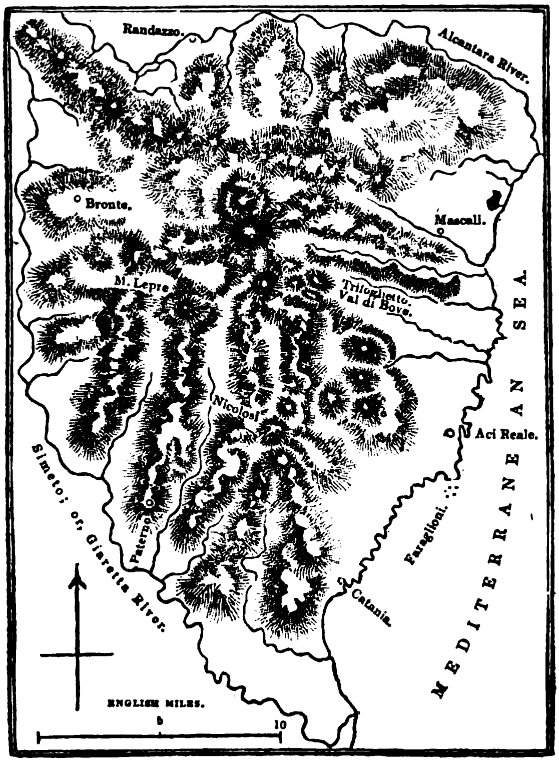
ÆTNA, a celebrated burning mountain, or volcano, in Sicily; it is situated in the north-eastern part of the island, close to the sea-coast, between the towns of Taormina and Catania, distant from one another twenty-five English miles, and is encircled on the north, west, and south by the rivers Alcantara and Simeto. It was called by the Arabs, after the conquest of the island, *Jebel en nar*, or 'Mountain of Fire:' the modern Sicilians call it Mongibello, which is evidently derived from the Italian *Monte* and the Arabic *Jebel*, both signifying mountain. The division of Sicily in which Ætna is situated is called Val Demone, in allusion to the popular notion that the mountain fires issue from the region of demons. It is the greatest volcano in southern Europe, and affords not only a most instructive field for studying that remarkable class of geological phenomena, but exhibits some of the most striking instances of the later revolutions which the crust of the earth has undergone, previous to the historical era; as well as of those changes which are in a constant state of progress, to a greater or less extent, on every part of the earth's surface. To convey a just idea of the structure of this remarkable mountain, it is necessary to begin with a brief sketch of the geological formation of the adjoining country. Sicily, and especially Ætna, has been described by many naturalists; but our information is derived chiefly from Lyell's *Principles of Geology*—a standard work, which contains comprehensive general views respecting this volcano.

The Val di Noto, or southern division of Sicily, is composed of a series of strata, belonging to what geologists term *the tertiary period;* that is, such as have been deposited while some of the species of animals now found in our seas were in existence; all the animal remains occurring in the strata that lie *under* the tertiary rocks belong to species of which there are now no living analogues. These strata in Sicily are associated with lavas and other volcanic products, but these last are not visibly connected with any source, as no volcanic vent exists in any part of the Val di Noto. The uppermost of the strata consist of limestone, full of shells, their united thickness being sometimes as much as 800 feet; beneath these comes a slaty sandy limestone with pebbles of limestone, then a blue marl containing numerous shells, called in Sicily *Creta*,—under that, a white laminated marl, and lowest of all, that is to say, the lowest discoverable, a blue clay containing much gypsum, sulphur, and sulphate of strontian, all of them often in beautiful crystals. The great limestone deposit is found at a considerable elevation in the very centre of the island; for the summit of the hill of Castro Giovanni, 3000 feet above the level of the sea, is composed of it. All the strata, except the lowest, abound in shells, and, what is truly remarkable, these shells, with very few exceptions, can be identified with species now living in the adjoining sea. Thus, as we find shells imbedded in the solid rock, at a height of 3000 feet above the Mediterranean, belonging to species inhabiting that sea at this moment, it follows, that those parts of Sicily must have been raised from the deep to that great elevation after the time when the Mediterranean became inhabited by many of the same species of animals as those now living in it. During the time that these strata were in the course of being deposited at the bottom of the sea, there must have been considerable volcanic activity in the same region, for layers of hard compact lava, and of that mixture of ashes and limestone called by the Italians *tufo* and *peperino*, are interposed between the calcareous and clay strata; and after the whole series had been consolidated, the mass must have been violently rent asunder, for there are cracks that traverse all the beds, and these are filled with hard lavas, presenting those appearances called *dykes* by geologists. That these strata were deposited gradually, and that long intervals occurred between the volcanic eruptions, is proved by the following remarkable fact. In the neighbourhood of Vizzini, which is twenty-five miles in the interior of the island, Mr. Lyell observed a bed of oysters, identifiable with our common eatable species, no less than twenty feet in thickness, resting on a current of lava, and covered by a second mass of lava and peperino.

The Val di Noto is separated from the Val Demone and the region of Ætna by the extensive plain of Catania, which is watered by the Simeto and its tributary streams. On the northern side of the plain, as we approach Ætna, we discover a low line of hills, which are composed of the *inferior* clay stratum of the Val di Noto, and the same argillaceous formation may be traced round the base of the mountain on the south and east, the strata dipping in various directions, sometimes *towards* the mountain, so that, in their prolongation, they would lie under the volcano. These sub-Ætnean strata do not rise in any part to a greater elevation than 1000 feet above the sea, and are usually much lower: in some places they are 300 feet thick without any mixture of volcanic matter; in others, as in the vicinity of Catania, they are composed of volcanic tufo, thinly laminated, and form there a steep inland cliff from 600 to 800 feet high, separated from the sea by a low flat, composed of recent lava and volcanic sand. The sea-cliffs, northward of Catania, are formed of the same sub-Ætnean marine strata, as are the rocky islands lying off this coast, the Faraglioni, the celebrated Cyclopean islands, hurled by Polyphemus against Ulysses and his crew. The largest of these is 200 yards from the land, about 300 in circumference, and 200 feet in height.

The summit and northern sides are formed of a mass of stratified marl, the laminæ of which are occasionally subdivided by thin arenaceous layers. These strata rest on a mass of lava, in regular basaltic columns, like the Giant's Causeway in Ireland, or Fingal's Cave in Staffa. This lava appears to have heaved up the stratified marly clay, for it is contorted in the most extraordinary manner, and is in some places hardened by the action of heat. These islands, therefore, have not been formed, as has been sometimes supposed, by a stream of lava from Ætna, for the lava of the islands underlies a stratum which underlies the volcano.

Such, therefore, is the nature of the soil from out of which the stupendous volcano has arisen. Whether it has been formed by successive eruptions subsequently to the elevation of Sicily above the level of the sea, the observations hitherto made do not enable us to decide; it is more probable that it was partly formed prior to that elevation, and rose at the same time; and it may have projected as a cone from the surface of the water, vomiting forth volcanic matter, as Stromboli now does. But this will be better understood when we have described the structure of the volcano as it now presents itself, and have given an account of some of the most remarkable eruptions.



[Plan of Ætna, from Captain Smyth's survey.]

The base of Ætna covers an area of nearly ninety miles in circumference; and, according to the measurement of Captain Smyth, the highest point is 10,874 feet above the level of the sea. Owing to this great elevation, the higher parts of the mountain have a climate almost as different from the valleys at its foot, as are the polar from the equatorial regions; and from this cause, together with the difference in the nature of the soil, there are three great natural divisions or zones in the mountain, the fertile, the woody, and the desert. The lowest is called the *Parte Piemontese*, merely expressing that it lies at the foot of the mountain: it is a beautiful, rich, and populous country, covered with luxuriant fields of corn, vines, and fruit trees. The limit cannot be very well defined, as it insensibly blends with the next, the *Regione Selvosa*, or the woody, which is covered by immense forests of chestnuts, oaks, beeches, and pines, forming a zone six or seven miles in width, the superior limit being about 6300 feet above the sea. The third and highest region, called the *Parte Scoperta*, the bare or desert, rises nearly 4600 feet higher. About 1100 feet from the summit there is an irregular plain, which, when Sir W. Hamilton visited it, about eighty years ago, was estimated to be nine miles in circumference, and from this plain rises the steep terminating cone, at the summit of which is the great crater or opening, continually throwing out sulphureous vapours. The dimensions of the crater have been very variously stated by different travellers, the circumference from two and a half to four miles, and the depth from 600 to 800 feet; but the height of the cone, the diameter of the crater and its depth, are liable to constant change from the eruptions. The cone has more than once fallen in and been reproduced: in the year 1444 it was 320 feet high, and fell in after the earthquake of 1537. In 1693, when a violent earthquake shook the whole of Sicily and killed 60,000 persons, the cone lost so much of its height, that it could not be seen from several places in Val Demone, where it was before visible. Although, taken as a whole, Ætna forms a cone which is in general of a very symmetrical form, when examined in detail it is found to be studded on its flanks, and particularly in the woody region, with numerous minor cones; small when compared with the great mass, but of a magnitude that would make them rank as mountains, if detached. One of the largest, called Monte Minardo, near Bronte, is upwards of 700 feet in height, and the Monti Rossi near Nicolosi are 450 feet high, and have a base of two miles in circumference, although ranked among the cones of the second magnitude. There are about eighty of these considerable cones, and they have all been produced by lateral eruptions of lava and ashes. By subsequent eruptions a cone is often surrounded by a lava stream or by ashes, and thus its height is diminished: a repetition of the process often causes its entire disappearance under the accumulated mass of new ejections. The sections exposed to view in many parts of the mountain show that the greater part of it has been formed in this way. The eastern side is broken by a deep valley of colossal dimensions, called the *Val di Bove*. This is a vast amphitheatre four or five miles in diameter, surrounded by vertical precipices, varying from 1000 to 3000 feet in height, and which, taken in connexion with other valleys that lead into it and each other, descends from near the summit to the confines of the fertile region, and exhibits a great part of the internal structure of the mountain, to the depth of from 4000 to 5000 feet. In these sections are seen layers of tufo interstratified with lava, and, towards the summit, these layers are broken up by fresh eruptions of lava from below, and are disturbed by the successive intrusion of lateral cones. We also see in the Val di Bove the beds of lava traversed in all directions by enormous dykes: they project from the precipices, towering vertically to a great height, and varying from two to twenty feet in breadth. The Val di Bove forms one of the grandest features of the sublime scenery of Ætna. It is thus described by Sir C. Lyell: 'The great plain which is inclosed by the magnificent circle of precipitous rocks has been deluged by repeated streams of lava, and although it appears almost level when viewed from a distance, it is, in fact, more uneven than the surface of the most tempestuous sea. The face of the precipices is broken in the most picturesque manner by the vertical walls of lava which traverse them. These masses usually stand out in relief, are exceedingly diversified in form, and often of immense altitude. In the autumn, their black outline may often be seen relieved by clouds of fleecy vapour which settle behind them, and do not disperse until mid-day, continuing to fill the valley while the sun is shining on every other part of Sicily, and on the higher regions of Ætna. An unusual silence prevails, for there are no torrents dashing from the rocks, nor any movement of running water in this valley, such as may almost invariably be heard in mountainous regions. Every drop of water that falls from the heavens, or flows from the melting snow and ice, is instantly absorbed by the porous lava; and such is the dearth of springs, that the herdsman is obliged to supply his flocks during the hot season from masses of snow laid up in hollows of the mountain during winter. The strips of green herbage and forest land, which have here and there escaped the burning lavas, serve, by contrast, to heighten the desolation of the scene. When I visited the valley, nine years after the eruption of 1819, I saw hundreds of trees, or rather the white skeletons of trees, on the borders of the black lava, the trunks and branches being all leafless, and deprived of their bark, by the scorching heat emitted from the melted rock.' This vast cavity in the mountain has none of the characters of a crater, but has probably been produced by a combination of different causes: by great subsidences, by lateral explosions, and by the great floods by which, even in historical times, it has been known to have been devastated, when a fiery torrent of lava had suddenly overflowed a great depth of snow in winter. The phenomena of the Val di Bove, as well as the position of the sub-Ætnean strata, are quite at variance with Von Buch's theory of the elevation of volcanoes from *craters of elevation;* a theory which, like another of that celebrated geologist, has not stood the test of rigid examination, and which has been too hastily adopted by many eminent naturalists, from the faith we are naturally inclined to repose in an authority, which we know to be entitled to great respect.

The records of history supply no materials from which we can arrive at any knowledge of the gradual growth of the mountain, for the additions to it from the accumulated produce of all the eruptions that have taken place within the period of history, great as they are, become quite insignificant when contrasted with the entire mass of the volcano. But if we compare the time that has elapsed since that comparatively thin covering began to be formed, with that which must have been required to produce, by a similar process, the remaining part, we shall form the most exalted notions of its remote antiquity. We have no ground for supposing that the altitude of Ætna has materially varied within the last 2000 years. Of the eighty most conspicuous lateral cones, not one of the largest has been produced within the period of authentic history. Every eruption does not produce a lateral cone, for one in three takes place from the crater at the summit; also when an opening is made in the flanks, a cone is not always produced, and many eruptions must have taken place from the sides, besides those which raised the eighty cones above-mentioned. We know, also, that there have been great intervals of rest between the eruptions, almost a century in some instances; so that, according to all probability, we must date the origin of the earliest of these cones, some thousand years prior to the historical era. But we may reasonably carry our views of the antiquity of the volcano much beyond even that remote date. If we were to remove the whole of the cones as well as the entire matter which has been ejected from them and from the highest crater during the period of their growth, we should cut off several miles of the diameter of Ætna at its base, and diminish its elevation by some hundred feet; but we should still leave a mountain more lofty than any other in Sicily. That stupendous mass of volcanic matter must have been ejected subsequently to the formation of stratified rocks containing the remains of animals identifiable with those now living in the adjoining seas; rocks, be it remembered, among the most recent of the whole series of strata of which the crust of the earth is composed.

There are not more than sixty-two eruptions recorded in history, from the earliest to the present times. Of these, ten happened before the Christian era, twelve in the next fifteen hundred years, seventeen during the sixteenth and seventeenth centuries, and twenty-three from that time to the present; the most recent having taken place in August 1852. The most remarkable would alone be noticed, and it is probable that many occurred in the second period of which we have no record; although a cessation for the whole period of fifteen hundred years would be in no degree at variance with the history of other and neighbouring volcanoes, for the island of Ischia enjoyed an interval of repose from the devastation of its internal fires for seventeen centuries. Diodorus Siculus (lib. v. c. 2.) speaks of old eruptions of Ætna, said to have taken place long before the Trojan war, and to have occasioned the emigration of the Sicani, the earliest inhabitants of the island, who were afterwards replaced by the Siculi from Italy. An eruption is recorded to have occurred in the time of Pythagoras, who is believed to have died 496 B.C. Another took place 475 B.C., and it is to this eruption that Æschylus and Pindar most probably allude, the one in his play of Prometheus, the other in the following passage of his first Pythian ode.—It was a poetical fiction or a popular superstition that the great giant Typhos was buried beneath Sicily, and, according to Pindar, the outstretched monster spread as far as the volcanic regions about Cuma and Naples.

'The sea-girt heights above Cuma, and Sicily too, press upon his shaggy breast; and the pillar of heaven, snowy Ætna, the perennial nurse of sharp pinching snow, holds him fast. From the recesses of Ætna are vomited forth the purest streams of fire, immeasurable in extent. By day the fiery current pours forth a burning torrent of smoke, but by night, the red flame, rolling along masses of rock, plunges them with loud crash into the surface of the sea. That monster sends up such horrid streams of Hephæstus (Vulcan)—a sight wonderful to look on; wonderful, too, to hear of from those who have seen it.'

An eruption is mentioned by Thucydides 425 B.C., which did some damage to the lands of Catana, as Catania was then called; and he adds, that this was the third eruption of lava on record since the Greeks had been settled in Sicily. Diodorus Siculus (lib. xiv.) mentions an eruption 396 B.C. which stopped the Carthaginian army in their march from Messina to Syracuse, and obliged them to go round the whole base of the mountain in order to reach Catania. This stream of lava may be seen on the eastern slope of the mountain near Giarre, extending over a breadth of more than two miles, and having a length of twenty-four from the summit of the mountain to its final termination in the sea. There are similar notices of later eruptions which we do not think it necessary to particularize; for a mere list of dates would afford no interest to the general reader, and there is such a similarity in the phenomena, varying only in intensity, that it would be tedious and unprofitable to give a description of the several instances of activity in the volcano. We shall content ourselves with a notice of some of the most remarkable eruptions of which detailed accounts have been preserved. In 1537, after violent rains and great devastations occasioned by the flooding of the river Simeto, Ætna was rent in several places, and from the openings there poured forth deluges of liquid lava. They directed their course towards the monastery of St. Nicholas d'Arena, destroyed the gardens and vineyards, and proceeding towards Nicolosi burnt two villages and destroyed most of the inhabitants. When the conflagration ceased, the summit of the mountain sunk in with a terrific noise. These agitations of the mountain continued throughout the whole year. The smoke, noise, and shocks of earthquakes affected the whole island. In 1669 an earthquake had levelled to the ground all the houses in Nicolosi, a town situated near the lower margin of the woody region, about twenty miles from the summit of Ætna, and ten from the sea at Catania. Two gulfs then opened near that town from whence sand and scoriæ were thrown up to such an amount, that, in the course of three or four months, the double cone we have mentioned in a previous part of this article, called Monti Rossi, was formed. It is about 450 feet high, and two miles in circumference.

In the plain of S. Lio, a fissure six feet broad and of unknown depth opened with a loud crash, and ran in a somewhat tortuous course to within a mile of the summit of Ætna, traversing a length of twelve miles, and emitting a most vivid light. Five other parallel fissures of considerable length opened one after the other, and sent forth smoke and bellowing sounds, which were heard at the distance of forty miles. The light emitted from the great rent of S. Lio appears to indicate that it was filled to a certain elevation with incandescent lava, probably to the height of an orifice not far distant from Monti Rossi, which at that time opened and poured out a lava current. This stream, after overflowing fourteen towns and villages, some with a population of between 3000 and 4000 inhabitants, at last reached the walls of Catania, which had been purposely raised to protect the city; but the burning flood accumulated till it rose to the top of the rampart, which was sixty feet in height, and then fell in a fiery cascade and overwhelmed a part of the city. The wall, however, was not thrown down, and the solid lava may still be seen curling over the top of the rampart like a cascade in the act of falling. This great current had performed a course of fifteen miles before it entered the sea, where it was still 600 yards broad and forty feet deep.

The eruption of 1792 is thus described by Ferrara:—On the first days of March the mountain emitted thick clouds of smoke, and at night flames were seen to rise to a considerable height. On the 8th it shook violently, and for several days awful roarings were heard, which appeared to proceed from the innermost cavities of Ætna. During April the mountain was tolerably quiet, except that smoke and flames were occasionally seen issuing from its summit. In the beginning of May immense masses of smoke rose in perpendicular columns, and on the 11th lava was seen to flow from the great crater. Meantime shocks of an earthquake were felt at Messina; and on the morning of the 12th the internal roaring was repeated, the black smoke rose in the air in the shape of a gigantic tree, spreading its top to an immense extent around, and in the midst of these dense masses of black smoke were seen numerous globes of white smoke as fleecy as cotton. Towards eleven o'clock A.M. of that day, an explosion, like the discharge of heavy artillery, was heard and felt all around the base of Ætna, followed by a hollow rumbling noise, and the black smoke arose with fresh violence. In the evening the lava flowed down the sides of the mountain in several streams, one westward towards Aderno, and another ran to the south-east into the valley of Trifoglietto, and stopped at Zoccolaro, ten miles from the crater. On the 13th, the mountain became more quiet, and remained so till the 23rd, only sending forth a shower of ashes and hot sand, which fell all around its sides. On the 23rd the black smoke re-appeared; and the next day a new mouth opened itself in the plain Del Lago, about three miles south-east of the great crater, and from it, for several days, blocks of old lava and scoriæ were thrown to a great height, as well as masses of clay, moist and soft. On the 26th, another mouth opened in the same direction, and vomited a stream of lava which fell into the valley of Trifoglietto, and soon after all the old lava cliffs above tumbled down, and nearly filled the valley. On the 1st of June, a large mouth opened itself half-way up the southern side of the cone of the mountain, on the heights called Del Solfizio, facing Catania, and from it a huge torrent of lava issued forth, ran down the immediate slope beneath, then, turning eastward, rushed against the base of Mount Arcimisa, one of the numerous conical hills which rise round Ætna. The stream was then forced round into a valley 400 feet deep which had been formed by the waters, and which sloped down to the eastward into the cultivated plain and the vineyards. The lava soon filled up the valley, where it began to harden; but the liquid stream from the heights still pouring in pressed against it, so that now and then an enormous mass of half-hardened lava would detach itself, and having slidden some distance down the declivity would break up with a tremendous crash into a thousand fragments, and cover a fresh extent of ground. The lava stream covered, in this manner, the vineyards of Zaffarana, and approached the village of that name, when it fortunately stopped close to the houses from whence the inhabitants were all ready to fly.' The sight is described by Ferrara as extremely awful and grand, especially by night. The eruption continued for a whole year, till May, 1793. The stream of lava, in its fluid state, was often thirty feet high. The lava that flowed first cooled, and became condensed at a certain distance, and thus formed a dyke against the current of fresh lava which swelled up and overflowed its own bed, increasing in height at every fresh overflowing. Thus in many places strata of lava have been formed more than 300 feet high. The stream of lava sweeps the ground on which it flows, carrying along with it the earth, stones, trees, and other substances which it finds in its passage. At a short distance from the mouth the lava becomes covered with a crust of scoriæ, which increases in thickness progressively, the lower part of the stream continuing to flow underneath like a liquid paste. The scoriæ sometimes form bridges over the fiery stream sufficiently strong to bear a person.

In 1819, three large mouths or caverns opened very near those formed in an eruption eight years before, from which flames, red-hot cinders, and sand were thrown up, with loud explosions. A few minutes afterwards another mouth opened below, from which flames and smoke issued; and finally, a fifth, lower still, from whence a current of lava flowed, which spread itself with great velocity over the Val di Bove. The three original mouths at length united into one large crater, and sent forth lava, as did the inferior apertures, so that an enormous torrent poured down the great valley. When it arrived at a vast, and almost perpendicular precipice, at the head of the valley of Calauna, it poured over in a cascade, and, being hardened in its descent, made a tremendous crash as it was dashed against the bottom. So immense was the column of dust raised by the abrasion of the tufaceous hill over which the hardened mass descended, that the Catanians were in great alarm, supposing a new eruption to have burst forth in the woody region, exceeding in violence that near the summit of Ætna.

The following account of the eruption in the beginning of November, 1832, is by Professor Gemmellaro, of Catania, whose letter is dated the 15th of November. 'On the 31st of October, at half past two in the afternoon, several tremblings of the earth, accompanied with fearful subterranean noises in the woody region of Ætna, announced an eruption; but as the mountain was enveloped in clouds, the place could not be exactly ascertained. In the middle of the night, however, it appeared very evident that the volcano had broken out in two places, one of which was at the foot of the highest cone towards the S.W., at a height of 9300 feet. From several small orifices of the crater, ashes, sand, and cinders were thrown out; and one of them poured forth an inconsiderable stream of lava, in the direction of the Casa Gemmellaro, but the old lava stream of 1787 served as a dyke, and caused it to change its direction. The lava now flowed into the valley of Trifoglietto, towards the Cone San Simone (eruption of 1811), the distance it had travelled from its source being about two miles. But these appearances were of minor importance, in comparison with an eruption which took place in the neighbourhood of Monte Lepre, N. W. of the crater, eight miles distant from Bronte, and at an elevation of 6200 feet in the upper part of the woody region, near where it ends. Here four mouths of fire were opened, out of which, not only ashes, sand, and cinders, were projected to a vast height, but also enormous red-hot masses: the earth shook during these catastrophes without ceasing, and the subterranean noises were fearful. The explosions from the highest of the openings were very powerful, and continued without intermission. A pillar of flame rose to the height of 120 feet, which, falling at some distance, formed an arch of fire; and what was particularly remarkable, there was a dark blue stripe which rose upwards to a great height, and was a constant accompaniment of the eruption for several days. The four other mouths were not less active: a stream of lava burst forth from the lowest of them, which now threatens to be fearfully destructive: in five days it extended to the distance of four miles; it threatened first the woods of Maretto, but turned afterwards to those of Bronte. In the course of its rapid descent, the lava soon began to spread itself over cultivated fields, and did considerable damage: it is at this time only three miles distant from Bronte, a town of 13,000 inhabitants, which it threatens with destruction. The terrified inhabitants see the most dreadful fate awaiting them; part have fled in the greatest despair, others have been endeavouring, like the people of Catania at the time of the terrible explosion of 1669, to make the lava stream take another direction, but it is impossible to approach it within a quarter of a mile. At the moment I am closing this letter, I am told that the lava is within two miles of Bronte, and that to-morrow night the fate of the unhappy town will be decided; for the stream has reached a point from which it must either flow into a side valley, or inevitably overflow Bronte. On the 11th of this month, the five mouths united into one, the violence of the eruption increased, and the quantity of ashes and cinders thrown out was enormous; the finest ashes have been carried as far as this place. The lava is augitic, and contains very few crystals; the cinders are light, spongy, and half-vitrified.' In a subsequent letter, of date 22d November, he says: 'On the 16th, the alarm of the inhabitants began to diminish. Nothing could be more terrific than the first appearance. A stream of lava, dividing itself into two branches, eighteen miles long, including all its windings, a mile broad, and thirty feet high, threatened to overwhelm the defenceless land. There was also a great alarm lest it should fall into the bed of the Simeto, and cause a frightful inundation of the neighbouring country. The greater part of the lava has poured into a large gulf previously opened, and the earthquakes have ceased. A new cone has been thrown up, similar to those around the flanks of Ætna, which attest its former eruptions. The town of Bronte has been saved; no lives have been lost; and altogether the damage done is less than was at first apprehended.' The eruption of 1852 was one of the grandest and most terrible that has occurred for many years. One peculiarity of it was its long duration, which was upwards of a month. (For a graphic description of it, see the *Athenæum*, Nov. 27, 1852.)

For more than half the year, the upper part of the mountain is covered with snow; and it forms the great store from whence Sicily and Malta are supplied in summer with that necessary of life in a hot climate, yielding a considerable revenue to the bishop of the diocese, and constituting a great article of commerce. 'A remarkable discovery,' says Mr. Lyell, 'has lately been made on Ætna, of a great mass of ice, preserved for many years, perhaps for centuries, from melting, by the singular accident of a current of red-hot lava having flowed over it. The following are the facts in attestation of a phenomenon which must at first sight appear of so paradoxical a character. The extraordinary heat experienced in the south of Europe during the summer and autumn of 1828 caused the supplies of snow and ice which had been preserved in the spring of that year, for the use of Catania and the adjoining parts of Sicily, and the island of Malta, to fail entirely. Great distress was felt for the want of a commodity regarded in these countries as one of the necessaries of life, rather than as an article of luxury, and on the abundance of which, in the large cities of Sicily, the salubrity of the water, and the general health of the community, are said in some degree to depend. The magistrates of Catania applied to Signor M. Gemmellaro, in the hope that his local knowledge of Ætna might enable him to point out some crevice or natural grotto on the mountain where drift snow was still preserved. Nor were they disappointed; for he had long suspected that a mass of perennial ice at the foot of the highest cone was part of a large and continuous glacier covered by a lava current. Having procured a large body of workmen, he quarried into this ice, and proved the superposition of the lava for several hundred yards, so as completely to satisfy himself that nothing but the subsequent flowing of the lava over the ice could account for the position of the glacier.' Mr. Lyell thus accounts for this extraordinary phenomenon. 'We may suppose that, at the commencement of the eruption, a deep mass of drift snow had been covered by volcanic sand, showered down upon it before the descent of the lava. A dense stratum of this fine dust, mixed with scoriæ, is well known to be an excellent non-conductor of heat: the shepherds in the higher regions of Ætna are accustomed to provide water for their flocks during summer, by strewing a layer of volcanic sand a few inches thick over the snow, which effectually prevents the sun from penetrating. Suppose the mass of snow to have been preserved from liquefaction until the lower part of the lava had consolidated, we may then readily conceive, that a glacier thus protected at the height of 10,000 feet above the level of the sea would endure as long as the snows of Mont Blanc, unless melted by volcanic heat from below.'

Every one is aware that, in lofty mountains, the temperature of the air diminishes as the elevation increases, and that even under the equator there are regions of eternal snow. So in Ætna, he who ascends from the sea-shore to the summit, passes through all the gradations of climate which he would meet with, were he travelling from the country of the date and the sugar-cane to the arctic circle. His own feelings would not enable him accurately to mark the transitions, but the botanist can trace the lines of separation, drawn by the hand of Nature, with unerring precision. We have said that Ætna is divided into three regions, the fertile, the woody, and the desert; these zones are defined by the presence or absence of certain great classes of the vegetable kingdom, but each of them is susceptible of subdivisions, determined by the constitutions of certain families of plants, which can only thrive within certain limited ranges of temperature; and thus the mountain is divisible into seven distinct *botanical* regions. We can mention only a few of the plants that are characteristic of each, and must refer the reader for fuller details to special works on the subject.

The *first*, or what may be termed the sub-tropical region, does not rise more than one hundred feet above the level of the sea. Here grow the palm-tree (*Phœnix*), the banana (*Musa*), the Indian fig, or prickly-pear (*Cactus opuntia*), and the sugar-cane; and there may be seen in open gardens tree-cacaliæ, and euphorbiæ, together with varieties of mimosa and acacia, which, in the northern parts of Europe, are nursed in our hot-houses and conservatories. The *second*, or hilly region, extends to the height of about 2000 feet, where the culture of the vine ceases. Here we find many plants of the South of France, Spain, and Italy, and cotton, maize, the orange, the lemon, and the shaddock. From the great dryness of the atmosphere, mosses and lichens are extremely rare, and the mushroom tribe (*fungi*) are only met with in winter. The *third*, or woody zone, lies between the elevations of 2000 and 4000 feet: it is the region of the cork-tree (*Quercus suber*), and other kinds of oak (*Q. pedunculata*, *Q. robur*, *Q. congesta*), the maple (*Acer*), and, especially on the eastern side, of luxuriant chestnut-trees, often of extraordinary size. The *fourth* region, which lies between the elevations of 4000 and 6000 feet, is characterized by the presence of the beech (*Fagus sylvestris*), Scotch fir (*Pinus sylvestris*), birch (*Betula alba*), and, among small plants, clover (*Trifolium roseum*), sandwort (*Arenaria condensata*), mouse-ear chickweed (*Cerastium album*), dock (*Rumex arifolius*), and plantain (*Plantago victorialis*). The *fifth*, or sub-alpine region, lies between the elevations of 6000 and 7500 feet, and produces the barberry (*Berberis ætnensis*), soap-wort (*Saponaria depressa*), toad-flax (*Linaria purpurea*), and juniper (*Juniperus hemisphærica*). The *sixth* region lies between the elevations of 7500 and 9000 feet. With the exception of *Berberis ætnensis*, *Astragalus siculus*, and *Juniperus hemisphærica*, almost all the plants of the fifth region are also found in this; but the *Saponaria depressa*, the *Rumex ætnensis*, and the fleshy and jagged groundsel (*Senecio carnosus* and *S. incisus*), are characteristic of it. The *seventh* region is very narrow, its upper limit not rising above 9200 feet; and it only produces a few lichens, among which the *Stereocaulon paschale* is the most common. Beyond that elevation utter sterility prevails.

It is very remarkable that the Flora of Sicily produces scarcely any, if any, peculiar indigenous species, the plants being common, almost without exception, to Italy or Africa, or some of the countries surrounding the Mediterranean, whereas there are several indigenous plants in Corsica and some other Mediterranean islands. Mr. Lyell supposes the plants of Sicily to have migrated from pre-existing lands; and, as the remains of living species of shell-fish and zoophytes are found imbedded in the strata at the summits of lofty mountains in the island, he brings us to this curious result, that the families of plants and animals of the Val di Noto, and some other mountainous regions of Sicily, are of higher antiquity than the country itself: that is, that these species flourished elsewhere before the island was raised from the depths of the sea, and even before the materials of its strata were deposited beneath the waters.

We cannot allude, even thus briefly, to the vegetable productions, of Ætna, without noticing the gigantic chestnut-tree,—one of the most celebrated wonders of the island; it occurs in the third region, and is known by the name of the *Castagno de Cento Cavalli*, because it is said to be capable of sheltering a hundred horses under its boughs. It appears to consist of five large and two smaller trees, which, from the circumstance of the barks and boughs being all outside, are considered to have been one trunk originally. The largest trunk is thirty eight feet in circumference, and the circuit of the whole five, measured just above the ground, is one hundred and sixty-three feet. It still bears rich foliage, and much small fruit, though the heart of the trunk is decayed, and a public road leads through it wide enough for two coaches to drive abreast. In the middle cavity a hut is built for the accommodation of those who collect and preserve the chestnuts.

This is said, by the natives, to be 'the oldest of trees.' From the state of decay, it is impossible to have recourse to the usual mode of estimating the age of trees by counting the concentric rings of annual growth, and therefore no exact number of years can be assigned to the age of this individual. That it may be some thousand years old is by no means improbable. Adanson examined in this manner a Baobab tree (*Adansonia digitata*) in Senegal, and inferred that it had attained the age of five thousand one hundred and fifty years; and De Candolle considers it not improbable that the celebrated Taxodium of Chapultopec, in Mexico (*Cupressus disticha*, Linn.), which is one hundred and seventeen feet in circumference, may be still more aged.

The ascent of Ætna is a work of great fatigue, especially in the upper or desert region, both on account of the heat and of the feet sinking and receding at every step in the loose ashes. But under favourable circumstances of weather, the labour is amply rewarded by the magnificence of the vast prospect, varied as it is by the view of Sicily itself, spread out like a map, by the islands with which the surrounding sea is studded, Stromboli pouring forth volumes of smoke, and by the distant shores of Italy. If to this we add the grandeur of the scenery of the mountain itself, so diversified and majestic in all its features, the splendour of the heavens at night, and of the rising of the morning sun, the whole presents a combination perhaps not to be found on any other spot of the earth. The best accounts of Ætna are to be found in the following works: Ferrara, *Descrizione dell' Etna; Palermo.*—1818. Gemmellaro, *Quadro Istorico dell' Etna*, 1824. Daubeney, *On Volcanos*, 1826. Scrope, *On Volcanos*, and *Principles of Geology*, by Charles Lyell, 1832,3; and for the botany of Ætna, Presl, *Flora Sicula*, Prague, 1826.

ÆTO'LIA, according to the ancient geographers, consisted of two chief divisions, one on the coast, extending from the mouth of the Achelous eastwards along the north shore of the Corinthian gulf as far as its narrow entrance at Antirrhium—the other, called Epiktetos, or the acquired, was the northern and mountainous part. The length of sea-coast, as Strabo incorrectly gives it, from the mouth of the Achelous to Antirrhium, is 210 stadia, or about 21 miles the same line of coast, according to the best modern charts is about 42 miles, measuring in straight lines from one projecting point to another. If the great recesses of the sea about Anatolico and Mesolunghi were included, the distance would be much greater. The south-eastern boundary of Ætolia, which separated the province from that of the Locri Ozolæ, was a mountain range named Chalcis, afterwards, in its north-eastern course, taking the name of Corax. The north and extreme north-eastern boundaries of Ætolia were the small territory of Doris, the branches of Pindus, and part of the western line of Œta; but as no ancient geographer has given anything like a definite boundary to Ætolia, and as we are still only imperfectly acquainted with the mountains of northern Greece, any further description is impossible. The western boundary was the Achelous. [See ACARNANIA.]

The only considerable river of Ætolia, besides the Achelous, is the *Fidari*, formerly the Evenus, which rises in the N.E. part of Ætolia, in the range of Corax, which is some distance south of the great chain of Pindus. Its course is south, inclining in its lower course considerably to the west. Ætolia contains several lakes in the interior, two of which, as they are marked in our maps, communicate with one another and with the Achelous; but there is some difficulty in identifying these with the lakes mentioned by the ancient geographers and historians. Indeed, nearly the whole ancient and modern geography of central Ætolia is one heap of confusion. One of the lakes is called in our maps *Angelo Castro*, and the other *Vrachori*.

The principal ancient positions in Ætolia were, Thermum, in the interior; Trichonium, on the lake Trichonis, now *Vrachori;* Calydon, the oldest establishment of the Ætolians, and Antirrhium, at the entrance of the Corinthian gulf.

The Leleges in the north, and the Curetes, probably a kindred race, in the level plains of the south, are the oldest inhabitants of this country that we can trace. The name of Ætolia and Ætolians was introduced, according to tradition, by Ætolus and his followers from Elis, in the Peloponnesus, six generations before the war of Troy. In course of time the original inhabitants and the strangers formed one people, and increased by the intermixture of Æolians and Bœotians from Thessaly, they became in part, though not altogether, a Grecian people. In the time of Thucydides, one of the most numerous divisions of the Ætolian nation was characterized by that writer as 'speaking a language not understood, and being in the habit of eating raw flesh.' [Thucyd. iii. 94.]

The history of the Ætolians, as a nation, is closely connected with that of the Acarnanians, but, like the latter, they were a people of little importance during the most flourishing periods of the commonwealths of European Greece. After the death of Alexander the Great, B.C. 323, they came into notice by their contests with the Macedonian princes, who allied themselves with the Acarnanians. In the reign of Philip II. of Macedon, (which commenced B.C. 220,) the Ætolians, after seeing their chief town, Thermum, plundered by this king, and feeling themselves aggrieved by the loss of all they had seized from the Acarnanians, applied to the consul Valerius Lævinus. (B.C. 210.) Though this produced no beneficial effects, they formed a second treaty with the Romans (about B.C. 198) after the end of the second Punic war. The immediate object of the Romans was the conquest of Macedonia, but it proved eventually that this fatal alliance of the Ætolians was the first step that led to the complete subjugation of all Greece by the Romans. A series of sufferings and degradations led the way to the occupation of all Ætolia, when it was made part of the Roman province of Achæa. Under Roman dominion, the few towns of Ætolia almost disappeared: many of the inhabitants were transplanted to people the city of Nicopolis, which Augustus built at the entrance of the Ambracian gulf, opposite Actium, where he had defeated Antony. Since the time of the Romans it is probable that the face of this country has undergone as few alterations, or received as few improvements from the hand of man, as the most remote parts of the globe. The Romans themselves under the emperors had not even a road through Acarnania and Ætolia, but followed the coast from Nicopolis to the mouth of the Achelous.

The surface of Ætolia is of a mountainous character, with exception of the sea-coast, which is level and very fruitful, and a plain to the north of the lakes above mentioned. The mountains abounded in wild beasts, and were celebrated in mythology for the hunt of the Calydonian wild-boar.

The earliest traditions of Ætolia, properly known by that name, speak of a monarchical form of government under Ætolus and his successors; but this form of government ceased at a period earlier than any to which historical notices extend, and we find the Ætolians existing in a kind of democracy, at least during the time of their greatest political importance. This period extended from about B.C. 224, to their complete conquest by the Romans, B.C. 168, a period of about 50 years. The Ætolian league at one time comprehended the whole country of Ætolia, part of Acarnania and of South Thessaly, with the Cephallenian isles; and it had besides, close alliances with other places in the Peloponnesus, especially Elis, and even with towns on the Hellespont, and in Asia Minor. This alliance with Elis would tend to confirm the tradition of the early connexion already alluded to. Following, probably, the example of the Achæan league, the different parts of Ætolia formed a federal union, and annually chose a general or president, a master of the horse, a kind of special council called Apokletoi (the select), and a secretary, in the national congress held at Thermum about the autumnal equinox. Such scattered notices as we possess about their history and constitutional forms are found principally in the Greek writer Polybius, (books ii. iv. xvii., &c.) Though the Ætolian confederation, such as it was in its earlier times, was anterior to the Achæan union of Dyme, Patræ, &c., yet its more complete organization was most probably an imitation of the Achæan league. Under the Turkish Empire, Ætolia was partly in the province of Livadia. It now forms, along with Acarnania, a *nomos* of the kingdom of Greece. Chief town, Missolonghi.

AFFETTUO'SO (Ital. *affectionate*), in music, signifies a tender, expressive style; and slowness is invariably implied. In regard to movement, it may be considered as equal in degree to larghetto. [See LARGHETTO.]

AFFIDAVIT, in Law, is a written statement on oath, sworn before some person duly authorised to administer it. The word is the perfect tense of the barbarous Latin word *affido*, to pledge faith to, and is taken from the old Latin form of a declaration on oath, which commenced thus: '*Affidavit J. S.*,' 'J. S. hath sworn, &c.' By the law of England, affidavits are necessary in a variety of cases, in order to bring facts under the cognizance of courts of justice: all evidence of facts must be given on oath, either by oral testimony or by affidavit. Where evidence is to be acted upon by juries, it is given as oral testimony; where it is to inform a court or judge, it is usually reduced into the form of an affidavit.

In point of form, an affidavit should express that the deponent made oath, otherwise it is insufficient. And by the 15 and 16 Vic., c. 86, every affidavit to be used in court shall be divided into paragraphs, numbered consecutively, each paragraph being confined, as nearly as may be, to a distinct portion of the subject. Thus prepared, the paper is then shown to the deponent, and he is requested to swear to his name and handwriting, and that the contents of the paper are true. Lastly, the *jurat* (a term derived from the Latin word *juratum*, 'sworn') expressing the officer before whom, and where, and when, the affidavit is made, is signed by such officer. According to the 15 and 16 Vic., c. 86, the word 'affidavit' includes an affirmation.

AFFINITY. Chemical affinity, sometimes called chemical attraction, is that power by which bodies combine and form compounds always possessing some properties very different from those of their constituents, and frequently diametrically opposite to them. It differs from the attraction of gravitation in not acting on masses, and only at insensible distances. In this last property it resembles cohesive affinity, but is distinguished from it by occurring only between the particles of dissimilar bodies. Thus, the particles of a mass of sulphur are held together by cohesive affinity, and so also are those of a mass of copper; but if a particle of sulphur be brought into contact with a particle of copper, the two particles being different, and possessing chemical affinity for each other, unite by this power, and form sulphuret of copper.

Chemical affinity, then, can be exerted only between the particles of dissimilar bodies; and when these are placed in contact, the proportions in which they combine are fixed and definite. It is, indeed, true, that there are some bodies, and especially fluids, which mix and appear to combine in all proportions. Thus, any quantities of water and alcohol (spirit of wine) may be mixed, and no separation afterwards ensues; yet though they thus *mix* in all proportions, it is probable that they *combine* chemically only in definite quantities. When common salt is added to water a certain portion of it is dissolved, dependent upon the affinity existing between the solid and the fluid. The solution of salt is said to be saturated when the water refuses to dissolve more of it; but with water the solution will mix to any extent, for no repulsive power exists between them as between oil and water: we may, however, consider the water which is so added as merely in a state of mixture, and not of chemical combination.

Although none but dissimilar bodies unite by chemical affinity, mere dissimilarity will not of itself ensure combination: thus, water and mercury, water and oil, mercury and oil, though very different fluids, cannot be made to unite; and hence it is concluded that they have no chemical affinity for each other.

The simplest cases of chemical affinity are those in which two elementary bodies unite into a binary compound, as when iron combines with oxygen to form oxide of iron. This is the result of what is termed *single affinity*, and this power may be exerted between two elementary or two compound bodies; and also, though it occurs more rarely, between an elementary and a compound substance. For example, sulphur and copper, both elementary bodies, readily unite when heated: sulphuric acid and oxide of copper, both compounds, combine with great readiness; but no combination of sulphur and oxide of copper, or of sulphuric acid and copper, is at present known. There is then a greater disposition to combination between two elements or two compounds, than between an element and a compound: the rule is, however, by no means without exception, for cyanogen, a compound body, combines with mercury, an elementary one, to form cyanide of mercury.

It has been mentioned that, when bodies combine by chemical affinity, they undergo great change of properties: it might, however, be supposed that a compound would possess qualities intermediate between those of its constituents. This, however, is by no means the case; nor, even though we may be well acquainted with the properties of the elements, can we at all tell, *à priori*, what kind of a compound they will form: sulphur is yellow, copper is red, but the sulphuret of copper, resulting from their union, is black. Again, sulphuric acid has great affinity for water, and, when diluted, turns blue litmus red: potash has also great affinity for water, and renders red litmus blue. The acid and potash are also both extremely acrid, and they have great affinity for each other; but combine them by *single affinity*, and a salt, called sulphate of potash, is produced, which has very slight affinity for water, does not act upon any vegetable colours, and, instead of being acrid to the taste, like both its constituents, is merely bitter and saline. In this case of chemical affinity an almost total reversal of properties has occurred; but there are cases in which it is far from being so complete, and in which one or both of the ingredients still exert some of their original powers: thus, the sulphate of potash, above alluded to, is capable of combining with an additional quantity of sulphuric acid. This salt, which is called bisulphate of potash, resembles both its constituents in having affinity for water, as is shown by crystallizing in combination with it, and by being readily soluble in it; and it resembles sulphuric acid in having a sour taste, and turning blue litmus red.

We have stated a few examples of the changes produced in bodies by a combination effected by chemical affinity. The alterations, in many cases, are more striking and complete; the properties of the substance formed by the combination being altogether different from those of the bodies from which it has originated. Sulphuret of copper, as already noticed, differs in colour from both its elements, yet it resembles both in being solid; but there are numerous cases in which the form, colour, smell, taste, density, and other physical qualities, and the chemical properties of fusibility, volatility, solubility, and tendency to combination in the compound, bear no resemblance to its constituent parts.

Although, when speaking of the action which is induced by chemical affinity, chemists are frequently in the habit of stating merely that one substance has affinity for another, yet it is to be understood that the force with which bodies unite arises from mutual and equal affinity: thus, sulphuric acid and potash combine, not merely on account of the affinity of the acid for the alkali, but of the alkali equally for the acid. Chemical affinity, then, is mutual and equal between those substances which combine by its power. Many different compounds may be formed by uniting one substance, an acid, for example, with various others, as with the alkalis, earths, and metallic oxides; these are called bases; and the force of affinity of any acid for any base differs in every instance. Now, this difference constitutes what has been termed *elective affinity*,—the existence of which is easily proved, and the results of its action are of the highest importance, both in a scientific point of view, and with regard to chemical agency as connected with the most common processes in the chemical arts and manufactures.

Nitric acid is capable of combining by *single affinity* with lime or with magnesia; and if some dilute nitric acid, containing 54 parts of real acid, be mixed with 28 parts of lime, the earth will be dissolved in the acid, and a neutral solution of nitrate of lime is obtained. A similar quantity of this acid forms a neutral solution of nitrate of magnesia by combining with 20 parts of that earth. Now, if we mix together 54 parts of nitric acid, 28 of lime, and 20 of magnesia, it might be supposed that the acid—which is of course incapable of dissolving the whole of both of the earths—would dissolve them in the proportions of 14 of lime and 10 of magnesia: it is found, however, that this is not the case, for the whole of the lime is dissolved and the magnesia entirely left.

It appears, then, a greater mutual affinity, or an *elective affinity*, exists between nitric acid and lime, than between nitric acid and magnesia. There is another mode in which elective affinity acts, and is employed in a vast number of chemical processes. It has been just stated that 54 parts of nitric acid combine with 20 of magnesia by single affinity. Now, if to the solution of nitrate of magnesia thus obtained we add 28 parts of lime, and boil the mixture, the lime separates the magnesia from the nitric acid; and being dissolved instead of it, we procure a solution of nitrate of lime, instead of nitrate of magnesia: this operation is termed *single decomposition*, and it is produced by single elective affinity. It is therefore evident, that this power may not only prevent one substance from combining with another when three are mixed, but supposing two to have been previously combined, it is capable of effecting a separation between them.

On the action of single elective affinity producing single decomposition, depends the process of preparing acetic acid from acetate of soda by means of sulphuric acid; and the production of ammoniacal gas by heating a mixture of lime, sulphate of ammonia, and water.

To exhibit the degrees of elective affinity, tables were constructed by Geoffroy, a French chemist, about a century ago. In these the substance whose affinities are to be expressed is placed at the head of a column, and is separated from the rest by a horizontal line; beneath this line are arranged the bodies with which it is capable of uniting in the order of their respective forces of affinity; the substance which it attracts most strongly being placed nearest to it, and that for which it has the least affinity at the bottom of the column: thus, in the case of sulphuric acid, the affinities are exhibited in the following order:—

SULPHURIC ACID.

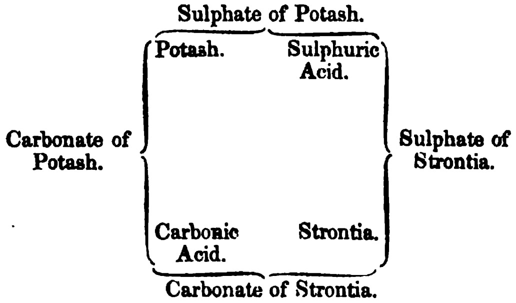
Barytes,
Strontia,
Potash,
Soda,
Lime,
Magnesia.

It would appear from this table, that barytes separates sulphuric acid from combination with all the substances placed below it, and that magnesia is separated from sulphuric acid by all that are above it. There are, however, many circumstances which interfere with the accuracy of tables thus constructed, and diminish their utility, since affinity is not an absolute force, but subject to anomalies and to modifications from various disturbing causes.

In the above, and many similar tables, the affinity of an acid for different bases is expressed: but on other occasions, the affinity of the same bases for different acids is required. In this case the alkali, earth, or metallic oxide, is placed at the head of the column, and the various acids are arranged according to their affinity for it.

There is yet another mode in which elective affinity is exerted. Certain compounds can scarcely be obtained at all, or with great difficulty, either by single affinity or single elective affinity, but are readily obtained by what is termed *double elective affinity*. There is a well-known mineral body called sulphate of strontia, which consists of sulphuric acid and the earthy base (or strictly speaking, metallic oxide) strontia, and they are combined by single affinity. Now potash has great affinity for the sulphuric acid of the sulphate of strontia; but if we mix them, no decomposition takes place, the potash being incapable, by single elective affinity, of detaching the sulphuric acid from the strontia. Again, carbonic acid and strontia have great affinity for each other, but if carbonic acid gas be passed through water in which powdered sulphate of strontia is diffused, it does not by single elective affinity separate the strontia from the sulphuric acid.

That decomposition, however, which single elective affinity cannot in this case perform, may be effected by double elective affinity, producing *double decomposition*. If, instead of acting upon the sulphate of strontia with the carbonic acid and potash separately, we combine them and boil the powdered sulphate of strontia in a solution of the carbonate of potash thus formed, double elective affinity ensues, and two new compounds are formed,—namely, sulphate of potash, which remains in solution, and carbonate of strontia, which, being insoluble in water, is precipitated in the state of a white powder. The double elective affinity which produces double decomposition will be illustrated by the annexed diagram:



Double elective affinity and decomposition are extensively employed in chemical operations; the preparation of various acids, such as the nitric and muriatic, and of a great number of saline compounds, depends upon the application of these modifications of chemical affinity. We shall now illustrate a position already stated, viz., that chemical affinity is not to be considered as an invariable power, but subject to causes which prevent, increase, or reverse its action; and it is on this account that tables of affinity express merely the order of decomposition, and not that of attraction under every circumstance. The causes now alluded to may be comprehended under *form* and *proportion*, and the modifying effects of heat, electricity, and light.

With respect to *form*, it may be observed, that the solid state is unfavourable to the exertion of chemical affinity; and it was once supposed that two solid bodies could not act chemically upon each other. That this is not the case may be proved by adding lime to muriate of ammonia, for by their mutual action ammoniacal gas is plentifully evolved. Division is, however, in all cases favourable to chemical affinity: thus, a mass of marble dissolves slowly in muriatic acid, but when reduced to powder the action is extremely rapid. In some cases mechanical division, however minute, is insufficient to allow combination: thus, if finely powdered pipe-clay be added to dilute sulphuric acid, no chemical affinity is exerted between them, the cohesive affinity of the particles of clay exceeding that of their chemical affinity for the sulphuric acid. If, however, we take a solution of alum and add ammonia to it, the clay is precipitated from it in so minutely divided a state that the acid immediately dissolves it.

When a jet of hydrogen is thrown upon a mass of platinum surrounded by air, the effect is barely sensible; but when the platinum is very minutely divided, chemical affinity is excited between the hydrogen and the oxygen of the air, flame ensues, and water is produced during the combustion.

Minute division, then, so as to reduce the cohesion of a body, is in many cases necessary to the exertion of chemical affinity, and in all cases it increases the rapidity of its action.

Fluidity is always favourable to chemical action, and in most cases it is requisite that one body, at least, should be in that form. Thus galls and sulphate of iron, though both are reduced to fine powder, do not act upon each other: dissolve either of them and add the other in powder to the solution, and chemical affinity will be exerted; but if they are both dissolved, then the action is instantaneous.

There are some instances in which affinity is but feebly, if at all exerted, unless both bodies be so finely divided as to be exposed to each other in the aëriform state: thus sulphur is capable of combining with alcohol. Little of it is, however, dissolved by the spirit when it is merely powdered; but if the sulphur and alcohol be heated in separate vessels, and their vapours be suffered to mix, they then unite.

The nascent state of bodies is one which is extremely favourable to the action of chemical affinity. Chlorine has affinity for silver, and the compound which they form, called chloride of silver, is white and insoluble in water; hydrogen has great affinity for chlorine, and they combine to form muriatic acid. If, however, hydrogen gas be passed into water holding chloride of silver in suspension, no change occurs, for the hydrogen has not, under these circumstances, the power of separating the chlorine from the silver.

If the hydrogen be evolved in the vessel which contains the suspended chloride of silver, it has then an opportunity of coming into contact with it in its *nascent state*, that is at the moment of its separation from combination, and before it has assumed the state of gas. Under these circumstances the hydrogen separates the chlorine from the silver, muriatic acid is formed, and metallic silver separated. It is, however, easy to combine chlorine and hydrogen gases by exposing a mixture of them either to the sun's rays, the taper, or the electric spark. But the gases which constitute ammonia, viz., hydrogen and azote, do not unite unless one of them, at least, is in the nascent state; thus if several pieces of zinc be covered with water, and treated with nitric acid, ammonia is produced, for the water is decomposed by the zinc, its nascent hydrogen unites with the azote to form ammonia, and its oxygen with the zinc to form the oxide of that metal.

The nature of the compounds, arising from the chemical affinity and action of their elements, is greatly influenced by the *proportion* of the substances employed to produce them. When equal weights of sulphuric acid and alcohol are subjected to distillation, the product is sulphuric ether; increase the quantity of acid, and on the application of heat, the whole mixture blackens, and olefiant gas is evolved by their mutual action. Again: if a mixture of two parts of nitre and one part of sulphuric acid be distilled, there are produced nitric acid and sulphate of potash; but if a part of the sulphate of potash be dissolved in the nitric acid, nitrate of potash will be again formed, accompanied with bisulphate of potash.

There are several other cases which prove that the proportions of the substances which act chemically upon each other, greatly influence the nature and proportions of the new compounds formed: thus, when 100 parts of sulphate of barytes are boiled in a solution of 59 parts of carbonate of potash, 23 of the sulphate are decomposed and converted into 19·3 of carbonate. When also 85 parts of carbonate of barytes are boiled in a solution of 74 of sulphate of potash, decomposition also takes place, and there are formed 67 of sulphate of barytes, and 40 of carbonate of potash. In these experiments, then, it appears that decomposition cannot in either case be entirely effected, while the new compounds formed remain in mixture with the portions of the original salts which remain undecomposed. In other words, there takes place a partition of bases between the acids whose action is opposed to each other.

Heat, according to its degree and under various circumstances, produces very different effects on chemical affinity, and causes, increases, reverses, or prevents its action. If we mix oxygen and hydrogen gases, they will remain in a state of mixture for an indefinite period without combining: but if flame be applied to them they combine with explosion, and water is formed. Water dissolves certain salts, but to a limited extent only when cold; heat it, and the solvent power is greatly increased. When mercury is moderately heated in atmospheric air it is converted into peroxide, by combining with the oxygen of the air: heat the compound thus formed more strongly than was required for its production, and the affinity is destroyed: oxygen gas is given out, and the mercury returns to its metallic state. Mix solutions of chloride of calcium and carbonate of ammonia; double decomposition ensues; carbonate of lime and muriate of ammonia result. Evaporate the mixture to dryness, and heat the residue; the order of affinities is reversed, and chloride of calcium and carbonate of ammonia are reproduced: in this case, heat reverses the order of affinities. There is one instance, however, in which heat produces effects that are quite anomalous and irreducible to any idea of their dependence upon degree of temperature; it is this:—when the vapour of boiling water is passed over ignited iron, the water is decomposed; hydrogen, one of its elements, is evolved in the state of gas; and oxygen, the other, combines with the iron and converts it into oxide. Now if we ignite this oxide of iron and pass hydrogen gas over it, the oxide is decomposed, its oxygen combines with the hydrogen, and water is re-formed. No satisfactory explanation of the laws of affinity, by which these opposing results are obtained, has hitherto been offered. These facts afford an illustration of the disturbing causes which very much limit the usefulness of tables of affinity. According to the first experiment, oxygen and iron combine in preference to oxygen and hydrogen, whereas it appears from the second that the affinity of oxygen for hydrogen exceeds that for iron. But it is evident that these statements are irreconcilable with each other; and as the temperature is in both cases the same, no variation of it can account for the incompatible results of the experiments.

Electricity possesses remarkable power over chemical affinity: if the electric spark be passed through a mixture of oxygen and hydrogen gases, it causes them to combine, and water is formed by their union. It is, however, probable that this and some similar effects are produced by the heat which accompanies the electrical spark; but there are other cases of combination which must perhaps be attributed to specific action, as, for example, when nitric acid is formed by the agency of electricity upon atmospheric air.

The action of electricity is much more remarkable in causing decomposition than combination, and especially that form of it which is termed voltaic electricity, or galvanism; the first substance decomposed by it was water. When two platina wires are connected with the poles of a voltaic trough, and their unconnected ends are immersed in water, hydrogen-gas is evolved at the negative, and oxygen-gas at the positive wire. Many other compound bodies have been similarly decomposed: their elements separate at the opposite poles, and the same body always appears at the same pole: thus in all decompositions, oxygen, chlorine, and the acids go over to the positive surface, while hydrogen, the metals, inflammable substances in general, and the alkalis, are found at the negative surface.

In common electrical attraction, the bodies attract each other in consequence of their opposite electrical states; and in the same manner, in the electro-chemical theory proposed by Sir H. Davy, it is supposed that acids and other substances which are attracted in electrical decompositions to the positive pole, are negatively electrical at the moment of their separation from combination; and on the contrary, the alkalis, which are found at the negative extremity, are positively electrical.

It has, however, by no means been proved that chemical affinity is identical with electrical attraction; and we must yet consider it as a peculiar species of attraction, subject indeed to the control of electrical agency, which is capable, not merely of decomposing compounds, but of suspending chemical action and reversing the order of affinities.

If sulphate of soda be dissolved in an infusion of purple cabbage, and subjected to voltaic electricity in a glass tube, it is soon found that the fluid at the positive pole becomes red, indicating the presence of an acid, while at the negative, it is green, showing the action of an alkali. In this case, the sulphate of soda is decomposed, and its constituents (sulphuric acid and soda) appear at the different poles. This decomposition does not arise from any attraction between the elements of the sulphate of soda and the platina terminal plates, nor is there any passage of either element (sulphuric acid or soda) from one pole to the other through the liquid in the vessel. [The theory of this and other electrical changes will be discussed under ELECTRO CHEMISTRY.]

That affinity may be controlled by altering the electrical state of a body, is also proved by Sir H. Davy's very curious experiments on copper-sheathing, which, though they failed from unforeseen causes, are worthy of his genius. It appeared to Sir H. Davy, that the copper was oxidized by the atmospheric air in the sea-water, and that then it took muriatic acid from muriate of magnesia and formed with it submuriate of copper, and hence ensued the destruction of the metal. Now, as metals combine with acids only when oxidized, it occurred to Sir H. Davy, that if he could render the copper negative, which is the electrical state of the oxygen, they would not combine. This he effected by bringing the copper into contact with zinc or iron; these being rendered positive, the copper became negative, scarcely combined at all with oxygen and was so little acted upon by the muriate of magnesia in sea-water, that when protected by only 1-1000th part of iron, oxidizement and conversion into submuriate were, to a certain extent, prevented.

The following will also serve as an example of the reversal of chemical affinity by electricity. Immerse a piece of copper in a solution of nitrate of silver; the copper is dissolved and the silver precipitated: if we reverse the experiment, and put a piece of silver into a solution of nitrate of copper, no change is effected; if, however, the silver while immersed be touched by a piece of iron, a voltaic circuit is formed, the order of affinity is reversed, the copper is precipitated, and the silver is dissolved.

Light is capable of controlling chemical affinity both with respect to decomposition and combination. If a mixture of hydrogen and chlorine gases be exposed to the sun's rays, they combine with explosion, and form muriatic acid: this effect does not appear to be produced by the heat which accompanies the light, for a considerably higher temperature is not capable of producing the combination. With respect to the decomposing agency of light, it is well known that if pale nitric acid be subjected to it, it suffers decomposition to a certain extent, oxygen gas being evolved: it is also found that some metallic oxides which retain the oxygen with but slight force of affinity, evolve it and are reduced to the metallic state by the agency of light. A beam of solar light is made up of three distinct sets of rays—the luminous, the calorific, and the chemical or actinic rays. It is the latter set which influences chemical changes. [See LIGHT, DAGUERREOTYPE.]

AFFINITY, in Law, means a relationship by marriage. The husband and wife being considered, in law, as one person, those who are related to the one by blood, are related to the other in the same degree by *affinity*. This relationship not being the effect of nature, but the result of civil institution, the persons between whom it exists are said to be related *in law*; the father or brother of a man's wife being called his *father* or *brother-in-law*. Almost the only point of view in which affinity is a subject of any importance in the English law is, as an impediment to matrimony;—persons related by affinity being forbidden to marry within the same degrees as persons related by blood. [See MARRIAGE.] It is in consequence of this rule that a man is not permitted, by our law, after his wife's death to marry her sister, aunt, or niece,—those relations being all within the prohibited degrees of *consanguinity*; and therefore, according to the principle just laid down, the prohibition extends to the same relations by *affinity* also. This rule, which excludes from marriage relations by affinity within certain degrees, is founded upon the Levitical law; and doubts have been entertained by very learned writers, whether its introduction into the municipal laws of modern countries is necessary or useful. [See Michaelis, *Mosäisches Recht.* b. iii. c. 7.]

AFFIRMATION, in Law, is the solemn asseveration made by individuals belonging to the class of Dissenters called Quakers, in cases where an oath is required from others. This indulgence was first introduced by the statute 7 and 8 Wil. III., chap. 34, which enacts that the solemn affirmation of Quakers in courts of justice shall have the same effect as an oath taken in the usual form. The provisions of this statute are explained and extended by 8 Geo. I., chap. 6, and 22 Geo. II., chap. 46, sect. 36; but in all these statutes there is a clause expressly restraining Quakers from giving evidence on their affirmation in criminal cases. This absurd exception, which Lord Mansfield called 'a strong prejudice in the minds of the great men who introduced the original statute' (Cowper's *Reports*, p. 390), was removed by the 9 Geo. IV., chap. 32: and Quakers and Moravians were allowed to give evidence in all cases, criminal as well as civil, upon their solemn affirmation. This privilege in favour of Quakers, Moravians, and Separatists, has since been extended by several recent statutes, the last of which is 15 and 16 Vict., chap. 86, which declares that the word 'affidavit' shall include an affirmation. It may be remarked, that the penalties of perjury attach to wilful falsehood upon affirmation as well as upon oath.

AFFIX, a term in Grammar, to which the name of *suffix* also is sometimes given. It signifies a *syllable* attached to the *end* of a word by which the form and signification of the word are altered. This will be best explained by some examples from our own language. Thus in the words *wealth-y*, *weight-y*, *bulk-y*, and in *god-ly*, *odd-ly*, &c., the syllables *y* and *ly* are the affixes, which qualify the meanings of the words to which they are attached, and fit them for a new and different use; as 'This man loves *wealth*;' 'That is a *wealthy* merchant.' Verbs are in this way made from adjectives, as from the adjectives *sharp*, *quick*, *thick*, we have *sharpen*, *quicken*, *thicken* respectively; and adjectives and adverbs from nouns, as in the examples just given. The 's which marks our possessive case, is an affix, having originally been a distinct syllable, as we see from our old books in such expressions as *Goddes* will; *mannes* duty. Some persons are of opinion that this '*s* has arisen from the possessive pronoun *his*, as in such a phrase *God his will*, *man his duty;* but we are of opinion that this final '*s* is to be referred to the German and Anglo-Saxon genitive termination *es*. When we hear people vulgarly say *hisn*, *hern*, for *his*, *her*, the *n* is the remnant of the syllable *en*, which in these instances marks a kind of pronominal adjective, akin to the genitive or possessive case;—as we may still observe in the German forms *dessen*, &c.

In the Latin and Greek, and many other languages, there is the same system of affixes of which we have given examples in the words *weighty*, *bulky;* and in these languages the different cases of nouns, and adjectives, and the different tenses and persons of the verbs, are also formed by affixes. Thus the nominatives *Pindaru-s*, *Homeru-s*, *Liviu-s*, *Antoniu-s*, are the true Roman forms of these names, which, in the accusative, form *Pindaru-m*, *Homeru-m*, &c., respectively, and so on in the other cases. With the English, it is the common practice to shorten all these words to Pindar, Homer, Livy, Antony; and yet we are not consistent in this practice, for we say *Tibullus*, *Æmilius*, &c. keeping in these instances the genuine form just as it is in the language to which these names belong. The irregularity depends upon the greater or less familiarity of the names. With the French, the changes are still more violent.

AFGHANISTAN. It is difficult to assign exact limits to Afghanistan. It may be said to be included between 29° and 36° N. lat., and between 61° and 72° E. long. It is bounded on the north by Turkistan, on the east by the Punjab, on the south by Beloochistan, and on the west by Persia.

Afghanistan forms a part of the great central table-land of Asia, which extends from the Korea to the coast of Asia Minor. Its continuity with the higher plateau of Thibet, on the north-east, is interrupted by the remarkable mountain-knot called the Hindoo-coosh, formed by the convergence of the Himalaya range, and the great Altai system which forms the north border of the eastern highlands. From this isthmus, the border of the table-land extends southwards, mainly in the direction of the Indus, and keeping at a distance from the western bank of that river, varying from 100 to 50 miles. This eastern side of the table-land, which rises abruptly from the low grounds along the river, is considerably elevated, having a medium height of 6000 feet, which declines towards the west, till on the Persian border the general elevation is only about one-half.

The highland of Afghanistan is skirted on the north, east, and south by mountain-ranges, rising more or less above its general elevation. The highest is that on the north, called by the general name of the Hindoo-coosh, the several parts of which will be described below. The eastern crest is formed by the Suliman range, whose highest summits are in the north. The Muree and Boogtee Mountains, which form the southern crest, become blended at the south-east of the plateau with the Suliman system. This outline may be best filled up by taking it in sections.

I. The mountain-system which bounds Afghanistan on the north, and is known by the general name of the Hindoo-coosh, divides itself into two ranges, in about 70° E. long. The more northern range, to which the name of Hindoo-coosh more strictly applies, forms the continuation of the Kuenluen Mountains, and is the water-shed between the Oxus and the Indus. The other is an offshoot from the Himalaya, cut off from the main chain by the river Indus. The country contained between these two ranges is called Kaferistan, and does not belong to Afghanistan.

The southern declivity of the Himalaya range (which belongs to Afghanistan), presents from the base the appearance of terraces, and encloses considerable valleys, with narrow stripes of cultivable soil along the line of drainage. The forests that cover these mountains are the most extensive in Afghanistan. About 70° 12′ E. long., and 37° 55′ N. lat., near the union of the Himalaya with the Hindoo-coosh, the sides of the mountains are destitute of trees, and almost bare of soil; the rocks project in every direction; and the intervening places are strewed with large rough pieces of rock. The Hindoo-coosh presents this appearance to 68° E. long.; that is, to the mountain-pass called Hindoo-coosh, from which the whole range takes its name. This mountain rises to 15,000 feet.

The Hindoo-coosh Mountains contain some very populous valleys, of which the best known is that of Panchshir, about 70 miles long, and nearly 2 miles broad. One of the roads from Kabool to Kunduz passes through this valley. At its upper end, the road traverses the mountain-pass of Khawack, 13,000 feet high. There is another road over the Hindoo-coosh, further to the west, leading to the plains of Oxus, through a valley watered by the Parwan.

The Hindoo-coosh range, strictly so called, ends with the mountain-pass from which it takes its name. Here the mountains bend nearly due south, running between 35° and 34° 20′ N. lat., and decreasing in elevation, and are called the Pughman Mountains. This portion of the range consists of two parallel branches, including a valley 10 miles in width, and 10,000 feet high. This valley is too high for cultivation, but is the resort of the nomadic tribes in summer, for the sake of its fine pastures. The ranges are from 2000 to 3000 feet higher than the valley. There are several passes over these mountains to the Valley of Bameean, beyond the western range, whose elevation is 8500 feet. The Koh-i-Baba, which rises suddenly where the Pughman Mountains terminate, is a single range, which runs due west. At its eastern extremity are three peaks, 1500 feet above the general mass, whose elevation is 14,000 feet. North and west of the Koh-i-Baba are the mountain regions of the Hazarah and Eimack (Paropamisus), which occupy the whole country between 34° and 36° N. lat., and between 68° and 63° E. long., including the Koh-i-Baba, an area of about 50,000 square miles. The mountains of this region furnish pasture for the flocks in summer; but in winter the sheep have to be taken down into the valleys, and fed with grass, which is cut in great quantities for winter fodder. The valleys are cultivated—the higher yielding barley; the lower—wheat, barley, and millet.

II. *The Suliman Range and Eastern Declivity of the Table-land.*—The Suliman Mountains are just the elevated crest of the eastern declivity of the table-land facing the Indus. They are from 5000 to 7000 feet higher than the river, and hence appear as mountains, although on the land side they are only a few hundred feet high. The most northern point of this range is the Sufaid-Koh south of the river Kabool, in E. long. 70°. The summit of this mountain rises to 16,000 feet, and is always covered with snow. On the east, it is connected with the Kyber Range. The declivities of Sufaid-Koh are covered with forests up to 10,000 feet of elevation. The Suliman range extends from Sufaid-Koh to 29° N. lat. west of the confluence of the Indus with the Sutlej. Here it turns to the west, and meets the Hala Mountains of Beloochistan in 68° E. long. This portion of the crest is called the Muree and Boogtee Mountains.

The Suliman Range takes its name from the summit called Takt-i-Suliman, whose height is 11,000 feet.

The Indus river drains the declivity of the table-land, and the eastern portion of it as far as the ridge which forms the water-shed between the Indus and the Helmund, and which we shall describe afterwards.

The chief tributaries of the Indus from this region are the Kooram and the Gomul.

The Kooram rises in some of the southern offsets of Sufaid-Koh, and drains the country south of the Salt Range. This range runs at right angles across the Indus, and abuts on the Suliman Range south of Sufaid-Koh. It is composed of sandstone, containing very thick and extensive layers of rock-salt, which are largely worked at Kalabagh, on the banks of the river. The country around this range is very poor.

The declivity south of the Kooram is called by the name of Daman. Here the country descends by terraces, each terrace being enclosed by two ridges running from north to south. In some places there are three, in others four, terraces in the descent. The most of these valleys are fertile, and each valley is inhabited by a different tribe. The head towns of the tribes contain from 2000 to 4000 inhabitants. South of the Gomul the declivity is not well known, and what is known is of little consequence. The same thing must be said of the eastern portion of the table-land drained by these rivers. It does not appear that much of this tract is under cultivation. The country is occupied by nomadic tribes, who live in the manner peculiar to them everywhere.

Having described the contour of Afghanistan, we proceed to notice the Valley of Kabool and the central plain between Ghuznee and Kandahar, with the other portions of the table-land which are of much less importance.

III. *The Valley of the Kabool River.*—The Kabool drains the northern mountainous part of Afghanistan and Kaferistan. It rises at the foot of the Pughman Mountains, and flows eastward to the Indus, through a space measuring nearly 200 miles in a straight line. The Valley of the Kabool is divided into three basins by ridges which run across it. The basins, from west to east, are those of Kabool, Jellalabad, and Peshawur; the mountain regions are those of Lattabund and Kyber—so called from the most frequented passes across them. Before reaching Kabool, the river drains the Valley of Mydan, which lies between the Pughman Mountains and the western extremity of the mountainous tract bounding the valley on the south. Through the Plain of Mydan lies the road from Kabool to Ghuznee and Kandahar. This valley has great metallic wealth, but presents a dismal aspect. Within the Kabool basin, the river receives the Logur on the south, and the Ghorbund on the north. The Plain of Logur is very level and swampy, and has but little cultivated ground. The Ghorbund drains the region called Koh-Daman, which is bounded on the west by the Pughman Mountains, and on the north and east by the Hindoo-coosh and its offsets. This region is about 30 miles long, with a medium width of 7 miles. It is a favourite country residence of the wealthy inhabitants of Kabool, and is thickly studded with castles and gardens. The entire basin of Kabool extends about 36 miles from west to east, and from 8 to 16 from north to south. Its principal article of trade is dried fruits, which go to Hindustan. There is an immense variety of fruits in this region.

The town of Kabool is 6396 feet above the sea, and hence has a moderate climate. It is situated on the right bank of the river, between two ranges of lofty hills, and is about 3 miles in circumference. On a hill overlooking the city stands the Balla Hissar, the upper part of which commands the whole town and suburbs. The houses of the town are mostly flat-roofed, and the streets for the most part narrow and tortuous. It has a grand bazaar, 600 feet long and 30 broad, which excites wonder by the splendour and profusion of its articles. The houses are built of sun-dried bricks and wood. The population of Kabool is about 60,000, and is of a very mixed character, composed of people from nearly all Eastern nations; they all, however, speak Persian.

The mountain region of the Lattabund Pass is about 30 miles in extent; and in passing through this space, the river falls 4000 feet. From this it enters the basin of Jellalabad, which is 40 miles long and 10 miles broad. A few miles below the town, the river receives the Kameh, Kama, or Kuner, from the north, which drains the hill country of Chittral, in Kaferistan, and the Himalaya range, and has a course of 300 miles. The Jellalabad basin is a poor country, except a narrow strip bordering the river.

The Plain of Peshawur, into which the river emerges after flowing for a space of 20 miles through the Kyber Mountains, is 60 miles long and 30 to 40 broad. At the entrance into the plain, the river divides into two branches, which reunite after a course of 25 miles in a straight line, forming an island inhabited by Daoodzyes, and called after them; hence to the Indus it has a course of 35 miles. The Valley of Peshawur is densely populated, and highly cultivated. Like the Valley of Kabool, it abounds with all sorts of fruits. In summer, the heat is excessive. The spring rains are heavier there than anywhere in India, except Cashmere. The Plain of Peshawur does not reach the Indus, as the river is skirted by a ridge from north to south, through which the Kabool flows by a narrow gorge. The town of Peshawur is about five miles round, and has a population of 100,000, consisting of Afghans, Cashmerians, and Hindoos. The town resembles Kabool in its mode of building. From Jellalabad downwards, the Kabool is navigated by rafts, floated on inflated skins.

IV. *The Central Table-land, or that of Ghuznee and Kandahar.*—The water-shed betwixt the Indus and the Helmund is formed by a ridge, called Sir-i-Koh, which rises 1000 feet above the table-land, and runs from N.N.E. to S.S.W. till it reaches 32° N. lat., where it declines to the S.W. It continues in that direction to 66° E. long, where it terminates in the Desert of Beloochistan. The ridge after turning S.W. is called the Khojeh Amram or Toba Mountains: they rise nearly 2000 feet above their base. This ridge is the eastern boundary of the Central Table-land. The western boundary is a ridge which forms the continuation of the eastern chain of the Pughman Mountains, and terminates a little to the N.W. of Kandahar. This region so enclosed opens into the basin of Kabool by the Plains of Mydan and Logur, where it is about 20 miles broad, whilst at Kandahar it is 100 miles wide. Its elevation varies; 8 miles north of Ghuznee there is a hill-pass 9000 feet high. This pass is 40 miles distant from Mydan valley, and 200 miles from Kandahar, where the level has lowered from 9000 feet to 3500. At the northern end of this region, the temperature may almost be called cold; at Kandahar, it is very hot. The surface of this tract is greatly diversified: north of Ghuznee, there is no level tract of any extent, but the valleys are well cultivated; south of Ghuznee, the surface is less broken, the hills retire, and fertile plains 15 or 20 miles broad occur. To supply the deficiency of irrigation, aqueducts, called karezees, are made at the foot of the hills, by digging deep holes into the hill at different elevations, making the bottom of them all nearly in the same level, so that the water of all the higher wells is collected in the one at the foot of the hill. The water thus collected is conducted to any spot in the plain where it may be desired.

Between Kelat-i-Ghilzie and the neighbourhood of Kandahar, nearly the whole country is pasture-ground, in possession of nomadic tribes—the Ghiljies. Kelat-i-Ghilzie is about 80 miles north of Kandahar. It is an isolated fortress, situated on a barren eminence, exposed to the wintry winds and driving dust-storms—one of the dreariest spots in Afghanistan. The country between this fortress and Kandahar is watered by the Urgundab, a tributary of the Helmund. The part of the country around Kandahar, which is situated on the Urgundab, is very highly cultivated, and produces the various sorts of grains and fruits. Its pomegranates are much esteemed. Kandahar, the western capital of Afghanistan, is of a square form, more than a mile in circumference. The streets run from the four principal gates and converge to the bazaar, which is of a circular form. The walls of the city and the houses are built of sun-dried brick. The streets are very filthy, and mendicity is common. Kandahar is the centre of a great trade between India and Persia; its population is 60,000, chiefly Afghans. It is said to have been founded by Alexander the Great.

Ghuznee, in the north, the capital of a powerful kingdom in the twelfth century, is in ruins, and the present town is small and of no consequence. Near the town is the tomb of Sultan Mahmoud, the conqueror of India.

V. The part of the table-land lying to the south, between the Khojeh Amram Range and the Muree and Boogtee Mountains, and the Desert of Beloochistan, is mostly a poor and uninteresting country. It consists of the valley of the river Lorah and the country of Shawl. The Lorah rises on the borders of the Eastern Table-land, drains the Valley of Pisheen, and then enters the Desert, and terminates, it is said, in a lake. The road from Shikarpoor to Kandahar traverses this region in the middle, between the Bolan Pass and the Khojuk Pass. Here its elevation is 5000 to 6000 feet. The Valley of Shawl is described by Kaye (*Afghan War*, vol. i. 408), as 'a favoured spot in a country of little favour. The clear crisp climate braced the European frame; and over the wide plain, bounded by noble mountain-ranges, intersected by many sparkling streams, and dotted with orchards and vineyards, the eye ranged with delight.' Quettah, the chief town, is described as 'a most miserable mud town, with a small castle on a mound, on which there was a small gun on a rickety carriage.'

VI. The western part of the table-land, or that beyond the central district, is mostly high and bleak, fit chiefly for pasturage, and is generally inhabited by shepherds who dwell in tents. That portion of it which is contained between the road from Girishk on the Helmund to Furrah, and, on the north, the base of the Ghor Mountains, is called *Zemin Dawar*. The eastern part of Zemin Dawar is drained by the Helmund. This river, which thus drains such a large part of the country, including the whole of the Central Table-land and part of Zemin Dawar, is the largest in Afghanistan. After flowing through the region already described, it passes along the northern edge of the Desert, crosses the Plain of Seistan [SEISTAN], and falls into Lake Hamoon or Zurrah. Its entire course is 400 miles: its chief tributary on the right bank is the Kash-rood. The other rivers which drain Zemin Dawar run south into the Lake Hamoon: the most important of these is the Furrah-rood, on which is situate the town Furrah, on the highway to Persia from Kandahar. The land about this river is the best of Zemin Dawar.

In that portion of the western table-land which is west of the country of the Eimack, and borders on Persia, the Ghor Mountains become low ridges, running generally from N.N.E. to S.S.W., between which are level tracts, some sterile, some fertile. The Plains of Subzawar and Herat are very fertile; they are each about 30 miles long and 20 wide. The Plain of Herat is watered by the Heri-rood, which rises in the mountains of Hazarah. Herat is a well-fortified town, three-quarters of a mile square, containing 50,000 inhabitants, and numerous manufactories. Subzawar is situated south of Herat, in an extensive valley, and contains about 1000 houses. Both towns are on the highway to Persia from Kandahar.

Climate.—The climate is very variable, and a region hot as India may be found within a day's journey of a perpetually frozen country. The east is generally much hotter than the west, and in the plains of Peshawur a thermometer in the shade rises to the height of 128° in July. In the same place, frost lasts to the beginning of March. The spring is very rapid: before the end of March, plum-trees and apple-trees are in full foliage; barley is in the ear; the heat is already disagreeable; and in May the very wind is hot. In the hot parts of the country, the simoom is felt occasionally. The south-west monsoon is felt in the eastern parts of Afghanistan, though not so violently as in India. It commences about the end of July, when the parched earth resumes the appearance of spring with miraculous rapidity; at other times there is little rain, fogs and clouds are rare, and the air is usually dry. The average heat is less than in India; and the difference of temperature between day and night, and winter and summer, is much greater than either in India or England. The climate generally is healthy.

Afghanistan has great mineral wealth. Gold is found in several streams from the northern mountains. Copper abounds between Sufaid-Koh and the town of Kabool, some places yielding 60 or 80 per cent. of metal; but it is not much worked. Iron of the best quality abounds in the Himalayas north of Peshawur. It is extensively worked in the district of Bajour. There are iron-mines on the Eastern Table-land, and also in the mountains of Hazarah. Here, as also in the Pughman Range, lead of excellent quality is found. of course salt abounds in the Salt Range.

In addition to most of the common grains, some of the grains of Hindustan are grown. Two crops are obtained annually in the Valley of the Kabool, up to Jellalabad. The common vegetables are grown, and all sorts of fruits. Forests are found only on the Himalayas and the Sufaid-Koh; in other parts, trees are found planted in rows along the water-courses and canals, and around orchards. These trees are chiefly willows and poplars. The mulberry-tree grows wild in all cold valleys; the fruit is much improved by cultivation; there are at least twelve varieties of it. In the valleys of the Hindoo-coosh, the mulberry is ground into flour, and is the chief food of the country. The produce is very regular.

The animals of Afghanistan are like those of India; the lion is small and very rare. Tigers and leopards are found in the eastern parts, and hyænas, jackals, wolves, and foxes, everywhere. There are many bears, but they rarely descend into the plains. Horses are common, and in some parts very fine. Asses are much used in the labours of agriculture; but the chief beast of burden is the camel, the same long-legged animal used in India. The stout short camel, with two humps, is sometimes used, but more rarely. The principal stock of the rural population consists of sheep; a fine handsome animal, with tails of solid fat a foot broad. Goats, dogs, and cats, with long silky hair, are all in abundance.

Population and Inhabitants.—The population is estimated by some at 14,000,000, inclusive of Beloochistan; but this is thought to be much too high. The Afghans are the ruling nation, and are dispersed over the whole table-land; the mountains are mostly in possession of other tribes. The large towns are inhabited chiefly by Persians and Hindoos—Kandahar is an exception. An Afghan never keeps a shop, or exercises any trade. The only Afghans found in towns, are the officers of government and their followers, soldiers, priests, and perhaps a few labourers. The Afghans have features resembling those of Jews, and for this reason many believe them to be of Jewish descent. According to their own tradition, they were transplanted to Ghorè, near Bameean, by Nebuchadnezzar. Their language, however, which is called Pushtoo—whence the name Pushtaneh, by which the people call themselves—has nothing in common with the Hebrew. Half the words are Persian, but almost all the particles and verbs are from some unknown root. They use the Arabic alphabet. The Persian language is chiefly used in composition.

The Afghans are frank and open, do not regard rank, but reverence old age. They are sociable, and fond of company; hence they have frequent dinner-parties, and a dinner is a common stake in play. Like the Arabs, they are extremely hospitable, but also addicted to robbery, which they practise on travellers. They have a reputation in the East for truthfulness, and have a strong pride of family.

Among the western tribes, the pastoral character prevails; but although the larger extent of ground is occupied by the dwellers in tents, the dwellers in houses are the more numerous body. Agriculture is on the increase. The Afghans are Mohammedans of the Sunite sect, with less bigotry than usual. Those of other religions live in peace and security. Social intercourse with women is less restrained than among other Mohammedans. In the country, though not in towns, women go out unveiled. Their marriage-ceremonies are like those of the Persians. The whole nation is divided into tribes, which are independent of, and live unmixed with each other. The government of the tribes is republican; they are divided into clans, and each clan has its chief or khan, chosen from the oldest family. The clans are eminently exclusive, and are often at feud with each other. They are little attached to their chief, but very strongly to their tribe. The chief tribes are the Duranees, inhabiting a tract extending from Herat to south-east of Kandahar, and the Ghiljies, inhabiting the Centre Table-land. From the former tribe was chosen, till lately, the king, who exercised a limited monarchy. The crown was hereditary in the family, but elective as to the person.

Every large town has a cadi, for the administration of justice. Death is rarely inflicted. Most cases are decided by the head of the tribe, and are not brought before the cadi at all. The police is defective. A defence for strangers is stationed in dangerous places; but to *purchase* security is the best way of obtaining it.

The military may be about 30,000, of which one-third are Gholams or military adventurers, who enlist for life; about 10,000 are furnished by landowners at a stated rate; and a large contingent is supplied by the Duranee tribe, as the condition on which they hold their lands. Their soldiers are chiefly horsemen, and their arms are swords and matchlocks.

The Hazarah and Eimack, who inhabit the Paropamisus, are of Mongol race; at present they speak Persian. The former tribe, who occupy the higher regions, have fixed abodes, living in small villages of low huts; these they, in company with their cows and sheep, occupy in winter; during summer, they live on the slopes of the mountains. The Eimack are nomadic, and live all the year in tents—in summer on the higher, in winter on the lower declivities of the mountains. These tribes are nominally dependent on the sovereign of Kabool. The agricultural community on the table-land are called Tajiks or Tadjiks, who are found in all countries from the Mediterranean to Chinese Turkistan. They are *glebæ adscripti* or serfs, who work the ground, and have to give up to their master one-fourth or one-half of the produce. In towns, they constitute the labouring-classes. They have preserved their language, which is generally acquired by the Afghans.

Besides these peoples, there are settled amongst the Afghans, Hindoos and Persians in towns and villages, who constitute the shopkeepers. There are also Kuzzilbashes, who are found only in towns, except at Herat, where they are found in villages; they are very numerous in Kabool. They are Turkomans, and their ancestors were members of some of the *Ilats*, which wander about in the plains of Persia. They are mostly soldiers, or secretaries, or stewards. Arabs are settled in Kabool and Jellalabad; they are agriculturists, and do not mix much with the other inhabitants. There are Armenian merchants in different towns. Abyssinians are imported as slaves.

Manufactures.—Manufactures for export are produced only at Herat and Kandahar. Those of Herat are silk and woollen stuffs, and sword-blades; and these articles find a ready sale in Persia. The manufactures of Kandahar are of the same description, with the addition of firearms. No manufactured articles are imported from India, except cotton stuffs. Elphinstone, in his work on Kabool, gives a full list of the trades exercised at Kandahar, which are much the same as those of any European large town. The inhabitants of the Paropamisus do not export their wool in a raw state, but manufacture it into several kinds of cloth, carpets, grain-bags, saddle-bags, rugs, felt, felt-cloaks, mittens, socks, and horse-cloths.

Commerce.—The transport of goods in Afghanistan is expensive from two causes—the want of navigable rivers and of roads; the latter deficiency is common to all Western Asia. The beasts of burden employed are camels in the level country, and mules and asses in the highlands. Almost the whole land-commerce between the countries south and north of it goes through Afghanistan. There are three lines of road: the most northern begins near Loodiana, on the Sutlej, passes through Lahore, reaches the Indus at Attock, proceeds through Peshawur to Kabool, and there divides into two roads: one ascends the Hindoo-coosh Mountains, and descends on their west flank to the plains of Turan, going through Kunduz to Bokhara; the other goes south to Kandahar, and meets the other two lines. The middle line passes west from Lahore, crosses the Indus at Dera Ismael Khan, and ascends the Gomul or Golair Pass, which leads across the Eastern Table-land. Thereafter it divides into two roads—one going to Kandahar, and the other to Kabool. The third road begins at Kurachee, a seaport on the Indian Ocean, N.W. of the western mouth of the Indus, and proceeds to Shikarpoor, thence N.W. through Dadur, and gains the table-land through the Bolan Pass, which is 60 miles in length, and runs westward to Kandahar. The road from Kandahar to Persia crosses the Helmund about two miles east of Girishk, proceeds to Furrah, thence to Subzawar, thence to Herat, whence it passes through Meshed and Nishapoor to Teheran. The commerce by the first line is not very active; by the other two, it is much more important.

Elphinstone's *Account of the Kingdom of Cabul and its Dependencies*; Burnes' *Travels into Bokhara*; Arthur Conolly's *Journey to the North of India, overland from England*: Wood's *Personal Narrative of a Journey to the Source of the River Oxus*; Vigne's *Personal Narrative of a Visit to Ghuzni, Kabul, and Afghanistan*; Masson's *Narrative of Various Journeys in Beloochistan, Afghanistan, and the Panjab*; Irwin's *Memoirs of the Climate, Soil, Produce, and Husbandry of Afghanistan*, in *Calcutta Asiatic Journal*, Nos. 93, 94, 95, 96, 97; Hutton's *Wool and Woollen Manufactures of Khorassan*, in *C. A. Journal*, No. 99; Edward Conolly's *Notes on the Eusofzye Tribes in Afghanistan*, *C. A. Journal*, No. 105; also his *Sketch of the Physical Geography of Seistan*, in *C. A. Journal*, No. 103; and his *Journal kept while travelling in Seistan*, No. 112; *The Bolan Pass*, *L. G. Journal*, vol. xii.; Forster's *Journey from Bengal to England through the Northern Parts of India*; Macfarlane's *Indian Empire*, 2 vols., 12mo. [For HISTORY and ANTIQUITIES, see SUPPLEMENT.]

AFIOUM, or OFIUM KARA HISSAR, (that is, the Black Castle of Opium,) is, according to D'Anville, situated on the spot where formerly Apameia Kibotos stood. At Afioum are remains of temples and palaces decorated with black marble. The site of Afioum is fixed in 38° 45′ N. lat. 30° 46′ E. long.

The original name of Apameia was Celænæ, under which denomination it is described by Xenophon, Herodotus, and Arrian. Antiochus Soter gave it the name of Apameia, as Strabo informs us, who also describes the place. Notwithstanding all this, it is not *yet* certain whether Afioum Kara Hissar, or some other town, represents Apameia; and this fact, when we consider the minuteness of the ancient descriptions, is one among other proofs how little we know of the interior of Asia Minor. Taking into account that Apameia was the centre of a great commerce, as Kara Hissar now is, and combining this with the resemblance of name and Pococke's description of the citadel, as compared with Arrian's account of Celænæ, it seems most probable that Afioum is Apameia. [But see Rennell's *Geography of Western Asia*, ii. p. 144.]

The following extract is taken from Pococke's *Travels*, whose opinion as to the ancient site differs from ours: 'Carahissar is distinguished among the Turks by the name of Aphioum Carahissar, on account of the great quantities of *ophium*, or opium, which is made here. I had great satisfaction in finding, by an inscription, that Carahissar is the ancient Prynesia of Ptolemy, because it is of great use in making conjectures as to the situation of other places mentioned by that author. It is situated at the foot of the mountains round a very high rock, about half a mile in circumference, on the top of which they have built a fortress. The work is a sort of bastard, brown granite; it is of a black hue, from which the town is called Carahissar (the Black Castle); it is so very steep that it would be impregnable if supplied with provisions and water, and it seems to be half a quarter of a mile in perpendicular height. The town is near three miles in circumference, and it is a great thoroughfare, has much trade, and good shops provided with all sorts of things, being in a plentiful country, and many caravans pass through it. It is the residence of a pasha. There are in the city ten mosques; one of them is a noble building with a portico before it, the whole being covered with domes. There are neither Greeks nor Jews in the city, but about fifty Armenian families, besides several merchants and tradesmen, who stay here part of the year as they do in other towns, living in khans; they have two churches, and of late they have had a bishop, whom they call metropolitan. In the country between this and Smyrna they make most of the Turkey carpets,' &c.

The population of this town is stated at 50,000 or 60,000. It is of some importance for its fabrics of wool, tapestry, fire-arms, and sabres. But the chief article of commerce is the opium cultivated in the neighbourhood. Afioum is also the rendezvous of the caravans from Constantinople and Smyrna, which from this place proceed further into the interior.

AFRICA. In describing any of the great divisions of our globe, we shall only give information of a general description. Details on particular parts will be found under distinct heads.

I. *Africa as known to the Greeks and Romans.*—The name *Africa*, which is no doubt of native origin, was probably first introduced into Europe by the Romans, who gave this appellation to one of their African provinces, which comprehended the city of Carthage. Africa was, therefore, properly the name of a limited district, which has since been extended to the whole of this vast continent: the same thing has constantly taken place in modern times, and the name of a remote spot or tribe has been magnified into that of a country or a nation. But the real name for this continent, both in the Greek and Roman writers, is Libya. Herodotus, the earliest extant Greek author who has transmitted to us any information about Africa, has given a proof of his limited acquaintance with it by the very simple division which he makes of its inhabitants. All the native tribes in the northern part he calls by the general name of Libyans, and those in the south Ethiopians. Egypt, according to his system, hardly belongs to Africa, but lies like an isolated slip between the two adjacent continents. He was evidently puzzled about assigning a boundary to Asia and Africa; and he is often led, almost unintentionally, though with perfect correctness, to give the name of Arabia to the part immediately *east* of the Delta and the Nile. Herodotus asserts that Africa is surrounded with water, except at the narrow neck now called the Isthmus of Suez; and one reason for his belief was apparently the story of Africa being circumnavigated by the Phœnicians in the reign of Pharaoh-nechoh (as he is called in 2 Kings, c. 23), King of Egypt, and between the years B.C. 610 and 594. The circumstances of the voyage, as reported by Herodotus, are very meagre; and when faithfully presented, will enable the reader to form his own opinion of the probability of the voyage having been made. 'Nechohs, King of Egypt (Herod. iv. 42), despatched some Phœnicians in vessels, with instructions to sail round Libya, and through the Pillars of Hercules (Straits of Gibraltar), into the Northern (Mediterranean) Sea, and so to return to Egypt. The Phœnicians set out from the Red Sea, and navigated the southern ocean. When the autumn came on, it was their practice to land on whatever part of the coast they happened to be, to sow the ground, and wait for the harvest. After reaping it, they would again put to sea; and thus after two years had elapsed, in the third they passed through the Pillars of Hercules and arrived at Egypt. And they said, but for my part I do not believe the assertion, though others may, that in their voyage round Libya they had the sun on their right hand.'

This Phœnician voyage is the only direct statement as to the ancient *circumnavigation* of Africa that deserves a particular examination; and the best critics are divided in opinion upon it. We do not believe the circumnavigation was effected, and for the following reasons:—Herodotus visited Egypt about 150 years after the event, a time long enough to allow the original story (for we believe the whole to be founded on *some* facts) to have become much perverted from the truth. The phenomenon of the sun being to the right hand, or to the *north* of the voyagers, would be observed during part of the year if they never went beyond the Straits of Bab-el-Mandeb. The time allowed for the circumnavigation is too short; and the difficulty of sowing and reaping on an unknown coast, to say nothing of the opposition which the natives might offer, and the dangers of the voyage itself, are serious objections: and, finally, the notion which Herodotus had, and which was long the prevailing one, that Africa did not extend so far south as the real equator, is decisive against the truth of the voyage. If it ever had been made, it is impossible that so erroneous a notion as to the southern extent of Africa would not have been corrected. We refer the reader to Mannert's *Geography of the Greeks and Romans*, vol. i., for further examination of this question, and other supposed circumnavigations. Compare also Gosselin, *Géographie des Grecs Analysée*, p. 108, &c.

Another ancient voyage is somewhat better authenticated. Hanno, one of the ruling men of Carthage, or king, as he is termed, sailed from that city through the Straits of Gibraltar, to establish some colonies along the Atlantic coast of the present empire of Morocco. He took with him a large fleet, and 30,000 settlers, whom he left at various places, and then bent his course further south. He passed a river with crocodiles and river-horses in it; and it has therefore been concluded that he went at least beyond the Senegal; but it is not easy to fix with any precision the extent of the voyage, though it must have been considerably to the south of the Senegal, according to the statement of the voyager. Yet it could hardly be further than the Sierra Leone coast, and it *may* not have extended so far. Major Rennell, whose opinion is entitled to the greatest respect, gives this extent to the voyage; but he also advocates the truth of the Phœnician circumnavigation of Africa, which makes us somewhat more scrupulous than we otherwise should be in receiving his interpretation of the voyage of Hanno. M. Gosselin, who is more sceptical than the English geographer, does not carry Hanno further than the latitude of the Canaries. Polybius, the Greek historian, was sent by Scipio Æmilianus to explore the same coast (Pliny, v. 1); but it is impossible to state how far he went, from so defective an extract as that contained in Pliny. The time at which this voyage of Hanno was made is uncertain, though we are inclined to place it before B.C. 500. Herodotus, however, who lived after this date, says nothing about it; yet this is not so strong an objection as it might appear at first, since Herodotus, consistently with the plan of his history, never mentions the Carthaginians, except incidentally; though it is certain that he knew much more about them than he has told us. The voyage of Hanno, which was originally written in the Punic language, has come down to us in a Greek translation, though probably mutilated, and may be seen in Hudson's *Collection of the Minor Greek Geographers*, vol. i.

One of the most curious documents with respect to ancient navigation on the east coast of Africa, is contained in the Periplus of the Erythrean Sea, which goes under the name of Arrian. This work, which was probably compiled from various log-books and journals, may be assigned to about the time of Pliny the elder, or perhaps to an earlier period. It has been illustrated, generally, in a very satisfactory way, by Dr. Vincent. The Periplus contains much valuable information on the Red Sea, and also a description of the coasts of Arabia, Persia, the western coast of India, and the eastern coast of Africa. The extreme south point mentioned on the African coast is Rhapta, which Dr. Vincent thinks to be identical with Quiloa. It would seem as if this work was intended for the use of merchants, as the compiler has carefully mentioned the articles of export at each place of importance, and also has informed his readers what kind of commodities would meet with the readiest sale.

From the tables of Ptolemy, the Greek geographer, it appears that the coast of Western Africa was known, probably through the navigation of the Carthaginians and the Romans, as far as to 11° north of the line. It is a curious question whether the ancient geographers were acquainted with the countries south of the Great Desert, and with the upper part of the river Quorra, commonly called the Niger. Herodotus tells a story, which he heard from some people of Cyrene, of some young men of the Nasamones, a tribe near the present Gulf of Sidra, crossing the Desert in a westerly direction, and coming to a great river which ran towards the rising sun, and had crocodiles in it, and black men living on its banks. It is very hard to give implicit credit to all the circumstances of this narrative; and yet it deserves great respect, because there are real facts corresponding to the description. The nature of the narrative, however, is such as to render it impossible to demonstrate satisfactorily either the truth or falsehood of this early discovery. But there are other considerations which must not be omitted in forming an opinion as to the knowledge which the ancients had of Central Africa. It can hardly be imagined that the powerful state of Carthage, which employed so many elephants in war, and carried on so extensive a commerce, could be altogether ignorant of the countries south of the Great Desert. The elephant, we have no reason to believe, was ever an inhabitant of the Atlas regions, except so far as it was domesticated among the Carthaginians, and therefore must have been brought to Carthage from Central Africa; while the articles of commerce, which the interior now furnishes to the coast of Tripoli, were commodities in which the Carthaginians used to deal, such as slaves, ivory, gold, &c. As to any objections raised to this statement about the elephant, from Pliny's assertion that it was found in Mauritania, we well know how to estimate that writer's evidence on such points; it is indeed of very little value, even though supported by Strabo, and the Periplus of Hanno. Seleucus Nicator kept a stud of 500 elephants (Strabo, xvi. p. 752) at Apameia, and he had to bring them a greater distance than the Carthaginians would have, if they procured them from Central Africa. The Carthaginians themselves had extensive elephant stables and grounds near the city (Strabo, *Casaub.* 832). When the Romans became masters of North Africa, we might expect to find them attempting, according to their usual policy, to enlarge their empire or their influence to the south; and we have, in fact, in Pliny, a distinct account of Suetonius Paullinus, A.D. 41, crossing the great mountains of Atlas, and going some distance south; and, in Ptolemy, we have an account of a Roman officer, Maternus, who set out from the neighbourhood of Tripoli, and went a four months' march in a southern direction. This route must have brought him into the latitude of Timbuctoo, and into the neighbourhood of the Tchad; and if the story is true, the great river, now commonly called the Niger, might have been thus known to the Romans. In examining the tables of Ptolemy, in which the positions of places are laid down according to their latitude and longitude, we find no reason to doubt their general accuracy along the western coast as far as N. lat. 11°. He has also given the position of a number of places in the interior, on a river which he calls Nigir; and the direction thus assigned to the river will come as near the truth as we could expect it to be, even if we knew Ptolemy's tables to be constructed upon real observation, such as was practicable at that time. A complete discussion of this question is given in the second number of the Journal of the Royal Geographical Society of London, by Colonel Leake, who is in favour of the opinion that the Joliba of Park, commonly called the Niger, was known to the Romans, and to Ptolemy, who constructed his tables from all the materials accessible to him in the rich commercial city of Alexandria, where he lived.

The Fortunate Islands (now the Canaries) were known to Ptolemy, and he reckons all his eastward distances or longitudes from them, or from some one point in them; for he does not appear to have known anything accurate as to the relative position of these islands. And as coasting voyages had considerably extended the knowledge of the east coast of Africa, without however showing any termination of the land, Ptolemy concluded that the southern parts of Africa joined the eastern parts of Asia; and thus he converted the Indian Ocean into an inland sea.

The Greek and Roman writers mention the following remarkable African animals with which they were acquainted:—The crocodile and the hippopotamus, both in the Nile and the rivers of Western Africa; the giraffe, or camelopard; the elephant; the two-horned rhinoceros; and the ostrich. With the exception of the hippopotamus, all these animals were at different times seen in the Roman capital. The camel is not mentioned as being found in Africa by any ancient writer, we believe, except Herodotus (vii. 69, 86; iii. 9), and it is therefore concluded that it was introduced into this continent by the Arabs; this opinion will be noticed under the head of AFRICAN ZOOLOGY.

On the occupation of Egypt by the Arabs in the seventh century of our era, and the spreading of this conquering people through Africa, the regions south of the Sahara soon became known to them, and felt the influence of their religion and their arms. The Moors have now for centuries been in the habit of sending caravans across the Desert to Sudan, as the country south of the Sahara is often called; and they accordingly possessed some knowledge of these central regions long before they were visited by any Europeans. But the accounts of the Arabic writers cannot be said to add much to the information contained in the Greek and Roman writers, if we admit that the evidence is satisfactory as to the acquaintance of the latter with the regions south of the Great Desert. With the exception of Leo Africanus and Ibn Batuta, the latter of whom, in the fourteenth century, visited the banks of the Joliba, it does not appear that any of the extant Mohammedan writers were personally acquainted with Sudan; and their accounts must therefore have been derived from the merchants who accompanied the caravans.

Edrisi, who studied in Cordova, and wrote his book in Sicily (about A.D. 1153), can only be considered as a geographer and not a discoverer. He was a native of Ceuta, in Africa, but never travelled in that country, as far as we know. Ibn Batuta, who was a wanderer for thirty years in Asia and Africa, crossed the Sahara from Segelmessa, and visited Sego and Timbuctoo. The work of Ibn Batuta, which is very imperfect, has been translated by Professor Lee of Cambridge. John Leo, an Arab of Granada, commonly known by the name of Leo Africanus, also crossed the Desert in the early part of the sixteenth century, and visited the cities on the banks of that great river which has given rise to so many conjectures. Leo wrote his work on Africa at Rome, during the pontificate of Leo X. According to some accounts, it was already written in Arabic when he was taken prisoner by the Christian corsairs and presented to Leo, at whose request he translated it into Italian during his residence at Rome.

Though the descriptions of the Arab geographers are often vague and unsatisfactory, they still show in some directions a more extensive knowledge of Africa than the Greeks and Romans have left on record; and indeed their accounts have been sometimes singularly confirmed by the inquiries of our own age. As an example, we mention the description given by Ibn-el-Wardi of the natives on the east coast of Africa, of their selling their children for slaves, filing their teeth to a point, and other peculiarities still found among the people of that coast. [See Salt's *Abyssinia*, p. 56.]

II. *Progress of Modern Discovery.*—The only portion of the west coast of Africa with which European navigators were acquainted at the beginning of the fifteenth century, was that between the Straits of Gibraltar and Cape Nam, or Nun, or Non, in lat., 28° 40′, an extent of not much more than 600 miles. From this point commenced that career of discovery by the Portuguese, by which the entire coast of Africa has been made known to the modern world. The original promoter, and for a long time the director of these expeditions, was Prince Henry, a younger son of John I., commonly called the Bastard, King of Portugal, and of his wife Philippa, daughter of John of Gaunt, and sister to Henry IV. of England. The curiosity of Prince Henry had been first excited about the unexplored parts of Africa, by the accounts of the country of Guinea, and the kingdoms in its neighbourhood, which he had received from the Moors. Animated by the desire to acquire further information respecting these mysterious regions, he took up his abode in his twenty-first year, at Terçanabal, in the Bay of Sagres, not far from Cape St. Vincent, the point of his native country nearest to the coast of Africa, and prepared to devote the remainder of his life, as in fact he did, to the task of achieving the circumnavigation of that vast continent.

Before this, however, a single ship appears to have been sent out, in the year 1412, by King John, which had doubled Cape Nun, although other accounts say that this exploit did not take place till 1415, when it was accomplished by two small vessels despatched by the Prince. The navigators advanced for about sixty leagues further along the coast, which was found continually to trend to the south-west; when at last they came upon a point which projected so far into the sea, and was lashed by the waves with such fury, that they were afraid to attempt to pass it, and returned home. This formidable promontory, since known by the name of Cape Bojador—that is, Projecting or Round Cape (in lat. 26° 20′)—does not appear to have been doubled till 1432, or 1433, when, after several attempts, it was at length doubled by Gilianez, by whom also its present name was given to it. Meanwhile, the isle of Porto Santo, one of the Madeira group, had been accidentally discovered in 1418, by Zarco and Tristan Vaz, who had come upon it in a storm.

In 1419, the island of Madeira itself (properly written Madera) was discovered by the same navigators; but this island had been visited long before, both by the unfortunate English captain, Macham or Machin, in 1344, and by the Spaniards in 1421. It was first called St. Laurence, and afterwards Madera—from the Spanish word for *wood*—having been covered with forests, which, being set on fire, are said to have burned for seven years.

In a second expedition, in the year 1434, Gilianez advanced about thirty leagues beyond this cape, and landed on a coast where he saw men and flocks, and to which, from a fish which he found there, he gave the name of the Angra de Ruivos, or Bay of Gurnets. In 1440, Antonio Gonzalez proceeded as far as to Cape Blanco, in lat. 20° 47′, which, however, was only in 1443 doubled by Nunno Tristan. The latter navigator also discovered at the same time the isles of Adeget, and Las Garças (or The Hawks), two of the Arguim or Arguin group, lying immediately to the south of the cape. The Portuguese afterwards formed a settlement in these islands.

In 1444, a number of individuals in the town of Lagos, in Portugal, formed themselves into a company for the prosecution of African discovery; and an expedition, fitted out at their expense the same year, discovered and took possession of two of the other Arguin isles, named Nar and Tider. In 1446, Dinis Fernandez sailed as far as to Cape Verde, in lat. 14° 48′, along a coast running nearly due south from Cape Blanc. Next year, Lancelot (or Lançarote, as he is called by the Portuguese writers) discovered between Cape Blanco and Cape Verde a great river, called by the natives Ovedec, but to which he gave the name of Sanagà or Canagà, being, say Barros and Sousa, that of a Moor whom he put ashore at the place. But it was doubtless the name, not of the individual, but of his nation, which he gave to the river; which was really therefore named, as Rennell, apparently without recollecting the statement of these writers, has conjectured, from the Senhaji or Assanhaji—in our maps, the Zenhaga—and the Sanhagæ of Edrisi and Abulfeda, who inhabit its northern bank. (See *Geography of Herodotus*, vol. ii. p. 28, note. Edition of 1830.) It is the same which is called in English maps the Senegal.

Lancelot also, on this voyage, touched at the isles of Palms and Gomera, two of the Canaries, which group, however, was known to the ancients, and had been rediscovered and in part taken possession of by the Spaniards about a century before this time. In 1447, Nunno Tristan advanced about sixty leagues beyond Cape Verde, along a coast now trending to the south-east, and discovered the Rio Grande, in sailing up which he was attacked by the natives, and killed, with the greater part of his men. The following year the Azores—which, although lying nearly due west from Lisbon, have been considered by Malte-Brun and other geographers to belong properly to Africa—were discovered by Gonzalo Vello; and about twelve years after, colonised under the auspices of Prince Henry, to whom a patent or charter was granted for that purpose by his nephew King Alphonso V. In 1449 (Sousa says 1460, and other authorities 1462), the Cape Verde Islands, the nearest of which lies about 300 miles west from that promontory, were discovered by Antonio di Noli, a Genoese, in the service of Prince Henry. The prince died in 1463, at the age of sixty-seven; but the zeal for African discovery, which, in the face of long-continued ridicule and opposition, he had so far fostered, was now become a national passion; and the work of prosecuting what had been so well begun was taken up by the government. The coast of Sierra Leone, about 200 miles south of the Rio Grande, was reached in 1467. By the year 1469, the navigation had advanced as far as to the portion of Northern Guinea called the Grain Coast, from the cochineal (then, and for a long time afterwards, erroneously supposed to be a vegetable seed) thence obtained; and in the course of that year, Fernando Po discovered the island in the Bight of Biafra, now known by his name, but at first called Hermosa (the Fair). Fernando Gomez now obtained from the government, at a rent of 500 ducats, a monopoly of the commerce to Guinea for five years, binding himself during that period to explore 500 leagues more of the coast. Soon after were discovered Prince's Island (about lat. 1° 50′ N.), that of St. Thomas (nearly on the line), and that of Anno Bom (about 1° 40′ S.). In 1471, John de Santarem and Pedro de Escalona advanced as far as Cape St. Catharine, in lat. 2° 30′ S. This was the furthest point reached during the reign of Alphonso, who died in 1481, and was succeeded by his son, John II. That same year the castle or fort of St. George of Elmina (the Mine) was built by the government, near the mouth of the river called Oro da Mina, on the Gold Coast, and became henceforth the capital of the Portuguese settlements; and soon after, the new king added to his other titles that of Senhor de Guiné (Lord of Guinea). After this the circumnavigation of Africa was prosecuted with renewed spirit. The deep Gulf of Guinea had now carried the coast about 27° east of the meridian of Cape Verde, and it was not found again to recede westwards. In 1484 took place the voyage of Diego Cam. He sailed from Elmina, and advanced as far as the river Congo or Zaire, the outlet of which is about lat. 6° S.; after having ascended which for some miles, he returned, and pursued his way along the coast, till he reached first what he called Cape St. Augustine (in lat. 13° S.), and after that Cape Cross, or de Padrono (in lat. 22° S.). At each of these points he set up a great cross of stone, having inscribed upon it the king's name and his own, with the date, and other particulars of its erection.

The next was the celebrated voyage of Bartholomew Diaz, who, setting out with three ships, was commanded, if possible, to pursue his course to the south, until he should arrive at the extremity of the continent. Having, accordingly, passed the furthest point reached by Diego Cam, he proceeded until he came to what is now called Sierra Parda (in lat. 24° S.), where he erected his first cross, calling it Padraõ de Santiago. He then passed on, till he reached Cape das Voltas (about lat. 29° S.), where he was detained for five days. On leaving this station, he was driven out to sea, when, attempting to regain the coast, he came to what he named the Angra dos Vagueiros (or Bay of Herdsmen), and found the land stretching to the north. He had, in fact, doubled the terminating point of the African continent without knowing it. He continued his voyage past the Bay of Herdsmen, till he came to a small island in the recess of Algoa Bay, which he named Santa Cruz, or the Holy Cross (in lat. 33° 45′ S.), where his crew, according to Barros, compelled him to put back after he had erected his second cross. Other accounts, however, state that he proceeded for about 25 leagues beyond this, when he found himself at the mouth of the river Del Infante; so called after the second captain, by whom it was first perceived. On his way back, Diaz came in sight of the long-sought promontory, which we now call the Cape of Good Hope, the name given to it by the Portuguese king; but Diaz himself had named it Cabo Tormentoso (the Cape of Tempests), from the stormy sea which he encountered in its neighbourhood. The Cape of Good Hope was also sometimes called, at first, the Lion of the Sea, and the Head of Africa.

The beginning of the year 1493 was signalised by the return of Columbus from the discovery of America, then imagined to be the western termination of India with respect to Europe, and thence named the West Indies. But this was not the only great achievement in navigation which marked the close of this century. John II. of Portugal died in 1495, and was succeeded by his cousin Emanuel, surnamed the Great, who, with the throne, inherited all the zeal for maritime discovery which had distinguished its late possessor. Under his direction, Vasco de Gama set sail on the 8th of July 1497, to attempt the passage to India by the course, around the extremity of Africa, discovered by Diaz. In the prosecution of this enterprise, De Gama, after having doubled the Cape of Good Hope on the 19th of November, and put in at the Bay of San Blaz, 60 leagues beyond it, left that station on the 8th of December, and on the 16th passed the island or rock of Santa Cruz, where Diaz had erected his last cross. He then came to the mouth of a river, which he named Dos Reis (the River of the Kings), from having discovered it on Epiphany Day. The part of the coast to the south of this he had called Tierra de Natal, in allusion to the season of Christmas. To the portion beyond, where he had some intercourse with the natives, he gave the name of the Land of Good People. The next place at which he touched was the Cabo de Correntes—that is, the Cape of Currents—near the tropic of Capricorn; from which, keeping out to sea, he passed the river and harbour of Sofala, without having observed the town there situated. Continuing his course to the north-east, he next arrived at the Port of Mozambique (in lat. 15° S.), but did not land, having discovered a plot of the Arabs there established to effect his destruction. By mistake, he passed Quiloa, at which he had intended to put in, having been falsely informed that its inhabitants were Christians; and the force of the currents preventing him from making his way back, he pushed forward for the town of Mombaça, which stands upon a projecting point of the coast in lat. 3° 30′ S. From this station he was also induced to take his departure after remaining about a week, on discovering reason to believe that some treachery was intended him; when he set sail, and the same day arrived at the town of Melinda, about 50 miles further to the north. Here he remained for some days, and then leaving the coast of Africa, steered right across the ocean to India. On his return from this great expedition, he passed in sight of the town of Magadoxa—more correctly Mukdeesha—in lat. 3° N., and also, in proceeding along the coast, touched at some other places besides those which he had visited in his voyage out. The ships of Portugal had now, therefore, navigated the whole extent of the African coast, from the Straits of Gibraltar to the Straits of Bab-el-Mandeb, at the entrance of the Red Sea, with the exception of the space of about 1000 miles from the latter straits to Mukdeesha. They had ascertained the general shape of the continent to this extent, and the position, at least, of most of the principal rivers and headlands. To the nations of Europe, the whole of the coast, the line of which had thus been traced, had been before entirely unknown, excepting, as already mentioned, the 600 miles, or thereabouts, extending as far as to Cape Nun. But the Arabs had long been acquainted with the greater part of the east coast, along which Vasco de Gama passed, after doubling the Cape of Good Hope; and the several great towns which he saw or heard of, from Sofala onwards to Magadoxa, were, in fact, for the most part settlements which they had established, and where they possessed, in all cases really, in some cases also nominally, the supreme authority. The chief of these Arab settlements was the town of Quiloa.

But in addition to this acquaintance with the coast, the Portuguese, in course of time, also acquired considerable knowledge of the inland country, partly through the establishments which they soon began to form at different points, and partly by means of information that was brought to them from other parts by the natives. One of the main objects kept in view in their early expeditions was, the discovery of the residence of the mysterious personage known under the name of the Priest John (Preste Joaõ), or Prester John, as it has been Englished, of whom we shall only say here, that whoever he may have really been, he was, from the first intercourse with Abyssinia, taken to be the emperor of that country. About the time of Diego Cam's voyage to the Congo, commercial relations were entered into by the garrison of Elmina with the King of Benin, the region lying at the head of the Gulf of Guinea; and from the people of this kingdom, intelligence was received of a great potentate, whom they called King Ogané, living at a place 250 leagues in the interior, from whom each sovereign of Benin, on his accession to the throne, was said to receive a sort of investiture. It was immediately concluded by the Portuguese that this could be nobody but Prester John; but Ogané was, no doubt, merely one of the great monarchies in the interior, in all probability that called Ghana by Edrisi, and Kano by Clapperton, which, although now much reduced, is represented as having been formerly one of the most powerful in Africa. In 1487, also, two persons were sent out from Lisbon to attempt to find out the dominions of Prester John and a route to India by land; and one of these, proceeding by Cairo and Aden, reached Goa, in India, returned thence by Sofala, and afterwards penetrated into Abyssinia, where he was detained for some years. At Sofala, he heard of the great island of Madagascar, called by the Portuguese at first St. Lawrence, the existence of which, however, had been long before made known to Europe by Marco Polo. Several natives of Africa, likewise, were at different times induced to visit Lisbon. Immediately before the adventurers we have just mentioned set out on their enterprise, a negro prince, named Bemoi, from the nation of the Jaloffs or Yaloffs, to the south of the Senegal, arrived in that city to solicit the assistance of the Portuguese to replace him on his throne, from which he had been driven by some rival. This application afforded those to whom it was made a favourable opportunity of introducing themselves into this part of Africa, of which they immediately took advantage. They soon formed various establishments in the space lying between the Senegal and the Gambia, and along the banks of these rivers; but although they eventually spread themselves to such an extent in this district as to create a large population of mixed Portuguese and African blood, it is not exactly ascertained how far they actually penetrated into the interior. They also, however, in course of time, acquired important settlements further to the south, along the banks of the Zaire, and in other parts of Congo; and the information which was obtained during the earlier period of their domination here, respecting the geography of that and the neighbouring regions, has been more fully given to the world. It was derived principally through the successive missions which were sent out, in the course of the seventeenth century, to attempt to Christianise the inhabitants; and the greater part of it is to be found in Labat's *Relation Historique de l'Ethiopie Occidentale*, published at Paris, in 5 vols. 12mo., in 1732, with maps by D'Anville. The country actually traversed by the missionaries, may be generally described as extending along the coast from Cape Lopo Gonzalves, in lat. 0° 44′ S., to the town of San Felippe de Benguela, in lat. 12° 14′ S., and as far in the interior as to Concabella, on the Zaire, about 400 miles from the mouth of that river, and to Massignan, about 100 miles up the more southerly river called the Coanza. They also obtained some information respecting parts beyond these points, which they did not visit. Finally, this nation very soon also established themselves along the east coast of Africa, by the conquest of Quiloa, Mombaza, and Melinda, from the Arabs, effected in 1505, and by the forts which they subsequently built on the island of Mozambique (which became the capital of their eastern settlements), and along the banks of the river Zambezi, a short distance to the north of Sofala. From these positions they obtained accounts, more or less accurate, respecting the whole coast of Zanguebar and Ajan, as far north as to Cape Guardafui, which may be found in Barros. They had also some intercourse with the Macooa or Makooana, whose territory, lying some days' journey from the coast, is described as extending from behind Melinda, as far south as to the Zambezi. On that river they have still factories at Tete, nearly 400 miles from its mouth, and at Zambo, which is almost twice that distance inland. Manica, which is the principal mart of the trade carried on with the natives by the settlers on the east coast in gold, ivory, and slaves, is situated nearly in 19° S. lat. and 31° 30′ E. long.

It has been maintained by some writers, that long before Cape Nun was passed by the Portuguese, settlements had been formed on the coast of Africa by the French, very far to the south of that Cape. The Abbé Labat, to whom we have just referred, and after him the Abbé Demanet, in his *Nouvelle Histoire de l'Afrique Française*, 2 tom. 12mo, Paris, 1767, assure us that so early as the middle of the fourteenth century, the merchants of Dieppe had establishments and a trade at Rusisque, three leagues south from Cape Verde; and that by 1364, they had extended their intercourse as far as to the river of Sierra Leone. In 1365, these writers go on to say, a company was formed at Rouen for African commerce, which, the following year, founded depôts at Rusisque, on the Niger (by which is meant the Senegal), on the Gambia, on the Sierra Leone river, and along the Grain Coast. One of these settlements, it seems, was called Little Paris, and another Little Dieppe. In 1382, the company built the Fort of La Mine d'Or, on the Gold Coast, and also those of Acora, Cormentin, and others. All these establishments, however, they after some time abandoned, except those on the Senegal. As the authority for this history, the Norman chronicles are appealed to; but still we cannot yield it our unhesitating belief. What is more certainly known with regard to the early intercourse of the French with the west coast of Africa is, that they appear to have been in the practice of sending four or five ships annually from Normandy to the river Gambia, soon after the middle of the sixteenth century. This is mentioned by the writer of the account of an English voyage to the Guinea Coast in 1591, printed in the second volume of Hakluyt's Collection. The company to whom these vessels belonged were certainly also possessed of some settlements in the neighbourhood of the Senegal, when, in 1664, they were compelled to sell them to the West India Company, that year established by royal charter. This association, however, broke up in 1673, when its African establishments fell into the hands of a new company. The Dutch had by this time obtained possession of the isles of Goree and Arguin; but they were driven from both in 1678 and the following year, by an armament sent from France under the conduct of the Count d'Estrées; and at the Peace of Nimeguen, these conquests were retained by the French king, who gave them up to the company. Demanet states, that by treaties with the native princes, possession was subsequently obtained of all the coast from Cape Verde to the river Gambia, being an extent of about fifty leagues, and to the depth of six leagues inland. French Africa, however, eventually comprehended much wider limits than these, stretching from Cape Blanco to Sierra Leone, or over about thirteen degrees of latitude, and going back also into the interior along the Senegal for some hundreds of miles. We do not mean that the company had acquired the sovereignty of all this territory, but that their settlements were spread from one extremity of it to the other.

The French African Company, however, repeatedly failed as a commercial speculation; and besides the one formed in 1673, which became bankrupt in 1681, two others had been successively associated and dissolved, when, in 1717, the trade was, by an edict of the crown, transferred from a third to the famous Western or Mississippi Company, then newly established. On the failure of this short-lived scheme, the African settlements were taken possession of by the crown, and the trade left free. France still possesses in this part of Africa some inconsiderable settlements.

Several journeys into the interior were undertaken by the French residents at the mouth of the Senegal about the close of the seventeenth and the commencement of the eighteenth century, accounts of which are given in Labat's *Nouvelle Relation de l'Afrique Occidentale*, 5 vols. 12mo. Paris, 1728. The most important of these were the voyages performed up the Senegal by the Sieur Brue, the manager of one of the companies, in 1697 and 1698. In the former year, he ascended the river for about 400 miles, when he landed at Ghiorel, on the north bank, and proceeded across the country to Goumel, the capital of the king of the Foulahs, about thirty leagues distant. On his return from this journey, he established a factory at Ghiorel. The following year he again proceeded up the river, and visited several more remote parts of the kingdom of Gallam. The town of Dramanet, the principal port of that state, he found to contain 4000 inhabitants, who traded with Timbuctoo, which they described as lying about 500 leagues further inland. The French afterwards established a factory at Dramanet. He extended his voyage up the river as far beyond this point as to the Cataract of Felu; and then leaving the water, passed that barrier by land, intending to proceed to the Cataract of Govinea, forty leagues higher up. But the apprehension of the water becoming too shallow from the heat of the advancing season to carry him back, induced him to return without accomplishing that object. He heard, however, while in Gallam, of the kingdom of Kasson, situated to the north-east of it, and of Bambarra beyond that. East of Bambarra, he was told, lay Timbuctoo, and beyond that the kingdom of Ghingala. He was also positively assured by some of his informants (although the statement was contradicted by others), that the Niger, which he supposed to be the same with the Senegal, flowed not towards the west, but towards the east, as it passed Timbuctoo.

It was not till some years after this time, that the French appear to have heard of the kingdom of Bambouk, lying to the south of Gallam, although it had formed part of the conquests of the Portuguese, whom, however, the natives had expelled after long experience of their oppression. But no sooner was intelligence obtained of the gold dust and mines in which it was said to abound, than the avidity of the new colonists of the Senegal was powerfully awakened, and every effort was employed to penetrate its frontiers—an attempt rendered infinitely difficult and hazardous by the vigilant jealousy of the inhabitants, who had not yet forgotten the miseries of European tyranny. The perilous undertaking, however, was at length accomplished in 1714, by M. Compagnon, who contrived to traverse nearly the whole of the territory. It was afterwards repeatedly visited by others of the French residents; and in 1802, a full account of it was given in the first volume of M. Golberry's *Fragmens d'un Voyage en Afrique*, from the communications of the negroes and of the English established on the Gambia, from a work which he describes as printed in England in 1782, and from the memoirs of Governors Levens, David, and others, who had repeatedly been in the country between 1730 and 1744. M. Golberry's book has been translated into English. The kingdom of Gallam was also visited, in 1785, by M. Saugnier, an account of whose journey has been published. The kingdom of Hoval, likewise, from which gum Senegal is brought, and which occupies the space between the Senegal and the Sahara, was early explored by the French settlers. An account of a journey thither by the Sieur Brue is to be found in Labat; and much additional information respecting the country is given in the work of M. Golberry.

Settlements upon the west coast of Africa were also early made in imitation of the Portuguese and French, first by the English, and afterwards by the Dutch; and some of the English traders repeatedly ascended to a considerable height on the Gambia. The Danes have also some small establishments on the Guinea Coast. But it is since the formation of the AFRICAN ASSOCIATION in 1788, that the chief efforts have been made in the prosecution of discovery in the interior. The expeditions sent out by the Association and by government, and those undertaken by individual adventurers, have sought Timbuctoo and the Niger from various points. But no considerable progress was made till the first journey in 1795 and 1796 of Park, who, on that occasion, proceeding from the west coast in the direction of the Gambia, till he left it and turned to the north at Medina, after passing through the kingdoms of Bondou, Kasson, and Kaarta, reached Sego, the capital of Bambarra, and there beheld the Niger (called by the natives the Joliba, or Great Water) 'flowing slowly to the eastward.' Park advanced beyond this point to another town named Silla, on the same river, and also acquired some valuable information respecting the further course of the Niger and the position of Timbuctoo, which he was told was not more than 200 miles from Silla. He returned to the Gambia by a more southerly tract, following the course of the Niger as far up as Bammakoo, which was stated to be about ten days' journey from its source, and then proceeding through the mountainous districts of Manding, Konkodoo, and Dindikoo. On his second expedition, which was undertaken at the public expense in 1805, this adventurous traveller, after again reaching Silla, embarked on the Niger at Sansanding in its vicinity, with the purpose of sailing down the river to its mouth, wherever that might be. He is ascertained to have passed in succession the cities of Jenné, Timbuctoo, and Yaour or Yaouri, and to have been killed in the river at Boussa, a short distance below the last; but no part of his journal after he left Sansanding has been recovered. Meanwhile, now that the interest taken in African geography had become strong and general, a good deal of information was collected from a variety of sources respecting both the regions in the interior and some parts nearer the coast. Hornemann, who, in 1799, penetrated from Cairo to Mourzouk, in the Desert, and on the line of the common route from Tripoli to Timbuctoo, learned many particulars which had not before been known in Europe respecting the countries to the east of Timbuctoo, and especially the kingdom of Bornou, then the most powerful state in Central Africa. Mr. Riley, supercargo of an American vessel, who had been taken captive by the natives in 1815, and carried into the interior, obtained from the information of an Arab merchant, by whom he had been purchased, an account of the course of the Joliba to a greater distance beyond Timbuctoo than previous notices had carried it; but his statements were evidently not to be altogether depended on. In 1816, an expedition sent out by government under the command of Captain Tuckey, to the Congo, in the idea that it would be found to be the same with the Joliba or Niger, ascended that river for about 280 miles, and also examined part of the adjacent country. At the same time, Major Peddie, and after his death, Captain Campbell, conducted another party from the mouth of the Senegal through the Foulah territory as far as Kakundy. In 1817, Mr. Bowdich explored a part of the extensive territories of the Ashantees, surrounding on the north, east, and west the district of the Fantees, who occupy that part of the coast of Guinea where the English settlement of Cape Coast Castle is established. In 1820, very considerable additions were made to the knowledge formerly possessed both of the geography and the people of interior Africa, by the publication of Mr. Jackson's account of the territories of Timbuctoo and Houssa, from the communications of El Hage Abd Salam Shabeeny, a Mussulman merchant, who had visited these states. This year also appeared at Paris the account of a journey made by M. Mollien to the sources of the Senegal and the Gambia, in which, setting out from the isle of St. Louis, at the mouth of the Senegal, he traversed the country in a south-easterly direction as far as the town of Timbo, nearly in 10° N. lat., and above 14° W. long. from Greenwich. Some further information was also obtained by means of the expedition of Messrs. Ritchie and Lyon, who, in 1819, penetrated from Tripoli to Mourzouk; and from the journey performed in 1821 by Major Laing, from Sierra Leone, through the Timannee, Kooranko, and Soolima countries.

But a more important and successful attempt than any which had been hitherto made to explore the interior of Africa, was that of Major Denham and Lieutenant Clapperton in 1822. These travellers, setting out from Tripoli along with a caravan of Arab merchants, crossed the Desert, and reached the great inland sea or lake called the Tchad, the coasts of which, to the west and south, were examined by Major Denham, while Lieutenant Clapperton proceeded to the westward through the kingdom of Bornou and the country of the Fellatahs, till he arrived at Sackatoo, situated on a stream which probably runs into the Joliba. A great mass of information respecting these hitherto unvisited regions, lying to the east of Timbuctoo, was obtained in the course of this expedition; but not much that could be depended on was learned as to the remaining course of the Niger, or the Quorra, as it was found to be called at Sackatoo. It was very generally stated to flow into the sea at Funda; but where that place was, could not be exactly ascertained. Soon after Clapperton's return to England, however, he was sent out by the government in the command of a new expedition, the plan being that he should endeavour to penetrate to the scene of his former adventures from the coast of Guinea. He, accordingly, set out for the interior from Badagry, a short distance to the east of Cape Coast Castle; and taking a north-easterly direction, proceeded through the kingdom of Yarriba or Eyeo, till he reached the Niger at Boussa, where Park perished. Crossing the river, he entered the kingdom of Nyffe; after traversing which, and some of the adjoining districts as far as the great commercial city of Kano, the capital of Houssa, where he had been in his former journey, he turned again to the west, and reaching Sackatoo, there died. His servant, Richard Lander, afterwards returned to Kano, and proceeded thence through the kingdom of Zegzeg, a considerable way towards the south, intending to embark on one of the branches of the Niger, and, if possible, to solve the grand problem of its termination by sailing down the stream. But he was stopped by the natives, and compelled to turn back when he had got as far as Dunrora, which he understood to be due west of Funda, and at no great distance from it. Meanwhile, Major Laing, already mentioned, had succeeded in making his way across the Desert from Tripoli to Timbuctoo, in August 1826, and had transmitted some brief notices of that famous city, where he spent some weeks. But he was murdered on his return in the Desert, and none of his papers have yet been recovered. Timbuctoo was reached from Sierra Leone, also, by M. Caillé, a native of France, who published an account of his journey in 1830. The discovery of the long-sought termination of the Joliba, Quorra, or Niger, however, has since been effected by the fortunate and well-conducted enterprise of Richard Lander and his brother. Leaving Badagry on the 22d of March 1830, these two travellers, following nearly the same route which had been taken by Clapperton through the kingdom of Eyeo, reached Boussa on the 17th of June. They afterwards ascended the river as far as Yaouri, from which they returned to Boussa, where they remained for some time, and then embarked on the river, which they hoped would conduct them to the sea. In this expectation they were not disappointed. After various adventures, Richard Lander had at last the happiness, on the evening of the 18th of November, to find himself at the mouth of the greater branch of the river, here called the river Nun, or the First Brass River, from the negro town of Brass, which stands upon its banks a short distance inland. There is another great branch entering the sea a few miles more to the south, called the Second Brass River. The traveller was afterwards joined by his brother; and the two reached Portsmouth together on the 9th of June 1831. They left England again with two steam-vessels and a transport, which were built and fitted out by some spirited merchants of Liverpool, for the purpose of attempting the ascent of the Niger, if possible, as far as to Sackatoo or Timbuctoo. The expedition sailed 27th July 1832. It ascended the Quorra as far as Rabba, having previously twice ascended the Chadda. The information derived from this expedition regarding the banks of the Quorra is but scanty. It showed, however, that that river could be navigated by moderate-sized vessels, between 400 and 500 miles from its mouth. The expedition was unfortunate, in being attended with dreadful mortality during the ascent of the Quorra.

In 1841, another expedition was sent out to the Niger by the government. Three iron steam-vessels were built for this purpose, and put under the command of captains of the royal navy. The object of this expedition was to prepare the way for the extinction of the slave-trade, by means of the civilisation of Africa. This project excited much debate and difference of opinion at the time. The expedition was a failure. It did not ascend so far as the one which had been despatched from Liverpool, having proceeded only to Egga, about 340 miles from the sea; and it suffered dreadfully from mortality caused by fever.

The zeal for discovery in Africa, which has been so strongly felt within the last half century, has also sent out a succession of travellers to explore the southern regions of that vast continent. The principal settlement in this quarter—that of the Cape of Good Hope—was founded by the Dutch about 1650, and remained in their hands till it was finally taken from them by the British in 1806. For more than a hundred years after the establishment of this colony, it occupied only the extreme angle of the African continent, or a part of the narrow stripe between the sea and the nearest mountains; nor does much information seem to have been obtained with regard to any of the native tribes, except the nearest Hottentots, lying beyond that boundary. The first traveller who penetrated any considerable way into the interior was Captain Henri Hop, who was sent out on an expedition of discovery by the Dutch governor in 1761, and traversed a considerable part of the country of the Namaquas. He was followed by the Swedish naturalist, Sparrman, and by Vaillant, whose journeys were made between 1775 and 1785, and extended to the territory of the Bosjesmans, three or four hundred miles north from Cape Town. In 1797, the regions lying in this direction were traversed by Mr. Barrow, from the territory of the Caffres in the east to that of the Namaquas in the west, including the desert of the Great Karroo, and as far north as the foot of the Sneuwbergen, or Snow Mountains. In 1801, the great barrier formed by this range was for the first time passed by Messrs. Trutter and Somerville, who, crossing the Gariep or Orange River, penetrated as far as Leetakoo or Lattakoo, the capital of the Boshuanas. Soon after, another party, under the conduct of Dr. Cowan and Lieutenant Donovan, was sent out from Cape Town to cross the country to Mozambique or Sofala, and accounts were received from them when they had advanced eleven days' journey beyond Lattakoo. But here, in the country of the Wanketzens or Wanketchies, the unfortunate adventurers appear to have been destroyed by the natives. A few years after, Dr. Henry Lichtenstein penetrated as far as Lattakoo, and brought back much more complete information respecting the Boshuanas, and the other tribes whose territories he traversed, than had been before obtained. Mr. Burchell also reached Lattakoo in 1812; and in the following year, it was visited by Mr. John Campbell, the missionary. In 1820, the latter gentleman returned to that capital, and proceeded thence as far east as to the hitherto unvisited city of Mashow, from which he directed his course northward till he reached Kureechanee, about latitude 25°. South-west from this last town he found himself on the borders of a desert, which, he was informed, extended an immense distance to the westward. In 1823, Lattakoo was once more visited by Mr. George Thompson, whose accounts of many parts of the country lying between this point and the colony, as well as of some of the Caffre tribes to the east, are much more complete than any that had before been given to the public. An expedition, headed by Dr. Smith, was sent out in 1834 by an association formed at the Cape of Good Hope, for the purpose of exploring Central Africa. It proceeded northward, crossed the Orange River, proceeded thence to Philippolis, a missionary station, and thence to the country around the sources of the Caledon, a tributary of the Orange River. Much information was obtained by this expedition of numerous tribes in these parts previously unknown, or known by little but the name; and the geographical positions of many places were accurately determined. A similar service was performed by Captain J. E. Alexander in 1836–37, in regard to the western side of Southern Africa, in the parts beyond the Orange River. He explored the countries of the Great Namáquas, Bosjesmans, and the Hill Damaras, extending from the Orange River to 23° S. lat., and filled up previously existing blanks in our knowledge of these parts.

In 1847 and subsequent years, Krapf and Rebman, missionaries stationed at Rabbai 'Mpia, situated on a ridge of mountains W.N.W. of Mombaz, on the east coast, in 4° S. lat., made journeys into the interior of Africa, west of their station. In his first journey, Rebman went as far as Taita, a country 100 miles west of Rabbai 'Mpia. This country consists of three great ranges of hills, with many hundreds of villages, and about 150,000 inhabitants, and is divided into three districts—namely, Kadiaro, Endara, and Boora. In the end of the same year, Rebman proceeded to Jagga, a remarkable country, N.W. of Taita, on the direct road to the Great Lake. On this journey, he perceived a very high mountain called Kilimandj-aro, or the Mountain of Greatness, which is covered with perpetual snow, and must be at least 20,000 feet high. From this mountain many streams, formed by the melting snow, descend in all directions.

To the W., and also to the N.W., are lakes, into which these streams run. The lake to the W. almost vanishes in the dry season, and the land around its banks becomes incrusted with salt, which is an article of commerce for the natives with the neighbouring tribes. The Mountain of Greatness is about 180 geographical miles W. from Mombaz. The existence of this mountain renders it probable that there is a mountain-chain running parallel to the east coast, from which the upper affluents of the Nile issue. North of the Taita range of hills, the country becomes open, and villages beyond are seen to a great distance. In that direction is the country of the Ukumbani, where Krapf discovered another snow-mountain called Kenia, apparently as high as Kilimandj-aro. He thought it probable that the volume of water descending from this mountain on the north was one of the head streams of the White Nile. The discoveries of these enterprising travellers have thus raised questions, to the solution of which future efforts will doubtless be directed.

The next discovery of importance was that of a large lake in the interior of South Africa, which had long been reported as existing, and even had had its position pretty correctly assigned on maps of Africa. This discovery was made in 1849, by Rev. David Livingston, missionary at Kolobeng, 25° S. lat., 20° E. long., accompanied by Messrs. Oswell and Murray, who went from England expressly for that purpose. They proceeded northward 300 miles, through Bakalihari or Kalahari Desert, which had previously been an insurmountable barrier to Europeans, when they came to a magnificent river called Zouga, 30 yards broad where first seen by them. They advanced westward along the river other 300 miles, finding to their surprise that it became gradually wider as they approached its source. Its source was found to be the Lake Ngami, and here its breadth was 200 yards. The lake, at the N.E. extremity of which is situated the town of the Batowani, in 20° 20′ S. lat., and 24° E. long., presented a horizon of water after they had proceeded 6 miles S.W. from the outlet. They ascertained nothing definite about its extent. In the following year, Mr. Livingston proceeded again to the lake, with the design of advancing northward along the river Tamunakle to Sebitoane; but he was obliged to desist, as the fly 'tsetse' abounded on that river, whose bite was fatal to domestic animals, though not to wild animals and man. Oxen, horses, and dogs, were sure to die, sooner or later, sometime five months after being bitten. Mr. Livingston was informed that Ngami was the reservoir for the surplus waters of a much larger lake, about 200 miles beyond, and that the two were connected by a rapid river called Teoge, which was swollen once a year in consequence of a rise in the upper lake. Other rivers were said to exist beyond Sebitoane, with a large population on their banks. In 1851, Mr. Livingston, accompanied by Mr. Oswell, again made a journey to these regions. They came upon the Zouga where its bed was dry, and where there were 'salt-pans,' or tracts of country incrusted with salt. The travellers penetrated as far north as 17° 28′ S. lat., and came upon several large rivers, of which the chief was the Seshéké. This river they believed to be the main branch of the Zambezi. Since the discovery of the Zouga, a considerable traffic in ivory has been established; and Mr. Livingston urges the introduction of commerce by Englishmen into the countries last visited by him, in the hope that the trade in slaves, commenced in 1850, may thus be checked or put down.

In 1850, Mr. Frank Galton left England with a view to follow up Mr. Livingston's discoveries. The emigrant Boers, however, were at that time obstructing the passage to the lake, and turning back all travellers coming from the Cape. Accordingly, on the strong recommendation of Sir Harry Smith, he proceeded to Walfisch Bay, and set out thence on a journey through Damara-land. He explored from that bay on the south to Ondonga, in Ovampo, 17° 50′ S. lat., and advanced to Otchombinde, in 21° E. long. He found a race of intelligent and kindly negroes, who were careful agriculturists, and lived in a land of great fertility, with a most healthy climate.

Since that time, the routes of Livingston and Oswell have been followed by enterprising traders from the Cape, who have visited the Lake Ngami and walked round it, finding it about 60 miles in length and about 14 in breadth. The natives, whom he describes as a fine intelligent race, far superior to the Bechuanas, informed Mr. Campbell that there was a much larger lake than Ngami a great way off in a N.W. direction, also a range of lofty mountains running north and south. They spoke of thirteen large rivers within a distance of 400 miles north of the Zambezi. Mr. Campbell ascended Teoge about 150 miles, but was obliged to return in consequence of the death of his horses and oxen, caused by the bite of the tsetse. Everywhere he found traces of Portuguese traders, who get from the natives slaves and ivory, and give in exchange firearms. They were said to come from a settlement on the west coast. The Geographical Society have quite recently received information from Mr. Andersson, a companion in travel of Mr. Galton, that he has penetrated from Walfisch Bay to Lake Ngami, and his explorations seem to show that there is water-communication from east coast to west coast, with exception of 60 or 70 miles.

In addition to these important discoveries on the east coast and in Southern Africa, of which we have given a short notice, there is a perhaps still more important and valuable expedition remaining to be noticed. Mr. Richardson, well known from his travels in the northern portion of the Great Sahara in 1845–46, after returning home, induced the English government to send him out, to make commercial treaties with the chiefs of the countries between Tripoli and Lake Chád. Drs. Barth and Overweg, two Germans, were sent along with him, to make scientific observations. They set out from England in 1849 for Tripoli; and the mountainous region south of Tripoli having been explored by the German travellers before Mr. Richardson's arrival, they proceeded on their journey southwards from Tripoli on 23d March 1850. They arrived at Tin Tellust on the 4th of September, having proceeded by Murzuk, Ghát, and Tarájit. Between Tripoli and Murzuk, the road lay due south over a continuous table-land, of an average elevation of 2000 feet. Between Murzuk and Ghát, the travellers found several curious sculptures on the rocks of the Wádí Felisjareh. Two of these, they believed, bore a striking resemblance to the sculptures of Egypt. Between Ghát and Tarájit, the first inhabited place in Aïr, they had to cross a vast desert totally uninhabited for about 250 geographical miles. At Tin Tellust the expedition stayed nearly three months, obtaining full information regarding the northern tribes and countries. During this time, Dr. Barth accomplished a journey to Agadez, the capital of Asben, of which he sent home a most minute and valuable account. Agadez is the residence of the sultan of that kingdom, and is about 150 miles west of Tin Tellust. In the beginning of December 1850, the travellers started all together from Tin Tellust, and proceeded to Damergu, on the frontiers of Sudan, where they separated; Richardson going straight to Kuka, the capital of Bornou, whilst Overweg made a geological excursion to Gober, and Dr. Barth proceeded south to explore the country of the Adamawa, and the waters that feed the Niger from that unknown region. Dr. Barth was able only to go to Kano, and turned from that place straight towards Kuka. Mr. Richardson died between Zinder and Kuka; and the other two travellers met at the latter place in May 1851, and immediately after Dr. Barth set out southward to Adamawa, and reached Fola, where he was obliged to turn back. On this journey he determined the water-shed between the Niger and Lake Tsad. Meantime, Dr. Overweg had launched the boat belonging to the expedition, which he called the 'Lord Palmerston,' and had made several excursions on the lake just mentioned. It was found to be 60 miles from east to west, but it was thought to extend further from north to south. There are in this lake very many islands, all covered with wood, full of inhabitants, and abounding with hippopotami and elephants.

Besides navigating Lake Tsad, the travellers have made a great many journeys on all sides of it, and especially towards the north. Our knowledge of the countries between Tripoli and Lake Tsad, will thus by these journeys be prodigiously extended, and the result of the discoveries towards the south, and the lower sources of the Kawara, will probably be the establishment of such commercial relations with Britain, as will eventually lead to the suppression of the slave-trade at present carried on in these regions.

But whilst this mission of discovery has already accomplished much, the most arduous part of its undertaking remains yet unaccomplished. Part of the design of the expedition was to penetrate from Lake Tsad through to Mombaz, on the Indian Ocean. The practicability of this journey is now ascertained, as the continent of Africa has already been crossed by a caravan of native traders, which set out from Zanzibar, and arrived at Angola, on the west coast, having traversed the great interior Lake of Nyassi on their way.

III. The extent of the African coast, and the portions surveyed by each navigator, will be seen from the following tabular view :—

	Eng. Miles.	
From El Arish, 33° 55′ long. E. (a village near the conventional boundary-line of Africa and Asia), to Alexandria, . .	238	There has been no actual survey of this part of the coast. Captain Gautier of the French navy merely sailed along, and determined a few points on the coast.
From Alexandria to the Fratelli Rocks, . .	1400	Surveyed by Captain W. H. Smyth, R.N.
From the Fratelli Rocks to Cape Spartel, . .	830	Partly surveyed by Capt. W. H. Smyth, and the coast of Algiers by the French.
Cape Spartel to Cape Bojador, ...	875	This part of the coast is but imperfectly known. The English and Spaniards have occasionally surveyed detached portions of it.
Cape Bojador to Cape Mirik,	530	Cape Bojador to Cape Blanco was surveyed by Cap. Baldy, R.N.; and from Cape Blanco to Cape Mirik, the outer edge of the Bank of Arguin only was surveyed by Baron Roussin; the line of coast not being visible.
Cape Mirik to Cape Verde,	875	Surveyed by Baron Roussin of the French navy.
Cape Verde to Cape Roxo,	160	By Captain Boteler.
Cape Roxo to Tumba Point,	300	By Captain Belcher, R. N.
Tumba Point to the south side of Sherboro Island,	150	By Captain W. F. W. Owen, R.N.
South side of Sherboro Island to Cape Formosa,	1470	By Mr. Anthony de Mayne, Master, R.N.
From the Cape Formosa to the Cape of Good Hope,	3010	By Captain W. F. W. Owen, R.N.
From the Cape of Good Hope to Cape Guardafui,	4550	
Cape Guardafui to Ras Bir,	610	By the East India Company's Marine.
Ras Bir to Salaka, . .	690	
Salaka to Suez, . .	860	
	16,048	

IV. This enormous peninsula is attached to the Asiatic mass by the isthmus of Suez; but at two other points, the straits of Bab el Mandeb, and those of Gibraltar, it approaches close to the respective continents of Asia and Europe. The equator cuts it into two masses of unequal magnitude; though the extreme southern and northern coasts are, on an average, pretty nearly removed the same distance from the equinoctial line. The latitude of Ras el Krun near Bizerta is 37° 20′ N., and that of Cape das Agulhas, (Cape Needles,) the most southern part of the continent, is about 34° 50′S. The distance between these two points is about 5000 miles. The most remarkable projection of the African coast is that which terminates in the bold headland, called by the Portuguese Cape Guardafui, in N. lat. 11° 50′, E. lon. 51° 22′; this is the most eastern point of Africa. Its extreme western point is Cape Verde, N. lat. 14° 45′, W. lon. 17° 32′: the distance between these two capes, in a direct line, is not much less than 5000 miles.

The geographical position and coast line of Africa are characterized by lying for the most part within the tropics, and by the comparatively few deep indentations of the coast. Its northern shores are washed by the Mediterranean, and are the most irregular part of the African coast, presenting the indentations of the Arabs gulf, the large gulf of Sidra, and that of Cabes. Many parts of this shore, especially about the Sidra gulf, are low, but neither so sandy nor barren as some writers represent them; while the Cyrenaic regions, and a large part of the coast west of the Sidra, as far as the straits, is considerably elevated, and, perhaps, with the regions of Marocco, form the most favourable part of the whole African coast for the habitation of man. Only one river of any considerable magnitude, the Nile, flows from the African continent into the Mediterranean, but this is one of the most singular streams in the world, whose course the traveller may follow from the coast into the interior for above 1200 miles, without meeting with one single current that adds its waters to those of this mysterious river. The streams of the Atlas regions that enter the Atlantic, though numerous, are inconsiderable as to the volume of water: the chief is the Mejerdah, the ancient Magradas or Bagradas, which flows into the sea near Tunis, and is subject to periodical inundations in the lower part of its course; and the perhaps larger river Molooyah, which belongs to the empire of Marocco. The Atlantic washes the western coast of Africa, which, within the dominions of Marocco, presents a coast generally low, succeeded in the interior by fertile plains of immense extent. Numerous streams, some with a considerable length of course, such as the Wad Seboo, Oom er begh, &c., flow from the Atlas into the Atlantic ocean within the limits of the empire of Marocco. South of this region, the arid character of the Sahara is found extending even to the shores of the ocean, and hardly disappearing before we arrive at the Senegal. From the Senegal to the Cape of Good Hope, the coast is now pretty well known, but the same minuteness of survey and of observation has not been applied to all parts of it. The great characteristic in its outline is the gulf of Guinea, the northern shores of which have a *general* direction east and west through 20° longitude. With the numerous rivers that flow into the Atlantic between the Senegal and Cape Negro, (N. lat. 16°,) we are still imperfectly acquainted; and the numerous openings that are observed on many parts of this coast indicate outlets of rivers, or channels formed by islands, which yet remain to be explored. The Senegal, Gambia, and Rio Grande, are the three largest rivers north of Sierra Leone, though the precise nature of the lower channels of the last-mentioned is not yet ascertained. Captain Belcher suspects the existence of an archipelago of islands between the Rio Grande and the Nuñez. The expedition of the Landers determined the long doubtful question of the outlet of the Quorra, in the bight of Benin; and the river Nun is now ascertained to be one of the several channels by which the Joliba of Park discharges its waters into the Atlantic.

The great African river, south of the equator, is the Zayre or Congo, which is found, on ascending its stream, to show a less volume of water than would be inferred from its appearance at the mouth; but this is the case with other large African rivers, and leads to no safe conclusion as to its course being comparatively short. Between the Congo and Cape Negro there are numerous streams, such as the great Coanza, and others which are of minor importance when compared with the Congo and Coanza, which appear to be the great rivers of south-western, as the Zambezi is of south-eastern Africa. From Cape Negro or the Bambaroughe to the Orange river, we have a coast of 800 or 900 miles almost without fresh water. The Orange river is a large stream, perhaps the fourth or fifth among African rivers, whose course to the Atlantic is determined, though its numerous tributaries rise far in the interior, by the general slope of this part of the surface from east to west.

The Cape colony, within the limits now assigned to it, is now so far known, that its geographical features need not be noticed in this general sketch; but we may remark, that the common notion of Africa terminating in a point requires correction. The mountain ranges, and extensive plains which run east and west within the limits of the colony form a series of heights and terraces, which are bounded on the south by an extensive line of coast running in the same direction. From False Bay to the extremity of Algoa Bay, we have a line of coast above 400 miles long, running nearly due east and west, and presenting to the southern ocean as broad a front as the Spanish peninsula offers to the Atlantic.

The great known river of the eastern coast is the Zambezi, which, though low in the dry season, is provided with prodigious channels to receive the floods of the rainy months. Further north on this coast, near the site of Melinda, we find the outlets of streams from the interior; and it is *possible* that the Zebee here finds its way to the ocean; but, unlike the other south African streams, we are acquainted, from the narrative of Fernandez, with its upper course, which lies north of the equator, but not with its lower course near the coasts of the Indian ocean.

The great currents on the coast of Africa are too remarkable to be entirely passed over; but as those which are best known belong to the North and South Atlantic, a brief notice of that round the Cape will be all that is necessary here.

The great bank which lies off the coast of South Africa, and takes its name of Agulhas, or, as it is often incorrectly called, Lagulhas, from the cape of that name, has probably been partly formed by the action of currents. It is, indeed, probable that the main mass of it owes its existence to the same phenomena which produced the terrace lands of the Cape; but it has also received great accessions of sand and weed from the action of the currents. Two main streams, one from the Mozambique canal, the other from the open Indian Ocean, impelled by the S.E. trade-wind, unite nearly opposite to Cape Padron (26° 20′ E. long.). From the meridian of Cape Recif (25° 36′ E. long.) the main stream gradually turns to the west, and strikes on the great bank (in about 35° 30′ lat., 23° long.), by which its course is changed successively to W. 36° S. to S.W., and finally (in lat. 38°) it becomes rather east of south. The greatest portion of this current is actually turned round by the east edge of the bank, and finally mingles with a South Atlantic eastern current, and, impelled by it, thus returns into the Indian Ocean by a line nearly parallel to its original course. A *part* of the stream passes over the deep water at the southern extremity of the bank and turns towards the N.W., and then uniting opposite the Cape of Good Hope with another part of the main stream, (which *crosses* the northern part of the bank in a western direction, between 34° 45′, and 35° 40′,) forms a wide stream running to the N.W. as far as 25° S. lat., where it joins the N.W. current formed by the S.E. trade-wind. The existence and course of these currents are indicated not only by their actual motion, but also by their temperature. Off Cape Recif (Reef), where the temperature of the Mozambique stream was found (in June) to be somewhat lower than it was further north and east, it was still 68°, or 8° above the ocean temperature. On the bank, in lat. 35° 45′, it has been found 7° above ocean temperature; and diminishing westward towards the edge of the bank, it becomes of the ocean temperature for some distance before attaining its western extremity. But what is singular, and confirms the statement above made as to the current that *rounds* the Agulhas bank joining that which *crosses* it—the temperature rises again to 4° above the ocean temperature, *west* of the bank, as soon as the junction with the southern branch is effected. For further information on this current, the reader may refer to our authority (Major Rennell, *On the Currents of the Atlantic*, London, 1832). Salt, in his voyage up the Mozambique channel, found the current between Capes Correntes and Sebastian, setting strong to the south, so as 'to impede the course not less than sixty miles in twenty-four hours.' And further north (12° 37′ S. lat., 41° 24′ E. long.), Mr. Salt speaks of 'a strong current setting to the southward at the rate of thirty miles in twenty-four hours.'

On doubling Cape Guardafui the same writer experienced along the coast, a strong current that headed the ship; but the information which he gives about it leads to no conclusions. This current has no connexion with that just described.

The only other phenomenon of African currents, that requires a short notice here, is that part of the North African current, as Major Rennell calls it, which sets into the Mediterranean through the straits of Gibraltar. The great loss which the Mediterranean experiences from evaporation is supplied by a constant current pouring in from the Atlantic. This current is most obvious to the east of a line joining Cape St. Vincent in Spain, and Cape Cantin (32° 35′N. lat.) in Africa. The form of the coasts is like the wide part of a funnel, and the straits of Gibraltar are the pipe. It is probably owing to this rush of water towards the straits that an eastern current has been perceived, in summer, as far as the Azores, increasing in velocity eastward from the meridian of Cape Vincent. South of the latitude of the Canaries and Cape Bojador, the current, instead of pointing to the straits' mouth, sets upon the coast of the Great Desert, which is sandy and low. This current, from whatever cause it arises, is that which has brought so many ships on this inhospitable shore, navigators having been deceived in their reckoning by not estimating the force of the stream. Ships' crews that have had the misfortune to be cast on this savage coast, inhabited by a brutish race of barbarians, have frequently either perished of hunger, or been sold into slavery. [See Rennell.]

In consequence of the still imperfect knowledge which we possess of the interior of Africa, it is impossible to give an account at once minute and accurate of its physical configuration. That immense continent may be divided into two parts, which are widely different in their physical features. These are the Sahara or Great Desert, and the remaining portion of the continent, extending from the Cape Colony to Nubia and the southern border of the Sahara. The latter portion seems, at least in the regions adjoining the coast, to be an elevated table-land, with mountain-ranges rising more or less above the general level. Such, at all events, has been found to be the character of those parts of the above division of the continent which have been most thoroughly explored. We need only mention the table-lands of Abyssinia; of the region traversed by Richardson, Barth, and Overweg; of the Damara country; of the southern part of Africa generally; and of the country west of Mombaz, visited by Krapf and Rebman. The existence of table-lands thus distributed all round the border of the continent, suggests the thought that there are no very considerable depressions in the interior. Still, on the other hand, there is no ground for the inference, that the surface becomes more and more elevated as we proceed further from the coast. It appears from the journey of Mr. Galton in Damaraland, 'that whilst plateaux of some altitude fringe the coasts, and advance some distance into the interior—rising, as in the Damara country, according to Mr. Galton, to heights of 5000 and 6000 feet above the sea—the more central country, instead of being a mountainous region, is a water-shed of little greater elevation; whilst the most central region of all is of no great altitude, and is occupied by a succession of lakes, of which Ngami is the southernmost.' Sir R. Murchison, in an address delivered to the Royal Geographical Society of London, 24th May 1852, from which the above extract is taken, thinks it likely that the basin-shaped structure which characterises Southern Africa is characteristic of the entire interior of the continent. He says: 'Looking at that much broader portion of the continent, we have some reason to surmise that the higher mountains also form, in a general sense, its flanks only. Thus, wherever the sources of the Nile may ultimately be fixed and defined, we are now pretty well assured that they lie in lofty mountains, at no great distance from the east coast. In the absence of adequate data, we are not yet entitled to speculate too confidently on the sources of the White Nile; but judging from the observations of the missionaries Krapf and Rebman, and the position of the snow-capped mountains called Kilmanjaro and Kenia (only distant from the eastern sea about 300 miles), it may be said that there is no exploration in Africa to which greater value would be attached than an ascent of them from the east coast, possibly from near Mombaz. The adventurous travellers who shall first lay down the true position of these equatorial snowy mountains —to which our Abyssinian medallist, Dr. Beke, has often directed public attention—and who shall satisfy us that they not only throw off the waters of the White Nile to the north, but some to the east; and will further answer the query, whether they may not also shed off other streams to a great lacustrine and sandy interior of this continent, will be justly considered among the greatest benefactors of this age to geographical science.' After remarking the similarity of the Atlas range of mountains to those which encircle the Cape Colony, in respect to geological structure, he proceeds to say: 'I venture to throw out the general suggestion of an original basin-like arrangement of all Africa, through the existence of a grand encircling girdle of the older rocks, which, though exhibited at certain distances from her present shores, is still external as regards her vast interior.' He asks: 'How long will it be before we shall be able to calculate backwards, by our finite measure of time, to those remote periods in which some of the grandest physical features of this continent were impressed upon it; when the lofty mountains from which the Nile flows were elevated, and when the centre of Africa was a lacustrine jungle?'

The interior country watered by the Quorra, by the tributaries to the Tchad, and by other unknown streams that probably exist, may be in general described as a fertile region, well suited to the habitation of man, and apparently not possessing a climate unfavourable to life, either for the natives, or Europeans who know how to take care of themselves. This country, known by the general name of Soudan, cannot be accurately defined. Dar-Fûr would seem to be properly included in it, though it partakes also of the character of the neighbouring Sahara, and forms a kind of oasis; but the periodical rains from before the middle of June to the middle or end of September, and the presence of the elephant and hippopotamus in some parts of the country, mark these at least as belonging to the Soudan regions. The winds that fill Dar-Fûr with thick dust blow constantly from the south, and are the hot winds,—thus indicating a considerable extent of southern country of a low and sandy character.

The great characteristic feature of Northern Africa, the Sahara or Great Desert, would form a complete physical barrier between the Mediterranean and the interior but for the long and narrow valley of the Nile; which, in fact, bounded as it is in many parts on the west by a high rocky barrier of limestone, from which the traveller descends to the lower region of the western desert, may be considered as a separate portion of the continent. The broad belt of the desert stretching across the continent seems as if it were only interrupted by the Nile, to recommence with the same arid character in the broad wastes of Arabia and the Syrian desert. Arabia, in fact, in its physical conformation, belongs rather to Africa than Asia. But this extensive waste is not so uniform in its appearance as to be one mass of sand. Its surface is in various parts of very unequal elevation. Occasionally it rises into rugged barren ranges of hills, some of which, of limestone formation, contain marine shells; and sometimes, particularly in the eastern part, it is diversified with springs of water, both warm and cold, which give fertility to the small spots around them, which were called by the Greeks, oases, the same word as the modern wady. The Sahara, indeed, may be divided into two great divisions, of which the eastern is far more diversified with springs and habitable spots; the western portion, through which the traders from Marocco make their way to the Joliba, is the most barren, parched, and terrific waste on the surface of our globe. The abundant supply of natron (sesqui-carbonate of soda) and common salt contained in the salt lakes of the Sahara, and some which is found in a fossil state, has always furnished an important article of trade between the people of the desert and Soudan, where this necessary of life is wanting. The western portion of this desert is less known than the route from Mourzouk to Bornou, and presents, as we have said, a far more fearful and extended waste than the eastern division; it stretches westward to the very shores of the Atlantic, displaying on the coasts of the ocean the same desolate and sandy appearance. We have yet no observations sufficiently accurate or numerous to determine the general elevation of the Sahara, though there can be little doubt that it contains many uninterrupted levels of considerable height. (See SAHARA.)

The countries north of the Sahara from the southern limits of the empire of Marocco, nearly as far as the Gulf of Sidra, are sometimes comprehended under the general name of the Atlas regions, so called from the predominant mountain range to which that name is given. The various branches and the geological character of this range will be described under the head of ATLAS. This region contains on the Atlantic coast fertile plains, bounded to the east by mountains covered with eternal snow. On the Mediterranean coast the level country is of much less extent, and the interior is a region of elevated ground filled with hills and mountains. Our imperfect knowledge of this interesting region has recently received extensive accessions from the French and others who have settled in the territory of Algiers. The Arab geographers considered this tract as more European than African in its character and position, an opinion which the physical features of the opposite Spanish peninsula, with its Sierra Nevada, its climate and productions, fully justify. We cannot yet assign satisfactorily any eastern limits to the *physical* region, which may be considered as belonging to the Atlas country. The gulf of Cabes, or rather the promontory of Cape Bon, may perhaps be assumed as its extreme limit along the coast, while, in the interior, a mountain range, the Ghurian, of no very great elevation, extends at least as far eastward as the western side of the coast of the gulf of Sidra. To avoid these mountains, the Fezzan caravans sometimes take the route through Mesurata on the coast.

The high lands of the ancient Cyrenaica, now included within the limits of what is often incorrectly termed the *desert* of Barca, form a separate system, and will require a distinct description.

It has been often remarked that Africa shows few, if any, traces of volcanic action within historical periods, and the occurrence of earthquakes is not established on record, except within the limits of Egypt. But undoubted traces of the former action of subterraneous fire are to be found; for instance, on the west coast on the banks of the Nuñez, and most particularly in the Canaries, the Cape Verde archipelago, the small islands at the mouth of the Rio Grande, those in the bight of Biafra, and those in Shoa. Jebel Teir, a small island in the Red Sea, is an extinct volcano.

The mineral treasures of this immense continent are of course very imperfectly known. Salt is perhaps one of the most universally diffused, being found from the salt lakes of the Cape colony to the northern coast, and yet extensive districts, as we have already remarked, such as the Soudan, are without it. But it occurs again south of the equator, and is plentifully procured from the salt quarries of Angola; and Brown mentions it also as being found in a fossil state in Dar-Fûr. It will probably be found on inquiry that the mineral treasures of Africa are nearly as various as those of other parts of the world, though at present they are imperfectly known, and in many cases only observed at spots widely removed from one another. The mineral wealth of Egypt alone is considerable; and that of the interior west of the Mozambique coast is also abundant. Gold dust, however, is that which has the most excited the cupidity of Europeans; and this mineral is found in the sands of the upper streams of nearly all the great African rivers.

The following are the chief African minerals and earths known to commerce, or the useful arts, with some of the countries in which they are found. It should be remembered that they are found in other places than those here enumerated.

GOLD.—Central Nigritia, Guinea coast, Mozambique coast, &c.

SILVER.—Mines said to be at Chicova, up the Zambezi river. (See Bowdich, *Account of Discoveries*, &c.); Elala in S.W. part of Marocco.

COPPER.—Mines of Fertit, south of Dar-Fûr; Atlas mountains; Egypt, &c.; the Moolwas; Zumbo, on the Zambezi, &c.

IRON.—Egypt; Dar-Fûr; on the banks of the Lucala, a branch of the Coanza; in the territory of the Cazembes, &c.

TIN.—Loango. (Bowdich.)

SALT.—Egypt, Tunis, Sahara, Angola, the Cape of Good Hope, Abyssinia, Dar-Fûr.

LEAD.—Loango. (Bowdich.)

CHALK.—Dar-Fûr.

SULPHUR.—Benguela; Cassandama? Kebrit on the Tripoli coast. (Beechey.)

COAL.—Zumbo. (Bowdich.)

V. THE MAN OF AFRICA. This extensive continent is characterized by certain varieties of the human species, which it will be useful here to distribute into their proper families as accurately as we can, in order to obviate that confusion which is often found in common treatises on geography. We propose merely to give such a general outline of the distribution of the human race in this continent as may show the large masses into which it divides itself: the subdivisions of nations and tribes will be found under other heads. The following sketch is founded chiefly on those *physical* differences, which characterize the animal MAN in Africa. The reader may see in Balbi's *Abrégé de Géographie*, the classification of the people according to *languages*, of which we will only remark, that we consider it at present impossible to make a classification of African languages without running the risk of almost endless error.

The southern regions of Africa are occupied by two nations, the Hottentots and Caffres. The Hottentots, under different names, were once spread over the territory now called Cape Colony, and at the present day may be considered as generally within its limits, though they have been driven from the southern parts by the European colonists. They occupy, also, the basin of the Orange River. The Hottentot presents some varieties both in physical appearance and moral character; but in his lowest state he is one of the most indolent, helpless, and dirtiest of the human family: his form, though spoken of by some travellers as not positively ugly, would appear from the best accounts to be revolting to our ideas. His hair is black, sometimes brownish, very short, and woolly; his profile is hideous, and remarkable for the prominence of the lips, over which the nose is flattened, displaying the open nostrils; the foot is so singularly formed that he can be tracked by his marks. The colour of the skin is dark brownish, or yellowish, but not black. The Caffres differ both from the Hottentots and those whom we call negroes. The nose approaches to an arched form; yet they have thick lips, and hair curly, but less woolly than the negro. Their colour is a blackish grey; and they are generally well made and of rounded limb. The females are among the handsomest of the black race of Africa. In the useful arts of life, the Caffres are far above their Hottentot neighbours. They extend from Natal, on the southern coast of Africa, into the interior, probably as far as the tropic, but it is not possible to fix their limits with any precision.

The most widely-extended race in Africa is the Negro, which some writers denominate the Ethiopian. The term Ethiopian is indeed often used, but, as it appears to us, rather vaguely, to include all the black-coloured races of Africa. We here understand by it *only* the true negro races, which, whatever resemblance they may bear to the other dark races of Africa, still differ from them considerably in physical character and geographical distribution. Varieties of language, shades of complexion, or other differences certainly subsist among them, (and they are by no means inconsiderable;) but we must still recognize the whole Ethiopian race as forming a distinct and widely spread family. Beginning on the west coast with the Senegal River, which is the southern limit of the arid deserts and the commencement of the fertile regions, we find a race essentially different from those of Northern Africa. In the woolly hair, black skin, the profile of the face and forehead, the oblique insertion of the incisive teeth, the form of the pelvis, and the legs, we see the undoubted characteristics of a race peculiar to the African continent. But it is still difficult to say what parts of Africa must be considered as their proper country, as war and the slave trade have often transplanted the negro from his localities in Africa, just as they have given him a new home in Europe and America, and made his form and character familiar to our every-day experience. We may safely assume, that the negro is on his native soil in all the regions that extend from the Senegal southwards, along the gulf of Guinea, and south of the equator as far as the sixteenth degree of latitude. On the eastern side the negro race hardly extends south of the tropic, for they must not be confounded with the Caffres who dwell from Natal northward. The natives whom Mr. Salt saw as far north as Sofala bay near lat. 20°, he conceived to be nearly allied to the Caffres, whom he also considers to be a race 'perfectly distinct from either that of the Hottentot or of the negro.' We may, therefore, consider the Caffres as stretching nearly as far north as the Zambezi river, where the negroes commence. It is quite impossible to fix the limit between the Caffres and negroes in the interior. The latter may, perhaps, be considered the aboriginal inhabitants of the Mozambique coast, from that coast westwards into the interior: the Mackoua, whom Salt saw at Mozambique, are described by him as the most genuine thick-lipped negroes that he had ever seen; and the expeditions into the interior inform us that the people are negroes, though some of them are described as of a superior appearance and character to those on the coast. This may be attributed to the want of communication with the white man of Europe, who, wherever he has been allowed freely to settle himself, has, for the most part, destroyed or demoralized the people among whom he has come. We cannot at present state how far north on this coast the negro tribes extend, but certainly not beyond Cape Guardafui. The Somaulis of Adel are not negroes.

We know very little of the interior of Africa, south of the points to which Brown, and Denham, and Clapperton advanced; but we may reasonably conjecture these unknown regions to be occupied by black tribes, which indeed is proved to be true, for a considerable distance at least, by the negro slaves whom the traders bring to Dar-Fûr. The cultivable countries which commence south of the Sahara, and are watered by the Joliba and the various tributaries of Lake Tchad, are the region of the negroes, and known among the Arabs by the general name of Sudan or the country of the blacks. But we cannot say how far eastward the proper negro extends. The natives of Dar-Fûr (whose capital Cobbe is in 14° 11′ N. lat., 28° 8′ E. lon.) are described by Brown as having hair generally short and woolly, and a complexion for the most part perfectly black; yet he says they differ in their persons from the negroes of Guinea, and from the black and genuine negro slaves introduced among them by traders from the south and west. The negro races of the Nuba have, however, spread as far north and east as Sennaar, where a negro dynasty of the Fungi (conquerors) established itself in 1504, and has mingled itself with Arab blood, and adopted a Mohammedan creed. The Shangalla, who also belong to the Nuba, have spread eastward as far as the Tacazze and Mareb, and to the coast of the Red Sea. It is, however, not improbable that there were negro tribes on the upper waters of the Nile during the period of the Pharaohs. The negro is easily recognized in the procession in the tombs of the kings at Thebes. (See Belzoni's plates, and Burton's *Excerpta*.)

The desert of the Sahara, and the southern limits that border on Sudan, swarm with innumerable tribes, of whom the greatest number are included under the general name of Moors. They are a mixed race, and live a wandering life; they are not Arabs, but they have adopted the religion of Mohammed. They are found spread toward the regions of Fez and Marocco, towards the arid Atlantic coasts that bound the western Sahara, and their dominion is fixed on the stream of the Mid-Senegal and Mid-Joliba; they form in fact, a narrow belt or slip stretching from the Atlantic along the southern limits of the Sahara into the interior, probably as far as the Bahr el Abiad. The Tibboos are a wandering tribe, who conduct caravans from Fezzan to Bornou, and are considered by some to speak a kind of Berber dialect. But the most numerous and widely-spread race of the deserts are the Tuaricks, who possess the chief trading ports from Ghadamis eastward, through Fezzan, Augila, and Siwah. They are said to speak a Berber language, and to be mixed on the north with Arabs, on the east with Tibboos, and on the west with Berbers.

The mountain regions of the Atlas, which by their position and character hardly belong to the continent of Africa, as well as the whole shores of the Mediterranean from the straits of Gibraltar to the Cyrenaic regions, have been subject to the invasion of conquerors ever since the earliest periods of history. The Phœnician, Greek, and Roman, Vandals and Goths, and Arabs from Asia, have at different periods possessed portions of these regions, and mixed their blood with that of previous races. The Arab invasion has produced the most permanent effects, and that nation now occupies the most fertile parts of the Atlas region and the towns on the coast, and are generally known to us by the incorrect appellation of Moors; the subsequent conquests of the Turks (also an Asiatic race) have done little more than establish a despotic power on a few isolated spots, under a military chief. But it seems not unlikely that, after all these violent revolutions, the Berbers and Shelluhs of the Atlas mountains are the descendants of the primitive inhabitants, and that they retain their original language in all its substantial parts. It has been well remarked by Ritter, that as the Atlas regions differ in character from the rest of Africa, so its primitive inhabitants have a different character also; and, however, their language or usages may have changed during the lapse of many centuries, we can hardly doubt about assigning them to the wide-spread Arabic family, which there is good reason for considering indigenous in northern and north-eastern Africa as well as in the great Arabian Peninsula. The wide diffusion of this race, across the continent as far as the waters of the Nile and the Gulf of Aden, according to some opinions, will be examined more particularly under the head of BERBER, a term applied, we believe, with no great precision, by many writers on African ethnography. We reserve to the particular descriptions of each subdivision of Africa, a short notice of the political revolutions that have affected the physical and moral character of its present inhabitants, or we shall refer for such information to the best authorities. We need only remark, in order to complete this general sketch of man in Africa, that the ruling race of Amhara, and Tigre, who are included under the name of Abyssinians, must either belong to Arabic stock, or, if they be considered as a separate, they are still a nearly related family. But at present we cannot attempt to classify the various peoples who occupy the widely spread Abyssinian provinces; it is probable that they contain many varieties of the human species, the remnants of nations become extinct, or the result of the intermixture of different races. The Galla, whose invasions of Abyssinia from the south may be compared with the movements of the Nomadic tribes of Asia, have not yet been identified with any other nation, and must for the present be considered as a separate family. The Arab race which sometimes has mingled with negro and other races, now occupies a large part of the countries north of Abyssinia as far as the Mediterranean; but the population of the Nile basin is of a very motley character. The Copts, or descendants of the Egyptians, are reduced to a small number; and of all the conquerors or settlers in Egypt, none have stamped their physical and moral character so strongly on the country as the followers of the Prophet. The Arabs have carried their faith as far as Dar-Fûr, and even to the banks of the Tchad; and the Fellatah empire acknowledges the precepts of the Moslem faith. Even in Comassie, the capital of Ashantee, Arabic is taught. The Mohammedan religion has spread over at least one-third of the continent; and some of its precepts and practices seem well adapted to win the favour of the indolent and pleasure-loving negro. When the Portuguese commenced their settlements at Mozambique, they found the Arabs in quiet possession of the coast, and though they succeeded in killing them all, and getting possession of the navigation of the Zambezi river, yet as some of the sovereigns of the interior had at that time adopted Mohammedanism, it is not unlikely that this form of religion exists in these parts of Africa still unknown to us.

The only African countries where Christianity is now established, excepting the few European settlements, are Egypt and Abyssinia. In Egypt it is confined to the Copts, and in Abyssinia both its doctrines and precepts are as ill understood as they are obeyed.

The Arabic is the only character that is now used in Africa by those who wish to read and write, except those employed by the people of Tigre and Amhara. Its use is, however, limited to very few in Sudan, where it is only great doctors who can read and write.

The Jews, a nation now dispersed over almost every part of the world, are found also in the Samen of Abyssinia, in Egypt, and indeed scattered as far west as the kingdom of Marocco. They do not seem to have established themselves south of the Sahara.

The great island of Madagascar, yet so little known, is occupied on the west side by negroes, who have at various times furnished large supplies of slaves to the Cape of Good Hope and the Mauritius. Whether the negro is aboriginal in this island, we do not know. Madagascar at present is to a great extent occupied by a race of Malay stock, whose arrival in the island is not recorded by any historical document. Some Caffres are found on the south coast. Many Arabs also are found in Madagascar, particularly the northern part, of the period of whose arrival there we are entirely ignorant.

VI. ANIMALS OF AFRICA. In the animal kingdom, at least, Africa is as rich in the number of its peculiar species, (if they are not so remarkable for the singularity and anomalous forms which they exhibit,) as any other quarter of the globe. The peculiar difficulties which have at all times opposed the progress of European discovery in this part of the world, have hitherto prevented us from acquiring so satisfactory a knowledge of its zoology as could be wished; but enough is already known to enable us to form a general idea of its productions, and to infer, with a tolerable degree of accuracy, their most prominent features and characters.

Of three hundred different species of mammals which are known to be inhabitants of Africa, upwards of two hundred and fifty are peculiar to that continent and the neighbouring island of Madagascar; and of these a vast majority are to be found only to the south of the great desert. The following table exhibits the relative numbers of the species of African mammals belonging to each of the orders of the Cuvierian system, compared with the whole number of species belonging to the particular order, and it distinguishes those which are peculiar to Africa from those which are common to it and other continents.

ORDERS.	Whole No. of known species.	Whole No. of African species.	No. of species peculiar to Africa.	No. of species common to Africa and other Continents.
I. Quadrumana (Apes, Monkeys and Lemurs) . .	202	62	44	18
II. Cheiroptera (Bats) . .	219	41	34	7
III. Carnivora (Carnivorous Mammals)	320	89	75	14
IV. Rodentia (Gnawing Mammals)	604	132	104	28
V. Edentata (Sloths, Anteaters, &c.)	28	3	8	3
VI. Pachydermata (Hog, Horse, Elephant, &c.) . .	39	20	16	4
VII. Ruminantia (Ruminating Mammals) . .	148	66	50	16
VIII. Cetacea (Whales) . .	100	10	8	2

An inspection of this table will at once show the relative number of species in each order, as well those which are proper to Africa alone, as those which are common to that and the adjoining continents of Europe and Asia. It will be remarked among other things, that Africa is richest in the number of its pachydermatous and ruminating animals, and very deficient in the number of its rodentia and edentata, compared with the whole number of known species belonging to each of these several orders; though it must be observed in regard to the rodentia in particular, that we have at present only an imperfect knowledge of the African species, as well from their diminutive size and timid character which cause them to be less frequently met with than larger and bolder animals, as from the danger and difficulty which have nearly always attended scientific researches of all descriptions among the Arab and Negro nations. This remark with respect to the great abundance of pachydermatous and ruminating animals in Africa will not be considered devoid of importance, if we reflect that it is principally from these two orders of mammals that the animal food, not only of man, but likewise of the lower tribes of carnivorous animals, is derived. We proceed to give a brief sketch of the most remarkable species of African animals.

The quadrupeds of burden are highly valuable. The Arabian camel (*Camelus dromedarius*) is now spread over all the northern and central parts of the continent, and is indispensably requisite in crossing the long arid deserts which cover so great a portion of its surface north of the equator. Some writers suppose that the camel was not indigenous in Africa, but we have no historical account of its introduction into this continent. It is mentioned in the book of Genesis, as being used by the merchants who traded to Egypt, and of course must have been well known at that period on the banks of the Nile. The head of the camel is found on obelisks and other ancient Egyptian monuments from the city of Alexandria as far south as 18° 25′ of N. latitude. Camels' heads are cut on the plinth of one of the two granite lions which Lord Prudhoe brought from Jebel Barkal in Dongola, in 1832. As to the horse, it is spoken of in the Bible, and is represented on some of the oldest specimens of Egyptian sculpture; but we cannot assert that it is indigenous in Africa, nor on the other hand can we mention any period at which it was introduced. Leo Africanus relates that there are wild horses to be met with in Africa, but this report has not been confirmed by any modern traveller, and there is strong reason to doubt its truth. However this may be, it is certain that the soil and climate of Africa are peculiarly adapted to develope the physical and mental qualities of these quadrupeds. The horses and asses of Barbary, those of the Bedoweens and of Egypt, yield in no respect to the finest Arabs either in beauty of form or spirit. The first of these races was introduced into Spain during the ascendancy of the Moorish power in that country, and from it the noble Spanish breed of modern times is descended.

Of horned cattle there are a great many different varieties in Africa. The most remarkable are the Sanga or Galla oxen of Abyssinia, with immense horns nearly four feet in length, and a kindred race in Bornou, the horns of which measure upwards of two feet in circumference at the base, and yet scarcely weigh two pounds a-piece. Of sheep, the most remarkable varieties are the broad-tailed kind, whose tails grow so fat and heavy that, according to Shaw's report, they are frequently obliged to be supported on little wheel-carriages, as Herodotus says of the Arabian sheep. This variety is common in Barbary, at the Cape of Good Hope, and in other parts of Africa. The edimain, a very tall variety, with long legs, small tails, and drooping ears, is common in Egypt, Sennaar, and Nubia. Both these breeds are covered with short coarse hair instead of wool, and their flesh is very inferior in quality to our European mutton. Goats are in many parts of Africa more common than sheep, as they subsist better on the dry aromatic herbs of the desert, yield a more abundant supply of milk, and are generally preferred for the table. Of these also there are many different varieties; among others, a dwarf species, with short smooth hair and very small horns, which has been introduced into South America, where it has multiplied prodigiously.

The domestic cat is very rare in Africa, but dogs are numerous, and of many different varieties. Among the Mohammedans, it is well known that these animals are considered unclean; but though they refrain from keeping them in their houses, all the large towns of Egypt and Barbary maintain public troops of dogs, which perform the offices of common scavengers, establish themselves in particular quarters of the city, maintain a kind of government among themselves, and are extremely watchful to prevent strangers from intruding into their particular districts. It is no uncommon thing for the wealthy Mussulmans to leave considerable legacies for the support of these animals; and it is very remarkable, that notwithstanding the great heat of the climate, and the constant scarcity of water, an instance of canine madness is never known to occur in Africa.

Domestic poultry are common enough in every part of Africa, though they also are of foreign introduction. Every one has heard of the artificial mode of hatching chickens which has been so long practised by the Egyptians, and of which an exhibition on an extensive scale was some years since afforded to the inhabitants and visiters of the metropolis. Turkeys have, of late years, been introduced about the neighbourhood of Sierra Leone, but they have not yet become numerous, and, perhaps, the country is not well adapted to their habits. It does not appear that the Guinea hen, though indigenous to Africa, is at present domesticated among the inhabitants: in Dar-Fûr, the Guinea fowl is indigenous. Geese and ducks are not extensively distributed, and even where they are found, are reared in small numbers, and held in very slight estimation. Probably, the extreme dryness of the climate may have a considerable influence in depreciating the utility of these birds.

Among the wild animals of Africa the first and most remarkable is the chimpanzee or pongo, the *simia troglodytes* of naturalists. This extraordinary animal, of which there is good reason to believe that more than one variety exists in Africa, approaches much nearer to the human form than the orang outang, or wild man of Borneo Sumatra, and the other large islands of the Indian Archipelago. Its arms are not so disproportionately long as in that animal; its neck is not so short and deformed, nor are its shoulders so high; and it has altogether a much greater facility of standing and walking upright, and of using the anterior extremities as hands, properly speaking. Its organization, however, determines its general habit of walking on all fours; and the hinder extremities are, as in all the order, marked by a thumb—a finger opposed to the other fingers. The adult chimpanzee has never been brought into Europe. Of the inferior tribes of quadrumanous animals, the greater number of the cynocephali, or baboons, are found only among the rocks and mountains of Africa. Many of these, such as the mandril (*Cynocephalus maimon*) and the tartarin (*Cyno. hamadryas*), attain a very considerable stature, and, from their great strength and malicious disposition, are much dreaded by the negroes. The monkeys, properly so called, (*Cercopitheci*,) are likewise an African genus. These playful and harmless little animals, of which there are a great many different varieties, many of them marked with the most brilliant and varied colours, swarm over the whole continent, living in large troops and enlivening the woods with their gambols and chattering. All the various and beautiful species of lemurs also, the tardier and slow lemurs *(nycticebi)* alone excepted, belong either to the continent of Africa or to the neighbouring island of Madagascar. In the latter country, so completely insulated from the rest of the world, and of which the natural productions are, for the most part, singular and anomalous, the different species and varieties of lemurs are extremely numerous, and even entirely replace the apes, baboons, and monkeys of the adjacent continent, none of which, as far as we are at present aware, have ever been found in this island.

The cheiroptera, bats, or winged mammals of Africa, are not so well known as some of the other tribes, though it is probable, from the physical nature of the country and climate, that they are quite as various and abundant here as in Asia and America. Of those which we do know, the most remarkable is the common roussette *(Pteropus vulgaris)*, which inhabits Madagascar and the Isle of France, grows to the size of a small fowl, feeds on fruits, and is eaten by the inhabitants, who compare its flesh to that of the pheasant and partridge.

Carnivorous and ferocious animals are extremely numerous in all parts of Africa. The lion, the panther, and the leopard, lurk in the vicinity of the rivers and fountains to surprise the different species of gazelles and antelopes, but, unless pressed by hunger, rarely attack the inhabitants; though it is said that the lion will often pursue the Hottentot in preference to all other prey. In some parts, however, these animals are so numerous, that the natives will not venture to travel through the woods unless in large parties and well armed. Major Laing informs us, in his journey to the Soolima countries, that he passed through a country which had formerly been well inhabited, but in which, at the period of his visit, there was not a single village to be met with for a space of twenty-five miles along his path, the former populousness of the country being alone indicated by the sites and ruins of several large towns: the inhabitants of these had been forced to remove to other provinces on account of the great numbers and constant attacks of the leopards and panthers. The whole genus of hyænas are, properly speaking, African animals. The common hyæna, indeed, (*Hyæna vulgaris*,) is likewise found in India; but the other two known species (*Hyæna crocuta et villosa*) are found only in the peninsula of Africa. Besides these, there is another animal described by Mr. Burchell, in his *Travels in Southern Africa*, which is intermediate in its habits and organization between the hyæna and the dog, and which has been associated with both these genera under the names of *hyæna venatica* and *canis picta*. All these different species of hyæna live entirely upon offal and carrion, and are of singular importance in the economy of nature, by preventing the accumulation of putrescent matter, and devouring dead carcasses and other garbage, which, under the influence of a tropical sun, would soon corrupt and produce the most noxious and unwholesome vapours. Like feline animals, the hyænas are nocturnal, and nightly visit the towns and villages, where they prowl through the streets till morning, eating the garbage and off-castings of the shambles, and devouring any tame animal which the inhabitants may have neglected to secure. The true civet (*Viverra civetta*) is found in a state of nature in most parts of Africa. Great numbers of these animals are kept by the natives for the sake of their perfume. Nearly allied to the civets are the animals which naturalists call ichneumons (*Herpestes*), of which Africa contains four or five distinct species, and which wage incessant war against the numerous serpents and other reptiles which infest every part of the country. As far as our present information extends, there are no bears in Africa. The older African travellers, indeed, often mention having had their dromedaries and mules bitten by bears during their night encampments, but their relations are always to be understood of the hyæna, which is usually called a bear in the north of Africa, as he is called a wolf in the south.

Of the Rodent mammals (*Rodentia*) of Africa, our knowledge has of late years received considerable accession. Two or three varieties of hares, differing little from our common European species, are found throughout every part of the continent; and the common rabbit, which is now so abundant in all the temperate countries of Europe, is said to have been originally introduced from Barbary. Eight or ten distinct species of jerboas (*Dipus*) inhabit the desert, where they burrow among the loose sand, and feed upon different bulbous roots, which in certain situations are very abundant. Beautifully-variegated squirrels inhabit the woods, and rats and mice, of many different species, are as numerous as in other countries. Among the latter, one species in particular, the Barbary mouse (*Mus Barbarus*), is remarkable for the beauty of its colours, being marked on the back with ten longitudinal white lines; and another (*Arvicola pumilio*), having four black stripes along the back, is thought to be the smallest of all quadrupeds, weighing, according to Professor Sparrman, not more than four scruples.

Though South America is the chief residence of Edentalous mammals, two species are nevertheless found in Africa. These are the aardvark (*Orycteropus Capensis*) and the long-tailed manis (*Manis Africana*). Both feed upon ants, and burrow beneath the surface of the earth; the latter is totally deprived of teeth, but its body is defended in every part by a thick covering of hard, trenchant scales, which protect it, like a coat of mail, from the assaults of its enemies. It has likewise the faculty of rolling itself up into a round ball like a hedgehog; and in this position it is safe even from the teeth and claws of the lion and panther.

The elephant necessarily occupies the first rank among the wild hoofed quadrupeds of Africa. The African elephant, though long confounded with the Asiatic, is now well known to be a distinct species; its forehead is more convex, its ears larger, the markings of its molar teeth are of a different form, and it has only four hoofs on the fore feet and three on the hind, whilst the Indian species has five before and four behind. In magnitude, intelligence, and docility, however, it does not yield to its Asiatic congener; and if we were to credit the exaggerated statements of travellers, it would even appear that the African elephant occasionally attains the height of seventeen or eighteen feet. However this may be, it is at least certain that the tusks of ivory imported from the coast of Guinea are considerably larger than those which are obtained from India—often weighing from one hundred and fifty to one hundred and eighty pounds, whilst the latter rarely exceed one hundred or one hundred and twenty pounds. These animals inhabit all the woody parts of Africa south of the Sahara, and are found in Dar-Fûr: they live in immense herds of from one hundred and fifty to two hundred individuals; and are said to be so numerous throughout the whole extent of middle and southern Africa, that we could scarcely credit the reports of travellers, were they not confirmed by the immense quantities of ivory annually imported into Europe from the western coast of Africa alone. A considerable quantity of this ivory is said to be found in the woods, being either broken by the animals in their combats with one another, or in their attempts to uproot different kinds of trees for the purpose of feeding upon their roots and branches; but much the greater part of it is the produce of the chase, whole tribes often devoting themselves to this employment. Various modes of capturing this huge animal are resorted to by different tribes. Major Laing informs us that the inhabitants of Soolimana attack him in the open field, and kill him with a spear having an iron head, formed like an equilateral triangle, and fired from a long Danish gun. The colonists of the Cape of Good Hope attack this animal, as well as the rhinoceros and hippopotamus, with simple fire-arms, only mixing a little tin with the lead, for the purpose of hardening thei balls, and preventing them from flattening against the tough hides of these beasts; and it is no uncommon thing for the expert and experienced hunters to bring down thei game at a single shot. Among the Shangalla, Bruce informs us that the elephant is attacked by two men mounted on the same horse, who ride round the beast til the hindmost hunter gets an opportunity of suddenly and secretly dropping down behind him, when, with a singl stroke of a sharp double-edged sabre, he severs the tendon Achilles immediately above the heel; and by this means so completely disables him, that the hunters can afterwards despatch him at their leisure. During these hunting expeditions, the hunters live entirely upon the flesh of the slain elephants; and recently a great quantity of ivory, and other valuable stores, have been exhibited in this country by the African hunter, Mr. Gordon Cumming, a Scottish gentleman. The African elephant is not now, so far as we know, employed in the service of man; though the Ptolemies undoubtedly obtained elephants of war from Ethiopia. In the sixth century, Cosmas says that the Ethiopians could no longer train them for war. [See ADULE.]

Of the rhinoceros, one species at least, and probably more, inhabits the middle and southern parts of Africa, frequenting the same localities as the elephant, and hunted as ardently by the people, though his hide and horns are the only part of him that can be turned to account. Of the hide, shields are made in some parts, and in others, traces and harness; for all of which purposes its great thickness and durability render it extremely appropriate. The African rhinoceros, like that of Sumatra, has two horns, but it is distinguished from the latter species by having no front or incisor teeth. The horns, as in the East, are highly esteemed for their supposed medicinal virtues.

The hippopotamus is found in the large rivers and lakes of Africa south of the Great Desert; and from being less hunted and more difficult to come at than either the elephant or rhinoceros, is in many parts extremely common. This animal appears to have kept possession of the fresh-water lakes and rivers of Africa, and to have inhabited the very same localities which he now occupies from the earliest ages. The Greek and Roman writers frequently mention him as an inhabitant of the Nile; and Hanno, the Carthaginian Admiral, in his voyage along the western coast of Africa, informs us that he came to a large river—which, it is supposed, must have been either the Senegal or the Gambia, or the Rio Grande—in which the hippopotami were very numerous. At the present day the hippopotamus is never seen below the second, and perhaps not below the third cataract of the Nile; but on the opposite coasts of the continent, in the Senegal, the Gambia, and the Niger, they are numerous, and extend southward as far as the Cape. Within the boundaries of the latter colony, indeed, this animal is at the present day rarely met with; but it was formerly as abundant as in other parts of Africa, and still exists on the northern and eastern frontiers. [Two have recently been imported alive.]

The engallo or wild boar of Africa (*Phascochœros*) is a very different species from that of Europe, though the latter is likewise said to be found in Egypt and Barbary, as it certainly is in India and other parts of the East. The engallo is, perhaps, the most hideous of all mammals in appearance. It resembles the elephant in the form and structure of its molar teeth. Of these there are never more than two in each jaw; they are not renewed as in ordinary quadrupeds by the new one growing under the old, and gradually pushing it out of the socket; but the young tooth is formed in this case behind the old one, and gradually advances forward and assumes its situation, as the latter is worn down by constant use.

The zebra, the dow, and the quagga (*Equus Zebra, duplivirgatus, and quaccha*) are found in most parts of southern and central Africa which are known. These beautiful animals, equally remarkable for the symmetry of their forms, the rapidity of their course, and the brilliancy and wonderful regularity of their colours and markings, associate in large herds upon the open plains and gentle declivities, and are the frequent prey of the lion, which is said to prefer their flesh to the dry and tough venison of the various species of gazelles and antelopes that inhabit the same localities. It has been repeatedly remarked by African travellers, that these animals and the ostriches seem to have a natural predilection for each other's society, and that the flocks and herds of these very different species are constantly found intermixed, though they refuse to associate with other animals. It is not a little remarkable, that the same was observed by Xenophon, during the expedition of the ten thousand Greeks, with respect to the ostrich and quagga or wild ass, on the plains of Syria and Mesopotamia. The fact may probably be accounted for by the mutual security which each feels in the other's company, the long and flexible neck of the ostrich enabling it to take notice of the most distant appearance of danger, and the well-known courage of the wild ass compelling beasts of prey to respect their quarters. It is to be lamented that no judicious attempts have ever been made to domesticate these beautiful animals.

Among ruminating animals, Africa is chiefly remarkable for the immense numbers of different species of antelopes which it contains; no fewer than sixty species, out of eighty which have been enumerated in this extensive genus, being proper to that continent. This is a very peculiar feature in the zoological character of Africa, especially when we consider that there have been only two species of deer (one of which is our common fallow deer, which has been ascertained to be indigenous to North Africa) hitherto discovered throughout the whole extent of the continent. Asia, on the contrary, whilst it abounds in many different species of deer, contains, comparatively, very few antelopes, being thus completely opposed, in an important zoological feature, to the neighbouring continent. For a more detailed account of the habits and external characters of these animals, see *Antelope*. Of other wild ruminating animals indigenous to Africa, the most remarkable is the giraffe or camelopard, which is found from the banks of the Gariep to the southern borders of the Great Desert. Two or three wild species of buffalo also inhabit the woods and marshy grounds of the interior, but we know little of their forms or habits. The bos caffer, or wild buffalo of the Cape, has the base of the horns extending all over the top of the head and forehead, in the manner of a helmet; he is a savage, dangerous animal, and much dreaded by travellers.

Among the cetaceous mammals which inhabit the seas and coasts of Africa, we need only mention the lamantin, (*manatus Senegalensis*,) which frequents the mouths of the great rivers on the Atlantic and Indian Ocean, and feeds upon the aquatic plants that it can reach along the shores. It was this animal which, from the pectoral situation of its mammæ, and from the habit of raising itself half out of the water, especially when in the act of suckling its young, gave origin to the fable of the mermaid, by which name it is often mentioned by ancient African voyagers and travellers.

Of the ornithology of Africa, we cannot undertake to give more than a very general account. Indeed, from the physical conformation of birds, they are not so confined and limited in their geographical distribution as quadrupeds; and, consequently, the ornithology of particular countries is never so peculiar nor exclusive as its mammalogy. The birds of Africa, according to the most recent calculations, number in all 174 species. Many of our European species, such as the common quail, the landrail, the cuckoo, and the different varieties of swallows which spend the summer and autumn in northern climates, migrate for the winter season to Africa; and others of our common species are found distributed over the whole eastern hemisphere, without presenting any sensible difference, even in the colour of a feather, in the most remote localities. The ostrich has already been incidentally mentioned as an inhabitant of Africa. At the present day, indeed, it would appear to be exclusively confined to that continent, though in the age of Aristotle and Xenophon it was found in the deserts of Syria and Mesopotamia. Captain Lyon informed us that the best ostrich feathers imported from Barbary are not procured from the wild birds of the desert, but from semi-domesticated individuals which the Arabs take young and breed up in stables, where they are well supplied with soft bedding to prevent them from wearing or injuring the feathers. Similar to the ostrich in many of their habits, and even somewhat in appearance, are the bustards, many different species of which inhabit the Karroos and arid plains of Africa. Of gallinaceous fowls, adapted to the poultry-yard, Africa possesses but a single genus, the Guinea-hens (*numidæ*), which, however, are found in no other part of the world. These birds, of which there are three or four distinct species, go in large flocks of 400 or 500, and are most frequently found among underwood in the vicinity of ponds and rivers. There are, besides, many species of partridges and grouse in different parts of Africa; but as these are not fitted for domestic purposes, and have otherwise nothing remarkable in their habits or economy, it will be sufficient at present to indicate them thus generally. Wild fowl of various species are also abundant on the lakes and rivers, as are likewise various species of owls, falcons, and vultures, the latter of which, like the hyænas among the quadrupeds, are highly useful in consuming the offal and carrion which might otherwise taint the air and produce disease. The exquisite sense of smell possessed by these birds is truly surprising. One of the most remarkable and useful birds of prey peculiar to Africa is the secretary (*serpentarius*), which may be not improperly described as an eagle mounted on the long naked legs of a crane. This bird preys exclusively upon serpents, which it pursues on foot, and destroys in amazing numbers.

Among the smaller birds of Africa are many species remarkable for the gaudiness and brilliancy of their plumage, or the singularity of their manners and economy. Of the former kind may be mentioned the innumerable varieties of parrots and parroquets, which, from the size of a sparrow upwards to that of a raven, swarm in all the forests, and make the woods resound with their hoarse unmusical screams. Of the latter kind, it will be sufficient to mention the honey cuckoo (*cuculus indicator*, *Lin.*) and the little bird called the republican (*loxia socia*, *Lath*).

Lizards, serpents, and other reptiles abound in every part of Africa. The crocodile inhabits all the large rivers of the tropical parts, and is still abundant in the Nile below the first cataract; different species of chameleons may be seen on every hedge or shrub; and the enormous python, a serpent of thirty feet long, lurks in the fens and morasses. Among the venomous species, the dipsas, the asp, and the cerastes, or horned viper, are frequently mentioned by the ancient classical writers; whilst the garter snake, the puff adder, and other species, are at present employed to poison their arrows by the Bosjesmans. There are at least 143 species of reptiles belonging to the African continent.

Of the insect tribes, Africa also contains many thousand different kinds. The locust has been from time immemorial the proverbial scourge of the whole continent; scorpions, scarcely less to be dreaded than the noxious serpents, are everywhere abundant; and the zebub or fly, one of the instruments employed by the Almighty to punish the Egyptians of old, is still the plague of the low and cultivated districts. For a particular account of the ravages of this dreadful insect, the reader is referred to Bruce's *Travels*, (4to. edit.) vol. i. p. 388, and *Appendix*, p. 188, where there is also a good figure.

VII. PLANTS OF AFRICA. The nature of African vegetation will be best understood by tracing geographically the changes it undergoes between a state but little different from that of the south of Europe, and the singular Flora of the Cape of Good Hope. To the traveller who passes from the south of Europe to Tangier, the appearance of the African coast presents nothing remarkably different from what he has left in Europe; and along the whole of the most northern shores so great a similarity continues to be preserved, that if it were not for a few striking objects, he might fancy himself still in Spain or in France. Groves of oranges and of olives; wide plains covered with wheat and barley; thick woods of evergreen oaks, cork trees, and sea pines (*Pinus maritima*), intermixed with cypresses, myrtles, arbutus, and fragrant tree heaths (*Erica arborea*), form the principal features of the landscape; while the plains are covered with the gum cistus, and the hills and rocks with odoriferous rock-roses, palmetto trees, and the wild caper. In January and the early months of the year, when the climate is like that of the warm days of our spring, the plains are green with grass, and embellished with innumerable little flowers of the monocotyledonous class, and the gardens are gay with the blossoms of the almond, the apricot, and the peach. Even in the summer season, when all the nore delicate plants have been dried up beneath a scorching sun, there is still the oleander, with its brilliant bunches of rosy flowers, by which are traced from afar the courses of the rivers on the banks of which it loves to dwell, and those humid spots which, from accidental circumstances, being never dried up, are then a kind of vegetable oases. On this northern coast the date palm is first found; but its fruit does not arrive at perfection, and it is chiefly valued as an object of ornament to gardens and houses.

The principal objects of cultivation in the Barbary States are a kind of wheat, (*Triticum durum*,) the stems of which are solid, and the grain horny rather than farinaceous; barley which the Moors give their horses instead of oats, maize, caffre corn, (*Holcus sorghum*,) rice, tobacco, olives, oranges, and figs of the most delicious quality; pomegranates, grapes, and jujubes, together with sweet melons and water melons. They also grow the white mulberry for silkworms, a kind of indigo, (*Indigofera glauca*,) cotton, sugar-cane, and most European esculent vegetables. It is in the mountainous country, south of the Barbary States, in the chain of Atlas, that grows that famous timber (*Thuja articulata*) called, from the substance it produces, the sandarach tree, which is almost imperishable, from which the ceilings of the mosques are exclusively constructed, and which is supposed to have been the shittim wood of Scripture.

As soon as the chain of Atlas is passed, the scene begins to change; the excessive dryness of the climate on the northern borders of the Great Desert is such, that few trees, except the date, can maintain an existence. It is, however, in this arid region, where rain seldom falls, where wheat refuses to grow, and even maize, barley, and caffre corn, afford the husbandman a miserable and uncertain crop—where the blasts from the south are scarcely supportable by the native himself, that this invaluable gift of Providence finds its fitting station. It is here that the groves of date palms form a screen impervious to the rays of the sun, and cherish beneath their shade, the orange, the lemon, the pomegranate, and the vine, the latter of which climbs to the summit of their trunks by means of its twisted tendrils. Although reared in constant shade, all these fruits acquire a more delicious flavour than in what would seem a more favourable climate.

Egypt exhibits a scene intermediate, as it were, between the first and the last of these descriptions; but also presenting more the appearance of a tropical country. European plants begin to disappear; in the districts still watered by the Nile, we find all the richness of vegetation of the spring months of Barbary; abundance of rice, barley, and wheat; rich fields of sugar-canes; olives, figs, vines, and plantains that have been introduced; while in the hotter or drier, or more southern, the date is the chief object of the scenery. Nothing but stunted and miserable looking bushes are able in the open plains to contend with the accumulating sand for the possession of the soil. In the richer parts of the country we find the acacias which produce gum arabic, large tamarisk trees, called atlé, great quantities of the senna plant (*Cassia obtusifolia* and other species), intermixed with various herbs belonging to tropical genera, all of which are either unknown or very rare in the more northern parts of Africa. Cotton, coffee, indigo, and tobacco are cultivated with the greatest success. At Thebes first begins to appear a third race of palms different from the date and the palmetto; viz., the forky-branched doom palm (*Cucifera Thebaica*) of Upper Egypt, which is most remarkable as being almost the only species in the whole palm tribe in which the stem is not perfectly simple and unbranched; and in Abyssinia are first found species of the ginger tribe (*Scitamineæ*), in the form of cardamoms, which afterwards become a feature of African vegetation within the tropics.

The deserts that occupy the interior of this continent, like inland oceans of sand, are scarcely inhabited by any plants except of the most stunted character; one of the most remarkable is a grass called kasheia (*Pennisetum dichotomum*), which wholly covers immense districts, and is said to cause intolerable annoyance to the traveller by its prickly involucrum; another is the agoul (*Alhagi maurorum*), which furnishes a grateful food for the camel.

In the equinoctial parts of Africa all trees of European vegetation, and even the date tree itself, disappear; where moisture exists in sufficient abundance to favour vegetation, the flora partakes in a certain degree, particularly on the east side, of the plants of India, but is to a much greater extent composed of species peculiar to itself. The landscape is characterized by masses of the unwieldy Baobab (*Adansonia*), the fruit of which affords the natives a grateful drink, huge cotton trees (*Bombax pentandrum*), the trunks of which project at the base into great buttresses, shrubs of richest verdure, large gramineous plants with branching stems, impenetrable thickets extending into the water, with thick groups of oil palms (*Elæis Guineensis*), sago palms (*Sagus raphia*), and others of the same majestic tribe. In the thickets numbers of combreta, of bindweeds, and of other climbers twine among the branches of the trees, which they adorn with flowers of white, or scarlet, or orange. On the branches of the forest trees grow sparingly various genera of epiphytes; the laburnum of the colonists (*Cathartocarpus fistula*) expands its branches of golden flowers, and replaces the senna of Alexandria; in some places the woods abound in pine-apples, which, although not natives of the continent, have established themselves as completely as in their native stations in tropical America; the plains are often covered with immense quantities of the papyrus plant, to the exclusion of all others; and in the regions near the line a new feature is introduced by the chandelier tree (*Pandanus candelabrum*), which rises singly in the plains, and divides its grotesque branches into repeated forks, the extremities of which are crowned with long, rigid, channelled leaves, like those of the pine-apple.

With the general nature of the vegetation change also the species that are cultivated for the food of man. In the tropical regions of Africa, no waving fields of corn reward the labours of the husbandman; the vine is unknown, the figs are of other and of useless species, and of all the northern fruits the orange and the lime alone remain. In their stead the cassava (*Iatropha manihot*), the yam (*Dioscorea*), the pigeon pea (*Cytisus cajan*), and the ground-nut (*Arachis hypogæa*) are the farinaceous plants; the papaw (*Carica papaya*), the tamarind, and the nitta or doura tree (*Parkia Africana*), are the fruits in some places; the Senegal custard apple (*Anona Senegalensis*), the grey plum (*Parinarium*), and the Safu, in others; and the bread fruit of Polynesia is represented by a large tree called musanga, the seeds of which are as agreeable as hazelnuts. Besides these, we have in Sierra Leone and along the same coast, the remarkable cream fruit, which, although of a most poisonous family, yields a wholesome and pleasant saccharine juice; the water-vine (*Tetracera potatoria*), the stems of which are a sort of vegetable fountain, discharging, when cut across, a cool, limpid, and refreshing fluid; the negro peach (*Sarcocephalus Africanus*), a brown succulent fruit, said to taste like a strawberry; the monkey apple (*Anisophyllea laurina*), the drupe of which is, in flavour and size, between a nectarine and a plum; and various species of pigeon plums (*Chrysobalanus*), together with the mammee apple (*Mammea Africana*), pishamins (*Carpodinus*), and star-apples (*Chrysophyllum obovatum*).

As we approach the southern point of this continent, a new change passes over the face of nature; tropical forms disappear as they have formerly appeared, and we lose the scenery of the cotton tree, the baobab, the palm, and the chandelier tree; not however to find their places occupied by the plants of Barbary and the north, but to contemplate an order of vegetable beings so different, that their very genera had been previously unseen: still the same wilderness of sand and drought occupies the centre of the country, but it is no longer covered with prickly grasses or waving thickets of papyrus. The karroos of the Cape Colony are the residence of fleshy, leafless, distorted, shapeless tribes of Stapelias, of Mesembryanthemums, Euphorbias, Crassulas, Aloes, and other succulent plants, each holding to the soil by the weak support of a single, wiry root, and feeding rather upon the dews of heaven than the moisture of the soil,—a situation to which they are admirably adapted by the want or imperfect state of their evaporating pores, so that whatever humidity they are able to collect is parted with as slowly as the limited supply is furnished to them. Among these grow stunted bushes of endless species of heath (*Erica*), and succulent geraniums (*Pelargonium*), strong-scented Bucku plants (*Diosma*), and a great variety of shrubby *Compositæ*. The hills and rocks are scattered over with a remarkable tribe of plants called Cycadeæ, intermediate, as it were, between ferns and palms; the plains are permanently clothed with patches of a rush-like plant called *Restio;* while the whole country, after the rains, teems with the fugitive but lovely blossoms of the *Ixia*, the *Gladiolus*, the *Disa*, the *Satyrium*, and the *Oxalis*. Plants of the Protea tribe also, of which there are very many species, for the first time appear since the country of Abyssinia, and under the name of Witteboom (*Protea argentea*) supply the inhabitants of Cape Town with fuel.

At Cape Town itself has been introduced the American aloe, which, with its spiny rigid leaves of six feet in length, forms impenetrable hedges, more resembling chevaux-de-frise than any living barrier; and the oaks and stone-pines of Europe have found a congenial climate.

Such are the more prominent features of the vegetation of Africa. Its islands partake more or less of the nature of the flora of the adjacent continent, modified chiefly on the west side by the cooling breezes of the Atlantic, and on the east by the wide expanse of the Indian and southern oceans. In these spots we have usually a total absence of African sterility, in consequence of their insular position; and from their luxuriant vegetation we may judge what that of Africa would be if either nature or the skill of man could succeed in conducting rivers and streams where there are now only barrenness and drought.

VIII. The following view of the great divisions of Africa, according to our present incomplete knowledge, will show under what particular heads further information will be found. This division is one of convenience, and may be liable to objections, but it is impossible to attempt, in a limited space, any complete division of Africa.

1. The region from the Orange river southwards, comprehending the CAPE COLONY, its mountains, elevated plains, European settlements, and native population; and extending eastward to the Great Fish River.

2. The eastern coast of Africa, from the Great Fish River to the neighbourhood of the Portuguese settlements, near Da Lagoa bay; comprehending the sea-coast occupied by the CAFFRES, or NATAL. In the interior the Caffre race is widely diffused in the high table-land, and has been found also, occasionally, on the coast as far as Quiloa.

3. From Da Lagoa bay to Cape Guardafui, the northern part of which coast is very little known; comprehending SOFALA, the settlements on the ZAMBEZI river, MOZAMBIQUE, and the native tribes of the coast and the interior, as far as they are known. From the neighbourhood of Cape Delgado north, we find the names of ZANGUEBAR and AJAN; the last-named coast terminating at the great eastern cape.

4. The ABYSSINIAN countries, with which may be grouped the almost unknown regions that border on them to the south; with the Galla, the Sòmaulis, Danakil, and other tribes, as far north as Masuah on the Red Sea [see ADEL].

5. The country of the BAHR-EL-ABIAD, or great western branch of the Nile, and the countries north of Abyssinia, comprehending the Nile Valley and the eastern deserts, between the Nile and the Red Sea. DARFUR and KORDOFAN may be most conveniently arranged in this division. Darfur is connected by some geographers with eastern Soudan. SENNAAR, DONGOLA, NUBIA, and EGYPT, belong to this division. The term NUBIA, since the conquests of Mohammed Ali, is sometimes used as a general name to comprehend all the countries south of the first Nile cataracts, which are subject to the Pacha. The BEJAS, BISHAREEN, ABABDES, and other tribes belong to this division.

6. The region west of Egypt, known to the Arabs by the general name of Maghreb, or the *West*, and extending to the extremity of the Atlas chain, comprehends the great political divisions of TRIPOLI, including BARCA, TUNIS, ALGIERS, and MAROCCO. This extensive region is often included by Europeans in the general term of BARBARY.

The chief OASES westward from Fezzan may be classed under this head, and placed in the division of BELAD-EL-JERID, or *Land of Dates*, according to some interpretations.

7. The SAHARA, or the great desert; with some of the oases.

8. SOUDAN or Central NIGRITIA, comprehending the regions watered by the Quorra and its tributaries, and by the tributaries to the Lake Tchad.

9. As a subdivision of No. 8, we may reckon the coast from the Senegal to the outlets and delta of the Quorra, including the countries watered by the Senegal, Gambia, Rio Grande, &c. &c., and the coast of Guinea, with the states in the interior. A name is wanting for this division: we shall use that of Western NIGRITIA, under which the subdivisions of this region, as far as they are known, will be given. The term of Senegambia was once in use, to signify the country from the Senegal to the neighbourhood of Sierra Leone.

10. The region from the Bight of Biafra to Cape Negro, which may be named Southern NIGRITIA, comprehending a long line of coast little known, and an interior still less explored. The names of LOANGO, CONGO, ANGOLA, and BENGUELA, are the chief great divisions hitherto adopted by those who have described this region.

These divisions of NIGRITIA, which are here adopted for the sake of convenience, are those of Balbi in his *Abrégé de Géographie*, except that he makes a fresh division of the Guinea coast, which comprehends the two great states of

Ashantee, Dahomey, &c., and calls it by the name of Maritime Nigritia.

The African islands, not immediately bordering on the coast, consist of the following chief groups, or single islands.

North Atlantic Ocean.

The Madeiras—Archipelago of the Canaries—the ten Cape Verde Islands—Islands in the Bight of Biafra; Fernando Po, Prince's Island, St. Thomas, Anno Bom, &c. —The nine Azores, or Western Islands, are considered by some geographers as belonging to Africa.

South Atlantic Ocean.

St. Matthew—Ascension—St. Helena.—The three small islands of Tristan d'Acunha.

The South Indian Ocean.

Madagascar, which may be considered as the centre of an Archipelago of small islands, to which belong the Mauritius and Bourbon, the Comoro Islands in the Mozambique channel, the Sechelles, with the Amirantes; and the islands on the coast of Zanguebar.

The North Indian Ocean.

The islands of Socotra, off Cape Guardafui. The islands of the Red Sea are generally small and inconsiderable, and partake of the character of the Arabian and African coasts, to which they may be respectively assigned according to their degree of proximity.

European Possessions in Africa.

Portuguese.—The government of the Madeiras—of the Cape Verde Islands; and the small posts of Cacheu on the San Domingo, Bissao, Zinghicor, Farim and Geba—of St. Thomas, and Prince's Island—the post of Whidah in Dahomey—the captaincy or government of Congo and Angola, consisting mainly of a few towns and posts—the Mozambique government, on the coasts of Sofala and Mozambique, extending from the bay of Da Lagoa to Cape Delgado: it is divided into seven captaincies, but the real possessions of the Portuguese are now few and insecure; the chief are, the little island of Mozambique, and the settlements of Quilimané, Senna, Tette, Manica, on the Zambezi river. Melinda, once a flourishing Portuguese settlement on the Zanguebar coast, is now deserted by that nation.

English.—Bathurst, on a small isle at the outlet of the Gambia, and a few posts dependent upon it—the establishment of Sierra Leone—the establishments on the Gold and Slave Coast, including the Danish settlements—*see below.* Cape Coast is the chief position: the rest are of little importance—the island Bulama, the Isles de Los, the islands of Ascension, St. Helena, and Tristan d'Acunha, which may be viewed as belonging to Africa; the colony of the Cape of Good Hope, Natal, the Mauritius, and a number of small islands belonging to the Madagascar Archipelago.

French.—The state of Algiers, on the northern coast of Africa, conquered by the French in 1830; on the Senegal and Gambia coast, the district of St. Louis, and that of Goree; the isle of Bourbon, and St. Marie, near Madagascar, with a few posts on the latter island.

Spanish.—The *Presidios*, near the Straits of Gibraltar, in the empire of Morocco, which contain the towns of Ceuta, Melilla, &c.; the Archipelago of the Canaries; Fernando Po, abandoned by the British in 1834, and taken possession of by Spain in 1843.

Dutch.—The only Dutch possessions now in Africa are some posts or forts on the Gold Coast, and chiefly within the limits of the Ashantee empire: the principal place is Elmina, the residence of the governor-general.

The Danish settlements were purchased for 10,000*l.* by Great Britain in 1850. They were Accra, Tasie, Temma, Ningo, Atoko, Adda, Akropong, and Quittah; including Forts Christianborg, Augustaburg, Friedensburg, Konigstein, and Prinzenstein, with large tracts on the Guinea Coast.

American.—The colony of Liberia near Cape Mesurado, founded by the American Colonization Society. It is a private enterprise, and has for its object the settlement in Africa of free negroes from the United States. The chief places are Monrovia and Caldwell.

Ottoman.—These are really foreign possessions, being held by Turkish authorities, who are nominally dependent on the Sultan of Constantinople. They are Egypt, the eastern desert, the Wadys of Siwah, Khargeh, &c., Nubia, Sennaar, Kordofan, &c. Tripoli and Tunis can be no longer considered as at all dependent on the Sultan.

AFRICAN ASSOCIATION. A society formed in London, in the year 1788, with the design of encouraging men of enterprise to explore the interior of Africa; of acquiring by their means a knowledge of the character of the native inhabitants; and of being enabled to introduce among them the arts of civilization.

At its first formation, the Association consisted of ninety-five members, many of whom were men distinguished by their zeal in the cause of science. The management was intrusted to a committee of five persons elected from among the members. This committee administered the funds, conducted the correspondence, and appointed the persons to whom the accomplishment of its objects was confided. Sir Joseph Banks was one of the first and most efficient members of this committee.

The first person commissioned by the Association was John Ledyard, an American, who had already gone round the world with Captain Cook, and had given other proofs of his adventurous disposition. The task assigned to him was that of traversing the widest part of the continent of Africa, from east to west, in the supposed latitude of the river Niger. While preparing himself for this undertaking, and making the necessary inquiries at Cairo, where he had arrived in August, 1788, Mr. Ledyard was seized with a bilious fever and died.

The committee lost no time in supplying his place; and in October of the same year despatched Mr. Lucas, whom they selected on account of the knowledge which he had acquired in previous travels of the language and customs of the Arabs. The instructions of the committee to Mr. Lucas were, to proceed from Tripoli over the great desert of Sahara, and to return homeward by the way of the Gambia or the coast of Guinea. To fulfil these instructions Mr. Lucas proceeded from Tripoli to Mesurata, where he remained about a month collecting information, when, owing to the difficulties and dangers, caused by a state of warfare, which constantly opposed themselves to his undertaking, he was induced to retrace his steps to Tripoli, and thence returned soon after to England.

The next person engaged by the Association was Major Houghton, an officer who had acquainted himself, in the course of former journeys, with the customs of the Moors and Negroes. He arrived at the mouth of the river Gambia in November, 1790, and ascended the stream to Medina, the capital of the kingdom of Woolli, on the north side of the river. He next crossed the river Faleme, and arrived at Ferbanna, sixty-five miles S.E. of Bambouk. Endeavouring thence to penetrate the kingdom of Ludamar, Major Houghton engaged with some Moorish traders at Jarra to accompany them to Tisheet, but was treacherously plundered by them and left in the desert. After severe privation, he returned to Jarra, and there died, in September, 1791, not without strong suspicions of having been murdered.

Without being discouraged by these repeated disappointments, the Association sought for some other person to prosecute their plans, and were fortunate in meeting with Mungo Park, who sailed in May, 1795, and arrived at Jillifree, on the banks of the Gambia, and near to its mouth, in the kingdom of Barra. In December he set out from Pisania, accompanied by two negro servants and four other natives, and advanced into the kingdom of Woolli. He then went through Kajaaga, crossed the river Senegal, and proceeded through the kingdoms of Kaarta and Ludamar to Jarra. Mr. Park afterwards successfully explored the banks of the river Niger, here called the Joliba, which till then had been thought identical with the Senegal,—proceeding as far as the populous city of Sego, the capital of Bambarra, and to Silla. This last place (in lat. 14° 48′ N., long. 1° 34′ W.) was the extreme limit of his first journey, the particulars of which were communicated to the Association in 1798. The second journey of this adventurous traveller in 1804 was undertaken at the expense of Government.

In July, 1797, Mr. Hornemann, a German, left London under an engagement with the Association. This gentleman had previously endeavoured, by much study, to qualify himself for the task of exploring Africa, and with the same object remained some time at Cairo. Here, while waiting the departure of the caravan to Cassina, Mr. Hornemann was seized, together with other Europeans, but was released by order of General Buonaparte, who, on learning his destination, supplied him with passports and other facilities for his journey. He commenced his travels westward with the caravan in September, 1798, and arrived at Moorzouk, in Fezzan, in November. Here he remained for a considerable time; and in April, 1800, set out for Bornou. His last despatches were previously sent off by way of Tripoli, and expressed the confident hope of being able to penetrate farther to the southward and westward than any preceding European traveller. From that time no certain intelligence of his fate was ever heard. Vague rumours, received eight years afterwards, stated the probability of his being still alive in the interior of the country. According to one report, he was living, in June, 1803, in Cashna, where he had assumed the character of a Marabout or Mussulman saint, and was highly respected.

Mr. Nicholls was next engaged by the Association. This gentleman, who was instructed to proceed to Calabar, in the Gulf of Benin, arrived there in November, 1804, and died shortly after from the fever of the country.

A young German, named Roentzen, recommended to the Association by Professor Blumenbach, was next despatched to Africa. To fit himself completely for the journey, he acquired a competent knowledge of the Arabic language, put off his European dress, and assumed the character of a Mussulman. Great part of the year 1809 was spent by him at Magadore, that he might perfect himself in the part he was to act: he then set out, with two guides, to join the caravan proceeding to Soudan, but before he could accomplish this object, he was barbarously murdered,—a deed to which his guides were most probably incited that they might possess themselves of his property.

The last missionary of the Association was John Lewis Burckhardt, a young Swiss of good family, who visited England in 1806, and in 1808 offered his services to proceed to Africa. Between this time and March, 1809, when he sailed for Aleppo, Mr. Burckhardt remained at Cambridge studying Arabic. On his arrival at Aleppo he assumed the name of Ibrahim Ibn Abdallah, together with the eastern costume, and all the outward characteristics of a Mussulman. He remained in Syria two years and a half, which time was spent in acquiring a knowledge of all the spoken dialects of the country, and in habituating himself to the customs of the people. At the expiration of this time he set off for Nubia, crossed the Red Sea, and after visiting Mecca and Medina, arrived at Cairo in June, 1815. In the following spring he visited Mount Sinai, and returned to Cairo, where he remained until October, 1817, when he was seized with dysentery and died. The journal of his travels in Syria to the time of his arrival in Cairo was transmitted to the Association, and published. His papers of a later date, which are believed to have been highly interesting, have not hitherto reached this country, and it is feared are lost.

These repeated failures appear at length to have discouraged the Association from engaging other missionaries. A great deal of information, connected with the geography of Africa, was collected by them from various sources during the period of their active labours; and this information was communicated to the public in the occasional printed reports of their proceedings.

The Association has recently merged in the Royal Geographical Society, into which body its few remaining members were admitted in 1831. [See *Proceedings of the Association*, from 1794 to 1805; Leyden's *History of Voyages and Discoveries in Africa*, edited by H. Murray; and *Journal of the London Geog. Soc.* vol. i. p. 257.]

AFRICAN COMPANY. A regulated Company established by the act 23 Geo. II. cap. 31, (1754,) which was first charged with the maintenance of all the British forts that lie between Cape Blanco in lat. 20° 47′ N., long. 16° 58′ W. and the Cape of Good Hope, and afterwards with upholding those only which lie between Cape Rouge and the Cape of Good Hope. Previously to its incorporation, four other joint-stock companies had been successively established for prosecuting the African trade. The last of these, the Royal African Company, had an exclusive privilege by charter, under which it carried on a losing trade of conveying negroes to the plantations, and of importing gold-dust, elephants' teeth, and dyeing drugs from the inland parts of Africa. By the act which established the African Company this exclusive charter was recalled, and their forts and garrisons were vested in the regulated company. The fine which entitled any merchant to be admitted a member of this corporation was limited to forty shillings. The Company was prohibited from trading in its corporate capacity, or upon a joint stock; from borrowing money, or from laying any restraints upon the trade, which might be carried on freely from all places and by all persons, being British subjects, who should pay the fine. The government was vested in a committee of nine persons, who were elected annually by the freemen of the Company resident in London, Bristol, and Liverpool; three members being returned from each of the places, who held their sittings in London.

For the purpose of maintaining the forts and garrisons, an annual sum of about 13,000*l.* was voted by Parliament, for the due disposal of which the committee were responsible to Government. The salaries of their clerks and agents, with all other expenses of management, including compensation to the members of the committee for their trouble, were allowed out of the sums received as fines of admission from the freemen. In the course of time it happened that the whole expense of the Company came to be defrayed by the public, and for this reason the charter of its incorporation was recalled by Parliament in 1821 (1 and 2 Geo. IV. cap. 28); his Majesty being empowered to grant allowances to the officers and servants of the Company. The possessions of the Company on the west coast of Africa were by this act annexed to and made dependencies upon the colony of Sierra Leone.

AFRICAN INSTITUTION. A society established in London, in April, 1807, whose declared objects were, to collect accurate information respecting the natural productions, as well as the agricultural and commercial capabilities of the African continent, and, also, respecting the condition, intellectual, moral, and political, of its inhabitants: to cultivate friendly relations with the African people, and to promote among them the diffusion of useful knowledge:—to introduce among them the arts of civilization; to promote the pursuit of agriculture, furnishing for that purpose seeds and plants, and implements of husbandry. Another object announced by the promoters of the institution, was that of introducing useful medical discoveries among the inhabitants—an object of the highest benefit when the nature of the climate is considered. In order to accomplish these aims, the institution proposed to employ suitable agents, to establish correspondences, and to reward the exertions of individuals in promoting its purposes. It was another principal object to obtain a knowledge of the African languages most extensively used, and to reduce them to writing, with the view of facilitating the spread of information among the natives. As an important instrument for promoting these objects, the members of the institution were invited to devote their individual attention and united influence to obtain the enforcement of the law, then recently passed, for abolishing the African slave trade, and to expose all attempts to evade its provisions.

Among the early patrons of these laudable objects, were to be found many of those members of both Houses of Parliament whose exertions had procured the passing of the abolition law.

The institution disclaimed all projects of a colonising or commercial nature, and did not profess the intention of imparting religious instruction to the African people.

To provide the funds required for the prosecution of its plans, four classes of contributors were invited to associate themselves; viz., hereditary governors, whose qualification was a donation of sixty guineas and upwards; life governors, whose donations amounted to thirty guineas; governors, who subscribed annually three guineas and upwards; and members, who contributed each one guinea a-year. The affairs of the institution were to be administered by a patron, president, twenty vice-presidents, and thirty directors; the latter body being chosen annually from among the governors.

Plans so extended required, for their accomplishment, the possession of very ample funds, if, indeed, success could be reasonably hoped from any efforts, however powerfully supported, where the directing body was so far removed from the sphere of action, and must necessarily intrust the execution of its schemes to agents whose views and interests might not coincide with those of the London directors. The subscriptions obtained at the first establishment of the institution were considerable both in number and amount, but they very soon fell short of the sum required, so that in 1815 its permanent income was already considerably below 500*l.*

In the first year of its establishment, the institution sent out to Sierra Leone three African youths, who had been instructed on the plans of Dr. Bell and Joseph Lancaster; it gave directions for engaging persons qualified to teach the Arabic and Sowsoo languages; conveyed various seeds and plants to different parts of the coast, and distributed them among the natives, together with proper instructions for their culture and management; it provided machines for cleaning cotton, and a press for expressing the oil of the castor-nut; and it offered premiums to the importers of cotton, rice, indigo, and coffee of African production. With all this, its vigilance was unceasing to detect infractions of the abolition law, and the exertions of the directors were successfully applied towards the obtaining of an act of parliament declaring the slave trade a felonious crime.

The African Institution was revived in 1840, as a society or company for civilising Africa through a union of agriculture, commerce, and civilisation, carried on by a multitude of missionary labourers on the plans of the Moravian Brethren. It was at the instigation of this society that the Niger Expedition, consisting of three steam-vessels, was sent out by government in 1841. Sickness visited the expedition shortly after its entrance into the Niger, and arrested its progress, so that Egga, about 340 miles from the sea, was the furthest point reached. The project was a complete failure, whether from mismanagement or from insuperable obstacles of climate, it might be difficult to decide.

AFRICA'NUS, LEO. [See Leo Africanus.]

AFRICA'NUS, SEXTUS JULIUS, a Christian writer of the third century, is considered by some authors to have been a native of Africa, and was, according to Cave, bishop of Emmaus, A.D. 232. Clavier, in the *Biographie Universelle*, makes him the descendant of an African family, and born in Palestine. Between the years 218 and 222, A. D., Africanus was employed in an embassy to the Emperor Heliogabalus for the restoration of Emmaus, which city, in consequence of his entreaties, was rebuilt under the name of Nicopolis. He attended the lectures of the bishop Heraclius at Alexandria, some time before the year 231.

Eusebius ascribes to Africanus a work which contains, under the title *Kesti*, a collection of passages from various authors, chiefly on physical, mathematical, and other topics which belong to domestic economy, medicine, botany, mineralogy, and the military sciences. Fragments of this work are printed among the *Mathematici Veteres*, Paris, 1693, folio, and reprinted in the 7th volume of the works of Meursius, Florence, 1746, but it is not quite certain whether this work contains the real *Kesti* of Africanus. It has been translated by Guischardt, in his *Mémoires Militaires des Grecs et des Romains*, 1758, in 4to. There exists, also, a translation by Africanus of the book of Abdias of Babylon, under the title *Historia Certaminis Apostolici*, 1566, 8vo.

The word Kestos signifies in the Greek language a girdle of various colours. Probably the title Kesti alludes to the different hues of an embroidered girdle, or to the magical power of the girdle of Venus. The *Kesti* teach, among other things, how to grow fruit in the shape of animals, or of the human countenance, and how to produce pomegranates without kernels, and figs of various colours, &c.

Valesius, Scaliger, and others, considered the contents of the Kesti to be unworthy of the Christian chronologer, Africanus, and attribute them to a pagan philosopher called Sextus; and Jerome omits the *Kesti* in his list of the works of Africanus. But Eusebius, *Hist. Eccl.* vi. 31. ed. Vales. p. 295, Suidas, Vossius, Wetstein, and others, ascribe the *Kesti* to Africanus. Compare Hamberger's *Zuverlaessige Nachrichten*, tom. ii. p. 525.

Africanus wrote a chronological work in five sections under the title of *Pentabiblos*, containing, as some learned men think, an abridgment and a continuation of Manetho's work. The *Pentabiblos* contained a sort of universal history, composed to prove the antiquity of true religion and the novelty of paganism. Fragments of this chronology are extant in the works of Eusebius, Syncellus, Malala, Theophanes, Cedrenus, and in the *Chronicon Paschale*. The *Pentabiblos* commences with the Creation, 5499 B.C. and closes with 221 A.D. The chronology of Africanus places the birth of Christ three years before the commencement of our æra. But under the reign of Diocletian, ten years were taken from the number which had elapsed, and thus the computation of the churches of Alexandria and Antioch were reconciled. [See Æra.]

According to Fabricius, *Bibl. Gr. ed. nova*, viii. p. 9, there exists at Paris a MS. containing an abstract of the *Pentabiblos*. Scaliger has borrowed, in his edition of *Eusebius*, the chronology of Africanus extant in *Geo. Syncelli, Chronographia ab Adamo ad Dioclesianum, à Jac. Goar, Gr. et Lat.* Paris, 1652, fol.

Africanus wrote a learned letter to Origen, in which he disputes the authenticity of the apocryphal history of Susannah. This letter has been printed at Basle, in Greek and Latin, 1674, 4to.

A great part of another letter of Africanus to Aristides, reconciling the disagreement between the genealogies of Christ in Matthew and Luke, is extant in Eusebius's *Ecclesiastical History*. In order to reconcile the difference between the genealogies, he has recourse to the law of adoption among the Jews, by which brothers were obliged to marry the wives of their brothers who died without children.

The fact of a man so learned and intelligent as the chronologer Africanus being a Christian, refutes the error of those who think that all Christians in the first centuries of our æra were illiterate. The criticisms of Africanus upon the apocryphal books seem to attest that he did not receive the canonical writings of the New Testament without previous examination; and from his manner of reconciling the different genealogies of Christ, it appears certain that he recognised the authenticity of the Gospels in which they occur.

AFTER-MATH is the grass which grows after the hay has been made; it is also called latter-math, rowen, or rowett, and when left long on the ground it is called *fogg* in some places. Where the land is rich and hay valuable, the aftermath is often mown and made into hay. This hay is inferior in value and nourishment to the first crop, which contains the flower-stalks of the grass. It is not good for horses, especially those which are driven fast and work hard; it is thought injurious to their wind. Cows and sheep are fond of it, and with them it is not liable to the same objection. Whether it be more profitable to cut a second crop of hay, or to feed off the aftermath, must depend on circumstances and situations. Unless the meadows can be irrigated, or well manured, taking off two crops of hay in one year exhausts them, and is apt to produce moss, which the tread of sheep and cattle prevents.

There is a practice with some farmers to leave the aftermath on the ground from hay-making time to the next spring; this is then called *fogg;* and the young grass, springing up through the old, makes it palatable to young cattle. Arthur Young mentions this practice with some commendation, as a resource in spring; but it does not accord with a well-regulated system of husbandry, in which all food should, if possible, be given in its most perfect state. The fogg, half rotten by a wet winter, cannot be wholesome food; besides, slugs and various insects breed in it. The aftermath should be fed off clean before winter. A good farmer should have hay, straw, and roots sufficient for his stock. Swedish turnips, mangel wurzel, carrots, &c., can be stored in winter and strewed upon the pastures in spring, by which the stock will be better fed, and the land improved.

AGA, the name of a dignity, and also an epithet of respect, among the Turks. It signifies literally a great man, a lord, or a commander. Some etymologists assert, that the original meaning of the word is a baton, taken as the ensign of command. In Turkey, the Aga of the janissaries, while that corps subsisted, was their commanding officer or colonel, whose place was one of high authority and dignity in the state. There is also the spahilar-aga, that is, the colonel of the spahis, or cavalry. Aga is likewise the common epithet of civility used in addressing or speaking of the eunuchs employed in the seraglio; and their chief is distinguished by the title of Capi Aga. The Capi Aga, or Capi Agassi, as he is often called, is one of the principal officers of the court of Constantinople.

AGAME'MNON, King of Mycenæ, and commander-in-chief of the Grecian army at the siege of Troy. According to the fabulous genealogies of the poets, he was fourth in descent from Jupiter, and grandson to Pelops, who came from Asia into Greece, and laid the foundation of a new dynasty of princes, which soon supplanted the older race of the Danai. Pelops acquired the kingdom of Pisa by marriage. Atreus, son of Pelops, being banished from his father's house for having slain his brother Chrysippus, fled to Mycenæ, where his sister's son, Eurystheus, grandson o Perseus, then reigned. He ingratiated himself so much with the people, that he was chosen king on the death o Eurystheus, and left the sceptre to his eldest son, (or, som have said, grandson,) Agamemnon. The dominion of My cenæ comprehended the northern part of Argolis, Corinth and Sicyon, with the territories annexed to them, an

Ægiaios, afterwards called Achaia; thus including the whole northern coast of Peloponnesus. Menelaus, second son of Atreus, obtained the kingdom of Lacedæmon by marriage with Helena, daughter of Tyndareus and Leda. The southern and larger portion of Argolis, though governed by a monarch of its own, was probably dependent to a great degree on its more powerful neighbour of Mycenæ. It does not appear who inherited the kingdom of Pisa after Pelops: none of the four chiefs who led the Eleians to Troy were of his family, so that the degree of influence which the Pelopid princes possessed over Elis can hardly be ascertained. A large portion of Messenia, according to Strabo, was occupied by colonists who followed Pelops from Asia. Thus, in at least four, probably in five, of the six principal divisions of Peloponnesus, (Arcadia being the one excepted,) the house of Atreus had a direct family interest and influence. The exact nature of the influence is not easily defined: but the best authorities concur in bearing testimony to its existence. Homer mentions the sceptre of Agamemnon as the emblem of authority 'over all Argos (Peloponnesus) and many islands:' and Thucydides expresses his belief that the above-named monarch 'assembled the Grecian forces, not so much through favour, as fear.'

In the earliest and most credible authors, Homer and Hesiod, we find no trace of the long train of horrors which laid waste the house of Pelops, according to later writers, and especially the tragedians. At present we shall confine ourselves to relating what bears some mark of historical truth. The history of Agamemnon, before the Trojan war, is comprised in two sentences: he was the son of Atreus, whence he and his brother were called Atridæ, according to the Grecian custom of giving to the son a *patronymic* name, or a name formed according to certain rules from the *name of the father*; and he married Clytemnestra, sister of Helen. The Trojan war arose out of the abduction of Helen by Paris, otherwise called Alexander, son of Priam, King of Troy. It is commonly said, that a number of the princes of Greece having been drawn together as suitors by the extraordinary beauty of Helen, Tyndareus exacted an oath from them, that on whomsoever the choice should fall, if the maid should be carried off, all the rest should unite to recover her: and that in virtue of this oath, the confederate princes assembled under the command of Agamemnon. In reference to this story, Thucydides has expressed his belief, 'that Agamemnon got together that fleet, not so much for that he had with him the suitors of Helena, bound thereto by oath to Tyndareus, as for this, that he exceeded the rest in power.' In continuation, the historian lays great stress upon his naval power, as evinced by his being, in Homer's words, 'king of many islands,' and by his lending sixty ships to the Arcadians, besides conducting a hundred filled with his own followers, a larger number than was led by any other chief.

The assembled fleet was detained at Aulis by contrary winds. The seer Calchas, being consulted how the anger of the gods might be averted, and the delay obviated, declared that Iphigenia, daughter of Agamemnon, who had incurred the displeasure of Diana by killing her favourite stag, must be sacrificed to the goddess. The natural reluctance of the father was overcome by importunity and ambition; and the intended victim was summoned to Aulis, under pretence of betrothing her to Achilles. At the point of death she was miraculously saved by Diana, whose priestess she afterwards became among a savage people of Asia, called the Tauri. This story is related neither by Homer nor Hesiod: it rests, however, on the early authority of Pindar, Pyth. ii., and Æschylus; and is pregnant with too important consequences to be omitted, since the alienation of Clytemnestra from her husband is said by those authors to have originated in her horror of this unnatural action. The siege of Troy was protracted for ten years. The most memorable event of it is the quarrel between Agamemnon and Achilles, the subject of the Iliad; in which the former placed himself very completely in the wrong. Homer represents him as brave, and expert in arms, insomuch that when a Grecian warrior was selected by lot who should contend with Hector in single combat, it was the general prayer that the lot might fall on Ajax, Diomedes, or Agamemnon. Still it is as the commander, rather than as the soldier, that he is presented to our notice, and usually with some reference to his wealth and power: 'king of men' is the distinguishing epithet constantly added to his name, as 'swift footed' is to the name of Achilles. Hesiod also (Fragm. 48) says that the Olympian god has given strength to the descendants of Æacus, wealth to those of Atreus. Returning from Troy he was treacherously murdered by his wife; who, during his absence, had formed an adulterous attachment to Ægisthus, son of his uncle Thyestes. This catastrophe is the subject of the Agamemnon of Æschylus, one of the most sublime compositions in the range of the Grecian drama. Orestes, son of Agamemnon, then a child, was saved by the care of his tutor, and timely flight. After passing seven years in exile, he returned in secret, avenged his father's death by the slaughter of his mother and of Ægisthus, and recovered his paternal kingdom, which he ruled with honour.

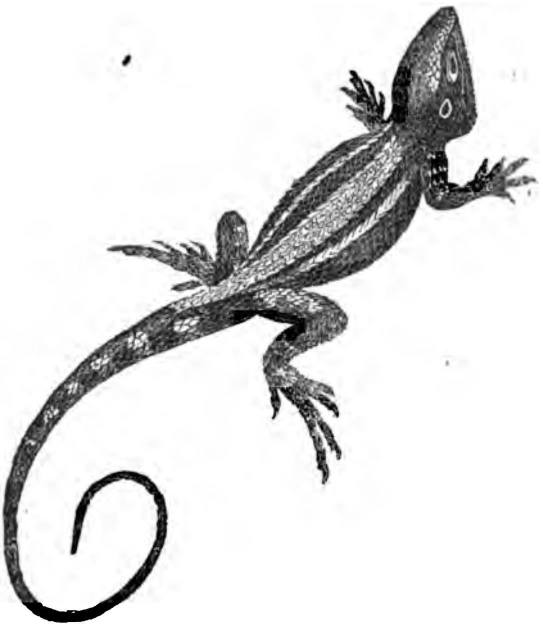
These legends of the house of Agamemnon formed a favourite subject with the Greek tragedians. Three of the seven remaining plays of Æschylus are founded on it, the *Agamemnon*, the *Chophorëi*, which has for its subject the revenge of Orestes, and the *Eumenides*, which relates the remorse and madness of Orestes, and his trial and acquittal before the Athenian court of Areiopagus. The Electra of Sophocles has the same subject as the Chophorëi. Euripides has two tragedies on the story of Iphigenia; and one called the Electra, which has the same subject as the Chophorëi and Electra of Sophocles, but is much inferior to both of them. The Orestes of the same author relates the history of Orestes subsequent to the death of Clytemnestra.

A'GAMA, in zoology, a genus of reptiles belonging to the order of saurians, and family iguanians, as established by Baron Cuvier in the *Règne Animal*. The division to which this genus appertains is one of the four natural orders into which M. Brogniart distributed the whole class of reptiles or amphibia of Linnæus, and in which he has been followed by the most judicious subsequent zoologists. The earlier division by which Linnæus proposed to arrange the amphibia in two orders, reptiles and serpents, or those with and those without feet, though plausible in appearance, and, to a certain extent, readily applicable to practical purposes, is, in reality, but little conformable to the physical nature and zoological conformation of these animals; because its principles do not comprehend all the characters which direct and influence their habits and economy. M. Brogniart, in joining to the Linnæan principle of division taken from the organs of locomotion, the additional consideration of the comparative quantities of respiration in this class, has laid the foundation of a distribution more agreeable to the system of nature, and, as far as it goes, perhaps, more satisfactory, than the primary divisions in any other class of animals. The four orders thus established by M. Brogniart, and now generally admitted by naturalists, are, 1st. the *Chelonians*, (or tortoises and turtles,) which have two auricles in the heart, four legs, and the body defended by two large plates or bucklers, the upper formed by the union and dilatation of the ribs, and the lower by the sternum: 2d. the *Saurians*, (or lizards,) with two auricles in the heart, four, or, in a few instances only, two legs, and bodies covered with scales: 3d. the *Ophidians*, (or serpents,) with two auricles in the heart, no feet, and bodies generally covered with scales: and 4th. the *Batrachians*, (or frogs, toads, salamanders, &c.,) which have only one auricle in the heart, four, or rarely two legs, and naked bodies; and which, moreover, like the insect tribes, are subject to a metamorphosis, passing, with age, from the state of a fish which respires through gills, to that of a quadruped breathing air by means of lungs. The example of this last order presented by the tadpole or young frog, and of the transformation which it undergoes upon assuming its perfect reptile form, are familiar to every one.

Having given this general preliminary view of the principles of classification established in this class of animals, in order that the reader may be enabled to comprehend the precise import of the terms which we are obliged to employ, it is only necessary to observe farther, that Baron Cuvier has subdivided the order, saurians, into six natural families, distinguished from one another by peculiar and influential characters. Of these the iguanians are the third in order; they differ from the other families chiefly in the nature of the tongue, which is thick, fleshy, and attached to the underjaw; consequently, without the power of being protruded, as in the generality of reptiles. The tongues of the crocodiles and alligators, indeed, are of the same form; but from these destructive reptiles the iguanians are zoologically distinguished by their long flexible toes not united by membranes, and generally by their diminutive size, round tails, and small imbricated scales. M. Cuvier again subdivides the family iguanians into two smaller sections, or sub-families; the iguanians, properly so called, which, besides the ordinary series of maxillary or jaw-teeth, have likewise two small additional rows on the posterior margin of the palate; and the agamians, which want these additional or palatic teeth. To the latter sub-family, of which, indeed, it is the type, belongs the genus agama, the subject of the present article, and of which we proceed to describe the characters, and a few of the principal species.

In the form of their heads and teeth the agamas resemble the common lizards, but differ in the imbricated scales which cover their tails. These animals have the body thick and shorter in proportion than the generality of the saurian family; the skin is lax and capable of being distended or puffed out with air at the will of the reptile: the whole body, as well as the head, neck, and feet, is covered with minute rhomboidal or hexagonal scales, often prolonged in the form of little spines, and bristling when the body is inflated with air. The head is short, broad, and flat, particularly towards the occiput; the neck also is short, and the tail seldom longer than the body. These proportions give the agamas much of the hideous and disagreeable appearance of toads, and, indeed, Seba and other older authors occasionally confounded them with these reptiles. In many parts of South America they are called chameleons, from their power of dilating the skin with air, and thus, to a certain extent, imitating these animals in the various hues which they are capable of assuming. In other respects the various species of agamas differ so considerably from one another, as to have induced Baron Cuvier to arrange them in separate subgenera, distinguished by the form of their scales and the presence or absence of pores in the thighs. Spix, and some other writers, are inclined to regard these distinctions as real generic characters, but they are obviously of too little importance, and exercise an influence too confined over the habits and economy of the animals, to warrant us in adopting the ideas of these zoologists. We shall therefore follow the more judicious sentiments of M. Cuvier, in regarding these subdivisions as of no intrinsic value in themselves, but merely useful, as a practical means of distinguishing the species. It will be sufficient at present to indicate these different subgenera, and to refer to the works of the above-mentioned naturalists for a more particular account of their several and respective characters. Generally speaking, the agamas have no thigh pores; some, however, are provided, as is the case with many other saurian reptiles, with a row of these pores along the inner surface of each thigh; some species have the toes so short and rigid as to compel them to live entirely on the surface of the earth, where they reside among rocks and heaps of stones, and conceal themselves in the crevices; others again, which have long and flexible toes, ascend trees with great facility, and sport among their branches with the utmost security. All are of a diminutive size, and, like most other reptiles, feed upon insects and other small animals: one or two species, nevertheless, are reported to be herbivorous. Their geographical distribution is very extensive, and embraces all the hot and temperate parts of the known world: Asia, Africa, Australia, and South America have each their appropriate species, which often differ from one another so slightly, that much confusion still prevails among their characters and synonyma. The most remarkable species are, of those without pores on the interior face of the thighs,—

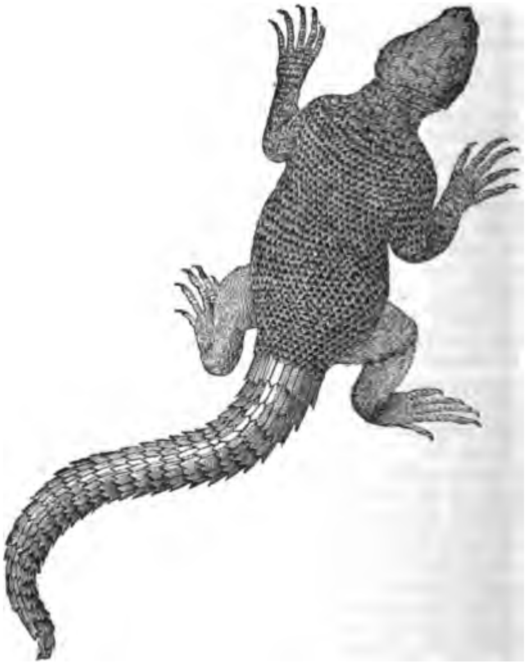
The muricated agama (*Ag. Muricata, Cuv.*), first described by the celebrated John Hunter in the zoological part of White's *Voyage to New South Wales.* It is one of the most common lizards of that colony; measures upwards of a foot in length, comprehending the tail, which is twice as long as the body, and, from the great length and perfect division of its toes, readily ascends trees, and lives entirely in the woods, where it hunts about for insects and caterpillars. Its general colour is a brownish grey, marked with dusky bars, which run in a longitudinal direction on the body, but transversely on the legs and tail. The scales which cover the upper and outer parts of the trunk and extremities are rhomboidal, and carinated, or elevated into sharp-pointed ridges, forming parallel lines or rows of spines upon the back and sides, from the shoulders to the very point of the tail. The head is covered with similar scales, all directed backwards and prolonged upon the occiput into a crest of weak spines. The toes of all the feet are well separated, and furnished underneath with small pointed scales; the two middle toes of the hind feet are nearly twice the length of the others.



[Agama muricata.]

The Agama Barbata of Cuvier is another species from the same locality. It is rather larger than the muricated agama, but preserves the same relative dimensions, and lives in the forests in the same manner. A range of large spinous scales passes in transverse bands over its back and tail, and the throat is covered with long-pointed scales, forming a sort of beard, though neither so strong nor so conspicuous as in the guanas. Similar scales cover the sides and form two oblique crests behind the ears; the belly is spotted with yellow, and the throat is capable of being distended at the will of the animal. This species is likewise figured and described in White's *Voyage*, p. 255, but was considered by Mr. Hunter as a mere variety of the former.

Other species of this division, having pores on the inner surface of the thighs, are the *Leiolepis* (A. Guttata) of M. Cuvier, of Cochin China, with white rays and spots on a bright blue ground; the *Tropidolepis* (A. Undulata), of a uniform dark blue colour with a white cross on the throat, and which, as well as the kindred species, *A. Nigri-Collaris* and *A. Cyclurus*, described by Spix, inhabits various parts of



[Agama aculeata.]

South America; the *Brachylophes* (A. Vittata), which seems to form the connecting link between this genus and the guanas, from which latter it is distinguished only by the absence of teeth in the palate; it is found in India, and has light blue bands upon a dark blue ground: and, lastly, the *Physignathes* (A. Cocincinus), from the Malayan peninsula, remarkable for its large size, uniform blue colour, but more particularly from being one of the very few species of saurian reptiles which feed upon vegetable substances; Baron Cuvier assures us that it lives entirely upon fruits and nuts. Of the agamas without pores in the thighs, the principal species are, the *Spinous Agama* (A. Aculeata) of a yellowish grey colour with numerous transverse brown bands. All the upper parts of the body are covered with elevated scales, forming small pointed pyramids of four sides; the body is short and thick, the tail likewise short, the head broad and flat, and the belly protuberant. Excepting in the length of the tail and the body being covered with scales, the whole animal has much of the form and appearance of a frog or toad: it is found at the Cape of Good Hope, and is of larger size than the generality of the other species.

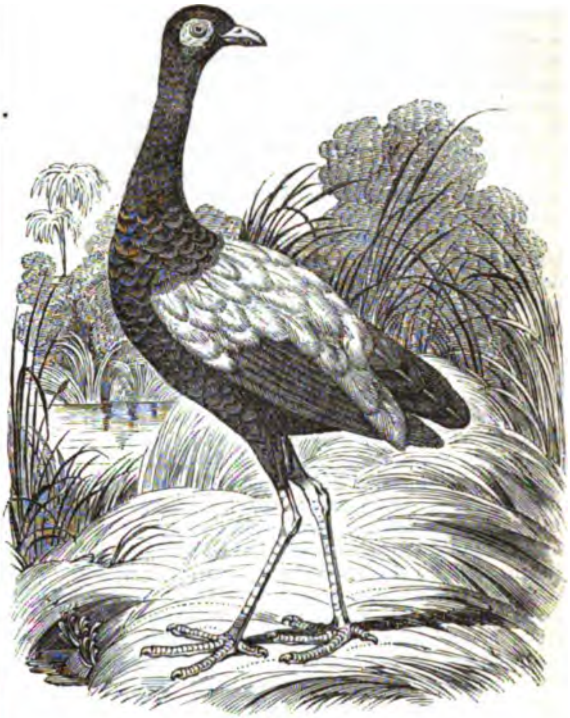
The *Tapayaxin* (A. Orbicularis), of Mexico, is very similar to the species last described in its form and proportions, but is still shorter and thicker. The extraordinary figure of this reptile, approaching almost to the form of a perfect sphere, its broad flat head, its skin covered with small tubercles or warts interspersed among the scales, and the faculty which it possesses of distending its body with air, and to a certain degree assuming different shades of colour, have caused it to be sometimes compared to a toad, and sometimes to a chameleon; but the truth is, that it has no actual relation or affinity to either of these animals, but is indebted solely to its naturally disgusting aspect, for the calumnies which the early Spanish writers have heaped upon it. The scales of this species are small, pointed and rough on the upper parts, smooth and flat beneath; on various parts of the back they are elevated into insulated spines, ranged in six or eight longitudinal rows, but without much regularity: the ground colour is dark grey above, with irregular brown blotches, and beneath yellowish red, speckled with small black spots. The legs are short and thick and the toes of equal length, both before and behind. The tapayaxin inhabits the mountainous and rocky parts of South America, from the Isthmus of Darien to Patagonia; according to Ray, it is capable of domestication, and even recognises and shows a kind of attachment to those who feed it.

Other subgenera and species belonging to this division of the agamas are *Trapelus* (A. Ægypticus), remarkable for its change of colour, even more sudden than that of the true chameleon; the *A. Calotes*, of a bright blue colour with transverse white marks on the sides, from the Mollucca Islands; the *Lophyres* (A. Gigantea, Kuhl), with a crest of long elevated spines on the neck; and the *Lyriocephalus* (A. Scutata), which has a similar elevated crest along the back, and the tail keel-shaped. This latter species, in many respects a most singular reptile, inhabits Bengal, and lives upon fruits.

In the short account which we have here given of this extensive genus, we have confined our remarks principally to the general characters and most remarkable habits of these animals, as far as the latter have been observed; but it is to be regretted that we possess fewer authentic observations upon the manners and economy of reptiles, than of almost any other class of animals. Of the many thousand different species of reptiles enumerated in the most complete catalogues of zoologists, it may be safely affirmed, that we do not know the habits of as many dozens; yet this defect of information is to be attributed only to the inattention or ignorance of travellers, for these animals afford at least the same facilities for observation and experiment as mammals and birds, and much greater than fishes or insects. For ample details concerning the specific differences of the agamas, we refer the reader to the works of Cuvier, Dandin and Merrem.

A'GAMÆ, in botany, is a name given by some authors to the large division of the vegetable kingdom, called Flowerless, and may be considered equivalent to the older term, Cryptogamic plants. The word, which means sexless, has been proposed upon the hypothesis that the whole of the flowerless class is absolutely destitute of stamens and pistilla. Although few persons can now be found who entertain any doubts as to such a fact, yet the invention of a new term in consequence, has been generally considered superfluous. It may be perfectly true, that ferns, and mosses, and lichens, and confervæ, and fungi, are wholly destitute of sexual organs, and yet the term agamæ may be unnecessary: for this reason it is seldom employed.

A'GAMI (*Trophia crepitans*, Latham), an interesting bird, sometimes also termed the gold-breasted trumpeter, classed by Pallas among cranes, by Brisson among pheasants, and making the first genus in Temminck's *Alectorides*. It is the size of a pheasant or large fowl, being twenty-two inches in length, but appears larger from having a long neck, and from standing high on its legs. It bears some slight resemblance to the pheasant in the glossy iridescent green on the breast, and in a space round the eyes naked of feathers; but has a very short tail, consisting of twelve black feathers, over which the long, loose, silky scapulary rump plumes hang droopingly. Its long greenish legs assimilate it to wading birds (*Grallatores*), but it is said not to have the habits of these, never visiting fens and the margins of water, and living wholly in upland forests and arid mountains. It inhabits the forests of tropical America, and never visits the cleared grounds or the settlements. According to M. Monoucour, it is very gregarious, being found in numerous flocks, which walk and run, but rarely fly, and, when they do, seldom rise more than a few feet above the surface of the ground. Even when pursued they trust most to their speed in running.



Agami.

Several naturalists have given accounts of the Agami in a domestic state. Its docility and attachment to man are remarkable. 'The Agami,' says Monoucour, 'is not only tamed easily, but becomes attached to its benefactor with all the fondness and fidelity of the dog; and of this disposition it shows the most unequivocal proofs. When bred up in the house, it loads its master with caresses, and follows his motions; and if it conceives a dislike to persons on account of their forbidding figure, their offensive smell, or of injuries received, it will pursue them sometimes to a considerable distance, biting their legs, and testifying every mark of displeasure. It obeys the voice of its master, and even answers to the call of all those to whom it bears no grudge. It is fond of caresses, and offers its head and neck to be stroked; and, if once accustomed to these familiarities, it becomes troublesome, and will not be satisfied without continual fondling. It makes its appearance as often as its master sits down to table, and begins with driving out the dogs and cats, and taking possession of the room; for it is so obstinate and bold, that it never yields, and often, after a tough battle, can put a middle-sized dog to flight. It avoids the bites of its antagonist, by rising in the air, and retaliates with violent blows with its bill and nails, aimed chiefly at the eyes; and after it gains the superiority, it pursues the victory with the utmost rancour, and, if not parted, will destroy the fugitive. By its intercourse with man, its instinct became moulded like that of the dog; and we are assured that it can be trained to tend a flock of sheep. It even shows a degree of jealousy of its rivals; for, when at table, it bites fiercely the naked legs of the negroes, and other domestics, who come near its master.'

The peculiar noise which these birds make, without opening the bill, is one of their most remarkable characteristics. This noise is no doubt produced by a peculiar conformation of the organ of sound. According to Pallas, the *larynx*, which is on the outside of the breast, is about as thick as a swan's quill and almost bony, becomes much more slender, loose, and cartilaginous when it enters within the breast, where two semicylindrical canals of a membranous texture, and capable of being extended, proceed from it. The air-bag on the right side descends to the pelvis, and within the breast it is divided into three or four cells by transverse membranes. The air-bag on the left side is narrower. Vosmaër tells us that the sound is sometimes preceded by a wild cry, interrupted by a call somewhat like 'scherck, scherck,' and then follows the characteristic noise somewhat resembling the cooing of pigeons. It utters, in this way, five, six, or seven times, with precipitation, a hollow noise nearly resembling the syllables 'too, too, too, too, too, too,' resting upon the last a very long time, and sinking the sound gradually till it terminates. During this, the breast is seen to heave, as in birds, while singing, though the bill remains shut. It is, no doubt, produced by the air pressed up from the lower air-bags on the right and left above described, which meeting with the transverse membranes in its passage, causes them to vibrate and sound, and this is communicated to the surrounding muscles, and by these to the external air; so that it is, in fact, a sort of ventriloquism, and requires not the bill to be opened in order to be heard.

The Agami, like the rest of the alectorides, builds no nest, but scratches a shallow place at the root of a tree where it deposits its eggs, from ten to sixteen in number, and of a light green colour. They are somewhat larger than a hen's egg, and of a rounder form. The down remains a long time on the young, and grows into long silky plumes very close, like fur, and it is not till they are one-fourth the size of the adult birds, that the true feathers appear.

Dr. Latham tell us, that 'one of these Agamis, a young bird, found its way into a farm-yard in Surrey, and associated with the poultry. It was perfectly tame, and, on one occasion, accompanied the hounds for three miles, and kept up with them. It was last in the possession of Lord Stanley, but died on its way into Lancashire.'

A'GAPÆ, the plural of the Greek αγαπη, (*agape*,) which signifies love, or charity. In the history of the Christian church, the agapæ were those meetings of the early believers, where they sat and ate, at a common table, of food which had been provided by the voluntary contributions of the members of the society, the entertainment being concluded with the holy kiss. These meetings, which were usually held in the same house or apartment in which they assembled for divine worship, are at least mentioned once in the *New Testament*, namely, in the 12th verse of the epistle of Jude, where it is said of certain unworthy brethren, 'these are spots in your feasts of charity:' the Greek word here is *agape*. It is probable also that St. Paul alludes to the same thing in 1 *Cor.* xi. 20, where his language would seem to imply that the agapæ had been originally instituted chiefly for the purpose of celebrating the sacrament of the Lord's Supper. But whether they arose in this way, or from those feelings of brotherhood and that charity towards their poorer brethren which were so strongly inculcated upon the first followers of Christianity, both by the religion they professed and the circumstances amidst which they were placed, it is certain that even in the days of the apostles these meetings had been occasionally perverted from the purpose of their institution. St. Paul, in the passage to which we have just referred, charges the Corinthians that, when they came together into one place, 'in eating every one taketh before other his own supper; and one is hungry and another is drunken.' And he continues, 'What? have ye not houses to eat and to drink in?' concluding, after an explanation of the solemn and spiritual manner in which the holy supper ought to be partaken of, with the general direction, 'Wherefore, my brethren, when ye come together to eat, tarry one for another. And if any man hunger, let him eat at home.' These love-feasts also gave great occasion of scandal to the enemies of the faith. The reader may find an account of the accusations of which they were made the groundwork by some of the pagan writers in the sixteenth chapter of Gibbon's History. They seem, however, to have continued to be generally celebrated for several centuries. Ecclesiastical writers mention three kinds of them,—first, those which took place at marriages, called the nuptial or connubial agapæ, to which the bishop or pastor was usually invited: second, the anniversary, or, as they were called, natal agapæ, which were held in the churches on the festivals of the martyrs: and, third, the funeral agapæ, at the interments of members of the congregation. The celebration of the love-feasts in the churches was at length expressly forbidden by the 25th canon of the council of Laodicea, in A.D. 364; although the enactment would seem for a considerable time not to have been quite effectual, since we find it repeatedly renewed by subsequent councils. Nor does the practice under improved regulations appear to have been discontinued in all circumstances by the heads of the church. In the sixth century, as we are informed by Bede, Pope Gregory, in his instructions to Austin when he sent him to Britain to convert the Saxons, advised him to allow the new converts to feast together on saints' days, and the anniversaries of the dedication of the churches, not in the churches themselves, but in sheds fashioned with green boughs close by them, to the glory, he says, of God, as they had formerly done to the honour of the devil. A great deal of ingenious speculation has been expended in the attempt to discover traces of the Christian agapæ, both among the Jews and pagans before the institution of our religion, and in the latter times of the church. But the only thing exactly corresponding to the primitive love-feast is the practice which has been introduced under the same name by certain modern sects, especially the Moravians and the Sandemanians.

AGAPHITE. [See TURQUOISE.]

AGARI'CIA, (Lamouroux.) The mushroom madrepore, a genus of coral madrepores, so called from its resemblance in form to mushrooms (*Agarici*). The animal inhabitants of agaricia are unknown, with the exception of a single species observed by M. Lesueur on the shore of St. Thomas in the Antilles. Lamarck enumarates five, and Parkinson seven species.

AGA'RICUS is the generic name by which all the species of mushrooms properly so called are collectively known. It comprehends such plants of the fungus tribe, as have a cap (or pileus) of a fleshy nature, supported upon a distinct stalk, and a number of parallel unequal vertical plates or gills arising out of the cap, and inclosing the particles by which the species are reproduced; particles which the vulgar call seeds, and the learned sporules. This genus consists, according to the latest writers, of not fewer than a thousand species, inhabiting meadows, and heaths, and rocks, and masses of decaying vegetable matter, in all Europe, and in many other parts of the temperate regions of the earth. Among them, a large proportion are poisonous, a few are wholesome, but by far the greater are altogether unknown in regard to their action upon the human constitution. The species are often extremely similar; there is no means of distinguishing botanically the tribes that are poisonous from such as are wholesome, but in every case practice is requisite to determine that point independently of general structure. It is for this reason that the use of wild mushrooms is so dangerous, and that a French botanist, of no little celebrity, would never suffer any to be brought to his table that had not been raised by art in a garden. Indeed there is this most remarkable fact connected with their qualities; a fact which seems to show that their properties depend upon climate and situation, and accidental circumstances, rather than upon any specific peculiarities; those kinds which are wholesome in one country are not so in another; thus, in Great Britain, the common mushroom (*Agaricus campestris, fig.* 1.), the fairy ring agaric (*A. pratensis, fig.* 2.), and the *A. Georgii*, are the only sorts that it is quite safe to eat; while the Fly agaric (*A. muscarius, fig.* 3.) and *A. virosus* (*fig.* 4.) are extremely poisonous. But in other countries of Europe it is different. In France, in Italy, and especially in Russia, a usual aliment is afforded by a great variety of species which, although very common in this country, it would be extremely dangerous to eat; and, on the other hand, even the dangerous A. muscarius is a species of food in Kamtschatka.

We propose to point out in this article what the distinctions are, by which it has been supposed that the eatable and poisonous species may be recognized, because the reader of such a work as this would be more likely to be misled by imperfect descriptions than benefited by speculative distinctions. We shall therefore confine ourselves to a few easy, plain, and intelligible observations, which it is to be hoped cannot possibly lead to error.

Of the thousand species thus much is certain, that all having the following characters are poisonous:—

1. Such as have a cap very thin in proportion to the gills.
2. Such as have the stalk growing from one side of the cap.
3. Those in which the gills are all of equal length.
4. Such as have a milky juice.
5. Such as deliquesce; that is, run speedily into a dark watery liquid.
6. And lastly, every one that has the collar that surrounds the stalk filamentous, or resembling a spider's web.

The following are the *eatable* kinds that can be safely employed in Great Britain:—

A. campestris, the common mushroom, (fig. 1,) the species that is so commonly raised artificially for food. This is readily known in any state by its fragrant odour, by which alone it may be always recognized, and the absence of which is extremely suspicious. When in a very young state, it resembles little snow-white balls, which are called *buttons;* afterwards it acquires a stalk, separates its cap, and becomes shortly conical, with liver-coloured gills, and a white thick fleshy cap, marked with a few particles of grey. At a more advanced age the cap is concave, the colour grey, and the gills black; in this state it is called a *flap*. For the method of cultivating it, and for its physiological characters, see MUSHROOM.

A. Georgii is like the latter, but its gills are always very pale, and its flavour inferior. It is said occasionally to weigh as much as fourteen pounds.

A. pratensis, or *oreades*, the fairy-ring mushroom, is so well known by its popular designation as to require no description. Well may it have gained that name; for, in former times, there would, doubtless, be great difficulty in imagining how such productions could spring up in a few hours in the regular rings they appear in, without the aid of some supernatural agency. The use to which this species is usually applied is that of being powdered and mixed with rich sauces, after having been previously strung upon a line, and dried in the shade.

[Eatable Agarici.]

[Poisonous Agarici.]

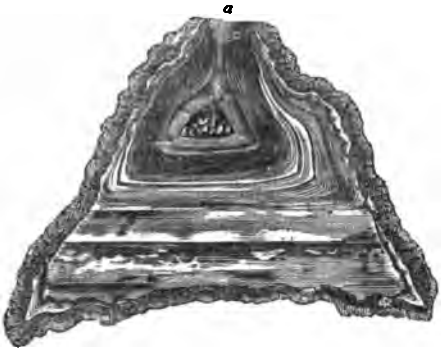
There are many other harmless species, but for further details we must refer to Dr. Greville's Memoir 'On the Esculent Fungi of Great Britain' (*Trans. Wern. Soc.*, vol. iv.), and also to a work by Dr. Badham, bearing a similar title, and more recently published; at the same time we would suggest attention to the following case:—

A lieutenant in the French army ate some mushrooms supposed to be of a wholesome kind, at ten in the morning. At seven in the evening he was attacked with severe colic; at ten his wife began to experience the same sensations, attended with nausea. In the course of the night they were both attacked with violent vomiting and purging, accompanied by intense thirst. This was succeeded by severe cramps, and the pulse became hard, weak, rapid, and irregular. At ten the next morning the husband died, and the wife at six in the evening. But the person from whom the agarics had been procured, as well as all his family, had eaten abundantly of them without inconvenience. Upon a careful inquiry, it appeared that the latter had well salted, then boiled for some time, and afterwards pressed the agarics before eating them,—precautions which the unfortunate lieutenant had neglected.

AGA'SIAS, a Greek sculptor of Ephesus, whose age is not accurately known. The statue now at Rome called the Borghese Fighter, which is a fine specimen of skill in representing a figure in action, and also shows a careful study of external anatomy, is the work of this Agasias. On the support behind the figure is the following inscription in Greek.—*Agasias the son of Dositheus of Ephesus made it.*

A'GATE, an ornamental stone used in jewellery, and for some purposes in the arts: it is sometimes called Scotch pebble. The name is derived from the Greek ἀχάτης (achates), a stone described by Theophrastus, and which, he says, came from the river Achates, in Sicily; now the Drillo, in the Val di Noto. It is one of the numerous modifications of form under which silica presents itself, almost in a state of purity, constituting in the agate 98 per cent. of the mineral. The siliceous particles are not so arranged as to produce the transparency of rock crystal, but a translucent, sometimes almost opaque substance, with a resinous or waxy fracture; and a variety of shades of colour are produced by a minute quantity of iron. The same stone sometimes contains parts of different degrees of translucency, and of various shades of colour; and the endless combinations of these produce the beautiful and singular internal forms, for which, together with the high polish they are capable of receiving, agates are prized as ornamental stones. Although occasionally found in other rocks, they are most usually met with in that variety of the trap rocks called Amygdaloid or Mandelstein, forming detached rounded nodules, not cemented to the base or mass of the rock, but easily separable from it, and having generally a thin layer of green earth interposed, and a rough irregular exterior, as if moulded on the asperities of the sides of a pre-existing cavity. The siliceous particles have often, but far from constantly, arranged themselves in thin layers parallel to the external surface of the nodule; sometimes the nodule is not solid, but a hollow space is left in it, studded with crystals of quartz; and not unfrequently crystals of carbonate of lime and other minerals, totally distinct in composition from that of the agate, are superimposed on those quartz crystals.

The theory of the formation of agates is a problem of great difficulty, and we must be much further advanced than we are, in our knowledge of the chemical processes of nature in the mineral kingdom, before we can expect to throw any light on this very obscure subject. The great supply of agates is from a class of rocks to which all geologists now assign an igneous origin, analogous to that of lava in existing volcanos. The theory divides itself into two parts: first, the formation of the cavities in which the agates are found; and, secondly, the filling of these cavities. With regard to the first, we have many analogies from modern lavas, and from processes of art, to guide us to a pretty satisfactory conclusion. Gases are evolved in great quantities by volcanos, and if produced at the same instant with a flow of lava, they would rise in bubbles in the melted mass; but in proportion as that became more viscid they would rise with greater difficulty to the surface, and when it consolidated would form cavities, the shape of which would be determined by the nature of the pressure of the surrounding viscid lava. To account for the filling up of the cavities three theories have been proposed: one supposes the siliceous matter to have been introduced in aqueous solution from without, and to have been gradually deposited in the cavities; another, that, in obedience to some peculiar laws of attraction, it has separated from the rest of the rock, and insinuated itself into the hollows left by the gases; and a third, that these hollows were filled by the sublimation of the silica and other materials from the rest of the mass by the action of heat. Each hypothesis is supported by particular cases, which it satisfactorily explains, but there are probably as many against as in favour of each; all of them imply conditions of chemical action different from anything of which we have had experience. We frequently find, it is true, masses of siliceous petrified wood in which hollows of the tree have been filled with agate, not to be distinguished from many nodules found in the trap rocks; and that the matter of the agate must have been introduced into the wood by aqueous infiltrations there can be no doubt: but, in this case, the whole substance of the sustaining mass, the wood, is penetrated by siliceous matter; and the difficulty of the theory of infiltration, in the case of the trap rocks, consists in the absence of any trace in the rock of the channel by which the solution of siliceous matter could have arrived at the cavity. The following section of an agate is a good example of the filling up of a cavity by infiltration, for it is evident that the siliceous matter, in whatever way it may have arrived, was introduced at the point *a*, and that there was a gradual deposition of it. Such examples would be more frequently met with, if there was anything in the external coat to tell us in what direction to slit the stone: this same specimen might have been cut in many directions without throwing any light upon its mode of formation, and the section we now see was an accidental cut in the right direction. An attentive consideration of the products of volcanos may lead to some satisfactory conclusion; for although agates have not been found in lavas, cavities in them are often partially or entirely filled with minerals distinct from any in the rest of the rock.



[Agate.]

Agates are often found as loose pebbles in the beds of rivers, or in gravel, but in those cases they have been derived from the disintegration of Amygdaloids, the base of which is very often subject to decomposition when exposed to air and moisture, and then the siliceous nodules fall out. They vary in size from that of millet seed to a foot in diameter; but one, two, and three inches in diameter are the most common.

The stones distinguished by mineralogists and lapidaries by the names of carnelian, calcedony, onyx, sardonyx, Mocha-stone, blood-stone, chrysoprase, and plasma, are so closely allied to agate, that they may be conveniently described under this head. In chemical composition they are not distinguishable, except in the case of the chrysoprase by its colouring matter.—CARNELIAN, so called because some kinds are of a flesh colour (*carnis*, Latin for flesh), is that variety of a uniform colour which is of most common occurrence: carnelians are never figured or striped. The colours are shades of red and yellow, the deep clear red being the rarest and most valuable. The great supply of carnelians is from Japan, where they exist in vast quantities, and they are also imported from Bombay, being collected in the province of Guzzerat; but the best, according to Niebuhr, come from the gulf of Cambay. Many of the antique gems are engraved in carnelian, and it is now much used for seals. —CALCEDONY, so called from having been early found at Calchedon (sometimes incorrectly written Chalcedon) in Bithynia, opposite Constantinople, is also of a uniform colour, generally of a milky white or pale yellow, like turbid jelly, often with an internal wavy structure in the form of stalactites, and very generally with a peculiar mammillary surface. It is found in great abundance in the Faroe Islands, in Iceland, in Cornwall, and many places of Great Britain, as well as other countries; sometimes in large masses, from which cups and other vessels are formed. Pliny describes it as being found in the neighbourhood of Thebes in Egypt and as brought to Rome from Carthage.—ONYX. In this agate the siliceous particles are arranged in alternating horizontal layers of opaque white and translucent blue, grey, or brown; and because these have a resemblance to the marks on the human nail, the stone was called from the Greek word for nail, ὄνυξ (*onyx*). It was known to the ancients, and was employed by them, as it is now, for those beautiful gems called cameos, the figure being cut out of the opaque white, the dark part forming the ground, or the contrary. It is most valuable when the contrast of colours is strong, and when the layer is thick enough to give a high relief to the object to be engraved. In the royal library at Paris, there is an antique cameo cut out of an onyx with four layers, representing the apotheosis of Augustus, eleven inches by nine, which is supposed to be the finest in existence. Agates with an onyx structure are not uncommon, particularly among calcedonies, but the finest are brought from India. Cameos are sold at Rome which are made from a thick shell, having different coloured layers like an onyx.—SARDONYX is a variety of onyx which is supposed by some to have received its name from having been brought from Sardes, in Lydia. By others it has been said that the name comes from Sardo, the Greek name of Sardinia, there being some reason for thinking that the Carthaginians brought the stones from that island, and exported them during their occupation of it. In this the opaque white alternates with a rich deep orange brown of considerable translucency, and as this is of rare occurrence the sardonyx is of greater value. The finest are brought from the east, and some antique gems are formed of them.—MOCHA-STONES and MOSS AGATES are semitransparent calcedony, including various ramified forms, produced by iron, manganese, bitumen, and chlorite or green earth, but sometimes also, as has been proved by Daubenton and Mac Culloch, produced by the presence of real vegetable bodies, such as confervæ and mosses. The first are found in Guzzerat, but received their name from having been brought from Mocha, in Arabia.—BLOOD-STONE is a green agate coloured by chlorite, with numerous bright red spots like drops of blood; called also heliotrope and oriental jasper.—CHRYSOPRASE (from χρυσέος, *chruseos*, beautiful—and πράσον, *prason*, a leek) is a rare apple-green calcedony, found in Silesia, which owes its colour to the presence of the metal nickel;—and PLASMA is another scarce green semitransparent calcedony, but of a dark tint, which, in the opinion of Mac Culloch, is coloured by chlorite.

The great supply of the figured agates of commerce is from Oberstein, in the old Palatinate, about thirty miles east of Treves, and forty-five miles south of Coblenz. When they were used as buttons, knife-handles, &c., the trade was more extensive than at present. They are found in many parts of Scotland, especially at the Hill of Kinnoul, near Perth, where there is an amygdaloidal trap very full of fine specimens.

AGATHA'RCHIDES, a Greek writer on geography, a native of Cnidos, in Asia Minor. He lived in the time of Ptolemy VI., called Philometor, king of Egypt, (who reigned from B.C. 181 to 145,) and wrote numerous works on geography, and among them, one on the Erythræan Sea.

This work is now only known to us by extracts from the first and fifth books preserved by the Greek patriarch Photius, and some extracts in the compiler Diodorus. The works of Agatharchides doubtless contained a great deal of useful information, as we may fairly infer from the character of the fragments which remain. He is the earliest extant writer who attributes the annual rise of the Nile to the periodical rains in the upper regions of that river: (Diodorus, i., 41.) he has left a very minute and curious account of the mode of working the gold mines which lay between the Nile and the Red Sea; and he is the first extant writer who has mentioned the giraffe or camelopard (*Camelopardalis*), a singular quadruped peculiar to the African continent.

His remarks on the mode of hunting elephants, and on the inhabitants of the Red Sea coasts, are curious, and prove him to have been an inquisitive and careful writer.

What remains of Agatharchides may be seen in Hudson's *Minor Greek Geographers*, vol. i. The description of the gold mines is also to be found in Diodorus, iii., 12.

AGATHE'MERUS, a Greek writer who lived about the middle of the third century, and wrote a short treatise on general geography. The Greeks seem to have applied themselves for many centuries from the time of Herodotus downwards to geographical inquiry, and the nation was at no period deficient in men who laboured to give precision to the science, and to arrange all the known facts in systematic treatises. What we are now labouring to do at the present day, Agathemerus attempted for his age; though his work, as we now possess it, is merely a collection of short heads, or rather a kind of syllabus for a set of lectures. There are two books extant, of which the second is so confused and contradictory, that critics are disposed to assign it to a pupil of Agathemerus. The remains of Agathemerus may be seen in the second volume of Hudson's *Minor Geographers*. His first chapter contains a very short sketch of the history of Geography up to that time, with the names of those who had rendered the most eminent services to the science. His sixth chapter treats of the spherical figure of the earth, and what is now called the doctrine of the sphere, &c.

A'GATHIS is the generic name given by botanists to the trees, known in common language by the name of dammar and kawrie pines. These plants belong to the natural order Coniferæ, from all other species of which they are known, firstly, by their broad, lance-shaped, leathery leaves, the veins in which are numerous and nearly parallel, diverging a little at the base, and converging at the apex; and, secondly, by their seeds having a wing on one side instead of proceeding from the end.

The dammar pine (*agathis loranthifolia*), or the pinus dammara of Linnæus, is a large tree found on the very summits of the mountains of Amboyna, Ternate, and in many of the Molucca Islands. When young it has something of the aspect of a young cedar, the wood of which it is said to resemble. It is occasionally cultivated in the hot-houses of curious persons; but is of little value except for its resin, which, when pure, is white, clear, and brittle as glass, but in time becomes amber coloured.

Its timber is represented to be light and of inferior quality, wholly unfit for any situation exposed to wet, but answerng tolerably well for in-door purposes.

The kawrie pine (*agathis Australis*) grows only in New Zealand, in the forests of which it attains a height of 200 feet, with a straight clean stem, which, from its lightness and toughness, has been found well calculated for the masts of ships. It is distinguished from the dammar pine by its narrower and more acute leaves, and by its more rapid mode of growth.

AGA'THOCLES, a Syracusan of low extraction, who became ruler of Syracuse, and great part of Sicily. The principal events in his life range between the years 330 and 289 B.C. He was the son of a potter, and is said to have worked at his father's trade. He was remarkable for beauty, strength, and capacity for enduring labour. In the outset of life, he belonged to a band of robbers; afterwards he served as a private soldier, and in that capacity gained the favour of a patron named Damas, who, being chosen general of Agrigentum, advanced him to the rank of chiliarch, or commander of a thousand men. On the death of Damas, who bequeathed his great wealth to his wife, Agathocles married the widow, and became one of the richest citizens of Syracuse. In this state of his fortune, he distinguished himself by his eloquence in the assembly of the people. But his conduct now was as seditious, as his former life had been profligate. Not content with wealth and popularity, he returned to his early habits, and committed continual acts of piracy against his countrymen.

The constitution of Syracuse, as established by Timoleon, was democratical: but, in the outset of Agathocles' political life, the aristocratical party, headed by Sosistratus, a personal enemy of his own, drove him into exile; and he retreated into Italy, where for some time he lived as a soldier of fortune. The restoration of democracy, and the banishment of Sosistratus and his friends, enabled him to return. The Carthaginians interfered in behalf of these new exiles; and a war ensued, in which Agathocles bore a distinguished part: but he was suspected of aiming at the tyranny, and was a second time compelled to quit Syracuse. In banishment, he collected an army which overawed both Carthage and Syracuse. After frequently defeating the troops of the former, he was recalled, under the pledge of an oath that he would attempt nothing against the democracy; and he was chosen general and protector, for the ostensible purpose of reconciling or putting down faction. Strong in the support of his own mercenary troops, united with some of the poorest and most desperate of the citizens, he proceeded to arrest and execute by military process the leaders of the aristocratical party, and gave up their adherents to the fury of his soldiery. In the massacre which took place, four thousand persons are said to have been murdered, and six thousand to have fled. The wives and children of the latter, those of them who were unable to accompany the fugitives, fell victims to the soldiery.

Agathocles now professed to have fulfilled his duty in clearing the city of the oligarchy, and declared his intention of retiring into private life: but he knew that the partners of his crimes could not maintain themselves without his countenance. At their call he consented to retain his office, on condition of holding it without a colleague (B.C. 317). He did not assume the state of a monarch, but exercised the powers of the most absolute king, with the title of *autocrator*, that is, *ruler according to his own pleasure*. He had risen as the champion of the poor; and he fulfilled his former promises by the abolition of debts and the distribution of lands. His whole career shows him to have been a bold bad man: but his government was able, and in quiet times not severe. It was not till the jealousy of the discerning rendered his situation difficult, or his unbounded ambition prompted him, that he incurred universal hatred by the renewal of sanguinary acts. He aimed at the dominion of the whole island; and succeeded in reducing all except the subjects of Carthage. But the Carthaginians made a strong effort to crush him, and they nearly succeeded. He was defeated with great slaughter (B.C. 309), his subjects nearly all revolted, and a siege being expected, he was obliged to shut himself up in Syracuse. In the following year he adopted the bold plan of carrying the war with his whole disposable force into Africa: but money was required for this purpose; and his contrivance for raising it seems borrowed from the habits of his early life. He offered to let those who feared the hardships of a siege retire from Syracuse, and he sent an armed force after them to plunder and murder those who availed themselves of the permission. By this atrocious act he at once gained supplies, and revenged himself upon his enemies.

On his first landing in Africa, the bold measure of Agathocles appeared to prosper. He burnt his ships, that his soldiers might have no opportunity of retreat, and no hope but in victory. He advanced inland, took several towns, defeated a powerful Carthaginian force sent to oppose him, and threw Carthage itself into great alarm. Meanwhile the Carthaginians prosecuted in vain the siege of Syracuse: but a new danger threatened the rule of Agathocles, from the powerful city of Agrigentum; which profited by the exhaustion both of Carthage and Syracuse to invite the Sicilians to shake off the dominion of both. Agathocles returned home in haste, and reduced some of the revolted cities. But the forces of the rest, united under the command of Deinocrates, a Syracusan, formerly general of the Greeks in the Carthaginian army, proved too strong for him. Moreover, his presence was again required in Africa, where the Carthaginians had repaired their losses, and regained their ascendancy. In this dilemma, he resorted to one of those infamous measures which disgrace his talents as a soldier and statesman. He saw the probability that the Syracusans might call in Deinocrates in his absence. A public festival took place shortly before his intended return to his African army. Being a man of popular manners, he affected to mix gaily in the mirth, and by plying the people with wine, encouraged them to open their hearts. By this insidious device, he ascertained who were his friends and who his enemies, and put to death the chief men of the latter, to the number of five hundred.

Whether in Sicily or Africa, the affairs of Agathocles never prospered in his absence. He was received on his return to the latter country by a mutiny among his troops, in consequence of his son Archagathus having been dilatory in furnishing their pay. On that occasion his popular eloquence saved him: he harangued the soldiery, saying that they must get their pay from the enemy, and that the booty, like the victory, should be in common. But the necessity of recovering the good will of his army betrayed him into imprudencies. He attacked the Carthaginians unadvisedly, and lost the battle, and a large portion of his men. He was compelled to retreat to his camp, where he saw that his rashness had set the soldiers against him, and he had reason to fear that they would renew the mutiny on account of the arrears of pay. He therefore fled in the night, accompanied by Archagathus. They were pursued, and the son was taken: the father, with better fortune, reached the ships in which he had returned from Sicily, and escaped. All his sons were murdered by the enraged soldiers, who then made terms with the Carthaginians. Agathocles avenged himself in kind on the murderers of his sons, by slaying the kindred of those who had served with him in Africa.

On his return to Sicily, he found that a large portion of the troops, and several of the cities, had gone over to Deinocrates, who himself aspired to sovereignty. He therefore made peace with the Carthaginians, and commenced a war against the exiles; whom he defeated, and treacherously slew to the number of seven thousand, after they had laid down their arms under assurance of safety. But he received Deinocrates with favour, and appointed him his general; nor did any enmity thenceforth occur between them, although both were equally ambitious and faithless. When all questions were settled between himself, the Carthaginians, and Deinocrates, Agathocles found it easy to reduce the revolted cities of Sicily. But he was not of a temper to be contented within the narrow boundaries of the island. He undertook an expedition into Italy against the Bruttii, laid the Lipari islands under contribution, and plundered their temples, but was obliged, by severe illness, to leave his main designs uncompleted. While in Italy, he made himself master of Crotona, and on the whole, with mingled prosperity and adversity, maintained the character of a mighty potentate, but a severe scourge of mankind. The final object of his ambition was to render Sicily a great naval power; and he had advanced far and successfully in the prosecution of this attempt, when he died, by one account, in consequence of a miserable and wasting illness,—by another, in consequence of poison administered by Mænon, one of his associates, in concert with his own grandson. His death took place in the year 289 B.C., at the age of seventy-two, after a reign of twenty-eight years.

AGATHODÆ'MON, of Alexandria, a map-maker, and apparently the author of the maps found in the oldest MSS. of the geography of Claudius Ptolemæus. There can be no doubt that Ptolemy's work was accompanied by maps; and indeed it is impossible that a tabular system of Geography, like his, could be without them. Maps on plates of copper are mentioned by Herodotus, who wrote above 500 years before Ptolemy. But, as we know nothing at all about the age of Agathodæmon, we cannot conclude, as some do, that he constructed Ptolemy's maps for him. It is more likely that he was a later editor or amender of them. In the Vienna and Venetian MSS., the following note in Greek is found at the end of the maps:—'According to the eight books of the geographical works of Claudius Ptolemæus, Agathodæmon of Alexandria delineated the whole earth.' It has been inferred from this that Agathodæmon was a contemporary of Ptolemy. But this does not seem to be quite conclusive. The shape which Agathodæmon gave to the different countries of the earth, maintained its ground on modern maps till the system of regular surveys became in use; and indeed till of late years, many features of our maps were only the traditional delineations of the old map-makers of Alexandria. [See Schoell, vol. ii. Heeren. *De fontibus Ptolemæi*. PTOLEMÆUS, CLAUDIUS.]

AGA'VE, in Botany, comprehends those plants which gardeners call American aloes. It consists of species producing clusters of long, stiff, fleshy leaves, collected in a circle at the top of a very short stem, and bearing flowers in a long terminal woody scape. With doryanthes and yucca it forms in the natural order Amaryllidaceæ a case of high development, both in vegetation and fructification, compared with what is more generally characteristic of that tribe. If a crinum or an amaryllis had the stem elongated into a woody trunk, instead of being contracted into a short disk, lying at the bottom of a scaly bulb, the affinity between them and agave would at once be obvious.

There are many species of this genus, one only of which requires to be mentioned.

Agave Americana, or the American aloe, is a plant which, when full grown, has a short cylindrical woody stem, which is terminated by hard, fleshy, spiny, sharp-pointed, bluish green leaves, about six feet long, and altogether resembling those of the arborescent aloes. Each of these leaves will continue to exist for many years, so that but a small number have withered away by the time the plant has acquired its full maturity. It is commonly supposed that this occurs only at the end of one hundred years; but this, like many other popular opinions, is an error; the period at which the agave arrives at maturity varying, according to circumstances, from ten to fifty, or even seventy years. In hot or otherwise favourable climates, it grows rapidly and soon arrives at the term of its existence; but in colder regions, or under the care of the gardener, where it is frequently impracticable to attend to all the circumstances that accelerate its developement, it requires the longest period that has been assigned to it. Having acquired its full growth, it finally produces its gigantic flower stem, after which it perishes. This stem sometimes is as much as forty feet high, and is surrounded with a multitude of branches arranged in a pyramidal form, with perfect symmetry, and having on their points clusters of greenish yellow flowers, which continue to be produced for two or three months in succession. The native country of the American aloe is the whole of America within the tropics, from the plains nearly on a level with the sea, to stations upon the mountains at an elevation of between 9000 and 10,000 feet. From these regions it has been transferred to almost every other temperate country; and in Italy, Sicily, and Spain, it has already combined with the date and the palmetto to give a tropical appearance to European scenery.

[Agave.]

Independently of its beauty and curiosity, this plant is applicable to many useful purposes. Its sap may be made to flow by incisions in the stem, and furnishes a fermented liquor, called by the Mexicans *pulque;* from this an agreeable ardent spirit, called *vino mercal*, is distilled. The fibres of its leaves yield the Pita flax or thread; the dried flowering stems are an almost imperishable thatch; an extract of the leaves is made into balls, which will lather water like soap; the fresh leaves themselves cut into slices are occasionally given to cattle; and finally the centre of the flowering stem split longitudinally is by no means a bad substitute for a European razor strop, owing to minute particles of silica forming one of its constituents.

AGE. In legal acceptation, a person is said to be of age when he has passed those periods of his life at which he is supposed to have acquired sufficient discretion to enable him to do certain acts and enter into certain contracts, of which, before those periods have arrived, he is presumed to be incapable by reason of the immaturity of his understanding. The common law of England appoints certain specific times in the life of a man or woman before either is permitted to form contracts and incur municipal obligations. Thus, at the age of twelve years, a man may take the oath of allegiance; at fourteen, which for many purposes is considered the age of discretion, a person of either sex may choose a guardian, and may also, according to ancient authorities, be a witness in courts of justice; in the latter case, indeed, the rule is at the present day considerably relaxed, for children of much tenderer years are frequently permitted to give evidence, having been previously found competent upon examination to understand the nature of an oath. A female at the age of twelve years, and a male at the age of fourteen years, may make a valid will of personal estate, if proved to have had sufficient understanding at the time the will was made; but it is particularly provided by statute that no person under the age of twenty-one years shall make a will of lands. At the age of seventeen years, a person of either sex may be an executor or executrix.

With respect to matrimony, a woman may by law consent to marriage at twelve, and a man at fourteen years of age: though, by several statutes, parties under the age of twenty-one years cannot actually marry without the express consent of their respective parents or guardians. [See MARRIAGE.] The age of twenty-one years is, for most civil purposes, the full age both of a man and woman, at which period persons of either sex may enter into the entire possession of their real and personal estates, may manage and dispose of them at their discretion, and form contracts and engagements of all kinds upon their own account. A man cannot, however, be ordained a priest till twenty-four, nor be a bishop till thirty years of age.

With respect to criminal offences, the law of England regards the age of fourteen years as the age of discretion, at which the human mind is competent to distinguish between right and wrong; a person of either sex, therefore, who has attained that age is liable to prosecution and punishment for crimes. Under the age of seven years, a child is not in any case responsible by law for an offence committed by him; but, above that age, and under the age of fourteen years, if it clearly appears that a child is conscious of the nature and wickedness of the crime he commits, he may be tried and punished for it. A very singular instance is related by Mr. Justice Foster of a boy nine years old, who, under circumstances of malice and premeditation, had killed his companion, and hidden the dead body with much care and cunning, and who was tried for murder, and found guilty. The case was afterwards considered by the twelve judges, who thought that the circumstance of hiding the dead body proved the fact of consciousness of guilt, and therefore a capacity of distinguishing good from evil, inconsistent with the presumption of innocence arising from the tender age of the child; and they unanimously agreed that he was a proper subject for capital punishment. Foster's *Crown Cases*, p. 72. For more particular information on the whole of this subject, see INFANT.

AGE (Physiology). The term of human existence is divisible into distinct periods, each of which is distinguished by characters peculiar to itself. These characters, as far as they are external, are obvious to every one; but these external characters depend on internal states which are not obvious, and which have been discovered only by careful and persevering research. And the curious and interesting facts which those researches have disclosed, show that the different epochs into which life is divided are not arbitrary distinctions, but arise naturally out of constitutional differences in the system, dependent on different physiological conditions. The natural epochs of human life are six, namely, the period of infancy, childhood, boyhood or girlhood, adolescence, manhood or womanhood, and old age. The space of time included in the first four of these periods is fixed. In all persons after the lapse of a certain number of years, a definite change in the system uniformly takes place, in consequence of which the peculiarities which distinguish one period give place to those which characterise the succeeding. Thus the period of infancy, commencing at birth, extends to the end of the second year, the point of time at which the first dentition is completed: the period of childhood, commencing at the close of the second year, extends to the termination of the seventh or eighth year, the point of time at which the second dentition is completed: the period of boyhood or girlhood extends from the seventh or eighth year to the commencement of the age of puberty; that is, in general, in this country, in the female, from the twelfth to the fourteenth year, and for the male, from the fourteenth to the sixteenth year: the period of adolescence extends from the commencement of the period of puberty to the twentieth year of the female, and the twenty-fourth of the male: the period of womanhood extends from the twentieth, and of manhood, from the twenty-fourth year, to an age neither determined nor determinable with any degree of exactness; because the point of time at which mature age lapses into old age differs in every individual. It differs in many cases by a considerable number of years; and it differs according to primitive constitution, to the management of early infancy and childhood; according to regimen, exercise, occupation, physical and mental, and the several other circumstances included under the general term '*mode of life*.'

It is an observation familiar to every one, that some persons are older at fifty than others are at seventy, while instances every now and then occur in which an old man who reaches his hundredth year retains as great a degree of juvenility as the majority of those who attain to eighty. The period extending from the age of thirty or forty to that of extreme old age is then the only variable period in the term of human existence; the only period not fixed by limits which it is beyond the power of man materially to extend or abridge—a fact abounding with the most interesting practical suggestions.

The changes which take place in the system at the different epochs of life consist of changes in the physical condition of the body which it will be useful briefly to trace. These changes are intimately connected with, and are mainly dependent on the operation of a principle of consolidation, the influence of which, commencing at the first moment of existence, continues, without intermission, until the last moment of life. By this principle the body is changed, first from the state of a fluid into that of a solid; and next, from a soft and tender solid, into a solid which slowly, imperceptibly, but nevertheless uninterruptedly, increases in firmness and hardness.

When first the human embryo becomes distinctly visible, it is almost wholly fluid, consisting only of a soft, gelatinous pulp. In this gelatinous pulp solid substances are formed, which gradually increase and are fashioned into organs. These organs, in their rudimentary state, are soft and tender, but, in the progress of their development, constantly acquiring a greater number of solid particles, the cohesion of which progressively increases, the organs at length become dense and firm. As the soft solids augment in bulk and density, bony particles are deposited, sparingly at first and in detached masses, but accumulating by degrees: these, too, are at length fashioned into distinct osseous structures, which, extending in every direction, until they touch at every point, ultimately form the connected bony frame-work of the system. This bony fabric, like the soft solid, tender and yielding at first, becomes by degrees firm and resisting, fitted, as it is designed, to be the mechanical support of the body, and the defence of all the vital organs.

While the osseous system is thus extending in every direction, and everywhere increasing in compactness, the progressive consolidation of the body is equally manifest in all the tissues which are composed of the cellular membrane as well as in all those which possess a fibrous nature. The membranes, the ligaments, the tendons, the cartilages, gradually increase in firmness and elasticity, and proportionally diminish in flexibility and extensibility; and this change takes place, to a considerable extent, in the muscular fibre also, as is manifest from the toughness of the flesh of animals that are used for food, the degree of which every one knows is in proportion to the age of the animal; and from the conversion in extreme old age, in many parts of the body, of muscle into tendon, a denser material being substituted for the proper muscular fibre.

The steady and increasing operation of the principle of consolidation is still more strikingly manifest in the deposition, as age advances, of bony matter in tissues and organs to which it does not naturally belong, and the functions of which it immediately impairs and ultimately destroys. The textures in which these osseous depositions most commonly take place are membranes, tendons, cartilages, and the coverings of the viscera, but above all the coats of the blood-vessels, in consequence of which these highly flexible, elastic, and moveable organs become firm, rigid, and immoveable. But even when not converted into bone, several of these structures lose their flexibility with advancing age, and acquire an increasing degree of rigidity. This is strikingly manifest in all the parts of the apparatus of locomotion; in the joints, the mechanical contrivances for facilitating motion, and in the muscular fibre, the generator of the power by which motion is produced. The joints in old age are less pliable, less elastic, and more rigid than in youth; first, because the ligamentous and cartilaginous structures of which they are composed are more dense and firm; and secondly, because the oily matter which lubricates them, and which renders their motions easy and springy, is secreted in less quantity, and of inferior quality. Induration and proportionate deterioration take place then in the muscular fibre, the origin of the motive power, and in the joint the instrument by which the operation of the motive power is facilitated; and consequently the movements become slower, feebler, less steady, less certain, and less elastic.

But among all the changes induced in the body by the progress of age, none is more remarkable, or has a greater influence in diminishing the energy of the actions of the economy, and in causing the ultimate termination of all those actions in death, than the change that takes place in the minute blood-vessels. The ultimate divisions, or the smallest branches of the arteries and veins, the capillary vessels, as they are termed, are exceedingly abundant in the early periods of life, and are as active as they are numerous. The capillary arteries, the masons and architects of the system, by the agency of which all the structures are built up, and all the parts of the body grow and are developed, are numerous and active in the early stages of life, while they are carrying on and completing the organization of the frame. But from infancy to childhood, from childhood to youth, from youth to maturity, and from maturity to old age, the number and the activity of these vessels progressively diminish. Their coats, like other soft solids, increase in density and rigidity; their diameter contracts, many of them become completely impervious and ultimately disappear. The diameter of the capillary veins, on the contrary, enlarges. The coats of the veins, originally thinner than those of the arteries, instead of thickening and contracting, seem rather to grow thinner and more dilatable: hence their fulness, their prominence, their more tortuous course, and their greater capacity. At the two extreme periods of life the quantity of blood contained in these two sets of vessels is completely inverted. In infancy, the proportion of blood contained in the capillary arteries is greater than that contained in the capillary veins; in youth, this disproportion is diminished; at the period of maturity, the quantity in one set, nearly if not exactly balances that in the other; in advanced age, the preponderance is so great in the veins, that these vessels contain probably two-thirds of the entire mass. This difference in the distribution of the blood, at the different epochs of life, affords an explanation of several important phenomena connected with health and with disease. It shows, for example, why the body grows with so much rapidity at the early periods of life; why it remains stationary at the period of maturity: why it diminishes in bulk as age advances; why a plethoric state of the system affects the arteries in youth, the veins in age; why hæmorrhage, or a flow of blood, is apt to proceed in the young from the arteries, and in the aged from the veins; and so on.

The growth of the heart does not keep pace with the extension of the sanguiferous system, nor does its force increase with the augmenting density and resistance of the solids; hence there is a disturbance of the balance between the forces of propulsion and of extension which increases with advancing age; the diminished energy of the heart being indicated by the languor and slowness of the pulse, often not exceeding fifty pulsations in a minute, and sometimes sinking even lower than this. Hence, not only is less blood sent to the several organs, but that which is sent is less completely acted upon by the air in respiration on account of the diminished quantity which is transmitted through the pulmonary system of vessels; hence, the diminution of all the secretions, and hence, finally, the failure of the function of digestion, the source of the materials from which the blood itself is prepared and its losses replenished.

Upon the whole, then, it is clear that two great changes take place in the physical condition of the body in the progress of age; first, a gradual diminution in the quantity of the fluids, both of the entire mass contained in the system, and of the proportionate quantity contained in each organ: and, secondly, a progressive augmentation and induration of the solids. With this change in the physical condition of the body is uniformly combined a no less important change in its vital action. Progressively and proportionally as the solid parts increase in density and rigidity, they decrease in irritability and mobility; that is, they are less sensible to the influence of stimulants, and the power of contraction resident in the muscular fibre is less excitable. Now the knowledge of this two-fold modification of the system suggests practical applications of the greatest importance in the management of health, in the prevention of disease, in securing the attainment of perfect maturity, corporeal and mental, and consequently in promoting a general extension of the term of life.

In each of the epochs of life the health is peculiar; the diseases to which each is prone have also a specific character. A degree of energy in the vital actions, constituting a state of healthy vigour in one period, may be destructive violence in another; and a degree of intensity in the physical agent upon which those actions depend, merely sufficient to produce moderate excitement in one, may produce fatal stimulation in another.

It has been shown, that in the human infant by far the greater proportion of its body consists of fluids; and that this state of the system is characterized by an extreme degree of irritability and mobility. The capillary arteries, especially, are not only more numerous in this age than in any other, but they are also far more irritable; far more easily and dangerously excitable. And this is most particularly the case with the capillary arteries of the stomach and intestines; with those of the lungs; with those of the external skin; with those of the spinal cord and brain: and a consideration of the manner in which these vessels are acted on, for example, by aliment and by temperature, two agents which exert the most important influence over the health and life of the infant, will suffice to illustrate the value of knowledge of this kind.

The chief organ by which the function of digestion is performed is the mucous membrane that lines the stomach and intestines. Food, when in contact with the inner surface of this membrane, acts upon it as a stimulus and excites it to the performance of its office. Now so irritable is this membrane in the infant, that it can bear the contact only of one kind of aliment, namely, the milk formed by the mother. For this food, and only for this food, has nature specially adapted the organ, and the adaptation of this food to this organ is in its turn equally specific; and this relation cannot be disturbed or disregarded without preventing the due performance of the function, and thereby endangering health and life. Even the blandest substances, the milk of other animals, which, at a more advanced age, can be readily converted into nutriment, over excites the delicate digestive organ of the infant, producing first grievous irritation in the system, and, ultimately, exhaustion and death. From large experience it is found, that of the infants who are deprived of this their natural nourishment, not more than one in seven reaches the more advanced periods of life. Without doubt circumstances may justify a mother in abandoning her infant, but she ought, at least, to know the extent of the sacrifice she makes when she withholds from it the only food by which it can live; she ought to be fully aware that by this act she does abandon it.

Cold acts upon the lining membrane of the air-passages of the lungs, as injuriously as improper diet upon the mucous surface of the alimentary canal; and it also acts most energetically and deleteriously upon the whole external surface of the skin. The new-born infant has been kept for months in a constant and unvaried warmth. Both its external and its internal surfaces have been completely shielded from the contact of foreign bodies. But at the moment of birth its condition is wholly changed; both surfaces are fully exposed to agents, to the influence of which it is acutely sensitive. Air surrounds the external skin and rushes to the lung and expands it; cold acts simultaneously and powerfully on both organs. If the cold be severe, or if the changes of temperature be great and rapid, inflammation is sure to be excited in the *lung;* and this is one of the chief sources of the mortality of infancy. The injurious action of cold upon the *external* surface is two-fold; first, upon the vessels, and nervés of the skin; and, secondly, upon the vessels, and nerves of the internal organs; for the cold, constringing the external vessels, causes the blood diffused over this extended surface to rush to the internal parts, and especially to the brain, in which it often produces dangerous and fatal disease. The mother should never forget that a degree of cold which the child can bear with impunity may excite a mortal inflammation in the infant; and that an intensity of cold which may only invigorate the adult may kill the child. Were an accurate record kept of the number of children annually destroyed in England by improper exposure to cold, the sum would fill the country with dismay. The proper management of the period of infancy consists essentially in causing the infant to subsist on the milk of the mother only, at least during the first months; in keeping it in an equal and moderately warm temperature; in surrounding it by night as well as by day, when asleep as well as when awake, by a large bulk of fresh air; in frequently washing the entire surface of its body first with warm, then with tepid, and towards the latter months of the period, in perfectly cold water, followed immediately by vigorous friction.

There is one caution in relation to medicine which cannot be too frequently kept in view. The same state of the system which renders the infant so susceptible to the influence of ordinary physical agents, renders it at least equally susceptible to the influence of irritant drugs; and especially of those which act primarily on the mucous surface of the alimentary canal, or on the nervous system. The regulation of the bowels by aperient medicine is often necessary; but a tea-spoonful of castor oil, or from four to six grains of magnesia, is all that the mother or the nurse should venture to give unless under the superintendence of a medical friend. The aperients often given are far too irritating; while of an opposite class of medicines it may be truly said, that every preparation of opium, even in the very minutest dose, is, in the early period of infancy, highly dangerous. Opiates act on the nervous system of the infant most energetically and banefully, and many is the new-born infant whose life is suddenly cut short by quack medicines, soothing as they are called, (and soothing indeed they are!) which often contain a concentrated dose of a powerful narcotic, and which, according to the dose, excites either an inflammatory action of the capillaries of the brain, or an accumulation of blood in the cerebral vessels, one or other of which co-operating with the irritable state of the system, for the quieting of which the opiate was given, produces the quiet of death.

From the seventh month to the end of the second year, the consolidation and development of all the tissues and organs proceed with rapidity. The process of ossification advances: the soft solids grow firmer: the muscles enlarge in bulk and increase in strength: the brain especially becomes more developed, and its functions more active and more extended: consequently, sensation not only increases in acuteness and exactness, but embraces a wider range; hence perception becomes more perfect; the phenomena of mind appear; speech commences; affection is generated; passion induced; moral habits, good or bad, acquired, each of which events introduces into the economy a new power which ever afterwards exerts over it a prodigious influence for good or for evil, for pleasure or for pain, for health or for sickness.

As infancy passes into childhood, the brain, the spinal cord, the bones, the muscles, and the other soft solids, progressively acquire bulk, cohesion, firmness, and strength. All the capillaries of the system still continue exceedingly active and highly irritable. For the support of their action a large supply of nutritious food is indispensable. There is scarcely an organ that is not still to be completed, and the magnitude of which is not to be augmented. Aliment is the material by which these results are to be effected, and the consequences of privation at this period are truly deplorable. Not only is the growth of the body checked for a time, but the physical and mental constitutions are irreparably injured. From the beginning to the end of this period every effort should be directed to the development and invigoration of the physical, and the formation and direction of the moral powers; as yet the development of the intellectual is of little consequence. The health, the strength, the longevity, the physical, the intellectual, the moral qualities, the usefulness or the mischievousness, the happiness or the misery of the future man, depend essentially on the management of these two periods of human existence. For this reason we have endeavoured to direct attention to their paramount importance, and to the value of that knowledge which teaches in what their proper management consists. We shall have other occasions to return to the subject, and to state more in detail the regimen proper to these earlier, as well as to the more advanced stages of human life. In the mean time we earnestly intreat the attention of WOMEN to subjects of this class. The health and life, and what is of much more importance, the virtue and happiness of their children are far more deeply involved in the soundness of the knowledge they acquire on subjects of this kind, than they have hitherto been taught to believe.

AGE OF LIFE. [See MORTALITY.]

AGE OF ANIMALS. It is often a matter of great importance to possess some means of determining the age of organized bodies, both in the animal and vegetable kingdoms. It is to be regretted, however, that for our guidance in these matters we possess but few general principles derived from well-regulated observations and experiments. As far as regards animals, indeed, it has been said, that the duration of life is generally between seven and eight times the period which elapses from birth till they become adult; but this rule, besides being vague and indefinite, is quite useless and inapplicable in practice, because it affords no scale of gradation which would enable us to ascertain the precise age of individuals, the only inquiry of real importance or of practical application to the interests of society. More certain and scientific principles are derived from observing the growth and decay of the teeth; and if we were acquainted with the various phenomena which attend the development of these organs in all quadrupeds, there is no doubt but that we should be enabled to obtain general and, in a great measure, certain rules, not only applicable to individual cases, but likewise to the speculative philosophical problem of the duration of life in each separate species. At present, however, we do not possess a series of observations sufficiently extensive to enable us to solve this problem generally; and we shall, therefore, confine ourselves to the few individual cases in which it has been determined, and which relate only to the most important domestic animals.

The age of the horse is known principally by the appearance of the incisive teeth, or, as they are technically called, the nippers. Of these there are six in each jaw, broad, thin, and trenchant in the foal, but with flat crowns marked in the centre with a hollow disk in the adult animal. The foal or milk teeth appear fifteen days after birth; at the age of two years and a half the middle pair drop and are replaced by the corresponding permanent teeth; at three years and a half the two next, one on each side, fall and are likewise replaced; and at the age of four years and a half the two external incisors of the first set drop and give room to the corresponding pair of permanent teeth. All these permanent nippers, as we have already observed, are flattened on the crown or upper surface, and marked in the centre with a circular pit or hollow, which is gradually defaced in proportion as the tooth wears down to a level with its bottom. By the degree of this detrition or wearing of the teeth, the age of the animal is determined, till the eighth year, at which period the marks are generally effaced; but it is to be observed that the external incisors, as appearing a year or two after the intermediate, preserve their original form proportionally for a longer period. After the eighth year the age of the horse may be still determined for a few years longer by the appearance and comparative length of the canine teeth or tushes. These, it is true, are sometimes wanting, particularly in the lower jaw, and in mares are rarely developed at all. Those of the under jaw appear at the age of three years and a half, and the upper at four; till six they are sharp-pointed, and at ten they appear blunt and long, because the gums begin about that period to recede from their roots, leaving them naked and exposed; but after this period there are no further means of judging of the horse's age, excepting from the comparative size, bluntness, and discoloured appearance of the tushes. The duration of the horse's life seldom surpasses thirty years, though there have been instances recorded in which it is said to have extended to double that period.

In horned cattle the age is indicated more readily by the growth of these instruments than by the detrition and succession of the teeth. The deer kind, which shed their horns annually, and in which, with the single exception of the rein-deer, they are confined to the male sex, have them at first in the form of simple prickets without any branches or antlers; but each succeeding year of their lives adds one or more branches, according to the species, up to a certain fixed period, beyond which the age of the animal can only be guessed at from the size of the horns and the thickness of the burr or knob at their roots, which connects them with the skull. In the common stag, the pricket or first horn falls during the second year of the animal's life, and is replaced by one with a single antler, and called, from this circumstance, the fork. This again falls during the third year, and is replaced by the third horn, which, as well as the fourth or following pair, have commonly three or four, and sometimes even five branches. In the same manner the number of antlers goes on increasing till the eighth year of the animal's life, beyond which period they follow no fixed rule, though they still continue to increase in number, particularly towards the summit of the horn, where they are often grouped in the form of a coronet, and in this state they are called royal antlers. The fallow-deer, the roe-buck, and others of this genus, present similar phenomena; the number of the antlers increases according to certain fixed rules up to a certain period, beyond which the age can only be determined, as in the stag, by the comparative size and developement of the burr and shaft, or that part of the horn from which the antlers grow. In the former species, the prickets of the second year are replaced by horns bearing two antlers, and already beginning to assume the palmated form which distinguishes them from the antlers of most other deer. Afterwards this palm increases in breadth, and assumes an indented form on the superior and posterior borders: these are the fourth horns, which are shed in the animal's fifth year, and are replaced by others in which the palm is cloven or subdivided irregularly into distinct parts, so that the horns of old animals frequently assume a great diversity and singularity of form. From this period the horns begin to shrink in size, and are even said to end in becoming simple prickets as in the first year.

The horns of oxen, sheep, goats, and antelopes, which are hollow and permanent, are of a very different form, and grow in a different manner, from those of the deer kind. These, as is well known, consist of a hollow sheath of horn, which covers a bony core or process of the skull, and grows from the root, where it receives each year an additional knob or ring, the number of which is a sure indication of the animal's age. The growth of the horns in these animals is by no means uniform through the whole year, but the increase, at least in temperate climates, takes place in spring, after which there is no further addition till the following season. In the cow kind, the horns appear to grow uniformly during the first three years of the animal's life; consequently, up to that age they are perfectly smooth and without wrinkles, but afterwards each succeeding year adds a ring to the root of the horn, so that the age is determined by allowing three years for the point or smooth part of the horn and one for each of the rings. In sheep and goats the smooth or top part counts but for one year, as the horns of these animals show their first knob or ring in the second year of their age; in the antelopes they probably follow the same rule, though we have very little knowledge of their growth and development in these animals.

There are very few instances in which the age of animals belonging to other classes can be determined by any general rules. In birds it may be sometimes done by observing the form and wear of the bill; and some pretend to distinguish the age of fishes by the appearance of their scales, but their methods are founded upon mere hypothesis and entitled to no confidence. The age of the whale is known by the size and number of laminæ of whale-bone, which increase yearly, and, if observation can be relied upon, would sometimes indicate an age of three or four hundred years for these animals.

AGE OF TREES. Every thing connected with the growth of timber-trees, their duration, and the causes which conduce to their decay, bears so directly upon points not only of general interest, but of great practical importance, that we have thought it advisable to devote an article to its separate consideration.

Plants, like animals, are subject to the laws of mortality: there is the same wear and tear, the same building up and pulling down of the cellular elements of which they are composed. But without doubt, not only their structure, but their vital actions are so peculiar, that little analogy can, in any case, be traced between the more perfect of them and the animal world, and a very large proportion appear to be capable of an almost indefinite period of existence, if it were not for accidents and disease, independent of old age.

It is chiefly to annual and biennial plants that what may be called a precise period of duration is fixed; a period determined by the production of their fruit, and not capable of being prolonged beyond that event, except by artificial means. Dismissing all such from our consideration, the remainder of the more perfect part of the vegetable kingdom, whether herbaceous, or shrubby, or arborescent, consist of plants which may be classed under two principal modes of growth.

One of these modes is to increase, when young, in diameter, rather than in length, until a certain magnitude is obtained, and then to shoot up a stem, the diameter of which is never materially altered. The addition of new matter to a trunk of this kind takes place by the insinuation of longitudinal fibres into the *inside* of the wood near the centre; on which account such trees are called Endogenous; they also bear the name of *Monocotyledons*.

The other mode is, from the beginning, to increase simultaneously in length and diameter, but principally in length. The addition of new matter to a trunk of this kind takes place by the insinuation of longitudinal fibres into a space beneath the bark, and on the *outside* of the wood near the circumference; on which account such trees are called Exogenous; they also bear the name of *Dicotyledons*.

Some modifications of these two modes are known to exist, but it would only confuse the subject if they were adverted to on this occasion.

To the first of these classes belongs the palm-tribe, and some other tropical trees. There is scarcely any well-attested evidence of these plants ever acquiring any considerable age. It has, indeed, been supposed, that certain Brazilian cocoa-nut palms may be from 600 to 700 years old, and that others probably attain to the age of something more than 300 years. But the method of computing the age of palms, which is either by the number of rings externally visible upon their rind between the base and the summit of the stem, or by comparing the oldest specimens, the age of which is unknown, with young trees of a known age, is entirely conjectural, and not founded upon sound physiological considerations; besides which, the date-palm, which is best known to Europeans, does not at all justify the opinion that palms attain a great age; the Arabs do not assign it a greater longevity than from two to three centuries. Independently of this, the mode of growth of such endogenous trees as palms seems to preclude the possibility of their existing beyond a definite period of no great extent. The diameter to which their trunk finally attains is very nearly gained before they begin to lengthen, and afterwards all the new woody matter, which every successive leaf *necessarily* produces during its developement, is insinuated into the centre. The consequence of this is, that the woody matter previously existing in the centre is displaced and forced outwards towards the circumference; as this action is constantly in progress, the circumference, which in the beginning was soft, becomes gradually harder and harder, by the pressure from within outwards, till at last it is not susceptible of any further compression. After this has occurred, the central parts will gradually solidify by the incessant introduction by the leaves of new wood which thrusts outwards the older wood, till at last the whole stem must become equally hard, and no longer capable of giving way for the reception of new matter; *for what has once been formed always remains, and is never absorbed by surrounding parts.* As soon as this occurs, and occur it must in trunks which rarely exceed a foot, and, perhaps, never a foot and half in diameter, the tree will perish; because its vitality is dependent upon the full action of all the functions of the leaves, and the cessation of one is the cessation of all. It is for these reasons that we feel justified in considering it probable that endogenous trees, such as palms, attain no considerable age, and that the duration of their existence must be absolutely fixed in each species by the power they may respectively have of permitting the descent of woody matter down their centre.

But in exogenous trees, it is quite the reverse: to their existence no limited duration can be assigned; on the contrary, there is nothing physically impossible in the notion that some individuals now existing may even have been silent witnesses of the Noachian deluge. In consequence, first, of the new woody matter which is constantly formed by the leaves of such trees being insinuated beneath the bark near the circumference of their trunk, and, secondly, of the bark itself being capable of indefinite distention, no compression is exercised by the new parts upon those previously formed; on the contrary, the bark is incessantly giving way to make room for the wood beneath it, while the latter is, in consequence, only glued, as it were, to what succeeds it, without its own vital powers being in any degree impaired by compression. It is in the newly-formed wood that the greatest degree of vitality resides: in the old wood near the centre life in time becomes extinct; but as each successive layer possesses an existence in a great degree independent of that which preceded it the death of the central part of an exogenous tree is by no means connected with any diminution of vitality in the circumference. Hence it is that hollow trees are often so healthy; and that trees in the most vigorous state are often found decayed at the heart without any external sign, as timber-merchants frequently discover to their cost. The manner of growth in exogenous trees being such as has been just described, they may be compared to a succession of hollow cylinders increasing gradually in diameter and sheathing one another. This being the case, and the last cylinder having its own independent vitality, it will be apparent that, under circumstances constantly favourable to growth, individuals of this kind may continue to exist to the end of time; for there is no conceivable manner in which their death can be brought about in the absence of accidents; among which would, of course, be classed starvation, arising from the destruction of nutriment in the soil where they grow, and suffocation caused by the obstruction of their respiration, whether by the absence of light or the exclusion of air.

This it is which explains the extreme old age which some trees certainly attain. Of the many remarkable cases upon record, the following are among the more interesting.

At Ellerslie, the birth-place of Wallace, three miles to the south-west of Paisley, stands an oak, in the branches of which tradition relates that celebrated chieftain to have concealed himself with three hundred of his followers. However improbable the latter circumstance may be, it is at least certain that the tree may well have been a remarkable object even at the period assigned to it by tradition, namely, in the beginning of the fourteenth century, and if so, this individual must be at least 700 years old. Its branches are said to have once covered a Scotch acre of ground; but its historical interest has rendered it a prey to the curiosity of the stranger, and its limbs have gradually disappeared till little remains except its trunk.

[The Wallace Oak.]

Many other cases of oaks of extreme old age are recorded, some of which have been estimated at 1500 or 1600 years.

At Trons, in the Grisons, there existed, in 1798, a lime tree which was a celebrated plant in the year 1424, and which, when last measured, was fifty-one feet in circumference. The age of this specimen could not have been less than 580 years.

In the year 1776, there existed in the Palace Garden of Granada some famous cypresses called *Cupresos de la Sultana*, in consequence of some event that occurred in the time of the Moorish kings, at which time they formed a cypress grove. These are thought to have been at least 800 or 900 years old.

The famous sweet-chestnut trees on Mount Ætna, especially those called the *Castagna de' Cento Cavalli*, 180 feet in circumference at the bottom of the trunk, *de Sta. Agatha*, seventy feet in circumference, and *della Nave*, sixty-four feet in circumference, must be of high antiquity; but nothing precise is known upon this point, and it is almost certain that the first mentioned has been in reality formed of five or six trunks grown together.

Equally unknown is the age of an immense oriental plane tree now growing in the valley of Bujukdere near Constantinople, which is 150 feet in circumference, with an internal cavity eighty feet in circumference.

The walnut sometimes attains a prodigious size, consequently a great age. Scamozzi, an Italian architect, mentions his having seen at St. Nicolas, in Lorraine, a single plank of its wood twenty-five feet wide, upon which the Emperor Frederick III. had given a sumptuous feast.

Eight olive trees still exist in the Garden of Olives at Jerusalem, which can be proved by historical documents to have existed anterior to the taking of the city by the Turks, and consequently to be at least 800 years old.

Of ancient yews several authentic instances can be named. At Ankerwyke House, near Staines, is a yew older than the meeting of the English barons at Runnymede, when they compelled King John to grant the Magna Charta.

[The Ankerwyke Yew.]

This tree, at 3 feet from the ground, measures 9 feet 3 inches in diameter; and its branches overshadow a circle of 207 feet in circumference. The yews of Fountain's Abbey, in Yorkshire, are probably more than 1200 years old, and to others an age of from 2500 to 3000 years has been assigned.

Even this degree of antiquity is, however, much less than that of the Baobab trees of Africa, estimated by Adanson at 5150 years; and the deciduous cypress of Chapultepec in Mexico, which the younger De Candolle considers still older.

The way in which the age of some of these specimens has been computed is twofold. firstly, by comparing them with other old specimens, the rate of growth of which is known; and secondly, by cutting out a portion of their circumference and counting the number of concentric rings that are visible. For in exogenous trees the woody cylinder of one year is divided from the succeeding one by a denser substance, which marks distinctly the line of separation of the two years.

The first of these methods is sufficiently correct to give at least an approximation to the truth, and the latter would be absolutely correct, if one could be quite sure that observers provided against all possible causes of error. But it has been shown, (see Dr. Lindley's *Introduction to Botany*, p. 66,) that in consequence of the extreme inequality in thickness of the annual layers of wood on opposite sides of a stem, a person who judged of the whole age of a tree by the examination of the layers of the stunted side only, would commit errors to the amount of sixty per cent. and more. It is by no means impossible that the great age assigned to the deciduous cypress and the Baobab may be connected with an error of this nature.

In the course of the inquiry into the method of computing the age of ancient trees, a discovery has been made of some importance to timber growers, inasmuch as it shows that those who plant for profit alone should not allow their trees to grow beyond a certain number of years, varying according to species: for it has been found that so far are exogenous trees from continuing always to increase in diameter at the same rate, that every kind diminishes in its rate of growth after a certain age;—the oak, for example, between its fortieth and its sixtieth year, the elm after its fiftieth, the spruce fir after its fortieth, and the yew probably after its sixtieth. With reference to this subject, Professor De Candolle has constructed a table of rate of growth, which we subjoin.

Table of the rate of Increase in Diameter of certain Exogenous Trees, expressed in lines.

Yrs. Yrs.	Quercus pedunculata, 120 years old.	Quercus sessiliflora, 210 years old.	Quercus sessiliflora, 333 years old.	Larch Fir, 255 years old.	Elm, 335 years old.	Spruce Fir, 120 years old.	Yew, 71 years old.
1 to 10	54	10	18	48	16	41	8
10 . 20	62	16	33	61	44	54	11½
20 . 30	54	22½	39½	58	58½	52	12
30 . 40	60	12	38	72	72	45	10½
40 . 50	48	13½	23	46	88	35½	7
50 . 60	44	14	12½	57	74	36	12½
60 . 70	56	10⅔	9	46	78½	18	8
70 . 80	44	11	9½	29	66	17	
80 . 90	32	9½	8½	30	59	13	
90 . 100	32	9½	8	24	45	13	
100 . 110	30	9½	7½	32	30	22	
110 . 120	36	9	8½	26	30	22	
120 . 130	30	9	8	20½	24		
130 . 140		9½	10	22	24		
140 . 150		10	8	23	18		
150 . 160		8½	8½	21	19		
160 . 170		9	9	20	17½		
170 . 180		10	8	19	23		
180 . 190		9	8	18	30		
190 . 200		9	7	21	34		
200 . 210		9	8	22	34		
210 . 220			7	22½	26		
220 . 230			6	21	36		
230 . 240			8	22	28		
240 . 250			8	20½	26		
250 . 260			7½		24		
260 . 270			8		17½		
270 . 280			8		26		
280 . 290			8½		28		
290 . 300			8½		29		
300 . 310			9		16		
310 . 320			8		16½		
320 . 330			8		21		

A specimen of *Ficus indica*, or the Banyan, on an island in the river Nerbudda, is believed to be identical with one that existed in the time of Alexander the Great, and, according to Nearchus, it was capable of overshadowing 10,000 men. The circumference of the principal trunk alone measures 2000 feet, and it has more than 3000 smaller stems.

AGES OF THE WORLD. In the mythology of the Greek and Roman poets, the history of the world was divided into four ages, the golden, the silver, the brazen, and the iron; as for instance, Hesiod in his poem entitled *Works and Days*, and by Ovid, in his *Metamorphoses*. The golden age, when Saturn reigned, is represented as having been that of perfect innocence and happiness; from which the others have gradually degenerated more and more,—the iron age, or that which now subsists, being the most wicked and miserable of all. Sometimes these ages are spoken of as merely so many successive periods in the history of Italy. Saturn having been driven out of heaven by his son Jupiter, is supposed to have sought an asylum in that country, where, in return for the protection he received from King Janus, he taught him and his people agriculture, and the other arts of cultivated life. According to this latter mode of telling the story, it will be observed, the golden age is represented as consisting in the triumph of civilization over previous barbarism; whereas the other version seems intended to indicate that the primeval state of man was that in which he enjoyed the greatest felicity and purity, and that he has been rather corrupted than improved by what is called civilization. The two statements, therefore, may be taken as expressing two opposite theories or opinions which have divided speculators upon this subject down even to our own day. The disagreement among the fabulists, however, is only with regard to the original condition of man; it seems to have been admitted on both sides that a gradual declension both of the happiness and virtue of the world has been going on ever since the age of gold. The golden age is that of which the most complete pictures have been drawn; indeed it may be said to be the only one of the four of which the description is at all distinct. The age of iron was deemed to have commenced long before Hesiod's day, who lived probably at least twenty-six hundred years ago; it was, in fact, merely a general name for the existing order of things, as distinguished from some imaginary previous state. But neither that immediately preceding state, designated the age of brass, nor its forerunner, the age of silver, is to be found discriminated in the poetic painting by anything more than some slight varieties of shade. Of the golden age, when universal harmony prevailed throughout the living creation, and the bounteous earth yielded her increase untilled, we have various descriptions from the pens of modern as well as of ancient poets. The reader of Italian poetry will recollect in particular the celebrated chorus at the end of the first act of Tasso's *Aminta*, and the imitation of it at the end of the fourth act of Guarini's *Pastor Fido*.

AGENEIO'SES, in Ichthyology, a genus of abdominal *Malacopterygious* fishes, separated from the silures by Lacepede, and containing two species, both from the fresh water lakes and rivers of Surinam.

AGENT. An agent is a person authorized by another to do acts, or make engagements in his name; and the person who so authorises him is called the principal. And almost any person, however otherwise disqualified, can act as agent. Even persons who are disqualified from acting in their own capacity, as infants and femes coverts, may yet act as agents for others.

An agent cannot be appointed to bind his principal by deed, otherwise than by deed; nor can an agent be appointed by a corporation aggregate otherwise than by deed, unless it be for certain ordinary and inferior purposes. The Bank of England, therefore, or any similar corporation, may without deed empower persons to make and sign in the name of the corporation bank-notes, bills of exchange, &c.; and for the purpose of making leases, and other acts specified in the first, second, and third sections of the statute of frauds, the authority of the agent is required to be in writing. In all other cases, no particular form is necessary: in commercial affairs, agents are most usually commissioned by a letter of orders, or simply by a retainer; but a verbal appointment is quite sufficient; and even the mere fact of one person's being employed to do any business whatever for another, will create between the parties the relation of principal and agent.

An agent's authority (unless it is an authority coupled with an interest, such as a power of attorney granted as a security for a debt) may, in general, be revoked by the principal at any time. It also ceases upon his death or bankruptcy.

There are numberless kinds of agents, answering to the endless diversity of modes in which one person may be employed to act for another. Many of these are known by specific names, such as bailiffs, factors, brokers, private attorneys, &c. The object of this article is to state the general principles of law, which are applicable equally to all.

In the first place, we shall explain what are the rights and duties with respect to one another, resulting from the relation of principal and agent.

And secondly, what are the rights and duties with respect to third persons, resulting from the relation of principal and agent, or, in other words, what is the effect of the contract implied by law between them, as far as regards third persons.

I. First, of the relative rights and duties of principal and agent.

1. The first great duty of an agent is to use faithfully, and in its full extent, the authority which has been given him.

An agent's authority is said to be limited, when he is bound by precise instructions; and unlimited, when he is not so bound. Where his authority is limited, an agent is bound to adhere strictly to his instructions in every particular. Thus, if instructed to sell, he has no right to barter: nor if instructed to sell at a certain price, is he authorized to take less.

When the agent's authority is not limited by precise instructions, his duty is to act in conformity with what may reasonably be presumed to be the intentions of his employer. And in the absence of all other means of ascertaining what these intentions are, he is to act for the interest of his principal, according to the discretion which may be expected from a prudent man in the management of his own business. Thus, if he is authorized to sell, and no price is limited by his instructions, it should be his endeavour to obtain the best price which the goods are fairly worth. If there have been other transactions of the same nature between the parties, it is to be presumed that the principal intends that the same mode of dealing should be pursued, which, in former cases, he had either prescribed or approved of.

In mercantile transactions it is a rule of universal application, that, in the absence of other instructions, the principal must be presumed to intend that his agent should follow the common usage of the particular business in which he is employed. This, therefore, is the course which it is the agent's duty to pursue; and he will, in all cases, be justified in so doing, even though, under the particular circumstances, he might have acted otherwise to the greater advantage of his principal.

Thus a factor of common right is to sell for ready money, but if he is employed in a dealing or trade where the usage is to sell upon credit, he will be authorized in selling to a person of good credit, and giving such time as is reasonable and customary.

An authority is always to be so construed as to include all necessary or usual means of executing it with effect. An agent is, therefore, authorized to do all such subordinate acts as are either requisite by law, in order to the due performance of the principal objects of its instructions, or are necessary to effect it in the best and most convenient manner, or are usually incidental to it in the ordinary course of business.

Thus it is the duty of an agent employed in the receipt or dispatch of goods, to take care that the custom-house duties are satisfied, and the proper entries made; and he will be authorized in making any advances, as well for such incidental charges as warehouse-room, as for any other expense necessarily incurred for the preservation of the property.

2. The next duty of an agent is, in the execution of his trust, to exercise a proper degree of diligence and skill. He is required to use, in the concerns of his employer, the same diligence and care which would be expected from a prudent man in the management of his own business; and he is bound, without any particular instructions, to take every precaution ordinarily used for the safety and improvement of property intrusted to him.

He is also expected, in common with every professional man who holds himself out as ready, for a proportionate remuneration, to transact any particular kind of business for another,—to possess and exercise such a competent degree of skill and knowledge, as may in ordinary cases be adequate to the accomplishment of the service undertaken.

If an agent does an act which is not warranted by his authority, either express or implied, or if he does an act within his authority, but with such gross negligence or unskilfulness that no benefit can accrue from it, the principal may, at his option, either reject or adopt what he has done. But if he rejects it, he must do so decisively from the first, and give his agent notice thereof within reasonable time; for if he tacitly acquiesce in what has been done, and still more if he in any way act upon it, he will be presumed to have adopted it.

Thus, if an agent puts out his employer's money at interest without his authority, or if a factor, employed to purchase, deviates from his instructions in price, quality, or kind; or if he purchases goods which he might at the time have discovered to be unmarketable, the principal may disavow the transaction; but if, in the first cases, he knowingly receives the interest, or, in either of the others, if he deals with the property as his own, he adopts the act of the agent, and takes upon himself all responsibility for the consequences.

But if he does not afterwards either expressly or impliedly adopt the act, the whole hazard of it lies with the agent, even though he did it *bonâ fide*, and for the interest of his employer. Any profit or advantage that may accrue from it he must account for to his principal; and if loss ensues, he is bound to make it good to him. An agent is likewise answerable to his principal for all damage occasioned by his negligence or unskilfulness. This responsibility applies in all cases, not only to the immediate consequences of his misconduct or neglect, but likewise to all such losses, as, but for his previous misconduct or neglect, would not have occurred: such, for instance, as the destruction of goods by fire in a place where he had improperly suffered them to remain; but it does not extend to such losses by fire, robbery, or otherwise, as are purely accidental, and happen by no default of his own; and his responsibility extends to the whole amount of the damage suffered by the principal, either by direct injury occasioned to his own property, or by his being obliged to make reparation to others.

If an agent's negligence is so gross, or his deviation from his authority so great, as to amount to a breach of the duty created in law, by the relation of principal and agent, or (which is the same thing) to a breach of the contract, which (if none exist) the law, as we have before seen, will imply between them, the agent is liable to an action for such breach of duty or of contract, whether any injury has been sustained by it or not; but if no injury has been in fact sustained, the damages will be merely nominal.

3. The third general duty of an agent is to keep a clear and regular account of his dealings on behalf of his principal, including as well what he has received as what he has paid; to communicate the results from time to time; and to account when called upon, without suppression, concealment, or overcharge.

An agent is not in general accountable for money until he has actually received it, unless he has, by improper credit, or by other misconduct or neglect, occasioned a delay of payment. But an agent acting under a commission *Del credere*, that is, one who has undertaken to be surety to his principal for the solvency of the persons he deals with, is, in their default, accountable for the debt; and in all cases where an agent has actually received money on behalf of his principal, he is bound to take care of it according to the general rules which regulate his conduct; and if any loss is occasioned by the fraud or failure of third persons, he will, unless his conduct be warranted by his instructions, or the usage of trade, be bound to make it good; if a stranger, for instance, calls upon him by a written authority to transfer the money in his hands, and the authority is a forgery, he will remain accountable for all that is transferred under it.

The principal is in general entitled not only to the bare amount of what has been received by his agent, but to all the increase which has accrued to the property while in his possession. The agent is, therefore, accountable for the interest, if any has actually been made, upon the balance in his hands; and likewise for every sort of profit or advantage which he may have clandestinely derived by dealing or speculating with the effects of his principal.

4. It is also the duty of an agent to apprize his principal, with all convenient expedition, of all material acts done or contracts concluded by him.

5. An agent, confidentially intrusted and relied on for counsel and direction—as an attorney, for instance—is rarely allowed, in equity, to take a gift from his employer; especially if it is a grant of the property which he has been employed to manage; and it is also a general principle, that an agent cannot make himself an adverse party to his principal —if he is employed to sell, he cannot make himself the purchaser: such a transaction is liable to be set aside in a court of equity, unless it be made clearly to appear that the principal gave his express consent to it, and that the agent furnished him with all the knowledge he himself possessed: and in like manner, an agent employed to purchase cannot be himself the seller; if he acts as such, he is accountable to his principal for all the profits he has made by his indirect dealing.

We are now to consider what are the obligations of the principal with respect to his agent; in other words, what are the rights of an agent.

1. The first right of an agent is to his commission; that is, the remuneration to be paid to him in return for his services. The amount of commission is sometimes determined by positive agreement between the parties; sometimes it is regulated by the usage of trade; and in some few cases, as of brokerage for the procuring of loans, &c., the amount of commission is limited by act of parliament.

An agent has no right to commission for doing any act not within his authority, unless it is afterwards adopted by his principal. He may also forfeit his right to commission by misconduct: as, if he keeps no account; if he makes himself an adverse party to his principal; or if, in consequence of his negligence or unskilfulness, no benefit accrues to the principal from the services performed.

2. Besides his commission, an agent is entitled to be reimbursed all such advances made on behalf of his principal, as are justified by his authority, whether express or implied, or subsequently sanctioned by his principal. And cases may sometimes occur of urgent danger, without means of refer-

ring for instructions, in which an agent, acting for the best, is justified in making advances without particular directions, and under exigencies not provided for by regular rules of business. Thus if, on account of the lateness of the season, or other good cause, he insures the cargo without orders, he is entitled to charge his principal with the premium, and in such a case even the assent of the principal would be inferred from very slight circumstances. But an agent is not entitled to be reimbursed payments that are merely voluntary and officious; nor expenses occasioned by his own negligence or unskilfulness.

An agent has also, as a further security, a LIEN upon the property of his principal; that is, a right to retain it in his possession in the nature of a pledge for the satisfaction of his demands. Lien is either particular or general. A particular lien is a right to retain the thing itself in respect of which the claim arises. This right is very extensively admitted in our law, and is possessed by bailees in general, and consequently by all agents in the nature of bailees. [See LIEN.] General lien is a right to retain any property of the principal which may come into the agent's possession in the regular course of business. This, being an extension of the general right, exists only where it is created by express contract, the previous dealings of the parties, or the usage of trade. Factors, packers, where they are in the nature of factors, insurance-brokers, and bankers, have, by usage, a general lien in their respective employments.

This right may in general be exercised in respect of any claim to commission or reimbursement, which the agent may have acquired in the due execution of his authority; but it does not extend to demands arising from transactions not within his course of dealing as such agent. An agent can, therefore, have no lien for debts due to him as agent for a third person, nor, as it should seem, for any demands which originated before the commencement of his agency.

An agent's lien does not attach unless the property is actually in his possession: a consignee has, therefore, no lien on goods consigned to him, if the consignor stops them before they come into his hands: nor unless it has come into his possession in the ordinary course of business; he has consequently no lien on property which has been casually left in his office, which has been deposited with him as a pledge for a specific sum, or which he has obtained possession of by fraud or misrepresentation. And if an agent parts with the possession of the property, the lien, being a personal right, is in general lost: but by stat. 6 Geo. IV. c. 83. (the factor's act,) if a factor pledges the goods or commercial documents of his principal as a security for advances made, with notice that they are not his own; or if, without such notice, he pledges them for a pre-existing debt due from himself, the lien of the factor on such goods or documents is transferred to the person with whom they are pledged; that is to say, in other words, he acquires the same right upon them which the factor, while they remained in his possession, could have enforced against the principal.

The right of lien may also be destroyed by the special agreement of the parties; and if the agent enters into a contract with his employer inconsistent with the exercise of the right, (as if he stipulates for a particular mode of payment,) he must be understood to waive it.

We have hitherto considered only the case of hired or paid agents; between whom and gratuitous agents there exists nearly the same difference with respect to their relative rights and duties as between bailees for hire and gratuitous bailees. [See Sir W. Jones, *On the Law of Bailments.*]

The responsibility of a gratuitous agent (the mandatary of the Roman law) is much less than that of one who is paid for his services. He will in general incur no liability, provided he acts with good faith, and exercises the same care in the business of his employer as he would in his own. But if he is guilty of gross negligence, or if, having competent skill, he fails to exert it, he will be answerable to his employer for the consequences. He has of course no right to commission, but he is entitled to be reimbursed for any reasonable payments made, or charges incurred in behalf of his employer. [For the principles of the civil law as to the rights and obligations of principal and agent, see Domat's *Civil Law*, book 1, tit. xv.]

II. Having considered what are the legal consequences of the relation of principal and agent, as far as regards the parties themselves, it now remains to explain the consequences of this relation as between the parties and third persons; and, first, as between the principal and third persons; and, secondly, as between the agents and third persons.

First, then, as between the principal and third persons: it is a general rule that the act of the agent is to be considered as the act of the principal; giving him the same rights, imposing on him the same obligations, and subjecting him to the same liabilities as if he had done it in his own proper person.

A bargain or agreement entered into by an agent is therefore binding upon his principal, whether it tends to his benefit or his disadvantage; and, in order to have this effect, it is not absolutely necessary that it should actually be within the agent's real authority, either express or implied, provided it be within what may most properly be called his *apparent authority*,—that is, provided it is such as the person dealing with the agent might, from the conduct of the principal, reasonably presume to be within his authority.

An authority may be presumed, first, from the principal's having previously authorized or sanctioned dealings of the same nature. Thus, if a person has been in the habit of employing another to do any act,—as, for instance, to draw or indorse bills,—he will be answerable for any subsequent acts of the same nature,—at least, until it is known, or may reasonably be presumed, that the authority which he had given has ceased. An authority may likewise be presumed from the conduct of the principal, with reference to the subject-matter of the transaction in question. For if a person authorizes another to assume the apparent right of engaging in any transactions, the apparent authority must, as far as regards the rights of third persons, be considered as the real authority. Thus, a broker employed to purchase has no authority to sell; and if he does, his employer may (unless the sale was in market overt) reclaim the goods so sold, into whatever hands they may have come. But if the principal has permitted the broker to assume the apparent right of selling the goods, he will be bound by a sale so apparently authorized.

Upon the same principle, where a general agent is employed,—that is, an agent authorized to transact all his employer's business of a particular kind, as to buy and sell certain wares, or to negotiate certain contracts,—he must be presumed to have all the authority usually exercised by agents of the same kind in the ordinary course of their employment: and though the principal may have limited his real authority by express instructions, yet he will not thereby be discharged from obligation incurred in the ordinary course of trade, towards persons who have dealt with the agent without any knowledge of such limitation. Thus where an agent purchases goods on credit, the seller may come on the principal for payment: and this right cannot be affected by any private agreement between the principal and agent, by which the agent may have stipulated to be liable to the seller.

Although the agent is, in all these cases, ultimately answerable to his employer for any damage that may follow from his having entered into an engagement not within his authority; yet the principal is, in the first instance, bound to keep an engagement so entered into by his agent upon a reasonable presumption of authority.

But in the case of a special agent (that is, of a person appointed merely to do certain particular acts), as no presumption of authority can arise from usage of trade, so the principal will not be bound by any act, not within the real authority of the agent,—and it lies upon those who deal with the agent to ascertain what that authority actually is.

Thus, in order to illustrate more fully the difference in this respect between general and special agents,—If a person employs a stable-keeper, whose general business it is to sell horses, to sell a particular horse for him; and he warrants the horse to be sound, inasmuch as the giving such warranty is within the ordinary course of his employment, the owner will be bound by such warranty, even though he may have directed expressly that none should be given; but if he employs another person to sell his horse, whose ordinary business it is not to sell horses,—then, although, if he has given no orders to the contrary, the agent will be justified in giving a warranty, as being a thing incidental to the main object of his employment; yet if he has given express orders that no warranty should be given, and the agent gives a warranty in opposition to his orders, he will not be bound by it.

As the agreement made by an agent, so likewise all his dealings in connexion with it, provided they are within his real or apparent authority. are as binding on the principal, as if they were his own acts.

Thus the representations made by an agent, at the time of entering into an agreement, (if they constitute a part of such agreement, or are in any way the foundation of, or inducement to it,) and, in many cases, even the admissions of an agent as to anything directly within the course of his employment, will have the same effect, as if such representations or admissions had been made by the principal himself. [See EVIDENCE.]

So also if notice of any fact is given, or if goods are delivered to an agent, it will be considered as notice or delivery to the principal. And in general, payment to an agent has the same effect as if it had been made to the principal, and in such cases the receipt of the agent is the receipt of the principal. But such payment is not valid if it is not warranted at law by the apparent authority of his agent.

Thus, if money is due on a written security, as long as the security remains in the hands of an agent, it is to be presumed that he is authorized to receive the money, and payment to him will therefore discharge the debt: but if the agent has not the security in his possession, the debtor pays him at his own risk, and will be liable, in case the agent should not account for it to his principal, to pay it over again.

So also if the principal gives notice to the buyer not to pay the money to the factor with whom he made the bargain, he will in general not be justified in doing so; but if the factor had a lien upon the goods for his general balance, then, inasmuch as his lien will attach upon the price of the goods when they are sold, he has a right to require the buyer to pay him instead of his principal: and such payment to the factor, notwithstanding any notice given by the principal, will operate as a discharge of the debt.

A principal is in general civilly liable for all damage occasioned to third persons by the negligence or unskilfulness of his agent within the scope of his employment; and for any misconduct or fraud committed by him, if it be either at his express command or within the limits of his implied authority.

From this liability, however, it is reasonable that those persons should be exempted, who, though they appear in some degree in the character of principals, yet have no power in the appointment of those who act under them. Thus the post masters-general, and persons at the head of other public offices, have been held not to be liable for the conduct of their inferior officers.

And, on the same principle, the owners and masters of vessels are by statute released from all liability to third persons from the negligence or unskilfulness of the pilots by whom they are navigated into port.

It now remains for us to state what are the effects of the relation of principal and agent, as between the agent and third persons.

An agent is not in general personally responsible on any contract entered into by him on behalf of his principal: to this rule, however, there are several exceptions.

First. If an agent has so far exceeded his authority that his principal is not bound by his act; as for instance, if an agent without any authority undertakes for his principal to pay a certain sum, or if a special agent warrants goods, contrary to his instructions; and the principal refuses to adopt such undertaking or warranty, the agent alone is liable to the person to whom it was given.

Secondly, an agent is liable where the contract was made with him individually. And, therefore, if in any contract made on behalf of his principal, the agent binds himself by his own express undertaking; or if the circumstances of the transaction are such that the credit was originally given to him and not to the principal, (whether such principal were known at the time or not,) in either of these cases he will be liable, in the first instance, to the persons with whom he has so dealt.

And for the same reason, when an agent takes upon himself to act in his own name, and gives no notice of his being employed in behalf of another person—as if a factor delivers goods as his own and conceals his principal—he is to be taken, to all intents, as the principal, and the persons who have dealt with him are entitled to all the same rights against him as if he actually were so. They may, for instance, in an action by the principal on demand arising from such transactions, set off a debt due from the agent himself; which they could not have done, if they had known that he acted only as an agent. And if he afterwards discloses his principal, he is, nevertheless, not discharged from his liability,—those with whom he has dealt may, at their option, come either upon him on his personal contract, or on the principal upon the contract of his agent.

And even where it is known, that the agent acts in a representative character, yet if the principal is not known, or if there is no responsible principal to resort to,—as may be the case with the committee of a club, or the commissioners appointed under a navigation act,—the agent will be personally liable on all the contracts he enters into.

An agent is likewise responsible to third persons for any wrongful acts, whether done by the authority of his principal or not;—and in most instances the person injured may seek compensation either from the principal or the agent, at his option.

An agent cannot delegate to another the authority which he has received, so as to create between his employer and that other person the relation of principal and agent: but he may employ other persons under him to perform his engagements, and the original agent is responsible to his principal as well for the conduct of such sub-agents, as for his own: but with respect to damage sustained by third persons from the wrongful acts of such sub-agents, the case is different; such damages must be recovered either from the person who in fact did the injury, or from the principal for whom the act was done. The original agent is responsible to third persons only for his own acts, and such as are done at his express command.

The misconduct of an agent, besides the civil responsibility which it imposes on him, amounts in some cases to a misdemeanour, subject to very severe punishment. For if an agent intrusted with any money or valuable security, with written directions to apply the same in any particular manner, in violation of good faith converts it to his own use; or if an agent intrusted with any chattel, valuable security, or power of attorney for the transfer of stock, either for safe custody, or for any special purpose, in violation of good faith, and without authority, sells or pledges, or in any manner converts the same to his own use, he is in either case guilty of a misdemeanour punishable with fourteen years' transportation. [See EMBEZZLEMENT.] But this does not extend to prevent his disposing of so much of any securities or effects on which he has a lien or demand, as may be requisite for the satisfaction thereof. There are other special misdemeanours and misconduct of which an agent may be guilty, as to which and their penal consequences, see 7 and 8 Geo. IV. c. 29. In the Roman and Scotch law, the relation of principal and agent is treated under the term *Mandate*, the principal being called the *Mandant*, and the agent the *Mandatary*. In modern Scotch law, however, which recognises the English law on this subject, the word *Factor* is usually applied instead of mandatary or agent.

AGESILA'US, younger son of Archidamus, king of Lacedæmon, succeeded his brother Agis, B.C. 398, to the exclusion of his nephew Leotychides, who laboured under the stigma of bastardy, being believed to be the son of Alcibiades, and not of Agis, his reputed father. As the crown descended in direct line from father to son, the succession of Agesilaus seemed, in his youth, to be barred; and his education was conducted as that of a private person, in all the strictness of Spartan discipline. He was lame, and advantage was taken of this to excite a prejudice against him: yet so high was his personal character, or so general the belief in the spurious birth of Leotychides, that by a vote of the general assembly, the heir-apparent was passed over, and Agesilaus was appointed king.

In the first year of his reign, a plot was formed to effect a change of government. The political constitution, established by Lycurgus, had degenerated into an oligarchy of a peculiar kind. Almost all political power, with the exclusive right to hold high civil or military office, was engrossed by those families who boasted to be of pure Spartan blood, the term *Spartan* being opposed to *Lacedæmonian*. This Spartan caste is supposed to have consisted of the legitimate and unmixed descendants of the original Dorian conquerors: the Lacedæmonians are conjectured to have been the progeny of enfranchised Helots, strangers associated into the citizenship, a remnant of the Achæi, and in a word, all who could not trace an unblemished line of Spartan descent to the early ages of the monarchy. Foreigners might become members of the community and Lacedæmonians: but they could never become Spartans; at least, Herodotus only knew of two instances up to his time (ix. 33, 35). The consequence was, that the bulk of the population became constantly more Lacedæmonian; in the time of Agesilaus, the number of Spartans had so dwindled, that they could not be spared for foreign service in any rank below that of commanders. The ephori, and all the leading officers of administration, civil and military, were taken from this privileged caste. The object of Cinadon's conspiracy, who complained that he counted only forty Spartans in the *agora*, or place of assembly, and that these were all official persons, was to extend the right of holding these high offices to all citizens. As happens in a majority of cases, the plot was discovered before it was ripe; Cinadon, the author and ring-leader, was executed, and the Spartans held fast their monopoly.

In order to prosecute more effectually the war with Persia (B.C. 396), Agesilaus was sent to command in Asia. At setting out, he pledged himself either to conclude an honourable peace, or to press his enemies so as to disable them from giving any further disturbance to the Greeks. His first object was to conciliate the Asiatic cities by prudent management and liberality; and he succeeded in reconciling their factions. It may be doubted whether the design of Agesilaus was limited to the protection of the Greek states of Asia. The recent example of the successful retreat of the *ten thousand* (see ANABASIS), the powers with which Agesilaus was invested, and the disorganized state of the Persian monarchy, would perhaps have tempted him to penetrate as far as Susa and Ecbatana, had he been allowed to follow up his successes. But the war that broke out in Greece, after he had been about two years in Asia, saved the Persian monarchy for a time, and reserved the triumph of its overthrow to the Macedonians and Alexander.

The intrigues of the Persians and the hatred of the Spartan influence had occasioned a dangerous league to be formed against Sparta; nor were the Spartans sorry to have an opportunity for going to war, especially against the Thebans, whom they detested for various causes (Xenophon *Hellenic.* iii. 5). Thebes, Argos, and Corinth declared against the Lacedæmonians, and Athens followed the example at the pressing instance of the Thebans. The ephori ordered Agesilaus home: in the height of his glory, and with the prospect of victory, he instantly obeyed. The Lacedæmonians and their enemies met near Coroneia in Bœotia, and a fierce battle took place (August, B.C. 394). The Thebans alone made a gallant resistance; and the Spartan king was wounded, who obtained only a doubtful victory. He returned to Sparta, not importing with him the luxuries of Asia, but adhering to the temperance and frugality characteristic of his country's discipline. Those virtues were peculiarly Spartan: and that nation was not exempt from the meanness of jealousy. The probability of Athens recovering her former power after her walls were rebuilt (B.C. 392), induced the Spartans to send Antalcidas (B.C. 387) with proposals to Persia, favourable to themselves, but disadvantageous to the rest of Greece. The bearer of these offers was the personal enemy of Agesilaus, and was supposed to have a mean pleasure in lessening his power and tarnishing his glory. The Persians dictated the treaty in the language of conquerors (Xen. *Hellen.* V., i. 31). All the Grecian cities of Asia were to be subject to the king of Persia: all the rest to be independent: the king was to keep possession of Cyprus and Clazomenæ; and the islands Lemnos, Imbros, and Scyros, were given to the Athenians, to whom they formerly belonged. Artaxerxes concluded with denouncing war against those who should not submit to his terms. The Thebans refused; but their steadiness was shaken by preparations for coercion on the part of the ephori, invidiously recommended by Agesilaus, in revenge for a former affront. Thus the bad policy of the Greeks, arising from their foolish dissensions, annihilated the advantages which should have been the fruit of victories and military virtue of no common stamp. Sparta had now, though not worthily, recovered her power in Greece. Her virtues, indeed, were to be found rather in adversity than prosperity; nor did she profit by her own experience, that tyranny leads to the destruction of the tyrant. Phæbidas, one of her generals, on his march into Thrace against Olynthus, was encamped in the neighbourhood of Thebes, while parties were so nearly balanced, that Ismenias and Leontiades, the heads of opposite factions, exercised the chief magistracy together. Leontiades, who courted the friendship of Lacedæmon, secretly introduced Phæbidas and his troops into the Cadmeia, the citadel of Thebes (B.C. 382). This at once gave the superiority to that party of which he was the head: Ismenias was apprehended, and 400 of his friends immediately fled to Athens. Complaint was made at Sparta of this treacherous aggression in time of peace. Agesilaus was, in general, more just and liberal than the rest of his countrymen; but he contended that it was necessary to examine whether the possession of the Cadmeia was of advantage to Sparta, to which every other consideration must give way: and in this instance, he not only discredited, but contradicted his better thoughts. On a former occasion, speaking of the king of Persia, he said, 'Can this king, whom you call Great, be more so than I, if he be not more just?': this anecdote rests on Plutarch's authority. The decree of the Spartans was, as we might expect, in their own favour. The assembly resolved to keep the citadel, and to bring Ismenias to trial, who had been seized and imprisoned by his opponent, ostensibly on the vague charge of seeking Persian connexions, but really for the vote which he had carried, forbidding any Theban to join the army of Phœbidas. But a counter-revolution was soon effected; and the Spartans were compelled to evacuate the citadel.

That the Lacedæmonians, when now at the height of power, were all at once involved in a train of misfortunes which effectually broke that power, is ascribed by Xenophon to the divine anger against their perfidious seizure of Thebes. Agesilaus probably had come round to the same opinion; for he excused himself from the command of the army sent to reduce the Theban revolutionists, on the plea of being weighed down by age. His colleague, Cleombrotus, was appointed in his stead. The events which occurred during the absence of Agesilaus, form no part of the present subject. On returning home, Cleombrotus left Sphodrias at Thespiæ, in command of part of his army. Sphodrias, whether from his own folly, or, as many believed, induced by Pelopidas, made a most unwarrantable and faithless inroad upon Attica. The Athenians complained to Sparta, and Sphodrias was recalled, and brought to trial. Unfortunately, Agesilaus was persuaded to exert his influence in the delinquent's favour and he was acquitted; at which the Athenians were so much offended, that they immediately concluded an alliance with Thebes against Sparta. Agesilaus then resumed the command, and held it through two successive campaigns, till obliged to resign through failing health.

The battle of Leuctra, (B.C. 371,) in which the Lacedæmonians under Cleombrotus were overcome by inferior numbers, produced a striking instance of Spartan character. The news arrived at Sparta during a religious festival, but the ephori did not allow the celebration of it to be interrupted. The list of the slain was sent to the houses of their kindred, and the women were told to bear their sorrows in silence. Those parents whose children had met with a glorious death went abroad the next day to receive congratulations; the friends of the survivors kept their houses, as if in shame and sorrow. On this occasion, a number of the combatants having fled, Agesilaus was allowed to suspend the law, which visited cowardice with disgraceful punishment. He prudently announced that it might sleep for one day only, and then resume its power.

There was a proverb, frequently repeated by Agesilaus, 'That a Spartan woman had never seen the smoke of an enemy's camp:' but he had the mortification to see his proverb belied. The Theban army increased daily by the defection of the allies of Sparta: it penetrated into Laconia, and laid waste the whole country; the city, however, was saved by the prudence of Agesilaus, who shut himself up in Sparta, and avoided an engagement. Epaminondas did not venture to assault the city; and at last, his allies growing weary of the service, the winter approaching, and relief coming to Sparta from Athens, the Theban general found it necessary to retreat.

After the death of Epaminondas, at the battle of Mantinæa, (B.C. 362,) the weariness of all parties produced a partial cessation of hostilities. Agesilaus was now above eighty years old, but he had still vigour enough left to lead an army into Egypt, to assist the Egyptians who had rebelled against the Persian king. According to Plutarch, Agesilaus went expressly to help Tachos against his master King Artaxerxes II.; but a rival to Tachos starting up in the person of Nectanebos, another Egyptian, Agesilaus found it convenient to change sides. That his motives were not of the purest kind, may very safely be asserted. After establishing Nectanebos in the government of Egypt, the old king set out on his voyage homewards, loaded with money and presents, the reward of his services and his treachery. Being driven by contrary winds on the coast of Africa, he died there at the advanced age of eighty-four. His attendants preserved the body in melted wax, and took it to Sparta to be buried, consistently with the usages of their country, which did not allow the body of a king to rest in a foreign land.

The character of Agesilaus is exalted by Xenophon far above its merits. The historian was on terms of personal intimacy with the Spartan king, and was besides no great admirer of the constitutional forms of Athens, his native city, which he loved to contrast disadvantageously with those of Sparta. We may admire the energy and vigour of Agesilaus, and grant him a full share of those peculiar virtues, as they are termed, which characterized his country. He may also have been temperate in his habits, kind to his friends, and not cruel to his enemies; but more than one public act of his life is of such a description as to throw suspicion on his integrity as an individual and a statesman. (See Plutarch's *Life of Agesilaus*; Xenophon's *Hellenica*, and *Panegyric on Agesilaus*; Pausanias, iii. 9.)

AGGERHUUS, a name of one of the five great divisions of the kingdom of Norway, better known under that of CHRISTIANIA.

AGGERZEEN, the name of a species of large antelope, mentioned by Pearce, in his *Account of his Residence in Abyssinia*. Unfortunately he gives no account of its form, nor description of its characters, and the only information which he affords of its habits is, that it occasionally mixes with the herds of domestic cattle which graze in the vicinity of the forests, and that the natives esteem its flesh for making brind, that is, meat cut into long slices of the breadth and thickness of a man's hand, and dried in the sun. This meagre account is insufficient to enable us to identify the species; but if, as we suppose, the aggerzeen of Pearce be the same animal which Salt mentions in the *Appendix to his Second Journey*, under the name of agayen, it would appear, according to the report of that traveller, to be the koedoe of the Cape, the antelope *Strepsiceros* of naturalists; a species which inhabits moist, woody situations, and to which the physical characters of the low parts of Abyssinia are in all respects well adapted. We have not been able to find the name in Lobo, Poncet, Bruce, or any other traveller. (See ANTELOPE, *Strepsiceros*.)

AGHRIM, a village in the county of Galway, in Ireland, famous for the great victory obtained in its neighbourhood, on the 12th of July, 1691, by the forces of King William, commanded by General Ginkell, over those of King James, commanded by General St. Ruth. The latter were 25,000 strong, and very advantageously posted; the former amounted only to 18,000, and had to march to the attack through a bog, in which they sunk up to the middle. The result was in a great measure owing to the circumstance of General St. Ruth being killed by a cannon ball in the early part of the action; and the officer who took the command having, through a jealousy which subsisted between them, been left in ignorance of the dispositions of his superiors. The attack of the English, however, was singularly bold in conception, and the impetuosity with which it was commenced was sustained in a manner which has probably never been surpassed. The victors, not satisfied with gaining the battle, followed up their success with a terrible slaughter of the defeated and flying enemy, whom they pursued till night-fall: no fewer than 7000 are said to have been destroyed. Only 450 prisoners were taken. The loss of the English did not exceed 700 killed, and 1000 wounded. All the enemy's baggage and ammunition fell into their hands, and the victory was followed by the immediate and complete submission of Ireland. The accounts of this battle mention an old castle of Aghrim, which was occupied by a party of the Irish infantry. In Archdall's *Monasticon Hibernicum* it is stated, that there was formerly here a priory of canons regular of St. Augustine, which was said to have been founded in the 13th century. Aghrim parish is a rectory in the diocese of Clonfert, the patron being the diocesan. It is partly in the barony of Clonmacnoon, but chiefly in that of Kilconnel. The Kilconnel section contains the village. The latter has a clean and snug appearance, having a neat parish church, and an embowered glebe-house to adorn it. To the north-east of the village is a bog one mile long, said to be the wettest that can be met with in Ireland. There is another Aghrim in Wicklow, which is a market-town, situated on the banks of the Ovoca, or Avoca, thirty-five miles from Dublin. There is also a village named Aughrim in the county of Roscommon.

AGINCOURT, or **AZINCOUR**, a village in the department of Pas de Calais, France, in the ancient province of Artois, celebrated for a great victory obtained by the English under Henry V., over a French army vastly superior in numbers. Encouraged by the distracted condition of France, where the imbecility of Charles VI. had allowed the quarrels of the nobility to reach a great height, prompted by his own ambition, and perhaps desirous of finding employment for the turbulent spirits of his own court, the English monarch, in 1415, conveyed over to Normandy (the hereditary possession at one time of his ancestors) a considerable army, and having reduced the town of Harfleur near Havre, set out for Calais. The siege of Harfleur occupied thirty-six days; and the loss sustained by the English, principally by sickness, during this period, was immense. Upon reaching Abbeville and Amiens, Henry found the passes of the Somme guarded, and the bridges broken down; but, having erected a temporary bridge, at a place called Nesle, he passed his army over, and, pursuing his route, came to an engagement with his opponents on the 25th of October in the year above-mentioned. The disparity of forces was very great: the English army, at the commencement of the invasion, consisted of about 2500 men at arms, 4000 archers on foot and as many on horseback, and other troops to the number of 1000; but the attendants of the men at arms and other followers swelled the whole to about 30,000. The loss during the siege, the garrison left to defend the conquest, the ravages of disease (the dysentery), and the desertion of several, reduced this force exceedingly. An ancient muster-roll, still extant, gives 812 as the number of men at arms who were with the king at Agincourt, and 3071 archers; so that, allowing two attendants to each man at arms, we have a total of rather more than 5500. No ancient English writers make the number more than 10,000; and two French writers, one of whom was with the English army, say it was about 11,000 or 12,000 Other French writers make it 15,000, 18,000, or even 20,000. The accounts of the number on the other side differ as widely, varying from 50,000 to 150,000.

The previous night was passed by the English near the village of Maisoncelles, in preparing their weapons, confessing themselves, and receiving the sacrament; by the French, who were posted a mile off, between Ruissauville and Agincourt, in gaming and drinking. The descriptions of Shakspeare, in which these circumstances are mentioned, are supported by the contemporary chroniclers. In the morning the armies were formed. The English archers were posted in front, supported by the main body under the king in person, and flanked by the wings under the Duke of York and Lord Camoys respectively. The baggage had been left under a guard near Maisoncelles, and with it several priests on horseback, who put up their prayers for the success of their countrymen. The archers, to whom the victory was mainly owing, wore little armour, but, in addition to their bows, they had hatchets or swords hanging from their girdle; many were barefooted and had no hats, while others had leather caps crossed with iron. Henry had, during the march, ordered them to provide themselves with long stakes, which they might plant before them to resist the charge of cavalry.

The French were drawn up in three lines; the first under D'Albret, Constable of France (who commanded in chief), accompanied by many noblemen; the second under the Duke of Alençon, the Duke of Bar, and others; and the third under Counts Marle, Dampmartin, &c. The ground, being between two woods, was too narrow for them to avail themselves usefully of their superior numbers; and a heavy rain which had fallen the night before, and the trampling of the horses, who were kept moving all night by the pages, had broken it up.

Henry, who had heard mass in the morning, addressed his little army; and after an unavailing negotiation (commenced by the French), Sir Thomas Erpingham, who had drawn up the archers, threw up his truncheon, and gave the signal for the attack. The volleys of arrows did fearful execution among the French, while the stakes of the archers enabled them to repel the attack of some cavalry on their flanks. They gave way, indeed, for a minute, to the charge of the French line under the Constable, but, rallying, they cast aside their bows, and made havoc with bill-hooks and hatchets. The French pressed on over the dead until they were piled up almost to the height of a man, and then the English mounted on the heaps, and slaughtered their enemies, whose heavy armour and crowded array rendered them almost incapable of resistance. The first and second lines of the French were routed, notwithstanding a brave attempt of the Duke of Alençon to rally his forces. That nobleman exchanged blows with the king himself, and was slain, as were a vast number of knights and noblemen. The third line fled, with the exception of their leaders and a few others, who were either killed or taken; and, after a contest of three hours, the victory remained with the English. During the battle the baggage of the victors was plundered by some peasants and a few men at arms; and upon a report of this, and of the rallying of the French rear, Henry ordered the prisoners taken to be slain. This cruel order was, except with respect to a few men of rank, complied with.

The loss of the respective armies is variously stated: that of the French was probably 10,000, including the Constable, three Dukes, five Counts, and ninety Barons. The victors lost probably 1200, including the Duke of York, the Earl of Suffolk, and one or two other persons of rank. Henry continued his march to Calais, which he reached on the 29th, and from thence proceeded to Dover and London, which last he entered, with great pomp, on the 23rd of November. The immediate consequences of the battle were by no means important. It was a useless display of valour, prompted by personal ambition. Upon such fearful scenes of carnage mankind will, one day, look with astonishment and shame, instead of admiration. [See Nicolas's *History of the Battle of Agincourt*, 1827.]

AGIO, a term generally used to denote the per centage difference existing between the values of the current and standard monies of any place. The metallic currency of wealthy states generally consists of its own coin exclusively, and it is in the power of the state to prevent the degradation of that coin below the standard, so that no calculations of agio, strictly so called, are rendered necessary. In smaller states, the currency seldom entirely consists of their own coin, but is made up of the clipt, worn, and diminished coins of the neighbouring countries with which the inhabitants have dealings. Under these circumstances, banks were, at different times, established by the governments of Venice, Hamburg, Genoa, Amsterdam, &c., which, under the guarantee of the state, should be at all times bound to receive deposits and to make payments, according to some standard value. The money, or obligations of these banks being better than the fluctuating and deteriorated currency of the country, bears a premium equivalent to the deterioration, and this premium is called the agio of the bank.

To facilitate his money dealings, every merchant trading in a place where the deterioration of the currency is thus remedied, must have an account with the bank for the purpose of paying the drafts of his foreign correspondents, which drafts are always stipulated to be paid in bank or standard money. The practice being thus universal, the commercial money payments of the place are usually managed without the employment of coin, by a simple transfer in the books of the bank from the account of one merchant to that of another. The practical convenience, which this plan of making their payments affords to merchants, who would otherwise be obliged, when discharging obligations incurred in standard money, to undergo troublesome and expensive examinations of the various coins in use, causes the money of the bank to bear a small premium above its intrinsic superiority over the money in circulation, so that the agio of the bank does not usually form an exact measure of that superiority.

The term agio is also used to signify the rate of premium which is given, when a person having a claim which he can legally demand in only one metal, elects to be paid in another. Thus in France, silver is the only legal standard, and payments can be demanded only in silver coin, a circumstance which is found to be so practically inconvenient, that the receiver will frequently pay a small premium in order to obtain gold coin, which is more easily transportable; this premium is called the agio on gold.

AGIS. Four kings of Sparta have borne this name. The first was the son of Eurysthenes, and grandson of Aristodemus, to whom Laconica was allotted after the Heracleid invasion. Aristodemus had two sons, Eurysthenes and Procles: and this Agis was, therefore, the second in one of the series of that double race of kings, which reigned conjointly. No certain dates can be assigned to these early times. The other kings bearing this name were of the race of the Proclidæ. (See Pausanias, iii. 2.)

AGIS II. the son of Archidamus, reigned from B.C. 427 or 426 to 397, and was actively engaged in the Peloponnesian war. In the fourteenth year of the Peloponnesian war, the Lacedæmonians endeavoured to recover their influence in Peloponnesus, and marched out with all their force under Agis. His generalship was so skilful, that the Argeian army, against which his operations were directed, was completely hemmed in, and exposed to great danger. Two Argeians went privately to Agis, and pledged themselves to effect a reconciliation between their country and Lacedæmon, if he would grant a truce of four months. To this he consented on his own authority. The order to retreat was heard with astonishment by the army of Agis, and the Argeians, on their part, were highly incensed against their countrymen for having defrauded them of an opportunity, as they thought, of destroying the enemy. The Lacedæmonians were loud in their displeasure against Agis for his retreat. He was called to account, and it was proposed to fine him, and demolish his house; but his humble demeanour and earnest entreaty prevailed, and he was allowed to resume the command, under the mortifying restriction of a superintending council. But he made amends, a short time after, by defeating the Argeians, and their allies the Athenians, in a great battle. [Thucydides, v.—Pausanias, iii. 8.]

In B.C. 421, the Eleians had been involved in a dispute with Sparta, which afterwards led to their taking a part in the war just alluded to, as allies of the Argeians. Agis conducted an army into Elis, which yielded him abundant spoil, since it had usually been accounted sacred ground, as the scene of the Olympic festival, and therefore exempted from the ravages of war. The resort of strangers to the games also brought a great accession of wealth. The city of Elis, as neutral ground, was unfortified; and Xenophon says, that Agis was supposed rather to be unwilling than unable to capture it. At the siege and surrender of Athens, accompanied with the mortifying demolition of the long walls, and the fortifications of Peiræeus, Pausanias and Agis, the two kings of Sparta, with the whole strength of the Peloponnesian allies, conducted the operations by land, while Lysander blockaded the city with his fleet. Agis was succeeded by his brother Agesilaus. [See Agesilaus.]

AGIS III., the son of another Archidamus, reigned from B.C. 338 to 331 or 330. At the time of the battle of Issus, (B.C. 333,) Agis was communicating with the Persian naval commanders in the Ægean, to obtain supplies for the war against the Macedonians. While Alexander was engaged in his fourth campaign in Asia, (B.C. 331,) an action between Agis and Antipater, whom Alexander had left governor of Macedonia, took place in Peloponnesus. Authorities differ as to the precise date of the battle: Plutarch ascribes it to the year here mentioned; Diodorus places it one year later. The Lacedæmonians had formed the siege of Megalopolis, which however held out till the arrival of Antipater to its relief. A bloody battle was fought, in which the Lacedæmonians behaved with their accustomed gallantry, but were overpowered by superior numbers. Agis, their king, fell after this phalanx was broken, and with him more than five thousand three hundred of the Lacedæmonians and their allies. After this defeat they sued for peace, and obtained it: giving hostages that they would submit to Alexander's decision on their fate. (Pausan. iii. 10. Arrian, ii. 13.)

AGIS IV., son of Eudamidas II. (B.C. 244). On his accession to the throne, at the age of twenty, at a period when the public manners had degenerated from their ancient severity, Agis undertook the task of restoring the institutions of Lycurgus. His system carried with it its best recommendation, and the sure pledge of its sincerity, in his own personal example. But unfortunately, both for himself and his country, his colleague, Leonidas, had formed his habits in the luxurious court of Seleucus, king of Syria. The manners of the mass of the people, as well as of the rich, had become tainted, and so wide as well as general had been the departure from the original pattern of conduct, that it seemed hopeless to attempt a general correction of abuses. The privileged class, to whom the name of Spartans was confined, was now reduced to seven hundred heads of families, of whom not more than one hundred enjoyed wealth; such was the effect of the inequality introduced by intercourse with strangers, and especially the Persians, and by the gains attendant on success in war. The oligarchy was rich, haughty, and licentious; the poor were oppressed and burdened with debt. These considerations suggested the immediate adoption of measures, sanctioned by the venerable authority of Lycurgus; but the event proved the hopelessness of reform, when the evils of corrupt government had worked their way into the sentiments and habits of the people. The two great features of the proposed reformation were, the renewal of the partition of the lands, and the abolition of all debts; the latter measure, which must in all cases necessarily be one of injustice, throws suspicion on the character of Agis, who otherwise might pass for an honest reformer. But the rich and luxurious, as Plutarch has it, shuddered at the very name of Lycurgus, like runaway slaves about to be led back to their masters. Agis also proposed adopting as an act of the legislature, what Cinadon, in the reign of Agesilaus, (see AGESILAUS,) had attempted to effect by conspiracy; namely, to abolish the distinction between Spartans and Lacedæmonians, retaining that between the Lacedæmonians and the Periœci, or people of the smaller towns. These latter, however, were to be trained in the strict discipline of Lycurgus, and to succeed to the privileges of citizenship as vacancies occurred. In laying his proposals before the senate, Agis recommended them most strongly by the offer of the first personal sacrifice, in the contribution of his own lands and money to the common stock. His mother and his kindred followed his example. The multitude applauded: but Leonidas and the rich men opposed the plan, and persuaded the senate to reject it: the question was lost only by a majority of a single vote. To rid himself of Leonidas, Agis contrived to get Lysander appointed one of the ephori; who forthwith accused Leonidas of having violated the laws, by marrying a stranger, and residing for a time in a foreign land; two acts forbidden to the race of Hercules. Leonidas could not venture to make his appearance: he was therefore deposed, and his crown devolved to his son-in-law, Cleombrotus, who co-operated with Agis in his measures of reform. On the expiration of Lysander's office, a reaction took place. As the reformers now despaired of succeeding by mild means, Agis and Cleombrotus went to the place of assembly, plucked the ephori, now of the anti-reforming party, from their seats, and placed others in their room. This violence was not followed up by personal injury. The life of Leonidas, who had returned into the city during the short triumph of his faction, was threatened; but Agis himself protected him from assassination, meditated against him by Agesilaus, who was the uncle of Agis. The want of sincerity in this unworthy relation of the reforming king occasioned the failure of the scheme, when all its difficulties seemed to have been nearly overcome. Agesilaus was deeply involved in debt: he therefore persuaded the two kings to burn all deeds, registers, and securities in the first instance. When the division was proposed, he devised repeated pretexts for delay. Before the first measure, owing to these underhand practices, could be completed, the Achæans, who were allies of Sparta, applied for assistance against the Ætolians, who threatened to lay waste the country of Peloponnesus. Agis was, therefore, unavoidably sent to command the army, and exhibited the same republican virtues in his military office, as in his civil administration. His popularity was deservedly great; and it enabled him, notwithstanding the licentious spirit of the times, to preserve the strictness of ancient discipline. He now joined his forces to those of Aratus, whose over-caution left no room for enhancing the glory of the Lacedæmonian soldiery: but the conduct of the troops, and the rigid performance of every duty on the part of their commander, impressed both the allies and the enemy with respect for the commonwealth.

On the return of Agis, he found that a change had taken place in the condition of his country. The poor had been disgusted by finding, that although Agesilaus was again one of the ephori, the lands were not divided according to promise. Their anger was natural enough, but they directed it unjustly and unwisely. They threw themselves into the party of their own enemies, and suffered them to dethrone Cleombrotus and restore Leonidas to power. The tide of popular favour had turned against Agis, and he was compelled to fly to sanctuary. Some treacherous friends entrapped him, got possession of his person, and dragged him to prison. Being questioned by the ephori, whether he did not repent of having introduced innovations into the state? he replied, that in the face of death, he would not repent of so worthy an enterprise. He was condemned, and executed with indecent haste; the plea for this was, the danger of a rescue. One of his executioners was moved to tears. Agis, observing this mark of feeling, said, 'Lament me not; though I suffer unjustly, I am happier than my murderers.' The cruelty of the victorious party did not end here: his mother and grandmother were strangled on his body. His reign lasted only four years. His widow was forcibly taken out of her house by Leonidas, and married against her will to his son Cleomenes. Though a husband by compulsion, Cleomenes was attached to his wife, whose conversation inspired him with the desire of accomplishing the projected reform. [See CLEOMENES.] (Plutarch's *Life of Agis.*)

AGISTMENT. A legal term in the law of England, taken from an old French word, *gister*, 'to lie down.' When the owner of land depastures the cattle of another person at a certain rate per week or month upon his ground, he is said to *agist* such cattle; because the stranger's cattle are permitted *agister*—that is, to lie down, or be domiciled in the particular land. There is also *agistment of sea-banks* where lands are charged with a tribute to keep out the sea. Such lands are called *Terrae agistatae.*

AGNA'NO, a remarkable lake near Naples, not far from the road leading to Pozzuoli and Bajæ. Its bed is supposed to have been formerly the crater of a volcano; it is about three miles round, and entirely surrounded by hills rising in the form of an amphitheatre. Some antiquaries have started the supposition, that this lake was originally the fish pond of Lucullus' villa, that wealthy Roman having had a magnificent residence in this neighbourhood. The banks of Agnano present a striking scene of solitude; hardly any habitation is to be seen on the slope of the hills; the country is very unwholesome in summer, and the malaria is increased by the practice of the country people steeping large quantities of flax in the water of the lake. The pestilent effluvia reach high up the hills, even to the convent at the summit of Mount Camaldoli, from which there is perhaps the finest view in all the neighbourhood of Naples. Tradition says, there was formerly a town on the site of Agnano, which was swallowed up in some earthquake, the epoch of which is unknown. Near the banks of the lake are the natural vapour-baths of San Germano, which are beneficial in cases of rheumatism and gout. On the opposite side is the famous *Grotta del Cane*, a small cave in the rock from the ground of which a mephitic vapour issues, which has the power of depriving a dog or other animal of all sensation in a few minutes. There is no mention in the ancient writers, either of Agnano or of the Grotta, only Pliny the Elder says in his Natural History, that in the country about Puteoli there were vents in the ground from which deadly vapours arose. Traces of ruins of mosaic pavements, and stoves for baths, are found scattered in the neighbourhood. On the western side of the lake rises the volcanic hill of Astroni, the extinct crater of which, about four miles in circumference, has been converted into a royal park and preserve, planted with large trees, and abounding in game of every description.

AGNE'SI (Maria Gaetana) was born at Milan in 1718. When very young, she distinguished herself by the acquisition of various languages; she is said to have understood Latin, Greek, Hebrew, French, German, and Spanish. She then turned her attention to mathematics and philosophy, and at the age of 19, wrote in defence of 191 theses which were published in 1738, under the title of *Propositiones Philosophicæ.* In 1748, she published her celebrated work, *Instituzioni Analitiche ad uso della Gioventù Italiana*, in two volumes, 4to. The first volume contains the elements of Algebra, with the application of Algebra to Geometry; the second contains an excellent treatise on the Differential and Integral Calculus. In 1750, her father, who was then a professor of the university of Bologna, being ill, she obtained permission from the Pope Benedict XIV. to supply his place. She ended her career, but in what year we cannot ascertain, by retiring into a convent, and taking the veil. She died in January, 1799, aged 81.

The second volume of the *Analytical Institutions* was translated into French by D'Antelmy, with additions by Bossut, and published at Paris in 1775. The whole was translated into English, and published at the expense of Baron Maseres in 1801.

There is an éloge of Agnesi by Frisi, translated into French by M. Boulard, which we have not been able to obtain.

AGNOLO, BACCIO d', a Florentine, was at first a wood-engraver, and afterwards an architect. He was born in 1460, and had already acquired considerable reputation in the practice of his earlier profession at Florence, when he was attracted to the study of architecture, and went to Rome to pursue it among the remains of antiquity there. He appears, nevertheless, during his residence in Rome, to have continued to employ himself in his art and business as a wood-engraver, probably for the means of subsistence, and his study or shop was frequented by the most eminent men of taste and learning then in Rome. Among these were Raffaelle, Michael Angelo, Sansovino, and the brothers Sangallo.

On settling himself as an architect in Florence, Baccio was engaged in several works of importance there, and acquired notoriety of a disagreeable nature through deviations from the ordinary practice of the time. He adorned the windows of a mansion or *palazzo*, (as the Italians term the large town-house of a distinguished person,) in the Piazza di Santa Trinità, with frontispieces, and put a frontispiece, consisting of columns with a regular entablature, to the portal, in the manner, indeed, which has been so commonly practised ever since, and is at the present time in vogue, but which had been restricted to churches up to this time. All the wits in Florence set upon poor Baccio, who was lampooned and ridiculed in every possible way, for making, as it was said, a palace into a church; indeed, he was almost induced to retrace his steps, but being conscious that he had done well, 'he took heart and stood firmly.' It was a novelty, and as the biographer of all the architects says, 'like almost all other novelties, it was at the first scorned and afterwards worshipped.' But the same writer is somewhat severe on him for making, perhaps, too bold a crowning cornice to the front of this identical edifice, saying, that it looked like a boy with a huge hat on his head!

Baccio had been engaged to complete the architectural arrangements about the tholobate or drum of the cupola of the metropolitan church of Santa Maria del Fiore, which were left incomplete by Brunelleschi, and whose design for that part was lost. Baccio was about to supply what was wanting after his own invention, and had begun to cut away the toothings left by Brunelleschi in the work because they did not suit what he proposed to do. At this juncture Michael Angelo happened to come to Florence from Rome, and attacked him so violently on the unfitness of his design, that Baccio was stopped, and in consequence of subsequent disputes on the subject, the edifice, in that particular, still remains incomplete.

Baccio d'Agnolo died in 1543, being eighty-three years of age, and left a son Giuliano, an engraver and architect, who succeeded to the direction of his father's works. The most esteemed of Baccio's productions are the villa Borghesini, near Florence, and the campanile or bell-tower of the church di Santo Spirito (a production of Brunelleschi's), in Florence. By some writers, the great palazzo Salviati, in the Transtiberine portion of Rome, is attributed to this architect, but it is more commonly referred to Nanni di Baccio Bigio, a man of far inferior merit and reputation to Baccio d'Agnolo.

A'GONUS, in Ichthyology, a genus of Acanthopterygious fishes, first separated from the Cotti by Block, and afterwards adopted, by Lacepede and Pallas, under the different names of Aspidophorus and Phalangistes. The greater number of the species belonging to the genus Agonus are found in the northern Pacific ocean, particularly along the coast of Japan, and northwards as far as Behring's Straits. They are all of diminutive size, never exceeding nine or ten inches in length, and are no where used as an article of human food. One species only, the Pogge, (*A. Europæus*,) inhabits our own coast, as well as the coasts of France, Holland, Iceland, and even Greenland; it is also found in the Baltic, but according to Baron Cuvier, never in the Mediterranean, though Brunnich expressly affirms the contrary.

[Agonus Accipenserinus.]

The reader who desires a detailed description of the characters of this genus is referred to Schneider's edition of Block's *Systema*; the *Spicilegia Zoologica* of Pallas; an excellent monograph of the genus by Tilesius, in the fourth volume of the *Memoirs of the Academy of Sciences of Petersburg*, and more particularly, the *Histoire Naturelle des Poissons*, of the late Baron Cuvier and M. Volenciennes.

AGOSTA, OR AUGUSTA, is a sea-port town on the south-east coast of Sicily in the *Val di Noto*. The town was built in the 13th century, by the Emperor Frederick the Second, on a low peninsula. On its north side the peninsula is connected with Sicily by a long narrow causeway, having considerable salt ponds on each side. The harbour formed by this projection is one of the safest and most sheltered in the island of Sicily. This town suffered from an earthquake in the year 1693, by which it was nearly reduced to ruins; during the shock, the powder magazine in the citadel exploded, and the light-house was thrown into the sea. Various accounts agree in stating, that one-third part of the inhabitants were crushed to death by the falling buildings. The town has since been rebuilt on a regular plan, and in order to mitigate the evils of any similar visitation in future, the houses are all made very low. The place is slightly fortified on the land side, and is protected towards the sea by three forts, built on as many small islands at the entrance of the port. Agosta has never recovered the degree of importance which it enjoyed previous to the earthquake. The knights of Malta, during the time of their prosperity, had a considerable establishment and extensive magazines at this port. The trade of Agosta is in wine, flax, olive-oil, salt, and sardines. The remarkable caves of Timpa are in its vicinity. The town is situated twelve miles north of Syracuse, in 37° 13′ N. lat., and 15° 14′ E. long. Population said to be about 12,000.

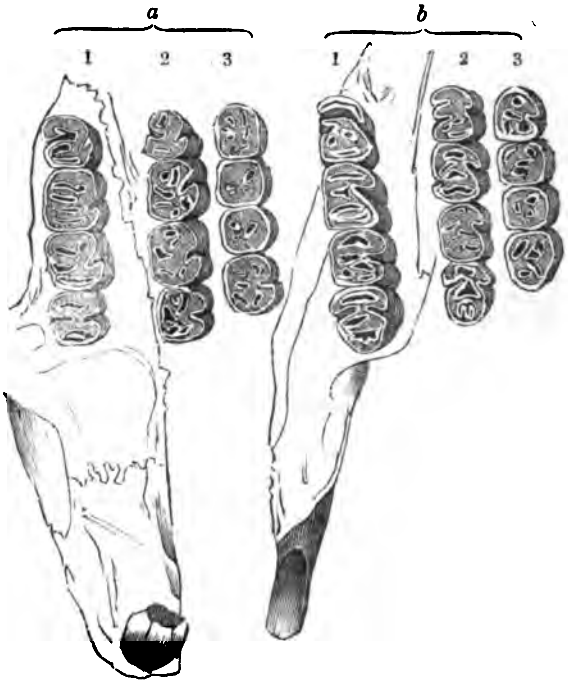
AGOUTI, (*Dasyprocta*, Illiger; *Chloromys*, F. Cuvier,) in Zoology, a genus of animals belonging to the class Mammalia and order Rodentia. The peculiar and appropriate character of the Rodentia consists in having two long incisors, or front teeth, in each jaw, with which they not only mince and triturate the hard substances which serve them for food, but which they likewise apply to a great variety of other purposes, such as the formation of subterraneous burrows, hollowing out artificial habitations in the trunks or among the roots of trees, sometimes even cutting down very large timber, as in the instance of the beaver, and generally in gnawing and destroying whatever they happen to encounter. To enable them to perform these operations, the incisor teeth, which, with these animals, are also the most important organs of mastication, are shaped something like a chisel. They are extremely sharp on the external edge, and slope abruptly towards the internal, so that the plane of the outer surface makes with the crown of the tooth a very acute angle. Neither is the enamel or hard flinty principle of the teeth dispersed through the body of these organs in waving irregular lines, as in the molar teeth of all animals which feed upon vegetable substances, but it is here accumulated in a particular part, covering the external surface of the tooth like a thin crust, so that the heart and inner edge, being composed of softer substances, (viz., common bone or ivory,) wears much more rapidly than the external surface, and thus continually preserves the sharp-edged, chisel-shape of the tooth, so essential to the economy of the animals. Leading as they do a peaceful, harmless life, and feeding principally upon vegetable substances, the rodentia are destitute of canine teeth; but in the number, form, and composition of their molar teeth, as well as in the number, separation, and moveableness of their toes, they present an almost infinite variety, and it is upon these differences that their generic characters are principally founded.

Though zoologists have not succeeded in subdividing the rodentia into natural families, distinguished by the same definite and logical characters as have been developed in some of the other orders of mammals, they admit of being distributed into small natural groups, the component parts of which are very intimately allied among themselves. Among these groups, certainly one of the most natural is that which composes the genus Cavia of Linnæus, at present divided into five natural genera, differing equally in the conformation of their organs of mastication and of locomotion. These are the capybara, (*Hydrochærus*, Brisson,) the pacas, (*Cælogenys*, *F. Cuvier*,) the moco, (*Kerodou*, F. Cuv.) the common cavies or guinea-pigs, (*Cavia*, Cuv.) and the agoutis, (*Dasyproctæ* and *Chloromys* of Naturalists.) Besides the large incisor or rodent teeth, the genera of this group have universally four molars in each side of each jaw, destitute of real roots, and penetrated by laminæ of enamel, which assume various forms, and appear marking the crowns of the teeth with divers irregular figures. This character, indeed, is not peculiar to the caviform rodentia, but is equally apparent in the porcupines, couendous, and other genera of the same order, but the number and form of the toes is, as far as we are aware, altogether peculiar to the present group. These are, four on the fore feet, and three on the hind, a combination only found in one other mammal, the tapir; and so invariable and essential does this character appear to be among the cavies, that the only instance in which the general rule admits of exception, is the case of the pacas, which have two small additional toes before and one behind: the supernumerary toes are mere rudiments, of no use in the functions of locomotion and prehension. Even in the qualities of their hair, these animals agree with one another, and differ from the generality of other rodentia; and their habits and economy are in most respects alike: the hair is universally of a coarse, bristly quality; they inhabit the hotter parts of South America and the West Indian Islands, and are most especially fond of low, marshy situations, and the banks of inland lakes, and rivers.

The most prominent zoological characters of the Agoutis are found in the nature and conformation of the feet and toes. The toes are provided with large powerful claws, and yet the animals make no use of them in digging or burrowing; they are pretty long and perfectly separate from one another, enabling them to hold their food between their fore-paws, and in this manner to convey it to their mouth. Like all other animals which are thus accustomed to use the fore-paws as hands, they have a habit of sitting upright upon their hind quarters to eat, and frequently also assume the same position when they would look around them, or are surprised by any unusual sound or occurrence. Their food is exclusively of a vegetable nature, and consists most commonly of wild yams, potatoes, and other tuberous roots: in the islands of the different West India groups, they are particularly destructive to the sugar-cane, of the roots of which they are extremely fond. The planters employ every artifice for destroying them, so that at present they have become comparatively rare in the sugar islands, though on the first settlement of the Antilles and Bahamas, they are said to have swarmed in such countless multitudes, as to have constituted the principal article of food for the Indians. They were the largest quadrupeds indigenous in these islands upon their first discovery. The same rule of geographical distribution holds good generally in other cases; viz., that where groups of islands are detached at some distance from the mainland of a particular continent, the smaller species of inhabitants are usually found spread over both, whilst the larger and more bulky are confined to the mainland alone, and are never found to be indigenous in the small insulated lands.

Though the Agoutis use their fore-paws as hands to hold their food whilst they eat, yet their toes are nevertheless rigid and inflexible, and their claws large, blunt and nearly straight. They are consequently deprived of the power of ascending trees; and as they also do not construct burrows they wander at large among the woods, sheltering themselves beneath fallen timber, or in the hollow of some decayed tree. Here they produce and nurture their young, bringing forth, according to some accounts, three or four times in the year; according to others, never having more than a single litter in the same season, and even that consisting of not more than two or three individuals. It is probable, however, from the amazing numbers of these animals found in all the hotter parts of South America, notwithstanding the destruction made among them by small carnivorous animals, as well as by the Indians, and likewise from the close affinity which they bear to the hare and rabbit of our own country, that the Agoutis are tolerably prolific. The young are brought forth with the eyes closed, as in the case of most of the rodentia and the carnivora; but they are covered with hair, or rather small bristles, of the same colour as the mother: they soon acquire the use of their limbs and members, and learn to shift for themselves.

The hind legs of the Agoutis are considerably longer than the fore, and their pace is tolerably rapid for a short distance. But they seldom trust to speed of foot for their safety, but seek for shelter and security in the first hollow tree, or under the first rock they meet with. Here they allow themselves to be captured, without any other complaint or resistance, than the emission of a sharp plaintive note. The head of the Agouti is large, the forehead and face convex, the nose swollen and tuberous, the ears round, short, and nearly naked, and the eyes large and black. The hair is annulated in different degrees, with black, yellow, and green; it is generally coarse and bristly, like the weak spines of a hedgehog, though in one species it approaches in fineness to the fur of the rabbit; the tail is most commonly a mere naked stump or tubercle, which in the acouchy alone attains any apparent length, and is covered with a few short scattered hairs. The teeth are twenty in all; namely, two incisors and eight molars, four on each side, in each jaw. The latter are all nearly of the same size, oval in figure, and with flat crowns, which exhibit the different convolutions of the enamel, as it penetrates the softer materials of which the body of the tooth is composed. It is impossible from mere description to convey an idea of the intricate figures which these convolutions assume; and we, therefore, refer to the annexed figure, where *a* and *b* represent respectively the upper and lower jaws, and the figures 1, 2, and 3, the appearances of the teeth at different ages, or after different degrees of trituration: No. 3, representing the teeth shortly after they begin to wear, No. 2, their intermediate state, and No. 1, when very much worn. This system, it will be observed, is exclusively adapted to a vegetable food; it is essentially formed for grinding and bruising, not for cutting and tearing: the stomach and intestines, therefore, which are always in harmony with the organs of mastication, are fitted only for the digestion of vegetable substances. The flesh of these animals is white and tender; it is a very common and favourite article of food in South America, and is dressed like hare or rabbit. There are ten species distinctly known; a selection of these we shall now describe, and very briefly allude to the names and habitats of the others.



[Teeth of the Agouti, from Cuvier's *Dents des Mammifères*.]

1. The common Agouti (*Dasyprocta Aguti*), sometimes called the olive cavy, from the prevalent colour of its back and shoulders, is the size of a middling hare, being one foot eight inches in length, and about eleven or twelve inches high at the croup. The head resembles that of the rabbit, the nose is thick and swollen, the face arched, the upper lip divided, the ears round and naked, the eyes large, the upper jaw considerably longer than the lower, and the tail a naked flesh-coloured stump. The hairs of the upper and fore parts of the body are annulated with brown, yellow, and black, which give the animal a speckled yellow and green appearance on the neck, head, back, and sides; on the croup, however, they are of a uniform golden yellow, much longer than on any other part of the body, and directed backwards; the breast, belly, and inner face of the fore-arms and thighs are light straw colour, and the moustaches

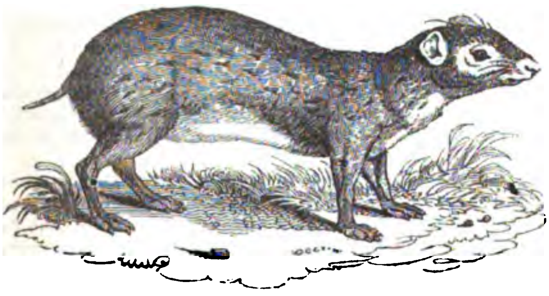
and feet black. The general length of the hair on the upper and anterior parts of the body is about an inch, that of the croup is upwards of four inches long, and all, excepting the short coarse fur of the legs and feet, and that on the breast and belly, is of a stiff, harsh nature, partaking more of the quality of bristles than of simple hair.

2. The black Agouti, (*Dasyprocta Cristata*,) is rather improperly called the crested agouti, by M. Geoffroy St. Hilaire, since the hairs of its head and neck do not exceed those of the shoulders and back in length. It is considerably smaller than the common agouti, being about the size of a rabbit, whilst that species approaches the dimensions of the hare.

[Black Agouti, from F. Cuvier.]

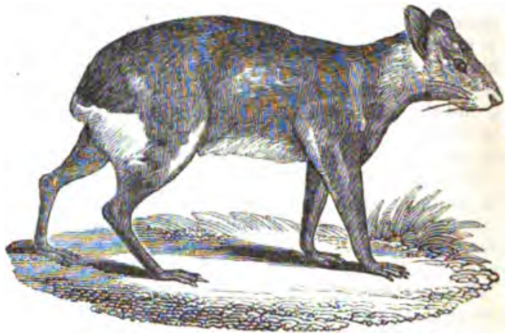
Its general proportions and form, however, are the same, but the hairs of the back and sides, instead of being annulated with various-coloured rings as in that species, are nearly uniform black, whilst the long hairs of the croup are perfectly so; the belly and legs are equally covered with short dark hair. There is not any appearance of crest, and the tail is still shorter than in the common agouti. M. Cuvier, in the *Règne Animal*, considered this species to be the female of the former, and M. Desmarest also marked it with an asterisk, as considering the question doubtful. Males and females, however, of both species have lived in the gardens of the Zoological Society for a considerable time, without undergoing any change in colour or appearance, thus proving beyond a doubt that they are distinct species. It appears also from the observations of MM. Desmarest and F. Cuvier, made upon two individuals which were formerly possessed by the menagerie of the Jardin des Plantes, that the black agouti has but six mammæ, whilst the other species (the common) is reported to have twelve. Both seem to inhabit the same climates—Surinam, Guyana, and Brazil; the common agouti, however, appearing to have a rather more extensive range, and to be likewise found in the West India islands, and even as far south as Paraguay.

3. The Acouchi (*Dasyprocta Acuschy*) is considerably smaller than either of the foregoing species, and is at once distinguished by the greater length of its tail, which is upwards of two inches in length, not much thicker than a crow's quill, and covered with short scattered hairs like those on the tail of a rat. In other respects it is of the same form as the Agoutis; has the same naked round ears, the same large black eyes, and the same olive-green colour mixed with yellow and black. The hairs of the croup are not so long as in the Agoutis, but are perfectly black, and all the under parts of the body, the breast, belly, and interior of the arms and thighs, straw-coloured with a tinge of red. The hair of the legs and feet is short and black, and that of the body much finer in quality than the hair of the Agoutis. Stedman informs us that this species is very rare in Surinam: in Guyana it is more common, though less so than the Agouti, and according to the report of De la Borde is there called a rabbit, whilst the Agouti is denominated the hare. It also inhabits the islands of St. Lucia and Grenada, lives in the woods like the Agoutis, but its flesh is said to be insipid and dry.



[The Acouchi, from Buffon.]

The Mara or Patagonian Cavy [(*Cœlogenys Paca*) was formerly associated with the genus Dasyprocta, but it is now more usual to separate it from the present group, forming as it does a connecting-link between the Agoutis and the Chinchillas and Lagostomys.] It is considerably larger than the Agoutis, measuring two feet six inches in length, and one foot seven or eight inches high at the croup. The ears also are essentially different, being three inches and a half in length, erect and pointed; and this circumstance, together with the length and elevation of the legs, gives the mara more the appearance of a small stag or antelope, than of a rodent animal. The hair also is materially different from that of the Agoutis, and approaches in texture and quality to the fine rich furs of the Bischaco and Chinchilla. On the head, shoulders, and back, it is greyish-fawn colour mottled with white, darker on the loins and hips, and terminating in a well defined curve over the croup, within which the colour is almost a jet black. All the under parts of the body are white; and this colour is separated from the greyish-fawn of the back and sides by a yellowish band, which passes along the flanks as in certain antelopes and gazelles. Under the chin and on the throat the colour is white, and there is a band of the same colour, and of a semicircular form, situated between the back and the hinder part of the thigh, above the groin, and surrounding the dark colour of the croup. The male and female are in all respects alike: the latter has four mammæ, and is said to bring forth but two young ones at a litter, which she conceals in the warrens of the Bischaco, till they acquire strength to follow her abroad and learn to shift for themselves.



[Patagonian Cavy, from Lesson.]

This animal inhabits the open plains and wilds of Patagonia, as far south as the Straits of Magellan, where, according to M. Lesson, it is called Mara by the natives.

The remaining seven *true* species may be here enumerated as follows:—

4. *Dasyprocta Croconata*, Wagler; this is an animal found on the borders of the Amazon river, in the Brazils. 5. *D. Fuliginosa*, Wagler; this species is frequent near Borba, in the northern provinces of Brazil, and more particularly in the district of the Rio Negro above the Coca. 6. *D. Prymnolopha*, Wagler; a species to be met with in Guayana. 7. *D. Azaræ*, Lichtenstein; an inhabitant of the more southern provinces of Brazil, of Paraguay, and also Bolivia. 8. *D. Carolensis*, F. Cuvier; locality doubtful. 9. *D. Leptura*, Wagner; another Brazilian species, also frequenting the region of the Rio Negro. 10. *D. Albida*, Gray; habitat in the island of St. Vincent, West Indies.

AGRA, City. The capital city of the province of Agra is situated on the south-west bank of the river Jumna, 27° 12′ N. lat. and 78° 17′ E. long. It was originally an inconsiderable village, but in the beginning of the sixteenth century was much enlarged by the Emperor Sekunder Lody, who bestowed on it the rank of an imperial city and made it the capital of his dominions, under the name of Badulghur. Half a century later, the city was further enlarged by the Emperor Akbar, who built here an extensive palace, and again changed its name to Akbarabad. This city continued to be the seat of the Mogul government until the year 1647, when Delhi was declared the capital by the Emperor Shah Jehan, from which period the decline of Agra may be dated. Shah Jehan, during his residence at Akbarabad, built a most superb mausoleum, as the cemetery of his favourite wife the Begum Noor-Jehan, about three miles from the city. This building, which is called the tâge-mahal, or crown of edifices, is composed of white marble, and is raised on an elevated terrace of white and yellow marble. It contains a central hall, within which are the tombs of the Begum and of Shah-Jehan himself, and around this hall are several smaller apartments and corridors. This mausoleum, the finest probably in the world, is said to have cost 750,000*l.*; it is kept by the British government in excellent order, together with its beautiful garden of trees and flowering shrubs. In this respect it contrasts favourably with the condition of the city, which is, for the most part, in a ruinous state,—the splendid palace of Akbar 'being used as warehouses, armories, offices, and lodging-rooms for the garrison.'

The houses in Agra are built of stone, and are very lofty, while the streets are so narrow as scarcely to allow a carriage to pass through them. The city contains many public baths, caravansaries, and mosques. Population in 1832, 65,250.

Agra was taken, in 1784, by the Mahratta chief Madajee Scindiah, and was retained by him until 1803, when it was captured, after a siege, by the forces under Lord Lake. It is now the seat of British government for the province. The Hindoo inhabitants hold the city in great veneration, as the place of the *avatâra*, or incarnation of *Vishnu*, under the name of Parasu Rama. Considerable public improvements have been effected of late years. Since 1835, Agra has been the residence of a lieutenant-governor of the north-west provinces.

AGRA, one of the north-western provinces of the Bengal Presidency, bounded N. by Delhi, S. by Malwah, E. by Oude and Allahabad, and W. by Ajmeer. It lies between 25° 35′ and 28° 18′ north latitude. Its length is about 250, and its breadth about 180 miles. The province is divided into five districts—Muttra, Agra, Farruckabad, Mynpoory, and Etawah; and these again into townships. The chief towns and fortresses are Alvar, Bhurtpoor, Deeg, Mathura or Muttra, Etawah, Gualior, Gohud, Calpy, and Narwar. The chief rivers of the province are the Ganges, the Jumna, and the Chumbul. There are also some smaller streams; yet the country is but ill supplied with water. To remedy this, a canal has been constructed running from Hurdwar, on the Ganges, down the great plain between that river and the Jumna. It is 800 miles long, has occupied eight years, and cost a million and a half sterling. It was opened amid a great concourse of natives and others on 8th April 1854. It is expected to triple the productive power of the whole country through which it passes, besides increasing the facilities for transit. North of the Chumbul, the country is, for the most part, flat and badly timbered; but on the other side of that river, and towards the north-western quarter of the province, the surface is somewhat hilly and more plentifully covered with trees. The climate, during a part of the year, approaches to temperate, and in the winter months may even be pronounced cold; but during the prevalence of hot winds, to which the whole of Central India is occasionally liable, the heat is insupportably great, and the climate, in consequence, unfavourable to European constitutions. These winds are seldom of long continuance.

The soil is in general particularly well adapted for the production of indigo, the cultivation of which may be extended almost indefinitely: the same may be said of sugar and cotton. It was from Agra that indigo, in the earlier periods of European commerce, was procured for the trade of Europe. The country between the Ganges and the Jumna, called the Dou-ab, is the most fertile part of the province, and furnishes all these articles for export.

There are but few mineral productions to be noticed in the province. It is said that copper has been discovered, but not under circumstances favourable to the working of the mines. There are marble quarries in the vicinity of Futtehpore. The breed of horses is superior to those of Bengal, and the more southern and eastern provinces. A good deal of coarse cloth is manufactured, principally for home use, in several of the circars; fine muslins and silks were formerly made, but these branches of industry have now much diminished.

Agra is not so thickly peopled as Bengal. It is said to contain not more than 6,000,000 inhabitants. All the territory which lies to the east of the Jumna, together with the city of Agra and a small district round the same, are in the immediate possession of the East India Company. The country north of the Chumbul is held by rajahs or native chiefs, in strict alliance with the British. South of that river, the territory is mostly held by, or tributary to, the Mahrattas. The natives are, for the most part, a handsome and robust race, and superior, in these respects, to the Bengalese. They are composed of a mixture of Hindoos and Mohammedans. Hindostannee is the language used in common intercourse, but the Persian is the official tongue, and is spoken by the higher class of Mohammedans.

AGRAM, a fortified town in Austria, near the Save, 45° 49′ N. lat., 16° 4′ E. long. It is about 166 miles nearly due south of Vienna. Agram is the chief town of Austrian CROATIA, and the residence of the viceroy of Croatia and Slavonia. The town consists of three parts—the upper, the lower, and the part called Opatowina. It is the seat of a bishop, has an academy, a grammar-school, and a convent of Franciscans. Agram carries on some trade along the Save, which joins the Danube at Belgrade; and is also the great market for the sale of Hungarian wheat and tobacco, and Bosnian pigs. The population is stated at 11,800.

AGRARIAN LAW was the general title of any law among the Romans which related to the *ager publicus*, or public domain. As the subject of agrarian laws constitutes perhaps the most important element in the history of the Roman republic, and as an utter misconception of their application has pervaded, till of late years, every work upon the subject, especially the popular writings of Hooke, Ferguson, &c., it seems desirable to place before the general reader a brief account of those more correct views which have been established by the researches of Heyne, Niebuhr, and Savigny.

Ever since the revival of letters it has been a universal error to look upon the agrarian laws, with which the names of the Gracchi and others were connected, as attempts to limit the amount of landed property that any individual might hold; and such an interference with private rights would indeed afford strong ground for condemning any statesman who could be the author of such a proposition, and any state where such a proposition could be favourably received. In the frenzy of the great French Revolution, there were indeed political fanatics, who, following the advice of Macchiavelli and Montesquieu, were willing to enact an agrarian law of this extravagant nature; and so much stress was laid upon the examples of Roman history, that Heyne, in March 1793, availed himself of the opportunity offered to him by the installation of a new prorector in the University of Göttingen, to address to that body a paper entitled *Leges agrariæ pestiferæ et execrabiles*, (see his *Opuscula*, vol. iv. p. 351,) in which he successfully contended that the laws so called among the Romans, instead of interfering with private property, solely applied to the lands of the public domain. Heeren and Hegewisch carried the inquiry further; but for the fullest and most satisfactory investigation of the whole subject we are indebted to Niebuhr and his friend Savigny.

As the victorious arms of the Romans extended their authority over one state of Italy after another, the right of conquest gave them a title to the lands of the conquered; but, except in cases of strong provocation, as in the defection of Capua in the second Punic war, it became the clemency of the conquerors to restore a part of the territory to the unfortunate owners. Yet a portion would perhaps always be reserved and added to the public domain. With regard to the disposition of the territory so acquired, we will not go back to an earlier date than the Servian constitution, which gave to the *plebes* or commonalty a share in the government, though an inferior one, with the patricians. The disposition of the conquered land was then, we may perhaps say, fourfold. Part was given in full property to religious uses, and part was sold by the quæstors for the supply of the treasury. The plebeians, who constituted the most important part of the army, received assignments of fixed and equal portions in full ownership, never perhaps exceeding seven jugers (*i. e.* between four and five acres) to each individual. These lands were often given under the form of a colony, the parent state sending a body of the citizens to occupy some conquered town, or to found a new one. In all cases the boundaries of lands so assigned were marked out according to the strict principles of Roman limitation, and placed under the religious sanction of the augury. But a large portion of the territory which fell into the hands of the conquerors in the issue of a successful war must often have been in a state of utter desolation, for devastation by fire and sword was a constant and leading feature in ancient warfare; and in a country where the olive and the vine form an important branch of agriculture, such desolation was not easily repaired. Thus large districts were unfit for distribution among the plebeians, or for sale by the quæstors. Moreover, much of the mountain land, and even of the unhealthy plains in Italy, was, as it still is, adapted solely for pasturage, and therefore equally unfit for partition, though far superior in immediate value. The disposition of this unappropriated land, which constituted the permanent public domain, led to a singular mode of occupation. An edict was issued, giving authority, most probably to the patricians alone, to cultivate these lands, but with the full understanding that the state reserved to itself the ownership, and might at any time resume possession,—a right which was from time to time exercised. Yet, though the occupants had no title whatever as against the state, they appear to have been protected against individuals by the interdicts of the prætor, and a branch of law entitled *caussæ possessionum.* Under this protection these lands often passed from father to son by a species of permitted inheritance, or as dowries to daughters, or were even transferred to other citizens by purchase; and in this way even plebeians, it would appear, might come into the occupation of them. But, no matter through how many hands the lands might pass, the tenure to the last occupier was as precarious as to the first; and, of course, this was always taken into account in estimating the value. On the other hand, the occupier was subject to certain restrictions and payments. He could not legally hold, at least after the Licinian law, more than 500 jugers (about 333 acres) of this public land; on the public pastures he was limited to 100 head of great, and 500 of small cattle; and he was bound to employ a fixed number of freemen. Some of these restrictions indeed did not always exist, but it seems highly improbable that some regulations of the kind should not have existed from the very beginning, if only to protect one patrician from another. But whatever doubt there may be on this subject, the state was always entitled to the payment of a tenth upon all grain, and a fifth on the olives and the wine, besides some charge, we know not how determined, for the use of the common pasture land. The technical terms used with regard to these possessions were as follows: the lands themselves were called *agri occupati, a. occupatorii, a. possessi, a. concessi, a. arcifinales,* or generally *possessiones.* The holder or *possessor* was said to have the *usus* of them; and the payment he made to the state was the *fructus* or *vectigal.* Instead of collecting this branch of the revenue directly, it was the practice to farm it out, which was expressed by selling or letting the *jus vectigalis* or *fructus;* and in the same sense they used the phrase *agrum fruendum locare,* or even more briefly, though somewhat ambiguously, *agrum locare.*

It must be confessed, indeed, that in this view of the first occupancy of the public domain, there is still something to be cleared up; for a mere edict, such as we have spoken of, without qualification or restriction, would have been little better than an invitation to a general scramble. Yet, however this may be, it is established incontrovertibly that the possession was simply permissive. If the original occupancy was founded in collusion, the case against the patricians will only be the stronger.

In the various usurpations of the patrician body the restrictions enumerated above were little attended to. The vectigal was rarely paid. While the plebeian was serving in the army abroad, the portion of the public domain possessed by him—and this could only be through purchase—was violently or fraudulently seized by a powerful neighbour. Large districts were monopolized by single holders. It was by them found more profitable to cultivate the land by slaves than by freemen, who were always liable and often called upon to perform military service. Those who held the chief power in the government conspired to deny the title of the state to resume their possessions; and even when new conquests added to the domain, the most desperate efforts were made to resist all further assignments of land to the plebeians, that is, to the very veterans who had effected the conquests. To redress these grievances, or rather to moderate them, agrarian laws were from time to time brought forward; but, we repeat, these laws never interfered with private property. The wealthy might hold land really their own to any amount. The sole object which the reformers had before them was to check usurpations of the public domain.

We cannot trace the subject historically through the whole existence of the republic, but a few remarks may still be useful. If we look at the birth, the station, the conduct, and the character of the distinguished men whose names are connected with the promulgation of agrarian laws, we shall find little reason for considering them as demagogues. Spurius Cassius indeed lived in a time when we can place little reliance upon the truth of Roman history; but he was himself a patrician, he had thrice been consul, and had thrice triumphed; and though he was eventually tried and executed for treason, the trial took place not before a plebeian court, as is generally stated, but, as Niebuhr has established, in the *Comitia Curiata,* where the patricians themselves, whose usurpations he had contended against, were at once his accusers and his judges. For understanding the true character of Licinius Stolo, and the wisdom and justice of his legislation, we will only refer to the third volume of Niebuhr's *History of Rome.* In the time of the Gracchi, it may be thought by many that injustice and tyranny had obtained a title by prescription; but though there may be a question about the policy of the reforms they were endeavouring to introduce, no candid reader of Roman history can doubt the purity of their intentions, or the baseness of the majority among those who resisted them by revolution and assassination. Except the presumed guilt of supporting these agrarian laws, not even their enemies could find a blot in the characters of the two sons of the virtuous Cornelia. Velleius was no friend to democrats, but he says, speaking of the elder Gracchus, *Vir alioqui vita innocentissimus, ingenio florentissimus, proposito sanctissimus, tantis denique adornatus virtutibus, quantas perfecta et natura et industria mortalis conditio recipit.*—('A man in other respects (*i. e.* except in his opposition to the usurpations of the patricians) as to his life most blameless, in ability most distinguished, in principle most upright, in fine adorned with every virtue in as high a degree as man can attain to, when the best gifts of nature are improved by discipline.')—At the same time his opponent Octavius, and his murderer the Pontifex Maximus, Scipio Nasica, were actually offenders under the very law which Tiberius was endeavouring to enforce. On the other hand, the consul Opimius, who headed his party in the premeditated massacre of the younger Gracchus and three thousand of his defenceless countrymen, and then erected a temple to Concord, was afterwards convicted of sacrificing the interests of his country for the gold of Jugurtha. For a full examination of the agrarian laws of Rome, see Niebuhr's *History,* transl. vol. ii. p. 129; Savigny, *Das Recht des Besitzes;* and among the ancient writers, Appian's *Civil Wars,* book i. c. 7—27; Plutarch's *Lives of the Gracchi;* Dionysius and Livy; Cicero's speech against Rullus, &c.

AGREEMENT, a mutual bargain, contract, or covenant. Jeremy Bentham, speaking of it as a contract, calls it 'a pair of promises by two persons reciprocally given, the one promise in consideration of the other.' In its most extended sense, it comprehends a large proportion of the transactions of civilised man in the mutual intercourse of society, and may even be said to form the basis of civil society itself. In a more limited sense, it gives rise to those obligations which it is the object of all government to enforce. The following is a short outline of the law in reference to the latter class of contracts: it may, however, be noticed, that as it appears to be founded, for the most part, on the obvious wants of society and the ordinary maxims of natural justice, its provisions will be found to coincide, in their general features, with the laws of civilised communities.

1. *Assent* is the essence of an agreement: hence the parties to a legal and valid contract must be in a situation to testify their free assent to it. Thus, lunatics, infants, and married women are, for obvious reasons, deemed incapable of binding themselves by any engagement. In some few transactions of urgent necessity—as in the purchase, for example, of those articles which nature, or the conventional usages of society, have rendered fit and necessary—the contracts of the two former classes of persons are obligatory on them; or, in the case of a married woman, on her husband. In the same manner, fraud, intimidation, or other undue advantage taken by the party who has attempted to secure to himself a benefit by an agreement, will discharge the party who, from ignorance or the operation of external force, has yielded an apparent assent to it.

2. The *subject* of agreement must not be tainted with

illegality; for it would be evidently repugnant to common sense, that the law should be called upon to enforce performance of any act which it has expressly forbidden, or which contravenes its general policy. Thus, an agreement in unreasonable restraint of trade, by which either professional, scientific, or mechanical skill, or any source or establishment of commerce or labour, is attempted to be withdrawn from the public market and confined to an individual, or a limited number of persons in a limited district or locality, is an agreement that would violate the freedom of trade and the policy of the law, and could not be enforced.

3. An agreement, in order to secure the aid of the law in carrying it into effect, must have certain qualities mutually beneficial to the parties, or must be entered into with certain prescribed solemnities. Courts of justice cannot be called upon to give effect to every idle or inconsiderate promise. An agreement must either be contracted by a formal instrument in writing, or if contracted in a less formal manner, by word or otherwise, it must appear that the parties derive from it reciprocal benefit. This is the meaning of lawyers when they affirm that a *parole* agreement—that is, an agreement not contained in a deed—cannot be legally enforced, unless there be a sufficient *consideration* to support it. Upon this principle it is that, by our law, a promise to make a voluntary gift can never be enforced; but there is a continuing right in the party promising, to retract his promised donation until the gift is actually completed. An agreement thus defective for want of consideration, is called a *nudum pactum*—a phrase borrowed from the Roman law, though used in a sense somewhat different from that which it bears in the Roman code. In the Scotch law, the principles stated in this article are generally received; but in Scotland, the rule as to a *nudum pactum* does not prevail, and there may be a valid obligation although there is no consideration. It is the engagement, as a deliberate act of the mind, which constitutes its validity.

4. The *form* of agreements has, in some cases in England, been regulated by positive law. The most remarkable instance is, that which was introduced by the Statute of Frauds, in the reign of Charles II., by which it is enacted, that contracts, in certain cases, shall not be available, unless there be some memorandum or note of them in writing, duly signed by the parties to be charged, or their agents. Similar precautions have, we believe, been adopted in other countries; and the legislature has, in our own time, been induced to extend its application to cases not within the scope of the original statute.

With regard to the mode of enforcing agreements, an injured party complaining of a breach of agreement, might formerly seek a pecuniary compensation in the name of damages in the Common Law Courts. But now, by the 17 and 18 Vict., c. 125, called the Common Law Procedure Act of 1854, it is competent either to sue for damages, or, in the alternative, for specific performance. The Courts of Equity also afford the latter remedy, although in a different form. In the Scotch courts, exact or specific performance is given simply by a conclusion in the summons, which is the initiatory pleading, *ad factum prestandum*, as it is called.

AGRICOLA (CNÆUS JULIUS) was born on the 13th of June, in the year 38 A. D., at Forum Julii, now Fréjus, a city at that period of considerable celebrity. (See FREJUS.) The father of Agricola was Julius Græcinus, a writer of some eminence on agriculture, and distinguished, as a senator, both for his eloquence and his integrity. But his virtues were the cause of his destruction. The emperor Caligula being desirous to get rid of his father-in-law, M. Silanus, called upon Græcinus to undertake the accusation which was to be the pretext for his destruction. This disgrace Græcinus refused to incur, and consequently he met with the same fate as the unfortunate Silanus. Agricola was an infant at the time of his father's death. His mother was Julia Procilla, and thus on both sides Agricola was connected with the Julian house. This fact, however, affords no evidence of any connexion by blood; and it is most probable that the name was originally obtained by the ancestors of Agricola as freedmen of Julius Cæsar, or Augustus. We find them at any rate connected with a colony, Forum Julii, which appears to have been founded by the former, for it existed in the time of Cicero; and again the grandfathers of Agricola on both sides held the dignity of procurator or chief fiscal officer in the provinces, which was not uncommonly bestowed on the favourite freedmen of the Cæsars. After receiving his education at Massilia, (Marseilles,) the principal seat of learning in Gaul, he was sent to Britain, where he served under the immediate eye of Suetonius Paulinus, one of the ablest generals of Rome; and his service in this island included perhaps the most critical period during the whole Roman occupancy, viz., the grand insurrection under Boadicea (61 A. D.), when, availing herself of the absence of Suetonius in his attack upon the sacred island of the Druids (Anglesey), she fell upon the three chief settlements of the Romans—Camalodunum (commonly supposed to be Maldon in Essex), St. Albans, London, and massacred seventy thousand men; for which Suetonius soon after exacted ample vengeance. In 62 he returned to Rome, where he married Domitia Decidiana, a lady belonging to one of the first families. He was now elected quæstor, and received Asia for his province, the wealth of which too often tempted the cupidity of Roman officers: and, on the present occasion, the Proconsul Salvius Titianus (a brother of the future emperor Otho) would willingly have made a compromise with his quæstor for mutual impunity: but Agricola did not yield to the temptation. During the latter part of Nero's reign distinction was dangerous, and Agricola, well knowing the jealousy of the emperor, endeavoured—even when holding the offices of tribune and prætor—to avoid all appearance of ostentation and ambition. On the accession of Galba (68) he was selected as a commissioner to examine the state of the treasures belonging to the temples, and to restore to them whatever had been taken away; for under Nero the valuable gifts consecrated in the temples had been repeatedly seized to fill the empty coffers of the prince. How far Agricola was engaged in the civil contests which ensued between Otho and Vitellius does not appear. At the outset of this war his mother was murdered by a detachment from Otho's fleet which landed in Liguria, and ravaged the property of the family near Intemelium (Vintimiglia). As Agricola was hastening to pay the last offices to his mother, he learned that Vespasian had been proclaimed by the legions in the east. He instantly declared in his favour, and was soon rewarded by the command of the twentieth legion in Britain. On his return to Rome (about 73) he was enrolled by the emperor among the patricians, and soon after appointed governor of Aquitania, a province which, since the distribution of the empire made by Augustus, included all the south-western part of Gallia, from the Pyrenees to the Loire. This appointment he held for nearly three years, and his successful administration of this peaceable province proved him to possess abilities beyond those of a mere soldier. He was recalled to receive the still higher honour of the consulship. His daughter, born during his quæstorship in Asia, was now betrothed to the celebrated historian, C. Cornelius Tacitus, and the next year she was given to him in marriage. Agricola, at the expiration of his consulship, was appointed governor in chief of the island where he had already twice served in an inferior capacity. He proceeded thither about the year 78, but the date cannot be fixed with any certainty. During his last absence from Britain the command had been in the hands of Petilius Cerialis and Julius Frontinus, the former of whom had subdued a part of the territory of the Brigantes (Yorkshire, Lancashire, &c.), and the latter had entirely reduced the Silures in South Wales. Agricola passed seven or perhaps eight summers in Britain; in the first of which he added North Wales and the sacred island of Anglesey to the Roman province. By the end of the fourth campaign, the whole island south of the Clyde and the Forth was secured to the Romans by a line of forts running from the one æstuary to the other. Every summer extended the dominion of the Roman arms, but it was only in the last year of his government that he entirely broke the spirit of the Britons, by the defeat of Galgacus on the Grampian hills. At the close of this campaign, a Roman fleet, for the first time, sailed round the island, as if to mark the extended boundary of the Roman empire. The splendid successes of Agricola were, however, unpalatable to the suspicious Domitian, who could not fail to observe how ready the people would be to contrast them with his own pretended victories over the Germans. Agricola was honourably recalled, under the pretext of being sent as governor to Syria. By order of Domitian he entered Rome at night, and after a cold reception by the emperor he quietly retired into private life. When his consular rank a few years after entitled him to the proconsulship of Asia or Africa, he wisely declined an appointment which had been fatal to the previous possessor. He died on the 1st of September, A.D. 93, in the fifty-sixth year of his age, not without some suspicion of poison. His property was left between his wife Domitia, his only child, (married, as we have already said to Tacitus,) and the emperor Domitian. The latter appeared highly pleased at this mark of esteem, but, as the historian observes, a good father never bequeaths his property to a good prince. All that we know of Agricola, with the exception of a single chapter in Xiphilin (66. 20) which is very inaccurate, is from the pen of Tacitus.

AGRICOLA (RODOLPHUS), one of the most learned and remarkable men of the fifteenth century, was born at a village, variously written Baffloń, Baffeln, Bafflen, Baffel, or Bafflo, two or three miles from Groningen in Friesland, about the end of August 1443, not in 1442 as often stated (see the inscription on his tombstone as given in M. Adam's *Apograph. Monument. Haidelburgens.* p. 22). In a short notice of Agricola by M. Guizot, in the *Biographie Universelle*, it is said, but we do not know upon what authority, that his name was properly *Huesmann*. His first master is also there said to have been the famous Thomas à Kempis. After distinguishing himself at school, he proceeded to the college of Louvain, where he remained till he took his degree of M.A. He was then solicited to accept a professorship in that college; but he declined an office which would have prevented him from visiting the chief seats of learning in other countries. According to a custom common with the students of that age, he set out on his travels and came to Paris. After remaining here for some time, he proceeded to Italy, and arrived at Ferrara in 1476, where he resided during that and the following year, and attended the prelections of Theodore Gaza on the Greek language. He also extended his own reputation by giving a similar course on the language and literature of Rome. The favour of the duke, Hercules D'Este, and the admiration of the most famous scholars of Italy were liberally bestowed upon the accomplished foreigner, who used to contend, we are told, in amicable rivalry with the younger Guarino in writing Latin prose, and with the Strozzis in verse. After visiting Rome and some of the other cities of Italy, he left that country, probably in 1479. On his return to Holland he appears to have occupied a chair for a short time in the university of Groningen, and he was also chosen a syndic of that city, in which capacity he spent about half a year at the court of the emperor Maximilian I. In the year 1482 he removed to Heidelberg on the invitation of Joannes Dalburgius, the bishop of Worms, whom he had taught Greek, and by whom he was appointed to one of the professorships in the university of Heidelberg. The remainder of his life seems to have been spent partly at Heidelberg and partly at Worms, where he lodged in the house of his friend the bishop. At the request of the Elector Palatine, who greatly delighted in his conversation, he composed a course of lectures on ancient history, which he delivered at Heidelberg, the Elector being one of his auditors. He also after coming to reside in the Palatinate, commenced the study of the Hebrew tongue, under the tuition of a converted Jew, whom his friend the bishop kept in his house for that purpose. In this new study Agricola had made great progress, when a sudden attack of illness carried him off at Heidelberg, on the 28th of October, 1485, at the early age of forty-two. There was certainly no literary name out of Italy so celebrated as that of Agricola during his age; and, if we except Politian and Mirandola, perhaps not even Italy could produce a scholar equal to him. The most eminent cultivators of classical learning in the next age have united in placing Agricola among the first of his contemporaries. We need only mention Cardinal Bembo, Ludovico Vives, the elder Scaliger, and, above all, Erasmus. Agricola indeed may be regarded as the immediate forerunner of the last great writer, and in some degree as the model on which he was formed. Agricola, in the same manner as Erasmus, appears to have clearly discerned many of the ecclesiastical abuses of his time, and to have anticipated the revolution in the opinions of men that was at hand, although he refrained from doing anything to urge on the crisis. If Agricola did not write Latin with all the exactness of Erasmus, his compositions are not less distinguished by a natural ease and perspicuity of style, and often by an eloquence which is altogether classic in spirit at least, if not in form. Erasmus has himself told us that in beauty of diction he placed him on a level with Politian, and in majesty before him. Besides his skill in ancient learning, Agricola was a skilful practitioner of the arts of music and painting. His collected works were published, as it is commonly stated, in two volumes 4to. at Cologne, in 1539, under the title of *R. Agricolae Lucubrationes aliquot, &c.* According to Gesner's *Bibliotheca Universalis*, and the *Bibliotheca Belgica* of Foppens, the principal contents of this collection are his three books De Inventione Dialectica, some letters, orations, and poems, and some translations from Aphthonius, Lucian, Isocrates, and other Greek authors. It does not appear to contain, as commonly stated, his abridgment of Universal History. The work De Inventione Dialectica is the most celebrated of Agricola's performances. It has been repeatedly printed with ample scholia; in 1534 a compendium of it, by Joannes Visorius, appeared at Paris; and an Italian translation of it was published in 4to. at Venice, in 1567, by Oratio Toscanella. It is considered to have been one of the earliest treatises which attempted to change the scholastic philosophy of the day. Morhof speaks of it as having anticipated in several respects the Logic of Peter Ramus. In the injunctions given by Henry VIII. to the University of Cambridge, in 1535, the Dialectics of Agricola and the genuine Logic of Aristotle are ordered to be taught instead of the works of Scotus and Barlæus; and in the statutes of Trinity College, Oxford, founded some years later, we find a similar recommendation. Besides the works already mentioned, the following authorities may be referred to for further information respecting Agricola; Bayle, *Dictionnaire;* Baillet, *Jugemens des Savans; Vitæ Germanorum Philosophorum,* a Melchiori Adamo;—*Vie d'Erasme,* par Burigny, Paris, 1757, vol. i., p. 17; *Vita R. Agricolæ,* autore Ger. Geldenhaurio Noviomago, in *Virorum eruditione et doctrina illustrium vitis*, Francfort, 1536, p. 83, &c. See also an interesting letter on the habits and character of Agricola, from Melancthon, dated Frankfort, 28 March, 1539, in the edition of Agricola's works published at Cologne.

AGRICULTURE. The important subject of the cultivation of the earth may be conveniently regarded in three distinct points of view, namely, practically, historically, and politically.

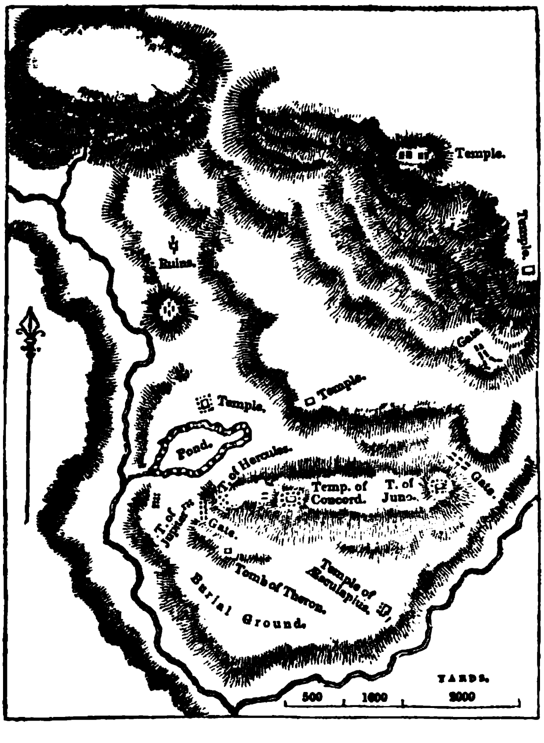
If we were to attempt, as is done in several *Cyclopædias*, to give a connected account of the practice, the history, and the statistics of Agriculture, many Numbers of this publication would be insufficient even for a slight sketch. We shall, therefore, only point out here some of the larger divisions in which the subject will be arranged.

1. The *Practice* will be found principally under the heads ARABLE LAND, DRAINING, FARM, GRASS LAND, LIVE STOCK, ORCHARDS, WOODS.
2. The *History* will be treated under the head BRITISH HUSBANDRY, which will include a comparative account of the progress of other nations.
3. The *Statistics and Political Economy* will chiefly be embraced under the heads CORN-LAWS, COTTAGE ALLOTMENTS, FOOD OF LABOURERS, FRENCH ECONOMISTS, MARKETS, POOR-LAWS, RENT, TITHES.

AGRIGENTUM, now called Girgenti, a Sicilian city, distinguished by the magnificence and gigantic size of its ruins, which bear certain testimony that the stories related of its extraordinary wealth in old times are not entirely without foundation. It was called by the Greeks Acragas, and by the Romans Agrigentum. It is situated on the southern coast of Sicily, about two and a half miles from the sea, 37° 17′ N. lat. 13° 28′ E. long. and was a colony from Gela, another city lying on the same coast, to the eastward, founded about Ol. 50, B.C. 580. We first hear of it in connexion with the well-known name of Phalaris, tyrant of Agrigentum, of whom many improbable stories are told. The duration of his power, variously stated by ancient authors, is placed by Dr. Bentley from Ol. 53, 4, to Ol. 57, 3 (B.C. 565 to 550). It seems that he was a prince of considerable ability, who, having made himself master of the state, like Pisistratus or Dionysius, was called *tyrant*, a word having in itself no signification of cruelty, but merely expressing the assumption of unconstitutional or absolute power. He was destroyed in a popular tumult, by a general attack of the people, (Cic. Off. ii. 7,) and after his death a democratical government was established for about sixty years, during which we find in extant history no mention of Agrigentum.

Anterior to the year 488, we find Theron ruling the city, with the title of prince, (*δυνάστης*, Diod. xi.) known by two odes of Pindar, composed in honour of victories gained by his chariots in the Olympic games. Theron was a mild and popular ruler. He reduced Himera, a town on the northern coast of Sicily, the tyrant of which, Terillus, sought help at Carthage, and gave occasion to the first important attempt of that city to extend its dominions in Sicily. A large army of Carthaginians passed over, and besieged Himera, but was defeated with great slaughter by the combined force of Agrigentum and Syracuse. A vast number of prisoners were taken and made slaves on this occasion, insomuch that it is stated, probably with some exaggeration, that 400 fell to the share of many individual citizens, and yet the greatest part were retained for the public use, and employed in those stupendous buildings, of which we still admire the remains. Theron died Ol. 77, 1, B.C. 472, and Thrasydæus, his son, a man of licentious and cruel temper, succeeded. He provoked a war with Syracuse, in which he was defeated, and his power probably being shaken, he was expelled by the Agrigentines, who again established a democracy.

When the Athenians invaded Sicily in the Peloponnesian war, Agrigentum remained neuter. We find few notices of it again till B.C. 408. At that time the city flourished, according to Diodorus, in wealth and luxury, such as no other state but Rome itself had exhibited. Of the means by which such wealth was acquired, we know nothing, except that extraordinary fertility is ascribed to the soil, and that the resort of foreigners makes it likely that it was a great commercial depôt. The number of citizens is stated by Diodorus (xiii.) at 20,000, and of foreigners settled there 180,000 more, a number probably much exaggerated. In B.C. 406, this prosperous city was again attacked by Carthage. The residents were supported by a body of Italian mercenaries, commanded by a Lacedæmonian, Dexippus; and a powerful diversion was made from without by Syracuse. But civil discord and insubordination rendered fruitless a resistance, which for some time was spirited, and might have been successful. The Carthaginians completed lines of circumvallation; and when the place was reduced to extremity by hunger, the bulk of the citizens passed the enemies' lines in a winter night, and reached Gela in safety. The town was preserved by Hamilcar or Imilcon, the Carthaginian general, for winter quarters, but razed in the following spring: the pictures, statues, and most valuable spoil was taken to Carthage, the rest sold. The vacant town and territory of Leontini was given by the Syracusans to the fugitives.



Agrigentum, from Capt. Smyth.

Of the subsequent history of Agrigentum only scattered notices remain. It is said, by Plutarch, to have been rebuilt by Timoleon, which must have been between the years B.C. 344 and 337. We find it stated, indeed, that the Agrigentines united with Dionysius the elder, when he declared war against Carthage, Ol. 95, 4. B.C. 397: but this may, perhaps, refer only to the Agrigentines established in Leontini. Ol. 117, 4. B.C. 309, they made an attempt to recover their ancient power in Sicily, and for a time seemed to prosper, but desisted from the attempt in the second year, in consequence of experiencing a defeat from the Syracusans. The prosperity of the city at a somewhat later period is rendered probable by a statement in Diodorus, (xxii. ecl. 14,) that Pyrrhus received from the Agrigentines 18,000 foot and 800 horse 'equal to the Epirot troops,' when they admitted him into their city, about B.C. 280. In the first Punic war the state adhered to Carthage. During the struggle in Sicily between the Carthaginians and Romans, it was taken, retaken, and taken again; and suffered very severely in all these changes. Little more is known of its history, and there would be no profit in attempting to combine the scattered notices of a city which never again filled an important part. For an account of the modern town, see GIRGENTI.

The situation of Agrigentum is said by Mr. Wilkins to be one of the most beautiful in Sicily. 'At the foot of the high mountains which bound the plains of the Acragas, a low ridge of hills extends from east to west. The southern side gently slopes towards the river, while the northern and western sides fall much more steeply towards the Hypsa, which still flows, though with a current much diminished.' (*Magna Græcia.*)

The most remarkable objects mentioned by Diodorus in his account of the town, (Book xiii. c. 82.) are the temple of Jupiter Olympius; and an artificial lake, seven stadia, or near a mile in circumference, and twenty cubits, or thirty feet deep, fed constantly by running streams, well stocked with fish, which were eaten at the public entertainments: the pond was also a favourite haunt of swans. This, before the time of the historian, was filled with mud, in consequence of neglect, and turned into orchard or garden ground, which afforded a considerable revenue to the town. He also mentions the tomb of Theron as a considerable work. The temple of Jupiter is said by Diodorus to have been the largest in the island: indeed, except the temple of Ephesus, it was the largest Grecian building applied to sacred purposes. Its dimensions, as given by him, are— height, exclusive of the platform, 120 feet; length 340; breadth 60. It was of the Doric order, but *apteral*, that is, it had no external portico, the interval between the columns being filled up by wall. This deviation from the general practice arose probably from the impossibility of finding stones large enough to serve as epistyles; for the distance from centre to centre of the columns being 30 feet, a series of masses of stone of that length, and of corresponding depth and thickness, would have been required, had not the superincumbent entablature been sustained by a continued wall. As it is, many blocks of the entablature weigh eight tons and upwards. The columns are *engaged*, that is, little more than half their mass projects from the wall. The circumference of the external and visible part is 20 feet, the diameter, as given by Mr. Cockerill, 13. Their proportions cannot be exactly ascertained; they are conjectured by Mr. Cockerill, from other examples at Agrigentum, to have been 4¾ diameters in height. The echinus of each (that is, the swelling part of the capital) was formed by two stones, each a quarter of the whole capital, had the pillar been disengaged. Two of them at least remain, each weighing (by computation we presume) 21½ tons. These enormous masses were raised to the height of 70 feet from the ground. To the inside of the building, as Diodorus expresses it, they are square, and 12 feet in diameter, that is, there is a series of pilasters within, 12 feet broad, corresponding in position with the external columns. The columns were built in courses of masonry, not single blocks, so that in fact they formed an integral part of the wall. The flutings are said by Diodorus, and the account is verified by recent travellers, to be wide enough to contain a man in their hollow, as in a niche. When the town was first taken by the Carthaginians, the temple was completed except the roof, and this deficiency was never supplied. In the eastern pediment was sculptured the war of the Giants: in the western, the siege of Troy. Within, the temple was divided into what we may call a nave and two aisles; and it may assist the reader's comprehension to state, that according to Mr. Cockerill's measurements, (whose description of the temple, in the 4th vol. of Stuart's *Athens*, is the latest and best,) the height of the nave was 18 feet more than that of the nave of St. Paul's, and its breadth 2 ft. 2 in. greater. The walls of the interior were strengthened by massive pilasters, supporting an entablature upon which stood a row of *Atlantes*, as the Greeks called male figures when thus applied. These colossal figures were about 25 feet high, and supported an upper entablature, which rose about 110 feet above the floor of the temple. Fragments enough to restore one of these giants were collected by Mr. Cockerill. The width of the chest is more than 6 feet, the head is 3 ft. 11 in. high, and 3 ft. wide. The style of sculpture approaches that of the Æginetan marbles: the giants must, however, be considerably later in date. Fazellus says, that 'one part connected with three giants and some columns was long standing, but fell, December 9, 1301, and the common people still call the spot the Palace of the Giants.'

A thin coating of plaster, resembling the finest marble, covered the whole building. The breadth, as given by Diodorus, is clearly wrong, unless we suppose him to mean the cell, or nave of the building, in which case he is not very far from the true dimensions as ascertained by measurement. We may here remark, that some modern works give the height, as stated by Diodorus, at 220 feet. Wesseling, however, reads 120, and the other is so glaringly out of proportion, that there can be no doubt which is right. The dimensions, given in English feet by Mr. Cockerill, are—

		ft. in.
Extreme length of basement		369 5
——— breadth		182 8
———— of cell		68 6
———— temple within the walls . .		142 6
Height of podium or basement . . .	9 6	
From the basement to the top of the capitals	61 6	
Entablature	25 6	
Tympanum	23 6	
Total height ——	120	

Of this splendid building, with the exception of the basement, scarce one stone remains above another. Traces of the walls, however, have been discovered by excavation, enough to enable the skilful architect to determine the ground-plan with accuracy. Not a single column remains standing, but two capitals are still visible on the ground,—one with a portion of the entablature attached,—which excite the wonder of the visiter by their gigantic size.

We have described at length this the most remarkable of the Agrigentine ruins in size and construction: of the others, we must speak very briefly—they differ little from other Greek remains. At the south-east angle of the ancient city, stood the remains of a temple formerly dedicated to Juno Lucina. Further to the west, stands the temple of Concord, in better preservation, owing to its having been converted into a Christian church. More recently it was restored according to the original design, by the late king of Naples. The portico is perfect, and the columns in good preservation. Both these temples are of the Doric order, and nearly of the same size and plan. Both are *peripteral*, or surrounded by a portico, consisting in each of six columns in front and thirteen on the side, and their dimensions are about the same—length 124 feet, breadth 54. They are situated on the immediate edge of an abrupt rock, and form most striking objects from the plain below. A good view of them and the surrounding scenery is to be seen in Mr. Wilkins' *Magna Græcia*. Of the temple of Hercules but one pillar remains; of that of Æsculapius, only three. The area of the fish-pond is still visible; it is now a garden, as in the time of Diodorus. The form is traceable, and the dimensions seem to be larger than those given by the historian. Other remains of antiquity exist, and among them, one is said to be the tomb of Theron; but there is nothing further to call for particular description.

Many stories of the extraordinary wealth and profuseness of the Agrigentines are told, which are not without interest; they may be summed up in the pithy observation of Empedocles, himself a native of the city, that 'the Agrigentines built as if they were to live for ever, and feasted as if they were to die on the morrow.'

AGRIMO'NIA is the name of a plant of the rose-tribe, to which the English give the name of herb agrimony. It is known from all the other genera of the same tribe by its having only two or three pistilla enclosed in the deep tube of its calyx, from seven to twenty stamens, and small-notched petals.

The common species, *Agrimonia eupatoria*, is an erect, hairy, herbaceous plant, frequent by the sides of hedges in fields, on the skirts of woods, and in similar situations all over England. Its lower leaves are interruptedly-pinnated, with the leaflets of an oval form, and coarsely serrated. When bruised, they yield a slight, but pleasant aromatic odour. The stem is nearly simple, and a foot and half or two feet high. The flowers, which are small and yellow, are succeeded by little bur-like fruits.

[Agrimonia Eupatoria.]

The leaves, which are astringent and aromatic, have been found useful in the preparation of fever-drinks, and for the cure of slight inflammation in the mouth or throat; on this account agrimony is always reckoned one of our wild medicinal plants, and is often employed as an ingredient in herb teas.

AGRIOPES (*Agriopus*, *Cuv.*), in ichthyology, a genus of acanthopterygious fishes, belonging to the family which M. Cuvier denominates *Joues Cuirassés*, and which are distinguished from other families of the same order, by having the suborbital plates extending backwards over the cheeks, so as to cover either the whole or the greater part of them, and thus defending them, as it were, with a buckler or cuirass. But what particularly distinguishes the Agriopes from most other genera of fishes, is that they have only nine rays in the pectoral fins, a number very rarely found in this class of animals. Three species are enumerated by MM. Cuvier and Volenciennes.

1. The *Agriopus Torvus*. This fish inhabits Table Bay and the seas around the Cape of Good Hope, where it is called by the Dutch colonists *Zee-paard*, or Sea Horse. This fish exceeds two feet in length, and is common in the markets of Cape Town.

2. The Warty Agriope, (*A. verrucosus*,) is so called from having the skin of the head and body entirely covered with prominent conical tubercles, surrounded at the base with small papillæ. It grows to the same size, and inhabits the same localities, as the preceding species.

3. The *Agriopus Peruvianus* is found in the neighbourhood of Lima, and grows to the length of eight or nine inches.

AGRIPPA (HENRY CORNELIUS) a remarkable personage, who may be ranked with his contemporaries, Paracelsus and Cardan, as at once a man of learning and talent, and a quack. It may be added that each of the three was probably to a certain extent the dupe of his own pretensions. Agrippa was born at Cologne, of a noble and ancient family, on the 14th of September, 1486. His first employment was as secretary at the court of the Emperor Maximilian, after which he served in the wars in Italy, where, having repeatedly signalized himself by his bravery, he obtained the honour of knighthood. About his twentieth year he seems to have assumed the character of a scholar, and to have commenced a wandering life. The profession which he took up was that of a physician; but he allowed himself also to be regarded as an alchemist, an astrologer, and even as a practitioner of magical arts. Not satisfied even with this extensive range, he thought proper to set up likewise for a great theologian, as well as to indulge himself with occasional excursions into other departments of literature and science. The effect in that age of all this pretension, supported as it was by unquestionable talent and by real acquirements of great extent, was to raise Agrippa, for a time at least, to high estimation and importance. Pressing invitations were sent to him by several crowned heads that he would enter into their service—by our Henry VIII. among the rest. He appears to have visited England before this, one of his pieces being dated from London in 1510. His excessive imprudence, however, was continually involving him in difficulties; and especially, having by some of the effusions of his satiric spirit provoked the enmity of the monks and the church, he experienced the consequences to the end of his days. After having led for many years what may almost be called a fugitive life, this singular character died at Grenoble, in 1535. He had been thrice married, and had several children. The works of Agrippa were published in two volumes, octavo, at Leyden, in 1550, and also at Lyons in 1600. The most remarkable of them, and the only one which is now remembered, is his Treatise *On the Vanity of the Sciences*, which is a caustic satire on the kinds of learning most in fashion in that age. Bayle has dedicated a very long article to Agrippa, to which we refer those of our readers who wish for more information respecting him. See also Gabriel Naudé's *Apology for the Great Men who have been suspected of Magic*.

AGRIPPA (HEROD, son of Aristobulus), king of Judea. [See Herod.]

AGRIPPA (HEROD) son of the above. [See Herod.]

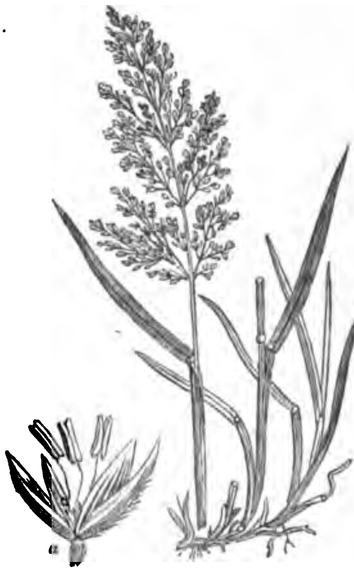
AGRIPPA (MARCUS VIPSANIUS) was born about the year 63 B. C., and thus was within a few months of the same age as Octavius, afterwards the emperor Augustus, with whom his whole destiny was so intimately united. When the assassination of Julius Cæsar led to a renewal of civil distractions, it was extraordinary to see the young Octavius, only in his twentieth year, boldly stepping forward into public life, and proving himself superior at once to the ablest generals and the most subtle statesmen of Rome. Not less extraordinary was it that he should find in a youth of his own age one so able to second him both by his counsel and his energies. Agrippa is already named in history as the companion of Octavius, while yet at Apollonia. The death of Cæsar brought them both to Rome, and Agrippa appears for the first time in public life as the promoter of an accusation against Cassius, one of the assassins. Again, in 40 and 41, when he was still only twenty-two years of age, we find him playing a highly important part in the war against Lucius Antonius; and indeed the capture of Perusia, which brought that war to a conclusion, was in a great measure due to the exertions of Agrippa, who covered the siege, on the eastern side, against the united forces of Ventidius, Pollio, and Plancus. In his consulship, 37 B. C. (or perhaps the year before his consulship,) he added to his reputation by a considerable victory over the Aquitani, and rivalled the glory of Julius Cæsar by leading a second Roman army across the Rhine. A large portion of this year was employed on the part of Augustus in preparing a fleet to oppose Sextus Pompeius, whose decided superiority at sea enabled him to blockade the whole coast of Italy, so that it was difficult for Augustus to provide a fleet, much more to train a body of sailors to the manœuvres of naval warfare. The fertile genius of Agrippa was able to meet the difficulty. By cutting a passage through the celebrated barrier of Hercules, which separated the Lucrine Lake from the sea, he converted that lake and the interior lake of the Avernus into a serviceable harbour, giving it the name of Portus Julius. In the following year he commanded the fleet of Augustus, in the victory off Mylæ; and afterwards in that more decisive contest which annihilated the power of Sextus Pompey, and gave to Augustus the full possession of Sicily. In the year 33, though already of consular rank, he held the office of ædile, his administration of which was distinguished by the restoration of the numerous aqueducts, and the erection of fountains throughout the city. In the naval victory off Actium, (B. C. 31,) which left Augustus without a rival in the empire, Agrippa was again the admiral of the successful fleet. In reward for these services he shared with Mæcenas the full confidence of Augustus, who associated him with himself in the important task of reviewing the senate; and in B. C. 28 again raised him to the consulate, giving him, at the same time, in marriage his own niece, the sister of the young Marcellus. Agrippa had indeed been previously married to the daughter of Cicero's friend, Atticus, by whom he had a daughter, Vipsania, afterwards the wife of Tiberius. Attica may have been dead, or it is not improbable that he divorced her to make room for Marcella. A third consulate awaited him the year following, in which he dedicated to Jupiter, in commemoration of the victory near Actium, the celebrated Pantheon, which remains to the present day, perhaps the most beautiful specimen of Roman architecture. It is now called, from its form, *Santa Maria della Rotonda*, but still bears the inscription, *M. Agrippa L. F. Cos. tertium fecit.* In 25 he assisted Augustus in the reduction of the Cantabri, and afterwards had the honour of representing the emperor at the marriage between the unfortunate Julia and Marcellus, who seemed thus marked out as the successor of Augustus. Yet the notion of any claim, founded upon hereditary descent, was not yet established among the Romans; and the splendid deeds of Agrippa, independently of his connexion with Marcella, gave him in some respects a superior title. A rivalry sprang up between them, which was encouraged by the ambiguous conduct of Augustus, more especially during his severe illness in 22, when, apparently on his death-bed, he publicly sent his ring to Agrippa. On the recovery of the emperor, Marcellus regained his influence, and Agrippa was sent by Augustus into honourable exile, as governor of Syria. Death in a few months removed his rival, and he was not merely recalled to Rome, but, at the request of the emperor, divorced his wife Marcella to marry the young widow Julia. In 19 he finally subdued the Cantabri, who had again been in arms for more than two years. Agrippa was now looked upon as the undoubted successor of Augustus; and in the following year was so far associated in the imperial dignity as to share the tribunician power with the emperor for five years. In 17 he proceeded a second time to the East, where his administration seems to have given general satisfaction, more especially among the Jewish nation, who benefited largely by his protection. On his return from that part of the world, his last military duty was to quell an insurrection among the Pannonians, for which his presence was sufficient. In Italy he received a renewal of the tribunician power for a second period of five years, but lived only a few months. He died in March, B. C. 12. His family, by Julia, were the two young Cæsars, Caius and Lucius, Julia, Agrippina, and Agrippa Postumus, born, as his name imports, after the death of his father; and it has been observed that every one of these came to a premature end. (Appian, Plutarch, Dion, Suetonius, &c.)

AGRIPPINA, the daughter of M. Vipsanius Agrippa and Julia, the only child of Augustus, married Germanicus, the son of Drusus, and nephew of Tiberius, to whom she bore nine children. Of these three died in their infancy, but among the remaining six were Caligula, afterwards emperor, and the second Agrippina, the mother of Nero. On the death of Augustus (A. D. 14), Germanicus and his wife were with the army on the banks of the Rhine, where they had much difficulty in restraining the mutinous soldiery from proclaiming Germanicus in opposition to his uncle. On this occasion Agrippina, by her determined bearing, shewed herself worthy of her descent from Augustus, and the following year she had again an opportunity of evincing the same spirit, in a general panic occasioned by an exaggerated report, that the army of Cæcina had been cut off by Arminius, and that a large body of the successful Germans were on the point of crossing the Rhine, and inundating the Gallic provinces. A proposition was made to destroy the Roman bridge over the river, but Agrippina, in the absence of her husband, prevented this disgraceful expedient. In the year 17, the disturbed state of the East afforded the emperor a pretext for recalling Germanicus from the scene of his successes in Germany. Agrippina accompanied her husband, and was with him in Syria when he fell a victim, at least such was his own conviction, to the arts of Piso and Plancina. Germanicus was not without suspicion that Piso and his wife had been urged on by the emperor and his mother, Livia, and under this feeling he implored his wife to restrain her proud temper, and submit to the evil times. Disregarding his prudent advice, she at once proceeded to Italy, and at Brundisium seemed to court the attention of the people as she left the vessel with the youthful Caligula and her youngest infant, bearing herself the funeral urn of Germanicus. The whole tenor of her conduct was such as to call upon her the anger of Tiberius, and when her cousin Claudia Pulchra (A. D. 26) was about to be the object of a prosecution encouraged by the emperor, she ventured to express her resentment to him in person in no measured terms. Agrippina had now remained in widowhood for seven years, when she requested the emperor to take pity on her single state and give her a husband. But Tiberius knew too well that the husband of Agrippina would be a dangerous enemy, and he parted from her without giving any answer to her pressing entreaties. The artifices of Sejanus completed the breach between them. By his agents he induced her to believe that there was an intention on the part of Tiberius to remove her by poison, and Agrippina, not accustomed to conceal her feelings, for ever offended the emperor, by plainly exhibiting to him her suspicions. She was banished to the island of Pandataria, and at last closed her life by starvation, October 18th, in the year A. D. 33. Her two eldest sons, Nero and Drusus, were also the victims of Tiberius. (Tacitus, Suetonius.)

AGRIPPINA, the daughter of Germanicus and the Agrippina of the preceding article, was born in the chief town of the Ubii, which she afterward raised to the rank of a Roman colony, calling it after herself *Colonia Agrippinensis* (now Cologne). She was but fourteen years of age when Tiberius gave her in marriage to Cn. Domitius Ænobarbus, by whom she had a son, who at first bore the name of his father, but afterwards under that of Nero became Emperor of Rome. After the death of Domitius, her disgraceful conduct was made by her brother Caligula a pretext for banishment: but on the accession of Claudius, she was recalled from exile and became the wife of Crispus Passienus. There seems to be some doubt whether Passienus was her first or second husband, though the probability is in favour of the latter supposition. By assassinating her husband Passienus she soon made herself again a widow, and now directed her efforts to gaining the affections of her uncle, the Emperor Claudius. Such a connection was held to be incestuous even among the Romans, but on the death of Messalina, the complaisant senate, influenced by the intrigues of Agrippina, affected to threaten the emperor with compulsion if he refused to take a step so essential to the welfare of the state (A. D. 50). Claudius yielded, and for the fifth time entered the state of matrimony. The control of the beautiful Agrippina over her aged husband was unbounded, and her first object was to secure to her own son those expectations to which Britannicus, the son of Claudius by the infamous Messalina, was more equitably entitled. The marriage of Domitius to Octavia, daughter of the emperor, and his adoption by the emperor himself, from which he derived the name of Nero, at once placed him above Britannicus; and in the year 54, Agrippina completed the object of her ambition by poisoning her imperial husband. Her son, now at the head of the empire, was not willing to allow his mother that share of the authority which she was desirous of assuming. Her power over him disappeared; and though for a time she partially recovered it by means of an incestuous intercourse with him, the beauty of Poppæa finally destroyed even this influence; and in the sixth year of his reign Nero determined under the encouragement of Poppæa to remove his mother from the world by her own arts. But it was not easy to poison one, who, familiar herself with poison, was ever on her guard. Nero, therefore, changed his course. After an unsuccessful attempt to effect her death near Baiæ by means of a vessel with a false bottom, which had been prepared for the purpose, she was openly dispatched by assassins (March, 60 A. D.). Her last words as she presented herself to the sword of her murderer were *Ventrem feri*, Strike the womb which gave birth to such a son. To enumerate all her debaucheries, all her murders, and other crimes, would require a much larger space than we think it necessary to assign to them. We will only add, that she wrote some commentaries of which Tacitus availed himself for his historical writings. They are also quoted by Pliny, vii. 8. (Tacitus, Suetonius, Dion.)

AGRO'STIS is a genus of grasses, consisting of a considerable number of species with loose-branched, capillary panicles of flowers, and a creeping habit. Among British grasses, it is at once known by the glumes (*a*), or outer scales of each flower, being two in number, unequal in size, of a membranous texture, and containing but a single floret; while the paleæ, or inner scales, are short, very thin, almost transparent, and two in number; the larger of them occasionally having an awn at its back.

Four species only are natives of this country—one of which, *A. vulgaris*, is found everywhere in dry, exposed, barren situations, and is of very little value to the farmer, except for its earliness; a second, *A. alba*, is equally abundant in marshy places, where it forms a valuable pasture. Under the name of Irish fiorin grass, this species has been the object of much attention from experimental agriculturists, some of whom, as Dr. Richardson, have extolled its qualities very highly as a marsh-fodder; but the experience of others does not confirm their opinion; nor does it appear to thrive in England to the degree that is represented in Ireland, where its vigour is such as to have led to the belief that the Irish plant is a distinct species, called *A. stolonifera*. In England it is best known, along with *A. vulgaris*, under the name of quitch, or quicks, and is generally extirpated as a troublesome weed, in consequence of the rapidity with which, by means of its creeping, rooting, vivacious stems, it spreads and overruns pasture and garden-ground. [3. *A. setacea*. 4. *A. canina*.]



[Agrostis Alba.]

AGUE. In treating of the individual diseases to which the human body is subject, it would be out of place in this publication to enter into the details which are proper and indeed necessary in works purely medical. All at which we can aim is to endeavour to convey a clear and correct conception of the nature of each disease, the signs by which its approach is denoted, the symptoms which demonstrate its existence, the circumstances which predispose to it, the causes which actually excite it, the precautions by which its attack may be averted, and the remedies which experience has shown to be the most effectual in curing it.

With the exception of those who have studied medicine as a profession, even the educated class in this country are grossly ignorant of everything relating to this subject. Yet there is no reason why sound knowledge may not be acquired by every man on this subject as well as on chemistry, for instance. That any one who does not study medicine with a view of practising it as a profession, should make himself so familiar with its details, as to be able to dispense with the assistance of the physician when either himself, or any one in whom he takes an interest, is afflicted with a serious disease, is not indeed to be expected, and the attempt would be quite absurd. But the more real knowledge any person can acquire on subjects of this class, the better he will be able to guard against the ordinary causes of disease; the more surely he will know, at the very first moment of its attack, when any serious malady assails him; the better he will be able to communicate with his physician and his physician with him; and the more effectually he will be enabled to co-operate with whatever plan of treatment may be adopted for the removal of his disease.

For these reasons we conceive that there is no part of our undertaking likely to be attended with greater benefit to the public, than that of rendering intelligible, in all its practical bearings, to the unprofessional reader, the nature, the causes, and the treatment of the more important diseases which afflict, and shorten, and destroy human life.

Of these diseases, the first of which we have to treat, is that termed Ague, a disease of no slight importance, though happily the peculiar interest which once attached to it, at least in this country, from its continual recurrence and general prevalence, is now greatly diminished. Ague belongs to the class of febrile diseases, and is indeed commonly considered as a paradigm or example of fever in general. Fevers are divided into three great classes. In the first the morbid phenomena that constitute the disease continue for a certain length of time; then they wholly disappear: after having been some time absent they again recur, and this repetition and return of the phenomena alternate with one another for many times. The period that elapses between the cessation of the febrile phenomena and their recurrence is called an intermission. Such fevers, then, as are attended with a cessation or intermission of the febrile symptoms for an observable space of time, are for this reason called *intermittent fevers* or *agues*. This is the first class. In the second class the febrile symptoms do not altogether disappear, but merely diminish in violence; they do not *intermit*, they only *remit;* for this reason this second class of fevers are called *remittent fevers*. In the third class, during the whole course of the disease, there is not only no retrocession of the symptoms, but no notable diminution of their violence. Such as the phenomena are when the fever is completely formed, such they continue to be with scarcely any variation until its close. For this reason this class of fevers is denominated *continued fevers*.

The concourse and succession of phenomena which constitute a fever is called a paroxysm. An intermittent fever, or an ague, is therefore a fever consisting of a succession of paroxysms, between each of which there is an intermission more or less complete.

The phenomena which constitute a paroxysm of fever are the following: The person is affected first with a loss of mental vigour, commonly indicated by inaptitude to attend to his usual avocations, or by dullness or confusion of mind. If not simultaneously with, very shortly after this mental debility there comes on a sense of physical weakness. The patient is languid, listless, disinclined to move, while every movement is performed with difficulty, and the effort to move is exhausting. The muscles or organs of motion are not merely weak—they are, at the same time, the seat of several uneasy sensations; the muscles of the extremities, and of the back especially, are affected with the sensation of soreness, as if they had been over-exercised, and this soon increases to decided pain, which is often very severe.

The next train of symptoms are ushered in by pallidness of the face and extremities: the features shrink; the bulk of the external parts is diminished; and the skin over the whole body is in a morbid state, as if drawn tight. Some degree of coldness is now felt, which at first is so slight as scarcely to be noticed, but at length the patient is fully conscious of a sensation of cold, which he commonly feels first in his back, but which thence extends over the whole body. This sensation of coldness increases until it becomes so severe as to produce a tremor in the limbs, amounting sometimes to trembling and shaking, and almost always producing distinct shivering.

From the first approach of the mental and physical languor, the pulse becomes weaker than in health. As the sense of cold comes on the weakness of the pulse is still greater, and it is at the same time always more frequent than natural; often irregular, and sometimes intermittent. The respiration also is shorter, feebler, and more frequent than in a state of health. The appetite fails; there is sometimes even an aversion to food: frequently the loss of appetite is succeeded by a sense of nausea and sickness, which occasionally increases to vomiting, and with the matter vomited there is, for the most part, a mixture of bile. From the commencement of the paroxysm there is generally some degree of thirst, which increases in urgency as the sensation of cold advances, being always proportioned to, and probably arising from, the dryness and clamminess of the mouth and fauces. Not the secretions of the mouth alone, but all the secretions of the system are diminished. The excretions also are lessened in quantity, and especially the urine, which is scanty and nearly colourless, and the alvine evacuations are usually altogether suppressed. Even in this stage, headache may come on, but it usually does *not* appear until the following.

These symptoms having continued for some time, at length disappear, and a remarkable change takes place in the character of those that succeed. The sensation of cold gives place to that of heat, and a temperature far greater than that of health prevails over the whole body. The face which had been pallid now becomes flushed and red. The eyes which had been dull and heavy, are now more bright and glistening than natural. The features of the face and the other parts of the body recover their usual size and become even more turgid. The pulse becomes more regular, strong, and full, the respiration fuller and more free, and the nausea and vomiting are less urgent: if before there were pan iin the head, it now increases in severity; if there were none, it is now sure to come on, and while the sensibility is increased, the intellectual operations are more and more disordered.

By degrees these symptoms also pass away, and are succeeded by a different train. A moisture now breaks out first on the forehead, which by degrees extends over the whole body. As the perspiration flows, the heat abates; the pulse becomes slower and softer; the respiration more free; the nausea and vomiting cease; the thirst diminishes; the secretions and excretions are restored; most of the functions return to their ordinary state, and the patient is left comparatively free from disease, feeling only weak and exhausted.

Such are the phenomena that constitute a febrile paroxysm, and such is the order of their succession, and they obviously constitute three distinct states, or, as they are called, stages or fits; viz., the cold, the hot, and the sweating stage.

After one such paroxysm has remained for a certain length of time it ceases; after it has ceased for a certain length of time, the same series of phenomena again arises, and observes the same course as before, and this alternation is repeated many times. It has been already stated, that the length of time from the end of one paroxysm to the beginning of another is called an INTERMISSION, while the length of time from the beginning of one paroxysm to the beginning of the next is termed an INTERVAL.

Different names are given to the different varieties of this fever according to the length of the *interval*. If one paroxysm be succeeded by another within the space of twenty-four hours, the ague is termed a quotidian; if after forty-eight hours, a tertian; if after seventy-two hours, a quartan; if after ninety-six hours, a quintan. Those with longer intervals are usually termed erratic. The most common form is a tertian; the next most common a quartan; the next a quotidian; the least frequent a quintan. Agues are likewise divided into vernal and autumnal, the vernal beginning in February, and the autumnal in August. There is a great difference in their character. The vernal in general are milder and easily cured, while the autumnal are often severe and obstinate.

It sometimes happens that two intermittents attack the same person at the same time, and the ague is then said to be complicated. The most common complication is the case in which two tertians or two quartans attack simultaneously. What is called the double tertian, for example, consists of two tertians, each of which attacks at its regular time, and consequently the paroxysm occurs every day. This form of ague is distinguished from the quotidian, by comparing the paroxysms with each other. Though a paroxysm occur every day, yet if they be carefully observed it will be found that the alternate paroxysms only resemble each other, while if the paroxysm of a preceding day be compared with that of a succeeding day, some manifest difference will be observable. There may also be another form of the double tertian; namely, with two paroxysms on one day, and another on the following day: or there may be a triple tertian, with two paroxysms on each alternate day, and one only in the intervals. The double quartan also varies. It may occur with two paroxysms on the first day, none on the second or third, two again on the fourth day, or with a paroxysm on the first day, another on the second, but none on the third.

But whatever be the form of fever, the nature of it is essentially the same: yet the form is of some consequence, as denoting the severity and tendency of the disease; for a quartan is far more obstinate than a tertian, while a quotidian is apt to change into a continued fever. Quartans, for the most part, appear in autumn, while tertians are the most common in spring.

Whatever be the form of fever, the duration of the paroxysm is different in almost every different case. The longer the paroxysm the shorter the intermission; the shorter the intermission the longer the paroxysm. An extension of the period of the intermission, or a postponement of the period of attack, is in general a favourable event, denoting that the disease is declining; on the contrary, a prolongation of the paroxysm, or an anticipation of the period of attack, marks an increase in the severity of the disease, and is a sign that the intermittent is about to lapse into a remittent or into a continued fever.

From the preceding history of the disease it is clear, that the distinguishing character of intermittent fever is the regular return of the paroxysm at a fixed period, the entire cessation of it after a certain time, and the renewal of it after a specific interval, according to the species of the ague. Nevertheless, though these distinct intermissions and accessions are always apparent when the ague is regular, yet in the most severe and formidable cases it entirely loses its intermittent character and assumes a remittent, or even a continued form.

Innumerable cases, which are commonly considered and treated as continued fevers, are really of the nature of intermittents, and of this the older physicians, who had so many more opportunities of witnessing this malady in its more formidable aspect than the physicians of the present day, were fully aware. ‘Intermittents,’ says Sydenham, ‘take their names from the intervals between the fits. This is sufficient to distinguish them, if the seasons of the year wherein they happen, namely spring or fall, be considered; but some of these have no very visible character whereby they may be distinguished from continued fevers, though they really participate of the nature of intermittents. In general the character of spring intermitting fevers is sufficiently obvious; but when autumnal intermittents come early, namely, in July, and are common, these do not immediately assume their own proper shapes, for they imitate continued fevers so well, it is hard to distinguish them. But the violence of the constitution of the season being a little quelled, about the end of autumn, they put off their disguise, and then openly appear to be intermittents, either tertians or quartans, as indeed they really were at first. And if this be not carefully observed we shall be deceived in our prescriptions, while we mistake fevers of this kind which are to be accounted intermittents, for real continued fevers.’

The apparent change of character or type here stated, dependent on the severity of the disease, is constantly observed. If a fever, truly of an intermittent nature, be of a bad kind, it often commences with the form of an alarming and dangerous continued fever, but as the disease declines and becomes milder, the intermission becomes apparent, and the true nature of the malady manifest, while, if an intermittent commences under its own form, but in its progress becomes severe, it often changes into a disease which cannot be distinguished from a continued fever.

There is nothing in the nature of disease more curious and inexplicable than this property of periodicity. During the intermission what becomes of the malady? Why after a specific interval does it uniformly recur? Physicians have endeavoured to refer this singular phenomenon, which, if it were not so clearly seen would not be credible, to the principle of habit. Dr. Cullen endeavoured to show that there is in the human constitution a diurnal exacerbation, occurring towards evening, very analogous to the febrile state, and that the recurrence of the febrile paroxysm is referrible to this diurnal habit. But were this diurnal exacerbation fully established as a fact, which is not the case, it would not account for the regular return of the paroxysm of an intermittent fever, which, as we have seen, is commonly of the tertian type, and which, therefore, returns not every day, but every alternate day, and not in the evening but at noon. The regular return of the appetite for food at a given hour; the regular return of the desire for sleep; the regular return of the alvine evacuation, which it is so important to the health to cherish; even the facility with which articulate speech is pronounced, and the formation of the gait or air of a person by which each individual is distinguished from every other, these among innumerable others are examples of that law of the animal economy by which, when any motions, whether voluntary or involuntary, are performed two or three times in succession, the same motions are easily excited again. But to no such law can the phenomenon in general be referred, for the difficulty is not to account for the renewal of motions once excited, on the reapplication of the cause that produces them, but to explain why a cause which is always present, that of the malady, acts vehemently for a given time, ceases to act at all for a given interval, and then regularly commences at the termination of that interval. We have not advanced a single step towards the elucidation of this matter beyond the point at which Sydenham left it 200 years ago.

Of the Exciting Cause of Ague.—That the effluvia which arise from stagnant water or marshy ground are the immediate or the exciting cause of this disease is now universally admitted. What the nature of these effluvia is, is not known. Neither their physical nor their chemical properties have been ascertained. Even their presence is known only by their effects on the human constitution. No other test of their existence has as yet been ascertained. The most distinguished chemists have applied all the resources of their art to the investigation of this subject, but hitherto with so little success, that all which they have ascertained is the mere fact, that in certain situations an aëriform substance is generated capable of producing intermittent, remittent, and continued fever, together with several other painful and dangerous diseases. Some conjecture that this poisonous gas is carbonic acid; others that it is azote; others again that it is hydro-carburetted gas, or hydro-sulphuretted gas, or an undiscovered compound of azote and oxygen called septon. But chemistry has yet to discover even whether this poison be a simple substance or a compound body, as well as by what test, other than its action on the human body, its presence may be determined.

Though this poison be generated in the greatest abundance and intensity in marshy and swampy ground, yet without doubt it is also produced in situations which have none of the characters of a marsh. Wherever the ground is moist and contains decaying vegetable matter, this poison is capable of being generated. Woods afford it in almost as large a quantity as marshes, because in woods the ground remains a long time damp, and always abounds with decaying vegetable matter. Hence in all the densely wooded parts of England both intermittent and remittent fevers are rife. This is especially the case in the woody districts of Kent, Sussex, Hampshire, Wales, &c. The jungle of India consists of a low and dense brushwood, or a thicket of reeds and grass; and intense heat acting on the wet and decaying vegetation, with which it abounds, the poison is here produced in the highest degree of concentration. Rice grounds, for the same reason, are notoriously productive of it. But it is curious that the clearing of woods sometimes increases the evil. Dr. Rush states that, in Pennsylvania, epidemics invariably follow the clearing and cultivation of forest lands, and that they do not disappear until after many years of continued cultivation. The same remark has been made in France; and the district of Bresse, (Lyonnais,) which was comparatively healthy when full of woods, has become nearly depopulated since they were cut down. The shade of the trees kept the sun in a good measure from the wet ground; but the removal of the trees exposes the wet ground to the full action of the sun. Meadow land, imperfectly drained, contains in abundance the two conditions, moisture and decaying vegetable matter, and is in England a frequent and extended source of this poison. It is commonly considered that a large space of land in the condition of a marsh, a swamp, a thick and damp wood, or an undrained meadow is necessary to the production of the poison; but while it is not easy to fix the minimum of the space that is requisite, it is quite certain that an exceedingly small space is sufficient. These facts show, in a striking manner, the danger and folly of creating artificial marshes as ornaments in parks and gardens. ‘Hereafter,’ says Dr. Macculloch, ‘perhaps an English gentleman will be as much surprised that his neighbour should dig a sleeping canal before his door, as that his feudal ancestor should have built his castle in a marsh, and inclosed it with a putrid moat. The pond which has been constructed for a few gold fishes, or the river which meanders through the woody valley, is often the death spring of diseases; and the produce of a few bunches of rushes, or even a splendid display of water-lilies, are dearly purchased at the cost of the fevers and the toothaches which are the torments of the owner's family, the ailing wife who is his own torment, and the sciatica which is the torment of his poorer neighbours.’

Wherever generated, this poison, either mechanically mixed or chemically combined in the air, is capable of being conveyed in unimpaired power to a considerable distance by currents of wind. The influence of the Pontine marshes, situated at the distance of fourteen miles from Rome, is often felt in that city.

In warm climates, where this poison is generated in the highest degree of intensity, it sometimes proves suddenly fatal to individuals of a ship's crew when the vessel is several miles from land. It is brought with the land-wind. It seems certain that the poison can be carried as far as the smell of the land is perceptible. A memorable instance of this occurred in a vessel that was five miles from shore. The wind suddenly shifted; the smell of land was perceptible; the nature of the neighbouring coast was known to the people on board, and the danger duly appreciated; every one that could do so hastened below to save himself from the noxious breeze. Some of the crew, however, were unavoidably employed on deck; the armourer of the ship was detained a few minutes in order to clear an obstruction in the chain cable, and was seized with fatal cholera in the very act in which he was engaged. Of the men that remained on deck, several died of the same disease in a few hours, —the attack having been simultaneous with the very first perception of the land smell; and in our own country it is often conveyed by currents of wind to a distance of several miles. It frequently proceeds to the hills of Kent, for example, several miles distant from the marshes of Erith, Northfleet, or Gravesend. The watery vapour that is so apt to arise in situations most favourable to the generation of this poison appears to be an exceedingly formidable conductor of it. Sir John Pringle, who had many opportunities of observing this fact in the campaigns in Flanders, about the middle of the last century, uniformly found that the number of men who were seized with sickness during the prevalence of a fog, far exceeded the number attacked when the weather was clear, though he did not attribute to the fog the production of the poison, but justly considered it as merely the conductor of it.

But to whatever distance a current of wind or a dense fog may be capable of conveying this poison in sufficient quantity and concentration to produce disease, yet there cannot be a question that the poison is most intense the nearer to the marsh and the closer to the ground. Persons who live within a certain distance of an unhealthy spot often suffer severely, while those who reside at a somewhat greater distance escape. Persons who live in the basement story of a damp and undrained house, and especially those who sleep there, are constantly attacked with fever, while those who live in the upper apartments of the same house remain free from disease.

There are spots in which this poison is generated in such quantity and intensity as to be capable of killing instantaneously whoever is exposed to it. Exposure to it in certain situations has proved fatal with a rapidity and certainty equalled only by a mortal dose of Prussic acid. Exposure to it in other situations produces what may appear to be, and what is sometimes mistaken for, apoplexy—an affection of the brain causing death more rapidly than almost any other disease to which the human body is subject. Exposure to it when less concentrated produces malignant fever of a continued form, destroying life in a few days or hours. Exposure to a still smaller concentration produces remittent, and to a yet smaller, the milder form of intermittent fever. And it may be so minute in quantity or so destitute of virulence in its own nature, as to be incapable of producing even intermittent fever, in its regular and well-marked form, and yet sufficiently potent to produce a long catalogue of grievous maladies. The secondary diseases which have this origin, and which have been much overlooked, consist for the most part of those painful affections of the nerves, which have been lately classed together under the general term of *neuralgia*. The exquisitely painful, and too often unmanageable diseases called tic douloureux, the disease called sciatica, the toothache, and more especially periodical headache, are oftentimes clearly traceable to this poison, and are as certainly produced by it as the most distinct and regular ague. Persons who live in situations where this poison is generated in abundance may never have ague, but at the same time they never enjoy a moment's health; while it is certain that long-continued exposure to it, though it may not produce any specific disease, included in the catalogue of the nosologist, fearfully abridges the term of life. Few persons in such situations attain the age of fifty. In some parts of America, few of the inhabitants formerly lived beyond the age of forty; those who survived thus long had, at that early period, all the characters of extreme old age; already in those very situations, by the clearing, draining, and general cultivation of the land, the average term of life has been extended fifteen or even twenty years. There can be no question that the value of life which, in modern times, has increased so much in our own country, and which has improved in the rural districts in proportion to the better cultivation and the more complete draining of the land; and in the larger towns and cities to the better ventilation and the greater cleanliness for which they have been remarkable, has been mainly owing to these causes. So recently as the beginning of the present century, a celebrated physician, who had large experience of this matter, states, as a fact that came within his own observation and experience, that in small villages, in which the annual number of persons attacked with ague amounted to 200, not one case had occurred for several years.

Dr. Macculloch gives a vivid and but too faithful picture of the external appearance and of the constitutional disorder of the people who constantly reside in the midst of this poison, and who are not suddenly cut off by it under some acute form of disease.

Of the remote or predisposing Cause. It has been stated* that the remote, or the predisposing cause of disease is that which brings the system into a condition capable of being affected by the immediate or exciting cause. Whatever diminishes the vigorous action of the organs, impairs their functions, and so weakens the general strength of the system, is capable of becoming a predisposing cause of fever; and every predisposing cause acts in one or other of these modes, and becomes a predisposing cause only and in proportion as it lessens the energy of the system, or disturbs the balance of its actions, which in fact is to render some portion of it weak. During a state of vigorous health the body is endowed with the power of resisting the influence of noxious agents, which in a less perfect state of health are capable of producing intense and fatal disease; and the action of all predisposing causes is to lessen this resisting power, or to weaken the energies of life.

Of all the predisposing causes of ague the most powerful is the continued presence, and the slow operation of the immediate or the exciting cause. The manner in which the immediate or the exciting cause of fever operates as a predisposing cause has been amply illustrated by Dr. Southwood Smith. 'It is a matter of constant observation,' says this author, 'that the febrile poison may be present in sufficient intensity to affect the health, without being sufficiently potent to produce fever. In this case the energy of the action of the organs is diminished, their functions are languidly performed, the entire system is weakened, and this increases until at length the power of resistance is less than the power of the poison. Whenever this happens, fever is induced; not that the power of the poison may be at all increased, but the condition of the system is changed, in consequence of which it is capable of offering less resistance to the noxious agent that assails it.

'We have seen that the vegetable or animal poison may exist in sufficient intensity to produce fever on the slightest exposure to it, without the operation of any predisposing cause, in a body in the state of the soundest health, and endowed with the greatest degree of strength. Examples of this kind are but too frequent in tropical climates. In countries where the temperature never rises so high, and seldom continues so long, it is rare that fever is produced immediately on exposure to the exciting cause. Concentrated and potent as that poison is in many parts of Flanders, yet Sir John Pringle states that, "on removing to an unhealthy situation, the men rarely became ill at once; that they generally continued in tolerable health for some days; and that recruits recently arrived in the country resisted the noxious agent longer than the men who had been long there." Dr. Potter gives a remarkable example of the same fact, with regard to the yellow fever, which fell under his own observation, and states other facts strikingly illustrative of the influence and operation of the predisposing causes. Strangers, from certain countries, he informs us, are insusceptible of yellow fever in America. In the most malignant and protracted epidemics which afflict that country, these strangers uniformly escape; emigrants from the West Indies, and other warm latitudes, for example, invariably resist the cause which produces these maladies in the native inhabitants. But the curious fact is, that such persons are unable permanently to resist the operation of the exciting cause; for, after a residence in America of some years, their constitution is so completely assimilated by the influence of the climate to that of the American, that they become equally sensible to its febrile miasma, and are as exquisitely impressed by them as the American citizens themselves. The illustration is equally striking and instructive if the position be reversed. The natives of northern climates are extremely susceptible to the influence of these miasma; that susceptibility is in exact proportion to the latitude of their country: those from the north of Europe scarcely ever escape an attack; the natives of Great Britain are nearly as susceptible to the influence of the poison, while persons even from the more northern countries of the United States are more liable to the disease than the citizens of the southern and middle states.'

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* See Treatise on Fever by Dr. Southwood Smith.

Among the other predisposing causes may be reckoned the period of life. All persons between the age of puberty and that of thirty-eight are peculiarly predisposed to this disease. After the disease has once existed, there remains in the constitution a remarkable susceptibility to its recurrence; and that from very slight causes, as from the prevalence of an easterly wind, or exposure to a very minute quantity of the poison that originally produced it, such as would not affect a person who had never been the subject of the disease. Hence, persons who have been once or twice, or oftener affected with ague, are most delicate tests of the presence of the exciting poison. Deficient and poor diet; intemperance; physical and mental fatigue; anxiety, cold, damp, debility, however induced—all these are extremely powerful predisposing causes. They enable a less dose of the poison to produce the fever, and they increase the intensity of it when established. They all act by weakening the resisting power inherent in the constitution, that is, by enfeebling the powers of life. In a vigorous state of the health, exposure to the poison, even in a concentrated state, may occasion no mischief, because the resisting power of the constitution may be greater than the power of the poison, but no human strength can resist a continued exposure to it; for, as has been already stated, if such long-continued exposure do not produce disease in the form of ague, it will certainly produce it in some other shape; which, if it do not immediately kill, will assuredly shorten life.

Of the Cure.—The first object in the treatment of a person affected with ague is to remove him from the influence of the poison by taking him out of an unhealthy, and placing him in a healthy situation. Unless this can be done, every remedy employed must act at a great disadvantage, and the power of the poison, or the debility of the patient, may be such as to render every effort to cure the disease unavailing without a change of residence. Often, however, circumstances will not admit of the removal of the patient. Whenever this is the case, the sick person must at least be put and kept in an apartment the most remote from the noxious spot, and it is a good and important general rule to place him in the highest part of the house. When this precaution is neglected, remedies constantly fail which readily and completely succeed when it is observed.

A vast variety of medicines have been recommended as sovereign remedies in this disease, and such an enumeration may be useful to the experienced and judicious practitioner, because he knows how to select, and he may find in the catalogue what may suggest the precise modification adapted to any individual case of peculiarity and difficulty which he may chance to have in hand. But the student and the young practitioner require more precise direction, and the mode of procedure which proves the most effectual in the great majority of cases cannot be too clearly and definitely pointed out.

Passing by the treatment adapted to the severest cases that occur in hot climates, in which, indeed, human art is too often of no avail whatever, we are fortunate in possessing three remedies, the proper employment of which seldom fails to cure the most formidable and inveterate intermittent which ever occurs in this country, namely, ipecacuanha, bark, and arsenic.

The treatment of ague includes the management during the paroxysm, the intermission and the convalescence. None of these remedies is suitable to all these periods, and what will effectually cure in one, may prove positively injurious in another.

First of the treatment during the paroxysm. The approach of the paroxysm should be carefully watched. The moment the first indication of its accession is apparent, whether that indication be afforded by a return of languor, or listlessness, or pain of the head, or a sense of confusion, or, above all, of coldness or chilliness, an emetic, consisting of twenty grains of the powder of ipecacuanha with one grain of the tartar emetic, should be given. The operation of the emetic may be promoted by drinking freely warm water, or warm chamomile tea *after* (*but not previously*) the first act of vomiting has occurred. As soon as the operation of the emetic is over, a draught should be taken, consisting of forty drops of laudanum in an ounce and a half of camphor julep. This plan, in almost all cases, will completely stop the coming on of the cold fit; in a great number of cases it will also prevent altogether the accession of the hot fit, inducing at once the sweating stage, that is, the stage which constitutes the solution of the paroxysm. But if it should not actually stop the accession of the hot stage, it will assuredly diminish its violence and shorten its duration; and as soon as the hot stage is formed, the laudanum should be repeated in smaller doses, namely, in doses of from ten to twelve drops, repeated every hour, and continued until the sweating stage is completely established.

As soon as the cessation of the sweating stage terminates the paroxysm, and the latter is succeeded by the stage of intermission, the bark should be freely taken. Of all the preparations of bark, the sulphate of quinine is incomparably the best. The dose is from two to four grains, and the most convenient mode of administering it is in the form of pill. During the whole period of the intermission, the dose of quinine should be repeated every hour, or every two hours, according to the urgency of the case. If the biliary secretion be unhealthy, which it almost always is, it will be useful to combine with every alternate dose of the quinine, from the sixth to the fourth part of a grain of blue pill, together with two grains of the extract of gentian. If the bowels be constipated, the addition to each pill of from one to two grains of the extract of rhubarb will form an excellent aperient. Given in this mode, the extract of rhubarb moderately, but in general effectually, stimulates the alimentary canal, gently increasing its action, without producing purging. If, however, the bowels be constitutionally torpid, or be rendered so by the disease, a more active aperient must be substituted, and such will be found in the compound decoction of aloes, or the infusion of senna with camomile. The condition of the bowels must never be neglected, for a state of constipation will powerfully counteract every remedy.

This plan should be continued without intermission until the recurrence of the symptoms which denote a fresh accession of the paroxysm. Then the quinine, &c. should be suspended, and the emetic should be again repeated, which, as soon as its action has ceased, should be followed by the opiate, and this, on the solution of the paroxysm, by the bark, and so on in a constant series, until the paroxysm return no more. By this method of treatment the disease is usually cured after the third accession, consequently it is seldom necessary to repeat the emetic more than three times, and often twice and even once is sufficient. Formerly there was a great difficulty in exhibiting the bark. From one to two drachms of the powder was prescribed every hour, and nothing was thought to be accomplished unless from one to two ounces were accumulated in the stomach before the expected return of the paroxysm. There were few stomachs which could bear this quantity, and accordingly all sorts of combinations with aromatics and spirits were tried, but commonly tried in vain, to enable the stomach to retain it. The system, besides being oppressed by the disease, was thus still further harassed by the disorder of the stomach and bowels occasioned by the remedy. The preparation of quinine has obviated all these difficulties, and the science of medicine owes a large debt of gratitude to chemistry, for the wonderful simplification and concentration of the most potent remedies which it has effected. One grain of quinine will accomplish more than a dram of the bark. The necessity of taking fifty-nine drams of useless matter which oppressed and irritated the stomach, already in a weak and irritable state, is obviated, and consequently the cure is much more easily and rapidly effected.

Bark, however powerful and effectual during the intermission, is commonly conceived to be useless and even pernicious during the paroxysm. But this is the period when opium is most effectual. It has now been tried on a very large scale, and the favourable report of it by those who first tried it has been fully confirmed by subsequent experience. Extended opportunities for observing ague do not occur in London, and when they do occur, the cases are never, perhaps, the most formidable. Cases, however, are continually occurring, and we have witnessed more than enough to satisfy us of the speedy and most beneficial effects of opium, especially when the exhibition of it has been preceded by an emetic. It has, however, been given with success as the sole remedy. Dr. Trotter, who had an opportunity of observing its effects on a large scale in the Channel fleet, under Earl Howe, states, that whenever the sick felt the first approach of an attack, he prescribed from thirty to forty drops of laudanum; that if this dose did not bring on some warmth in the course of ten or fifteen minutes, he gave from twelve to fifteen drops more; that it was seldom necessary to increase the quantity beyond sixty drops in the space of an hour, decided relief being always afforded in that time; that in a few minutes from the exhibition of the opiate the spirits became exhilarated; the constriction on the skin was removed, and was followed by relaxation; the countenance looked more animated; a flush spread itself over the cheek; the pulse, from having been weak, quick, irregular, and sometimes intermittent, became less frequent, and more full and more equal; an agreeable warmth was diffused over the whole frame, and every unpleasant feeling vanished sometimes in a quarter of an hour. As soon as any symptoms indicated a return of the paroxysm, the laudanum was repeated in the same manner as at the accession of a former fit, and always with equal success, so that the patient seldom experienced much trembling and shaking; it was observed that the second paroxysm was commonly an hour or two later in the day than the preceding, and but few instances occurred of a return of the disease after the third paroxysm. The patients themselves were so satisfied of the efficacy of this remedy, that the moment they felt the first approach of an attack, they were sure to run to the cockpit for relief.

Dr. Lind, who also tried this remedy on a large scale, states, that, according to his experience, the good effects of opium are more uniform and powerful in intermittent fever than in any other disease, and that it affects the disease more rapidly than any other medicine; that if taken during the intermissions, it has no effect either in preventing or mitigating the succeeding paroxysm; that when given in the cold fit, it occasionally removed it; but that when administered half an hour after the commencement of a hot fit, it almost always afforded immediate relief. 1. It abated the violence of the fit and shortened its duration. 2. It relieved the head, put an end to the burning heat, and brought on a profuse sweat, which was more copious than when not occasioned by opium, and attended with a softness of the skin instead of the intense burning sensation common in the sweating stage. 3. It constantly produced a tranquil and refreshing sleep, from which the patient awoke bathed in sweat, and in a great measure free from all complaint. From the speedy and complete solution of the attack, it is contended that this remedy not only shortens the duration of the disease more than other medicine, but more effectually preserves the constitution from injury, insomuch that, after its use, it is seldom that dropsy, jaundice, or ague, disease of the liver, spleen, or any other viscus, is witnessed. According to this physician, opium is the best preparative for the bark; since it not only produces a complete intermission, in which case alone the bark is effectual or even safe, but it occasions such a copious and salutary evacuation by sweat, as generally to render a much less quantity of bark requisite.

The names just cited are both good and independent authorities; their statements are the result of observation and experience, and they show in a striking manner the efficacy of the practice we have recommended, which is also derived from ample experience.

When the intermittent is of long continuance, or when the patient is advanced in years and weak, or when the season is rainy, or the situation damp, it will be advisable to add serpentaria to the quinine, and to combine some aromatic with both. Thus the quinine may be given in two ounces of the infusion of serpentaria, with a dram of the compound tincture of cardamom, and a scruple of the aromatic confection.

It is not sufficient that the recurrence of the paroxysm has been stopped once or twice by the use of the remedies prescribed. It should be borne in mind that there is in this disease a great tendency to relapse, and this tendency continues through the whole period of convalescence, and for some time after. The quinine should be continued in smaller doses for some weeks after the last paroxysm has supervened, especially if the weather be damp or easterly winds prevail.

If aperients are necessary, they should be warm and aromatic, and given during the intermission, so that their operation may be over before the accession of the paroxysm.

When an ague is severe, obstinate, neglected, ill treated, or attacks a person whose constitution was previously unsound, organic disease is occasionally produced, which always renders the treatment difficult and the cure uncertain. The organs that are most liable to be diseased are the liver and the spleen; these become enlarged and hardened, scirrhous, as it is technically termed. The tumors occasionally press upon the great veins of the liver, and prevent the blood from passing freely from the abdominal viscera; the passage of the blood being retarded, the serum or the fluid part of the blood is exhaled into the cavity of the abdomen in greater quantity than the absorbents can take up, consequently it accumulates and thus forms dropsy.

These tumors may also press upon the ducts that carry the blood from the liver into the duodenum, or the small intestines which receive it; it may, therefore, be taken up by the absorbents and carried into the blood, diffused over the system and so produce jaundice.

In the same way diarrhœa may be produced. The blood, not passing freely through the abdominal viscera, may be determined in larger quantity than usual upon the intestines; the capillaries of the mucous membrane of the intestines thus loaded with blood secrete actively, and pour a larger quantity of fluid than natural into the canal, which is excreted in the form of diarrhœa. This diarrhœa is always colliquative, that is, weakening and exhausting to the system, without diminishing, but rather increasing the disease. Astringents must be given cautiously. Mild aromatic aperients combined or alternated with opiates are the most effectual remedies. But the diarrhœa may be the consequence of inflammation of the mucous membrane; then bleeding or leeches may be necessary, and the oleaginous aperients are the only safe ones, as the oil of almonds, or castor oil with mucilage of gum arabic, combined with a few drops of laudanum, or a few grains of Dover's powder. During the paroxysm, the only food of the patient should be arrow-root, sago, panada, barley-water, and the like. During the intermission, animal food may be allowed and a moderate use of wine.

Change of situation is a most powerful remedy; 1st, because it may remove the patient out of the sphere of the poison that produces the malady; 2ndly, because this is one of the diseases in which mere change of air is beneficial.

This disease is peculiarly apt to return. Relapse is brought on by very slight causes; a very small dose of the poison will renew it.

It is probable that errors in diet, or constipation will also do it. It is certain that cold, and that the east wind will do so; but it is probable that in the cold and moist air, and in the east wind, there is diffused some of the malaria. The patient should not go out in damp or cold weather, or during the east wind.

In protracted and obstinate cases which do not yield readily to quinine, arsenic, without doubt, is a very powerful remedy, and its efficiency is increased by its combination with opium or quinine. The proper dose of the arsenic is from two to three or ten drops of the liquor arsenicalis three times a day. This remedy should always be given soon after a meal; for if taken when the stomach is empty, it is apt to produce pain and vomiting. The operation of the remedy should also be carefully watched day by day; for, like other mineral poisons, it is apt to lie latent in the system for a considerable time, producing no apparent effect, and then suddenly to produce violent symptoms. Even the physician is not warranted to have recourse to a remedy of this kind, when a milder medicine will accomplish the cure with equal efficiency and rapidity; but when the disease does not yield to ordinary remedies, the cautious and judicious employment of arsenic will seldom fail to remove it. In no case, however, should this most active poison be administered without constant watching on the part of the medical attendant, and, of course, the employment of it without medical superintendence is altogether out of the question.

AGUESSEAU (HENRI FRANCOIS D'), a chancellor of France. He was born November 27, 1668, at Limoges, the principal town of the then province of Limousin, and now the chief town of the department of Haute-Vienne. His father, who was *intendant* of that province, devoted himself to the education of his son. The sober judgment and the cultivated taste, which Henry displayed through life, reflect the highest honour upon his paternal teacher.

The abilities of Aguesseau brought him early into notice. At the age of 21, he was admitted an advocate at the Châtelet; and, three months after, he was made one of the three advocates general. It has been said, that this high office was conferred upon him through the recommendation of his father, in whom Louis XIV., the then reigning monarch, placed great confidence. During ten years that he filled the situation, he obtained that great reputation which secured his future elevation.

In the year 1700, he was appointed Procureur Général (Solicitor General). His opposition to the registration in parliament of the papal bull UNIGENITUS, which he considered as an assumption of the papacy inconsistent with the rights of the French nation, and destructive of the independence of the Gallican church, had nearly caused his disgrace with the king. But he maintained his position by the force of his talents and integrity. He employed his authority as Procureur Général in most cases wisely and honestly. He reformed the system of the management of public hospitals; improved the discipline of courts of justice; and instituted a quicker mode in the investigation of criminal cases previous to their being brought to judgment.

Aguesseau aspired through life to the high but difficult reputation of a legal reformer;—and it is in this particular that his character has the greatest claim upon our respect. His principal objects were to define the limits of particular jurisdictions; to introduce uniformity in the administration of justice through the various provinces; and to secure the right to the subject of a just testamentary disposition of his property. His praiseworthy attempts were resisted no doubt by all those whose mistaken interests suggested to them that the attainment of justice ought to be kept expensive and uncertain, instead of being rendered cheap and secure. He is said to have confessed that he did not go so far as he wished, because he did not like to reduce the profits of his professional brethren. This was a mistake even in mere worldly policy; for when law, as well as any other article of exchange, is dear and worthless, the purchasers will be few. D'Aguesseau was not much before his age, probably, in the knowledge of political economy, or he yielded to popular clamour. During the famine which afflicted France in 1709, he carried on vigorous prosecutions against what were called forestallers and monopolists, that is, holders of corn—a class of persons who, by equalizing the price of corn, by buying in times of plenty, and selling at a profit in times of scarcity, have done the only thing which could relieve the pressure of bad harvests upon the people.

In 1717, Aguesseau succeeded Voysin in the chancellorship. His appointment to this high office by the regent, (Duc d'Orléans,) in the minority of Louis XV., gave general satisfaction. However he did not retain it long, for he was dismissed and exiled the following year, on account of his opposition to Law's financial system. His perception of the fallacy of this adventurer's schemes for substituting fictitious wealth for real capital, showed that, in some points of political philosophy, his views were sound. His recall, two years afterwards, at the moment of the great crisis brought about by Law's system, was a signal triumph for Aguesseau. His high sense of integrity and justice would not allow him to hear of a national bankruptcy: he insisted on making good the government obligations, or at least allowing those who held its paper to lose only a proportionate part; and, by thus preventing a bankruptcy, he contributed in some degree to restoring general confidence.

New agitations were again raised on account of the bull *Unigenitus*, the registering of which parliament still opposed. Aguesseau, by endeavouring to conciliate both parties, exposed himself to the charge of a change of opinion in this matter. The parliament were on the eve of being exiled to Blois, when they at last consented to register the bull with modifications.

Cardinal Dubois, the unworthy favourite of the Regent, claimed precedence in the council; and Aguesseau retired from office in 1722, rather than yield to him. He lived quietly at Fresne until 1727, when he was re-appointed chancellor. During the five years of his retirement he assiduously cultivated those literary tastes which so greatly distinguished him amidst the mass of mere lawyers. From his re-appointment to office, till 1750, he continued to administer justice uninterruptedly; he was then eighty-two years of age, and feeling himself unable to discharge the high duties of his station, he sent in his resignation to the king, who accepted it, but granted him an annuity of 100,000 francs. This he did not enjoy long, as he died the following year, on the 9th of February. Aguesseau was buried by the side of his wife, in the churchyard of his parish church. He desired, after her example, that nothing should distinguish his tomb from those of his humbler fellow-parishioners; but the king and the public resolved upon doing greater justice to the memory of so great and excellent a man. A suitable monument was therefore erected in front of the church; but it was destroyed during the horrors of the French revolution: the remains of the chancellor were even disturbed, and removed to another place into which they were thrown with the bones of thousands. A statue, representing him, is now in front of the Palais Législatif, (Chamber of Deputies,) by the side of the one erected in honour of l'Hôpital. It was placed there in 1810, under the reign of Napoleon.

The principal features of Aguesseau's character, says the Duc of St. Simon, were much natural talent, application, penetration, and general knowledge; gravity, justice, piety, and purity of manners. According to Voltaire, he was the most learned magistrate that France ever possessed. Independently of his thorough acquaintance with the laws of his country, he understood Greek, Latin, Hebrew, Italian, Spanish, Portuguese, &c. His knowledge of general literature, assisted by his intimacy with Boileau and Racine, gave an elegance to his forensic speeches which was previously unknown at the French bar. His works, now extant, form 13 vols. 4to.; they consist principally of his pleadings and appeals, (*réquisitoires*,) when advocate and solicitor general, and of his speeches at the opening of the sessions of parliament.

AHANTA, the name of a small district lying along the Gold Coast, in Africa, which has been sometimes confounded with Ashantee. It is now, however, like the whole of the Gold Coast, subject to the sovereign of that kingdom. In Mr. Bowdich's map it occupies the space along the coast lying between 3° and about 2° 10′ W. longitude from Greenwich; and its breadth from north to south is very inconsiderable. On the west of it is the river which the Portuguese call Ancobra, and the natives Seenna, beyond which is the district called Amanahea; to the north is Warsaw: and to the east are the districts of Assin and Fantee, from which it is divided by the river Boosempra. Ahanta is itself divided into three districts, Amanfoo, Adoom, and Poho. Its chief town is Boossooa. At the town of Succondee, on the coast, there used to be an English settlement; but it has now, we believe, been abandoned. There are, or were, also two or three Dutch forts at other places. The principal projection of the coast is Cape Three Points. The district of Amanfoo is stated by Mr. Bowdich to abound in fine gold. Bowdich's *Mission to Ashantee*, p. 216, &c. [See ASHANTEES.]

AHASUERUS or **ACHASHVEROSH,** is the name of the Persian monarch whose feastings, revelry, and decrees are recorded in the book of Esther. The apocryphal additions to that book, as well as the Septuagint, and Josephus, call him Arthasastha or Artaxerxes; according to the writer of the article *Ahasuerus* in Kitto's *Cycl. of Biblical Literature*, he is probably the same as the Xerxes of the Greek historians. His favourable disposition towards the Jews (Esr. vii.) might be owing to the influence of the Jewish woman, Esther. The name Achashverosh occurs also, Dan. ix. 1, where some interpreters take it for Astyages, king of the Medes; and Esr. iv. 6, where Cambyses seems to be meant by it. (See Eichhorn's *Repertorium für Biblische und Orientalische Literatur*, vol. xv. p. 1, seq.) A. F. Pott suggests that the word Ahasuerus may be the Pehlvi *huzvaresh*, 'hero,' corresponding to ἀρήιος, which Herodotus says is the true sense of the name Xerxes. Several other etymologies have been proposed, involving the word *shah*, 'king.' Ahasuerus is thus rather a title than a name; and this accounts for the fact, that it is applied in the Bible to four Median and Persian monarchs.

AHAZ or **ACHAZ,** the son of Jotham (2 Kings, xv. 38; xvi. &c.), a king of Judah, who reigned 743–728 B.C., and was contemporary with the prophets Isaiah, Hosea, and Micah.

(See Is. i. 1.; vii. 1. Hos. i. 1. Mich. i. 1.) He made the dial mentioned Is. xxxviii. 8. Another Achaz is mentioned, 1 Chron. viii. 35.; ix. 42.

AHAZIAH, also written **ACHAZIAH** or **AHAZIAHU**, the son of Ahab, a king of Israel, who reigned 897-896 B.C. (1 Kings, xxii. 40. 2 Chron. xx. 35.) Another Ahaziah, the son of Jehoram, was king of Judah 884-883 B.C. (2 Kings, viii. 24.; ix. 16.) who occurs also under the name of Jehoahaz (2 Chron. xxi. 17.) and Azariahu (xxii. 6.) The name, according to its Hebrew etymology, is interpreted as signifying 'the property or possession of the Lord.'

AHMED I., the fourteenth sultan of the Ottoman empire, was the son of Sultan Mohammed III. He came to the throne in the year 1603, and, contrary to the practice of many of his predecessors, spared the life of his brother Mustafa. He was unfortunate in a war with Shah Abbas of Persia, during which he lost the important town of Erivan. (See ABBAS.) He at the same time supported an insurrection in Hungary and Transylvania against the German Emperor, Rudolph II.: in 1606, however, a treaty of peace was concluded at Komorn and Situarok between the two monarchs. The efforts of Ahmed's government were then directed towards the suppression of revolutionary movements in the Asiatic part of the Ottoman dominions, which had been instigated chiefly by two daring adventurers, Kalender Ogli and Janbulad-zade: both were finally subdued, and in 1609 tranquillity was restored in the interior of the empire. Ahmed I. died in 1617. He was of a mild and moderate disposition, and fond of the enjoyments of a quiet and luxurious life: it is said that his seraglio contained 3000 women, and that not less than 40,000 falconers were in his pay. A magnificent mosque, which he built at Constantinople, and a richly ornamented curtain which he sent to the sanctuary at Mecca, attest, at the same time, that he was not indifferent about the Mohammedan religion.

AHMED II., the son and successor of Sultan Soleiman III., occupied the throne of the Ottoman empire from 1691 till 1695. He owed his elevation to the throne chiefly to the influence of the celebrated grand-vizir Kiuprili or Kiuperli, who soon afterwards fell in a battle against the Austrians near Salankemen or Slankement. Ahmed II. was a weak and superstitious prince. His reign is marked by many disastrous events. The plague, a famine, and an earthquake desolated the empire, and the capital was afflicted with a destructive fire. The Bedouins of the Arabian desert, in defiance of the imperial safeguard, dared to attack the caravan of the Mecca pilgrims; and at sea the Turkish empire was infested by the Venetians, who took possession of the island of Chios, and even threatened Smyrna. Ahmed II. died, it is said, from grief, in 1695, at the age of fifty years. His successor was Mustafa II., who reigned from 1695 till 1702.

AHMED III., the son of Sultan Mohammed IV., was raised to the throne of the Ottoman empire in consequence of a revolt of the Janizaries, in 1702. When, after the loss of the battle of Pultawa (1709), King Charles XII. of Sweden took refuge at Bender in the Turkish dominions, he was well received by Ahmed, who even made him a present of ready money to the amount of 16,000 ducats. Charles XII. succeeded in kindling a war between the Ottoman Porte and Russia, which turned out favourable for the Turks. During several days Czar Peter the Great was cut off and placed in a most embarrassing situation on the banks of the river Pruth, almost within the grasp of the Turkish army; and though the unskilfulness of the Turkish commander Battaji Mohammed let him escape from this difficulty, he was yet soon afterwards obliged to resign to the Turks the important town of Azof. Ahmed III. was also fortunate in a war with the Venetians, who were compelled to quit the Morea, and to give up the islands of Cerigo and Cerigotto, and their possessions in Candia. But he failed in an attempt to take Hungary from the Austrians. Prince Eugene of Savoy won an important victory over the Turks near Belgrade, and by the subsequent peace (made at Passarowitz, in 1718) that town, as well as Orsowa, and part of Servia and Wallachia, came under the Austrian dominion. In 1723 Ahmed entered into a treaty with Russia, and soon afterwards commenced a war with Persia, which brought the frontier towns and provinces of Erdilan, Kermanshah, Hamadan, Urmia, Ardebil, and Tebriz into the possession of the Turks, and a peace subsequently concluded with the Persian king, Ashraf Khan, secured to the victors the possession of their conquests: but Nadir Shah, the successor of Ashraf Khan, disregarded these stipulations, and by degrees retook the conquered provinces. The news of the capture of Tebriz by the Persians caused a revolt at Constantinople, in consequence of which Ahmed III. abdicated the throne in favour of his nephew, Mahmud I. (1730). He died six years afterwards in prison, at the age of seventy-four.

AHMEDABAD, a fortified city, situated in a district of the same name in the province of Gujerat, or Guzzerat, and presidency of Bombay. This city is of great antiquity; it was formerly the Mohammedan capital of the province, and was celebrated, as well for the number and beauty of its religious and other public buildings, as for the extent of its commerce and manufactures. This prosperity it lost under the sway of the Mahratta chieftains, who ruined its trade by imposing enormous duties upon every branch of its commerce, and oppressed the inhabitants by taxing to the utmost all articles of consumption which were brought within the city.

In the year 1818, Ahmedabad came into the permanent possession of the East India Company, immediately upon which the exorbitant rates of duty exacted by their predecessors were abolished, and a uniform tax upon its commercial products was established in their stead.

The city, which is estimated to contain a population of 130,000 souls, is favourably situated on the banks of the Saburmuttee river, in 23° N. lat., and 72° 36′ E. long. It suffered considerable damage from an earthquake in 1819. The city walls were thoroughly repaired in 1834, at a cost of 250,000 rupees. An ample supply of water is raised from the river, and distributed throughout the city by means of pipes. A government English school was opened in 1846; there are also two government vernacular schools.

The distance of Ahmedabad from Bombay is 290 miles. From Poona the distance is 320; from Delhi, 490; and from Calcutta, 1020 miles. Rennell's *Memoir of a Map of Hindostan;* Sir John Malcolm's *Memoirs of Central India; Parl. Papers;* Thornton's *E. I. Gazetteer.*

AHMEDNUGGUR, a strongly fortified city, in the province known as Aurungabad, in the presidency of Bombay.

This city was founded in 1493, by Ahmed Nizam Shah, who, having established the independence of the state, gave his own name to it and to the infant city, and made the place the capital of his dominions. He resided here until his death in 1508.

Following the common fate of the native states of India, Ahmednuggur was, from this time, the scene of a series of revolutions, until, in 1634, it became a part of the Mogul Empire, and so continued until after the death of Aurungzebe in 1707. It was then seized by the Mahrattas, and remained under the dominion of the Peshwa until 1797. In that year the city, together with the surrounding district, was captured by Dowlut Row Scindia, from whom it was wrested by General Wellesley in 1803, and at the conclusion of the war, shortly after, was restored to the Peshwa. Ahmednuggur has since reverted to the possession of the Company, and is now the head station of a civil, military, and judicial establishment of Europeans.

About half a mile from the city stands a fort of an oval shape, one mile in circumference, built of stone, and flanked by numerous round towers. The city is also surrounded by stone walls. It contains a handsome square or market-place, and numerous well-built streets. The palace of the former sultans is a massy pile of building, surrounded by a broad moat faced by solid masonry. The fortress is altogether one of the strongest in India.

The city is supposed to contain above 20,000 inhabitants. It is situated in 19° 6′ N. lat., 74° 46′ E. long.; distant 71 miles from Poona, 122 from Bombay, 680 from Delhi, and 930 from Calcutta. Rennell's *Memoir of a Map of Hindostan;* Sir John Malcolm's *Memoirs of Central India;* Thornton's *E. I. Gazetteer.*

AHWAZ, or **AHWUZ**, is a town situated about 100 miles north-east of Bassorah, and 48 miles south of Shuster. The name of Ahwaz occurs early in the annals of Islam, but the date of its foundation is unknown. It was probably founded by the first Khalifs of the Ommiade dynasty; or, perhaps, these monarchs raised an insignificant town to its subsequent splendor. The zenith of its prosperity was attained under the earlier Khalifs of the house of Abbas, nor did it long survive their fall. Although the architectural decorations of the ruins of Ahwaz are Moslem, bearing

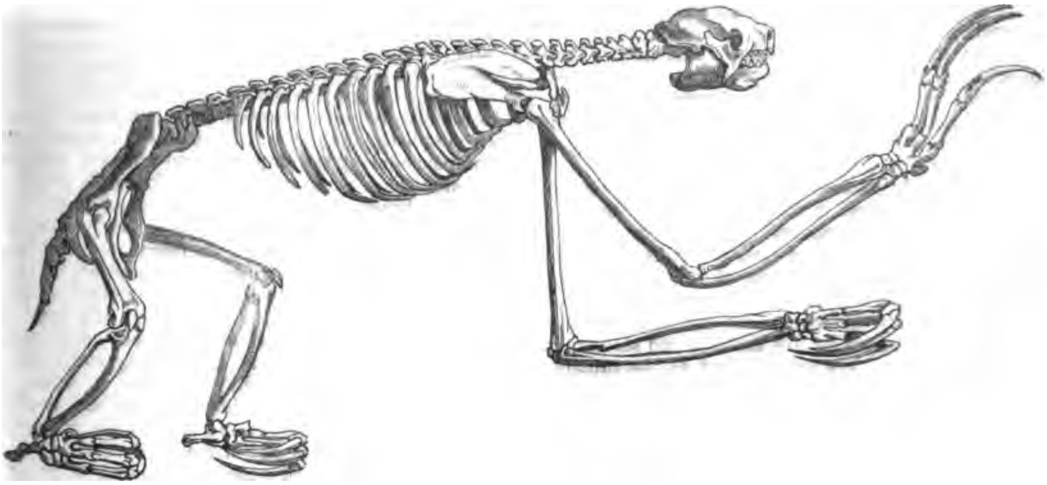
Arabic inscriptions in the early Cufic character, some intaglios on carnelian or oriental onyx, brought from thence, are of a higher antiquity than Mohammed. The city of Ahwaz lies on the banks of the river Karun (31° 20′ N. lat. 48° 50′, E. long.) in a flat and uncultivated country, abandoned by its former inhabitants to rapacious animals, and hordes of ferocious Arabs, who occasionally pitch their flying camps here, when in search of pasturage or plunder. The modern town of Ahwuz occupies but a small portion of the site of the old city, on the eastern bank of the Karun, and exhibits a mean and solitary appearance when contrasted with the immense mass of ruins. Its houses are almost entirely built of stone brought from the ruins, and it can only boast of one decent building, a mosque, apparently modern. The population at present does not exceed 1600 souls. Considerable traces are discernible of the *bund* or dyke that was thrown across the river, chiefly, if not entirely, to favour irrigation, by thus making a head of water. A part of this stone wall is still standing, remarkable for its state of preservation; it is in many places ten feet high, and nearly as many in breadth; while it extends upwards of one hundred feet in length, without any intermediate breach. Many single blocks in it measure eight and ten feet. The river dashes over the *bund* with great violence, and, being accelerated by the strong current of the Karun, the sound of the fall is heard from a considerable distance. Boats of every description are obliged to unload previous to an attempt at passing over, and even then the passage is attended with much danger, and they are frequently swamped. The river is one hundred and sixty yards in breadth at each side of the dyke, and of great depth. The shallowness below the town is caused by the great mass of masonry under the surface. Towards the south end of the town, there are several singular cavities, and a few water-mills erected between the rocks, the latter, probably, constructed since Kinneir's visit. Behind them are the remains of a bridge, and here, too, commences the mass of ruins, extending to least ten or twelve miles in a south-easterly direction, while their greatest breadth covers about half that space. All the mounds are covered with hewn stone. One of them is nearly two hundred feet high. In many parts flights of steps are in good preservation. At the base of this mass of ruins are graves, in which are found stones measuring five or six feet in length, several with Cufic inscriptions, and others with fret-work, indicative of an era subsequent to the Mohammedan. In every direction are found heaps of circular flat stones perforated in the centre, four, five, or six feet in diameter, and some with characters upon them—they have apparently been used for grinding. These circular stones appear in some places to have been used for the conveyance of water, and may be traced for great distances in successive rows in small dry rivulets, placed so firmly together, that it would require days to remove any of them. The above-mentioned large mound extends as far as the eye can reach, varying in height and breadth, and is the first in magnitude upon the plain. To the west of this is a mound entirely of stone, fifty feet high, and twenty feet broad, with several flights of steps traceable to its summit, but much mutilated and injured by the weather. About a mile to the east, separated by a deep ravine, stands an immense pile of materials, consisting of bricks, stone, and tile of various colours. The Arabs call it *kasr* or *palace*. Its ascent is gradual, but fatiguing from the numerous furrows, which have been apparently worn by water. The height is, at the lowest estimate, one hundred and fifty feet above the plain. At the summit are several floorings of stone, as fresh as if only recently laid down; together with several rounded troughs, some of which are of Persepolitan marble in its rough state. From numerous cavities start packs of jackals, and porcupine quills are strewed in every direction. One side of this mound is nearly perpendicular, so that it is impossible to descend. At its base the camel's thorn is plentiful, which, by its green appearance, relieves the landscape from the general gloom of sterility and dreariness. The *kasr* is about three miles from the east bank of the river. About half a mile north-west from the *kasr* is a circular mound measuring two hundred yards. At its base, a wall of masonry may be traced for twenty-one feet, the face of which is perfect and unbroken, and appears to have been the front of some building. To this mound is joined another ruined heap, covered with fragments of glazed tile, a coarse kind of crystal, pieces of alabaster, and bits of glass. Several mounds form one connected chain of rude, unshapen, flaked rock, lying in such naturally-formed strata, that the very thought of any part of the materials having been accumulated by human labour is scarcely admissible. The soil on which these ruins rest appears to be soft and sandy. Perhaps the site was naturally elevated before the city was built. Glass of all colours is found in abundance, and the fragments of pottery are remarkably fresh. Many of the burnt bricks that lie on the surface of the mound appear to have borne some written character; but exposure to the weather, and probably occasional inundations, caused by the melting snows of the mountains in the upper country, have nearly effaced all traces of it. On the hewn stone, some characters are as fresh as from the sculptor's hands. No bitumen was observed on the bricks. The villagers say, that they find sometimes, when digging for bricks, small intaglios, generally denominated seals, and probably used as such, similar to those found at and near Babylon. The Arabs are always digging up and removing stones for the purpose of building; but a large city might be erected from the materials still remaining. The ruins of Ahwuz extend also on the west bank of the river in a northerly direction, exhibiting the same appearance as the mounds on the east side, but less in magnitude. Ahwuz is generally supposed to be much lower in antiquity than either Babylon, Persepolis, or Susa. Alexander navigated the Karun, but his historians do not mention Ahwuz.

It appears from the extracts from oriental writers made by Captain R. Taylor, that the sugar-cane was once largely cultivated round Ahwaz, and the sugar was exported to all parts. Ahwaz, in the height of its prosperity, belonged to the Khalifs, from whom it revolted. Ali-ibn-Mohammed took the field against them, and after a long and destructive war, the Khalifs triumphed; and from that time we may date the ruin of this great city. (See *Transac. of the London Asiatic Soc.* vol. ii.)

AI (*Bradypus*, Illiger), in zoology, a genus of mammals belonging to the order Edentata of the Règne Animal, and, together with the genus Unau or Cholæpus, composing a small family to which Baron Cuvier has given the appellation of Tardigrada, from the peculiar conformation of their extremities, and the remarkable slowness of their pace. Both these genera were formerly included by Linnæus in the same group, under the common name of Bradypus or Sloth; but later zoologists have separated them, on account of certain anomalies in their organic structure, which will be explained, and which certainly deserve to be considered as important generic characters. With this difference, however, it must be confessed, that the two genera of Sloths are closely approximated to one another in many essential details both of structure and economy; and this fact is the more remarkable and interesting, since the modifications upon which their generic distinction has been founded, are greater and, as we might naturally presume, more influential, than those which frequently characterize two different families.

[Figure of the Sloth.]

The order Edentata comprises a number of genera, perhaps the most singular and anomalous among mammals, differing widely from all other quadrupeds, but unfortunately possessing so few natural affinities or relations of resemblance among themselves, that we cannot help regarding the order edentata as the most arbitrary and artificial of all the primary groups into which MM. Cuvier and Geoffroy have divided the mammalia. In other respects, every thing which relates to these animals, their habits and economy, but still more particularly their osteological structure, is in itself exceedingly interesting. The family of tardigrada, or sloths, are more especially deserving of attention, as well from the singularity of their physical structure, and the mistakes which have hitherto prevailed among naturalists concerning the habits and manners of these singular animals, as on account of the relation which they present in their osteological details to the megatherium, the most curious and anomalous of extinct animals. This family is distinguished from the other edentata by a short round head, and the presence both of molar and canine teeth, the incisors alone being deficient; but, above all, by the great length and singular structure of their arms, which, adapting them to a mode of progression altogether peculiar to themselves, and consequently disqualifying them for the exercise of that species of locomotion common to ordinary quadrupeds, has caused them to be considered as the most miserable and unfortunate of beings, imperfect monsters of creation, equally remarkable for their disgusting appearance and helpless condition. The valuable observations of several travellers have now fully dissipated the obscurity which so long prevailed upon this subject, and have shown in this instance, as in all others, that every modification in nature is adapted to a wise and useful end; and that deformity and imperfection appear only when, from our own imperfect knowledge, we fail to discover the adaptation of organic structure to the habits and economy of particular beings.



[Skeleton of the Sloth.]

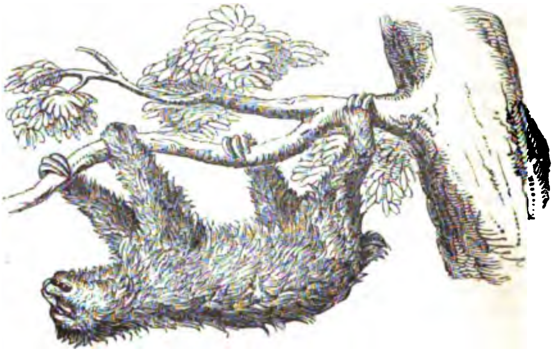
To enable us clearly to comprehend the nature and functions of these animals, it will be necessary to enter into a short description of parts of their osteological structure. The next view of the skeleton of the Ai seems to indicate a distortion of certain parts, and proportions altogether opposed to freedom of motion, at least of that kind of motion which we are familiar with in ordinary quadrupeds. The arm and fore-arm taken together are nearly twice as long as the leg and thigh, so that if the animal attempts to walk on all-fours, it is obliged to trail itself gradually and slowly on its elbows, and if it stands upright on the hind legs, the arms are so long that the fore-fingers touch the ground. This disproportion between the anterior and posterior extremities, obviously deprives these animals of the power of moving on a plain surface with that speed which is so admirable in the generality of quadrupeds; and, accordingly, we are assured by all observers, that their mode of progression, under these circumstances, is of the most slow and painful nature. The sloths, however, are not terrestrial animals, but live entirely among the thick branches of trees in the most extensive and solitary forests. This remarkable disproportion of their fore-arms is common to another genus of arboreal mammals, the real apes, in which, far from retarding their motions, this peculiar structure is of the most essential importance in adding to their agility. But the sloths partake of none of the accessory advantages which the apes possess. They have no opposable thumb; their fingers are short, and so perfectly rigid that the joints ossify at a very early period of the animal's life, leaving them totally incapable of individual motion, whilst they are at the same time so completely enveloped in the common integuments of the hand, that nothing is to be seen externally except the immense crooked claws with which they are provided. The wrist and ankle, also, are articulated or joined to the fore-arm and leg in an oblique direction; so that the palm or sole, instead of being directed downwards towards the surface of the ground, as in other animals, is turned inwards towards the body, in such a manner as to render it impossible for the sloth to place the sole of its foot straight down upon a level surface, but to compel it, under such circumstances, to rest upon the external edge of the foot. This position is obviously ill adapted for ease or motion on level ground. But there is still another singularity in the structure of the foot of this animal which materially increases its difficulties of progression on a plain surface. This arises from the peculiar form of the last phalanx or joint of the fingers and toes, that, namely, which gives insertion to the claws, and which is articulated with the second phalanx in such a manner as to permit the fingers and claws to be strongly bent inwards along the palm and arm, but at the same time prevents the animal from raising them upwards or opening the hand beyond a certain position. This structure is exactly the reverse of what we observe in the common cat, which has the phalanxes of the toes formed in such a manner as to keep the claws habitually retracted or drawn up, so that it requires a considerable degree of muscular force to extend or depress them. In the sloths, on the contrary, they are naturally depressed in the position represented in the figure of the skeleton, and the muscular force is exerted to expand or open them. The claws themselves are of a size altogether enormous, surpassing the entire foot in length. They are so sharp and crooked that they readily seize upon the smallest inequalities in the bark of the trees and branches among which the animals habitually reside; and united to the great muscular strength and rigid formation of the extremities, furnish the most powerful weapons of defence. Nor are the form and articulation of the posterior extremities less singular than those of the anterior. The formation of the pelvis alone is of such a nature as to render it impossible for the sloths to walk after the manner of ordinary quadrupeds; and the mode in which the hind legs are articulated with the pelvis, to use the expression of Baron Cuvier, seems almost expressly arranged for the purpose of depriving the animal of the use of its legs altogether. 'If,' says M. Cuvier, 'we consider the sloths in the relations which they bear to other animals, the general laws of organization at present existing apply so little to their structure, the different parts of their body seem so completely contradictory of those laws of co-existence which we have found established in the rest of the animal kingdom, that we might be almost tempted to consider them as the

remains of a former order of things, the living relics of that precedent nature of which we are obliged to seek the other ruins beneath the surface of the earth, and that they escaped, by some miracle, the catastrophe which destroyed their contemporary species.'

[Formation of Pelvis.]

The false and exaggerated opinions which have been entertained concerning the functions and condition of these animals, arise from preconceived notions which do not apply in any manner to the conformation of the sloths. If placed upon a plain surface, the sloth moves indeed with great pain and difficulty and only by seizing upon the little asperities which he finds in his way, and by that means dragging his body slowly forwards, just as we may observe a bat to do under similar circumstances. But this is a situation equally foreign to the habits and economy both of the sloth and of the bat: and we are no more justified in judging of the nature of the one under these circumstances, than we should be in reasoning upon the habits of the other. The sloth is eminently an arboreal quadruped: it is produced, it lives, and it dies in the trees; it never voluntarily descends to the surface of the earth, and those, therefore, who observe it in that situation, have not a favourable opportunity of judging of its nature and functions.

Yet if we attentively consider the organization of the extremities as already described, it will appear that the amazing disproportion between the hind and fore legs in point of length, the immoveableness of the toes, the reversed position of the claws, the oblique articulation of the feet, and the great rigidity of all the members, are circumstances which should equally disqualify this animal for moving along the branches of trees with anything like the ease and security of the squirrel or monkey. We are indebted to the valuable observations of Mr. Waterton, during his 'wanderings' in South America, for a final and satisfactory explanation of all these apparent difficulties and inconsistencies in the structure and habits of the sloth. 'The sloth,' says this traveller, 'in its wild state, spends its whole life in the trees, and never leaves them but through force or accident; and what is more extraordinary, not *upon* the branches like the squirrel and monkey, *but under them*. He moves suspended from the branch, he rests suspended from the branch, and he sleeps suspended from the branch. Hence his seemingly bungled composition is at once accounted for; and in lieu of the sloth leading a painful life and entailing a melancholy existence upon its progeny, it is but fair to conclude that it just enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence.' Nor are the motions of this animal so slow while suspended in this strange position, nor his habitat so circumscribed as naturalists have hitherto imagined. 'The Indians,' continues Mr. Waterton, 'have a saying, that when the wind blows the sloths begin to travel. In fact, during calm weather they remain tranquil, probably not liking to cling to the brittle extremities of the branches, lest they should break whilst the animals are passing from one tree to another; but as soon as the wind rises the branches of the neighbouring trees become interwoven, and then the sloth seizes hold of them and pursues his journey in safety. He travels at a good round pace, and were you **to see him, as I have done, passing from tree to tree, you would never think of calling him a sloth.'** Though the merit of explaining and accounting for the many apparent inconsistencies and anomalies observable in the conformation of these animals is undoubtedly due to Mr. Waterton, yet their habit of resting suspended from a branch or perch, was long since noticed by different authors, and is particularly described in a communication to Buffon from the Marquis de Montmirail, in whose menagerie a sloth was preserved for upwards of three years. Stedman, in his *History of Surinam*, has an engraving of a sloth in this position, which we have copied, as illustrating its singular mode of progression.


[Mode of Progression.]

The conformation of the extremities is not the only part of its anatomy in which the sloth differs from ordinary mammals. The number and form of the bones which compose the trunk, the nature of its teeth, and the conformation of its stomach and intestines, are all peculiar. The stomach is divided by transverse ligatures into four separate compartments, which bear a distant resemblance to the four stomachs of ruminating animals: they do not, however, exercise the functions of these organs, nor do the sloths regurgitate their food, or subject it to a second process of mastication like the ox and the sheep. The intestines, also, are unusually short for an animal which lives entirely upon vegetable substances, scarcely equalling twice the length of the body, whilst those of ruminants frequently exceed ten times those dimensions. Their simplicity and diminutive size in the sloths appear to be compensated by the superior and unusual complication of the stomach,—which, retaining the food for a longer period than in ordinary non-ruminating animals, allows it to be more perfectly macerated, and prepared for the action of the absorbent vessels which imbibe its nutritious particles in its passage through the intestines. The number of vertebræ in the necks of mammals is generally seven, so that the whales and dolphins, which have scarcely any neck at all, as well as the giraffe and camel, which have it developed in a most unusual degree, are all found to agree in this particular, however widely they differ in other respects. Until the year 1833, the Ai was considered as an exception to the above rule. Mr. Bell first pointed out that the two vertebræ, all along regarded as the eighth and ninth cervical vertebræ, are in reality the first and second dorsal, each of them bearing a pair of rudimentary ribs, movably articulated to their transverse processes. Mr. Bell further remarks, that the evident object of the increased number of vertebræ is to allow of a more extensive rotation of the head; for as each of the bones turns a little upon the succeeding one, it is clear that the degree of rotation of the extreme point will be in proportion to the number of movable pieces in the whole series. The animal is thus enabled to look down towards the ground.

The dental system of the sloths is the most simple that can well be conceived. They have no incisor teeth, but canines and molars only; and in the Ai the canines are diminutive, and in all respects very similar to the other teeth. The molar teeth are universally eight in the upper jaw and six in the lower, four and three on either side respectively. Their construction is most simple, consisting merely of a cylinder of bone, enveloped in enamel, and hollow at both ends,—at the upper by continual detrition, and at the under by default of ossification. They have no lamina of enamel penetrating the body of the tooth, as in other herbivorous animals, which renders them such effective instruments in grinding and masticating vegetable substances. Hence it results that the mastication of the sloth must be extremely imperfect, though the defect of dentition is probably compensated, in some degree, by the superior complication of the stomach.

The genus Ai, for which the name of Bradypus has been more properly reserved, differs from the Unau, Cholœpus, in many respects, but at the same time approximates more nearly to it than any other known animal: these two genera, together with the extinct fossil animals which have been called Megatherium and Megalonyx, and which, with the form and organization of a sloth, nearly equalled the elephant in size, constitute the Cuvierian family, Tardigrada. Besides the difference of the canine teeth, which are completely developed in the Unau, and in the Ai of the same form and subject to the same detrition as the molars, these two genera are distinguished from one another by the number of toes on the fore-feet, which are three in the Ai and only two in the Unau; by the comparative length of the fore-arms, which are much longer in the former than in the latter; by the number of cervical vertebræ in the Ai, as already mentioned; by the equally-unusual number of ribs in the Unau, which amount to no fewer than forty-six the greatest number hitherto found in any mammal, the Ai having but thirty-two; and by numerous other modifications which it is unnecessary to enumerate.

The sloths are known to bring forth, and suckle their young like ordinary quadrupeds. For this purpose they have two mammæ, which are situated on the breast; and the young sloth, from the moment of its birth, adheres to the body of its parent till it acquires sufficient size and strength to shift for itself. The head of the Ai is short, the face small and round like that of the American monkeys, the ears concealed in the long hair which surrounds them, the eyes small and deeply sunk in the head, and the tail a mere rudiment. The Ai is found only in the most gloomy and retired tropical forests of South America. The Indians like his flesh, and are in continual pursuit of him.

Naturalists reckon two distinct species of the Ai, and three or four varieties, some of which may probably be found to be specifically different, when they come to be dissected and carefully compared with one another. 1. The Common Ai (*Bradypus tridactylus*), has a short round head, furnished with coarse shaggy hair, disposed on the crown in verging rays, like that of the human species: the face is of a yellowish colour, covered with very short hair, whilst that of the body and extremities is universally long and shaggy; the eyes are encircled by a brown ring; the hair of the body varied with irregular patches of dark and light brown, or silvery white: between the shoulders there is an oval patch of short orange-coloured hair, of a finer quality than that found on other parts of the body, and divided in the centre by a longitudinal black stripe; the throat and breast are frequently of a light straw colour. The texture of the hair is altogether peculiar, and more nearly resembles dry hay, or grass shrivelled and withered by the sun, than the hair of ordinary quadrupeds. It is coarse and flattened at the extremity, but as small at the root as the finest spider's web; and its dry and withered appearance forms the Ai's principal security against its pursuers, as it renders it extremely difficult to detect it whilst at rest among the branches covered with bark and moss of the same colour; it is only when in motion that it can be readily distinguished from the trunk beneath which it hangs suspended. In other respects, different individuals of this species differ considerably from one another, in the shades and disposition of their colours, and in the intensity of the mark between the shoulders; some even want this latter mark altogether, others are of a uniform ash colour over the whole body, and there are others still, which have the hair of the head parted in the centre, and hanging down upon each side; but whether these constitute distinct species or mere varieties of the common Ai, is a point hitherto undetermined; the cabinets of Europe do not afford sufficient materials for an extensive comparison, and no naturalist has ever examined the Ais with this view in their native regions.

2. The Collared Ai (*Bradypus torquatus*), is a distinct species, even in the bony structure of its cranium. Its face is naked and of a black colour; the hair of its body less flattened, and withered-looking than in the common species; the forehead, temples, chin, throat, and breast covered with reddish or rust-coloured hair, slightly frizzled; on the crown of the head it is long and yellow, and on the rest of the body pale orange: but the most distinguishing mark of the species is a large black collar, which completely surrounds the neck, and from which it has acquired the name of the collared sloth. Beneath this outer coat there is an inner one of very fine fur, which is of a dark-brown colour on the collar, but gradually diminishes in intensity towards the croup, where it is entirely white.

Both these species feed upon the leaves of trees, and bring forth but a single young one at a birth. When in motion in the forests they emit a feeble, plaintive cry, resembling the word Ai, and which is the origin of the name they bear among the Europeans settled in America. They are extremely retentive of life, and have been seen to move their legs and exhibit other symptoms of vivacity, a full half hour after being deprived of the heart and other viscera.

AIA-SOLOUK, or AIA-SALUK, a small village of Asia Minor, on the banks of the Kitchik Minder, the old Caystrus; many remains are found there, which have given rise to the supposition that it occupies the site of Ephesus. But the remains of Ephesus are two miles lower down the river. [See EPHESUS, for an account of both places.]

AIDE-DE-CAMP, a French term, denoting a military officer usually of the rank of captain, one or more of whom is attached to every general officer, and conveys all his orders to the different parts of his command. A field-marshal is entitled to four, a lieutenant-general to two, and a major-general to one. The king appoints as many aides-de-camp as he pleases, and this situation confers the rank of colonel.

AIDS were a kind of pecuniary tribute paid by a feudal vassal to his superior or lord, on occasions of distress or emergency. They were originally mere benevolences, but at length the lords treated them as matter of right, and not of discretion. They were principally three.—1. To ransom the lord's person; 2. To make the lord's eldest son and heir-apparent a knight; 3. To give a suitable portion to the lord's eldest daughter on her marriage. The first of these aids has long been obsolete, and the two latter were expressly abolished by the 12 Car. II. c. 24.

AID, EXTENT IN, is one of the peculiar remedies to recover debts of record due to the crown. It issues at the instance of a crown-debtor against a person indebted to himself, on the principle that the crown is entitled to the debts due to the debtor. Of this fiction (called the *Quo minus*), a very oppressive use was formerly made under various devices—persons having no character of crown-debtors having been allowed to take benefit by it. A remedy was in some degree given by the statute 57 Geo. III. c. 117.

Aids is also a general name for the extraordinary grants by the House of Commons to the crown, and are synonymous with *subsidies* and the modern term *supplies*. The aids are considered to have been the origin of the modern system of taxation. This, however, is a speculative opinion, according to which it might not be safe to consider the subject.

AIKIN, JOHN, M.D., was the only son of the Rev. John Aikin, D.D., for many years tutor in divinity at the dissenting academy of Warrington in Lancashire. John was born at the village of Kibworth-Harcourt in Leicestershire, on the 15th January, 1747. Here, and afterwards at Warrington, he received a classical education under his father, from whom he imbibed that love of letters for which he was distinguished through life.

Having made choice of the medical profession, he was at an early age articled to a surgeon and apothecary at Uppingham, in Rutlandshire, where he remained for three years, and then went to pursue his studies at the University of Edinburgh. Having continued here during two winters, he returned to England in May, 1766, and after paying a short visit to Warrington, renewed his medical studies at Manchester. After a residence of three years in Manchester, he proceeded to London, and joined the class of Dr. William Hunter.

The first field which he chose for his professional exertions was the city of Chester, where he settled in the autumn of 1770, and here his earliest medical work was published. This was entitled *Observations on the External Use of Preparations of Lead, with some general Remarks on Topical Medicines*. This work met with a satisfactory reception from the members of the medical profession, and is still held in esteem. Not meeting with sufficient encouragement at Chester, in little more than a year he removed to Warrington, where he immediately succeeded in obtaining a moderate amount of practice. Shortly after this time, he published a pamphlet entitled *Thoughts on Hospitals*, which was well received both by the medical profession and by the public generally. Mr. Aikin's earliest publication, unconnected with his profession, was a small volume, entitled *Essays on Song Writing;* this was first published in 1772, and was speedily carried through a second edition. Very many years afterwards this little work was remodelled, and published with additions, under the title of *Vocal Poetry*.

In the year just mentioned, Mr. Aikin married Miss Martha Jennings, the daughter of his maternal uncle, a union from which he derived the truest domestic happiness during the remaining years of his lengthened life. In 1773, he assisted his sister, Mrs. Barbauld, in the composition of a small volume of *Miscellaneous Pieces in Prose*, and in the following year published a translation of *The Life of Agricola*, by Tacitus, with copious notes, which was soon followed by a translation of *The Manners of the Germans*, by the same author. His next was *A Specimen of the Medical Biography of Great Britain*, and this essay meeting with considerable attention from many professional and literary persons of celebrity, by whom he was incited to pursue the subject, he published, five years after, an octavo volume of *Biographical Memoirs of Medicine in Great Britain from the Revival of Literature to the Time of Hervey*. It was Mr. Aikin's intention to still further extend the work, but it was found impossible for him, as then situated, to procure materials for completing his purpose in a satisfactory manner.

To these literary occupations, and to the labour attendant on an extensive medical practice, were at this time added the task of delivering chemical lectures to the students at the Warrington academy, and the charge of privately instructing a few medical pupils.

The next publication of any consequence which we owe to Mr. Aikin appeared in 1784. This was a much enlarged and corrected edition of Lewis's *Experimental History of the Materia Medica*, in 1 vol. 4to., the preparation of which had occupied him during a large portion of the preceding year. About the same time was published the first of his works composed for the benefit of young people. This, which was entitled *The Calendar of Nature*, contained an instructive sketch of many striking circumstances in animal and vegetable life, and of the changes attendant upon the revolution of the seasons in our latitude. This little piece was republished fifteen years after, and entitled *The Natural History of the Year*.

Having lost his father by death, and the breaking up of the Warrington academy having scattered the literary and scientific society of that town, so much in accordance with his tastes, Mr. Aikin determined, upon the advice of many professional friends, to take his degree as a doctor of medicine, and to seek some more promising field than Warrington for the employment of his professional talents. With this view he proceeded, in July, 1784, to the University of Leyden, where, having gone through the necessary examinations, he received his degree, and returned to England.

At the end of some months spent in inquiries after a suitable opening for practice, Dr. Aikin was persuaded that such an opportunity presented itself at Yarmouth, in Norfolk, from many of the inhabitants of which place he received promises of support. The experiment of a year convinced the doctor, however, that the ground he had chosen was too far pre-occupied as a medical station to offer reasonable expectation of success, and he then removed to London, where he appeared to be rapidly making his way, when the retirement from practice of one of his former competitors at Yarmouth occasioned an invitation for his return to be forwarded to him from so large a number of the respectable inhabitants, that he felt it impossible, with prudence, to hesitate, and returned to that town after only a very few months' absence.

In 1788, Dr. Aikin wrote his popular little work, *England Delineated*, and also produced a new edition of Lewis's *Materia Medica*, with all the alterations called for by the then recent progress of medical science. Two years afterwards, upon the refusal of the legislature to repeal the Test and Corporation acts, Dr. Aikin, who was bound by the ties of birth and connexions, as well as by principle, to the dissenters, employed his pen as their champion, and published two strongly-expressed pamphlets on the question. This act of partisanship produced him many enemies. The clergy with their connexions, as well as the members of the corporation, chose to consider themselves thereby absolved from their promises of support, which they secretly transferred to another physician, who was invited by them to settle in the town. Dr. Aikin's situation was, in consequence, rendered so much less lucrative and agreeable, that early in 1792 he again removed his family to London, where he recommenced his medical practice.

In the same year, Dr. Aikin, who had before assisted Howard in preparing his works for the press, published, in one small octavo volume, *A View of the Character and Public Services of the late John Howard, Esq., LL.D., F.R.S.* This work comprises an account of the principal events of Mr. Howard's life, and of the origin and progress of his inquiries into the state of prisons, hospitals, and lazarettos, and it gives a summary of his character and exertions; a task for which Dr. Aikin was peculiarly qualified, as well by the continual and unreserved intercourse which had passed between Howard and himself, as by the peculiar turn of his own mind, which led him to view with interest approaching to enthusiasm every scheme which promised in any way to diminish human suffering.

The first volume of *Evenings at Home* the most popular, and probably also the most useful of all Dr. Aikin's works, was published very soon after he had settled in London. The volumes of this work appeared successively, the sixth and last in June, 1795. This work was the joint production of Dr. Aikin, and his sister, Mrs. Barbauld, whose contributions, however, did not exceed half a volume in the whole. The object of these volumes was a favourite one with their authors, who desired to teach things rather than words. In the execution of the task, they presented, in a manner sufficiently attractive to engage the attention of young persons, a good deal of natural history, with some of the elements of chemistry and mineralogy; but the principal charm and value of the work consist in its just views of human character, and in the uncompromising integrity visible in every line. 'Things by their Right Names' is the title of one of the papers inserted in these volumes, which might, with great propriety, have been adopted for the entire work. At the expiration of more than half a century from its first appearance, 'Evenings at Home' is still in possession of public favour, and the work has been translated into almost all the European languages.

In the beginning of 1794 Dr. Aikin published a volume of *Letters from a Father to his Son on various Topics relative to Literature and the Conduct of Life*. This may be characterised as an original work; as it was not designed for children, it is less elementary than the 'Evenings at Home.' The chief aim of these letters, thirty in number, appears to be to obviate prejudices, to lead the person who shall study them to judge and enjoy and act for himself, inculcating freedom of thinking on all occasions, lest the deference to authorities on small matters 'should induce the same habit of passive compliance in affairs of capital importance.'

In 1795 Dr. Aikin published in a large quarto volume, *A Description of the Country from thirty to forty Miles round Manchester*. The author brought considerable local knowledge to the execution of this task, which is written with much clearness and animation, and displays throughout the doctor's characteristic good sense and freedom from vulgar prejudices.

On the establishment of the *Monthly Magazine*, in the beginning of 1796, Dr. Aikin became its literary editor, the political portion being placed in other hands. This office the doctor retained for ten years with considerable credit to his literary reputation. At the close of the same year (1796) Dr. Aikin engaged in his greatest work, the *General Biography*, which employed a large portion of his time during nineteen years, and was extended to ten quarto volumes. In this undertaking he had the assistance, first of Dr. Enfield, and, after his decease, of the late Dr. Thomas Morgan. The portion of matter contributed by Dr. Aikin amounted to nearly one half the contents of the volumes.

His health, which had been declining from the summer of 1796, became so seriously bad in the spring of 1798, that Dr. Aikin was then obliged to have recourse to the relaxation of a country life; and he passed four months at Dorking, in Surrey. Even under these circumstances, however, he gave evidence of the activity of his mind by producing a second volume of *Letters from a Father to his Son.*

So little benefit to his health was derived from this residence at Dorking, that a total renunciation of London and of his profession became a matter of necessity, and he accordingly removed, in October, 1798, to Stoke Newington, where he continued to reside during the remainder of his life. Dr. Aikin did not, however, by any means relax in his literary exertions, but, on the contrary, undertook, in addition to the 'Monthly Magazine' and the 'Biography,' to superintend a new edition of Dr. Johnson's poets, and in the execution of this engagement he supplied several critical prefaces and biographical notices which had been omitted by Dr. Johnson.

During 1801 Dr. Aikin wrote an instructive little volume for the use of young persons, entitled, *The Arts of Life.* In this work a clear view is given, under the three heads of food, clothing, and shelter, both of the arts of first necessity and of those which minister to our comfort and convenience. This volume was followed in a very few months by *The Woodland Companion, or a Brief Description of British Trees, with some Account of their Uses.* In 1803 appeared his *Letters to a Young Lady on a Course of English Poetry.* In 1806, when his connexion ceased with the 'Monthly Magazine,' Dr. Aikin was engaged in establishing a new periodical work, which was called *The Athenæum*, and he continued to be its editor during the two and a half years that the publication was continued.

Towards the close of 1811 Dr. Aikin accepted the office of editor of Dodsley's 'Annual Register,' an undertaking which occupied a considerable portion of his time, so that he had now ample occupation without any attempts at original composition. Constant employment appears to have been a necessary condition of his existence, and on the completion of the *General Biography*, in the spring of 1815, he formed a collection entitled *Select Works of the British Poets*, to which he supplied short biographical and critical notices. He was also a contributor to the *Annals of the Reign of George III.* which were published in two vols. 8vo. The first edition of the work ended with the peace of Paris, in 1815, but, in a second edition, the *Annals* were brought down to the death of George III.

Early in the spring of 1817, a few months after the appearance of the *Annals*, Dr. Aikin experienced a dangerous stroke of paralysis, which for a time deprived him of his faculties. After a few months he partially recovered, and survived more than five years. He died of a stroke of apoplexy, December 7, 1822.

Dr. Aikin's temper was naturally cheerful and affectionate, a disposition which he cultivated as a principle. His attachment to the cause of rational freedom was ardent and uniform. His diligence in the performance of whatever he undertook was unwearied. His moral purity was unblemished.

AIMOIN, a benedictine monk, and an historian. He was a native of Ville Franche, in the province of Perigord. He wrote, or rather began, a history of the French, which he dedicated to his patron and principal, Abbon, Abbot of Fleuri-sur-Loire. It is said in his preface, that he intended to give an account of the origin of the French nation, and to bring his narrative down to Pepin le Bref, father of Charlemagne (741); but either he did not accomplish his task, or some part of it has been lost, for what we have of him brings us down only to the sixteenth year of Clovis II. (650). Two books were afterwards added by an unknown writer. This history of Aimoin is not esteemed; it is incorrect, and he does not dwell sufficiently upon the events which he has to relate. His best work, and also the most interesting, is an account of the life of Abbon; it contains a great number of anecdotes, and frequently alludes to the political and public circumstances of the times. Aimoin died in 1008.

AIN, a river in France which, rising among the slopes of the Jura, pursues a S.S.W. course into the Rhone. Its length is more than ninety miles, and its junction with the Rhone takes place about twenty miles above Lyon. Although not a stream of any great importance, it serves to give name to a department pretty nearly coincident with the district of Bresse, Bougey, Dombes, &c., sub-divisions of the former province of Bourgogne (Burgundy). This river separates the department into two parts of nearly equal extent, comprising, between them, about 2232 square miles, and containing, in the year 1851, a population amounting to 372,939. It sends three deputies, and is subdivided into five arrondissements. The district on the western or right bank of the Ain, though marshy in some parts, produces harvests sufficient for the inhabitants, whose chief occupation is agriculture: the eastern district, which is crowned by the ridges of the Jura and the intervening valleys, affords pasturage for a great number of horses and sheep, and yields iron and stone, which the inhabitants work. The best lithographic stones in France are procured here. In the S.W. of the department are numerous ponds, natural and artificial, which are used as fish-farms for two years, and the third are emptied and sown with barley. These cover an area of about 60,000 acres; they are very injurious to the health of the people. Among the manufactures carried on in different places, are those of cloth at Montluel, near the Rhone, a town of about 3000 inhabitants, and at the capital of the department, Bourg (see BOURG); and of linen and paper at Nantua (population, 3678), in one of the passes of the Jura. In the east is Ferney, a small town celebrated as the residence of Voltaire. Many of its population are employed in watchmaking; a branch of industry introduced by that celebrated man. Belley (population, 4517), near the S.E. corner of the department; Gex (population, 2710), at the N.E. extremity; and Trevoux (population, 3000), on the Saône. These, with Nantua, are the seats of sub-prefects; and we may add to them Thoisey and Pont-de-Vaux, near the Saône. Bourg, the capital, is on the Reyssouse, a feeder of the Saône, and contained in 1851 a population of 9698. The Saône bounds the department on the west; the Rhone (on the right or French bank of which is the Jura) limits it on the south and east, and the tributaries of these two streams water it; on the north, it has the departments of Jura and Saône-et-Loire.

AIN-TAB, a town of Syria (about 37° N. lat., and about 37° 35′ E. long.), near the sources of the Sajur, a tributary of the Euphrates; and hence its name, from the Arabic *Ain*, eye or fountain. It is about 70 miles N. by E. from Aleppo. It is a large town, inhabited both by Mohammedans, Greeks, and Armenian Christians. The Turkish is the common language. The houses are built of stone, which is found in the neighbourhood: some of the streets are refreshed by streams of water, and the air is wholesome. On the north, is a castle standing on an artificial elevation. The extensive burying-ground, looking at a distance like a large suburb, lies to the south of the town. The manufactures are, leather made of goat's skin dyed red and yellow, cottons, and various coloured woollens. The chief trade is in leather and raw hides.

Ain-tab is supposed, but without any reason, to have been anciently called Antiocheia ad Taurum. It was taken by Tamerlane in 1400. The population has been computed by some at about 20,000. [See Maundrell's *Journey from Aleppo to Jerusalem*, and Browne's *Travels.*]

AINSWORTH, ROBERT, the author of a well-known *Latin Dictionary*. He was born at Woodyale, about four miles from Manchester, in September, 1660. Having received, or at least completed, his education at Bolton, he afterwards taught a school for some time in that town. He then came to London, and formed an establishment at Bethnal Green, from which he removed, first to Hackney, and afterwards to other villages in the neighbourhood of the metropolis. It is said to have been about the year 1714 that he was induced by the offers of the booksellers to commence the compilation of his Dictionary; but the execution of the work was frequently suspended, and it did not appear till 1736. He tells us himself, indeed, that it had been begun more than twenty years before. The first edition, which was dedicated to Dr. Mead in a well-written Latin address, was in one volume quarto; and it was the only one published during the lifetime of the author, who died at London on the 4th of April, 1743, and was buried at Poplar, where an inscription of his own composition, in Latin verse, was placed over his remains and those of his wife. Having acquired a competency, he had retired from teaching for some time before his death. These particulars are given in a notice prefixed to the second edition of his Dictionary. Dr. Kippis, in his edition of the *Biographia Britannica*, adds, from private information, that in the latter part of his life he used to be fond of rummaging in the shops of the low brokers; by which means he often picked up old coins and other valuable curiosities at little expense. He is said to have written some Latin poems; and he also published *Proposals for making Education less Chargeable*, and some other treatises, the list of which may be seen in Watt's *Bibliotheca;*

but his Dictionary is the only work for which he is now remembered. A second edition of it, edited by Mr. Samuel Patrick, appeared in two volumes, quarto, 1746, and it has since been frequently republished. One edition, which came out in 1752, is in two folio volumes, and used to be in some request as a handsome specimen of typography. It was superintended by the Rev. William Young, the supposed original of Fielding's Parson Adams. Another, in two volumes, quarto, was published in 1773, by Dr. Thomas Morell, the author of the *Lexicon of Greek Prosody*. Both Young and Morell also edited Abridgments of Ainsworth's Dictionary, which, until lately, were much used in schools. There is also an abridgment of the work, published in two volumes, octavo, in 1759, by Mr. Thomas. The latest and best edition of the larger work is that which appeared in 1816, in one volume, quarto, under the care of Dr. Carey. This Dictionary, regarded as a mere word-book, is a laborious and useful work; but it has no claim to be considered as a philosophical exposition of the etymology of the Latin language, or as anything like a complete exhibition of the usage of words by Latin authors. Notwithstanding the corrections which it has received from the labours of its successive editors, it still remains disfigured by many errors and deficiencies, which could scarcely have been avoided when it was first compiled, but which leave the book a great way behind the present improved state of philological learning.

AIR. This word is derived from the Greek and Latin *aer*. Though generally applied only to the material of the atmosphere, this term was, about the middle of the last century, extended to all the gases, as they were successively discovered, with a distinctive name for each. Though we confine ourselves here to the properties of atmospheric air only, we give the references to the modern names of the principal *airs*, as they were then called, which will be found mentioned in the chemical works of the last century.

Dephlogisticated Air, Empyreal Air, Vital Air,	see	Oxygen.
Phlogisticated Air,	see	Nitrogen.
Nitrous Air,	see	Nitric Oxide. Deutoxide of Nitrogen.
Dephlogisticated Nitrous Air,	see	Nitrous Oxide. Protoxide of Nitrogen.
Inflammable Air,	see	Hydrogen.
Fixed Air,	see	Carbonic Acid.
Alkaline Air,	see	Ammonia.

Though no one has ever been able to see the little particles of matter of which the air is composed, yet it has been shown by the chemist to be a mixture of a number of different gases floating side by side. Two of these *airs*—namely, oxygen and nitrogen—constitute by far the greater portion of the atmosphere; so much so, that in speaking of its chemical composition, it is customary to regard it as essentially made up of these two gases. One hundred parts by weight contain 77 parts nitrogen, and 23 parts oxygen; and by measure, 79·19 nitrogen, and 20·81 oxygen. This is nearly equivalent to a mixture containing 1 volume of oxygen to every 4 volumes of nitrogen. These gases are spread through the whole atmosphere; but though associated together, they are merely mechanically mixed, and not chemically united. The difference between a mechanical mixture and a chemical compound, will be apparent from the following example:—When copper filings and sulphur are thrown together, no change happens to either; and though they may be both in such a minute state of division that the naked eye cannot distinguish the individual particles, nor the fingers be delicate enough to snatch each piece of copper-dust from the sulphur, yet it is conceivable that, however fine the mixture might be, a microscope could be made which would reveal the presence of both bodies, and a pair of pincers could be fashioned which would enable us to pick every particle of copper from each particle of sulphur. This is an example of a *mechanical mixture*. Now, if after the two substances have been well shaken together, the mixture be placed in a fire clay crucible, heated to redness, and then allowed to cool, a substance will present itself totally unlike the copper or the sulphur which have gone to form it, and which will defy the most powerful microscope to show that either the one substance or the other is present. In the latter instance, the copper and the sulphur are in a state of chemical combination, and afford an illustration of a *chemical compound*.

Though the principal constituents of the atmosphere, oxygen and nitrogen, are found there simply mechanically mixed, it must not be supposed that they have no chemical affinity for each other, and therefore no power to combine and form a chemical compound. Under favourable circumstances, one equivalent of nitrogen can unite with one, two, three, four, or five equivalents of oxygen, forming the chemical compounds called *Nitrous Oxide*, *Nitric Oxide*, *Hyponitrous Acid*, *Nitrous Acid*, and *Nitric Acid*; substances so unlike ordinary air, although containing the same elements, that were either of them to be produced in large quantity in the air, every living thing on the surface of the earth would die. This is prevented by the absence, not of the *material*, but of the conditions requisite to change it. To a very slight extent the conditions are favourable. When a lightning spark passes through the air, it compels a part at least of the oxygen and nitrogen which it finds in its course to combine and form nitric acid.

If bulk were to be taken as the standard whereby to judge of the importance of any substance, then, undoubtedly, oxygen and nitrogen must be considered the most important gases in the atmosphere, just as we should be compelled to regard sand and clay as pre-eminent among the solid matters of the earth's crust; but there are other gases or vapours present in the air, which, although occurring in comparatively small quantity, are yet of essential service, and could not be dispensed with. These are *Carbonic Acid*, *Ammonia*, *Nitric Acid*, and *water vapour*.

Carbonic acid occurs in the atmosphere to the extent of 1 volume in every 2000 volumes. The amount varies a little, being greater in summer than in winter, and during night than during day.

Ammonia and nitric acid are present in such small quantity, that their amount has not yet been accurately determined, and the only means of proving that they exist in the air, is to examine rain-water. Water vapour is a well-known constituent, exhibiting itself at times in clouds, rain, snow, hail, &c.

Besides the six substances already named, there are a multitude of vapours and gases which are seen to enter the air, but which the most diligent search has failed to detect there. Such are coal gas, hydrogen, the odoriferous principle of flowers, and the bad smells of decomposing animal matter. Indeed, a little of everything which can exist as gas no doubt floats through the atmosphere, just as a little of everything which can be dissolved in water finds its way into the sea.

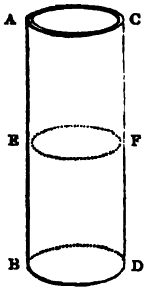
Considering the many different constituents of the air, it appears strange that these should all be so intimately mixed, that at no one part of the atmosphere, over sea or land, in valley or on hill, is anything but the most trifling variation to be found in the relative amount of the several gases. This thorough intermixture of matters, so different in their relative weights or densities, is owing to the operation of a force called the diffusion of gases, by which a gas, however dense, is compelled to float up and spread through a light one, and a light gas is forced to sink and diffuse itself through a heavy one. So perfect is this law, that air obtained by Gay Lussac, in 1804, at an altitude of 22,000 feet above the level of the sea, and that procured by Mr. Welsh, in 1852, at an altitude of nearly 19,000 feet (analysed by Professor Miller of King's College, London), did not differ from that found in a bottle discovered in the buried city of Pompeii, or that at present being wafted over the surface of the ocean. [See Balloon and Gas.]

The composition of air may be ascertained either synthetically or analytically. Synthetically, by mixing the proportions already noticed of oxygen and nitrogen; in which case it is found, that the mixture differs in no respect from common air. Analytically, by an experiment similar to the one already cited; in which, however, it is presumed, that we know the composition of water. If hydrogen be added to or mixed with a portion of common air, and the electric spark be passed repeatedly through the mixture, it will be found that the hydrogen has combined with eight times its weight of oxygen, (if there be so much,) and has produced nine times its weight of water. In this way, by trial, the quantity of hydrogen may be found which will combine with all the oxygen in the mixture, and the remainder is then found to be simply nitrogen.

Such are the principal chemical properties of air. For its effects upon animal life, see Respiration.

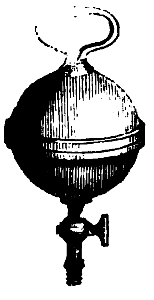
We have already observed that the air, in common with all other bodies, has weight. This is proved by weighing a bottle which contains air in a very delicate balance, and then by repeating the process after the air has been exhausted from the bottle by the air-pump. From this we are immediately led to conclude that, like all other heavy fluids, it exercises pressure upon all substances which are in contact with it. But this was not the order of discovery. The pressure was ascertained long before there was any other reason except analogy for inferring the weight, and the latter discovery was a consequence of the former. It is true, that Aristotle (Stanley's *History of Philosophy*, *Aristotle*, part 2, chap. vii.) expressly mentions that air has weight, and even cites the experiment of a bladder, which he asserts weighs more when filled with air than when empty: but his followers of the middle ages entirely abandoned the doctrine. We shall speak more at length of the discovery, under the heads BAROMETER and ATMOSPHERE. It is here sufficient to observe, that the density of the air depends upon, and is a consequence of, the pressure of the superincumbent atmosphere. For the air is an elastic fluid, that is, its bulk increases, and its density diminishes, whenever the exterior pressure is wholly or partially removed. Let a loose bladder, tied at the mouth, and not so full of air as to be distended, be placed under the receiver of an air-pump, so that the air which presses the outside of the bladder can be exhausted. The interior air will expand so soon as the exhaustion begins, will presently distend the bladder to its fullest dimensions, and in some cases will even burst it. On the re-admission of the air into the space surrounding the bladder, the latter will gradually resume its former dimensions, and its withered or flaccid appearance.

As we ascend the atmosphere, the superincumbent column of air becomes of less weight, and the density becomes less; that is, a cubic foot at the height of 1000 feet above the ground is not so heavy, or does not contain so much air, as a cubic foot at the surface of the earth: which is thus explained. The air having in itself a force which tends to separate the particles from one another, or to expand the whole bulk, but which force grows less and less as the particles are more and more separated, that is, as the bulk increases, the state of rest will always be that in which the elastic force upon a square inch of the surface of air, arising from its own constitution, just balances the external pressure upon that square inch. To illustrate this, suppose a vertical tube, A B C D, open at both ends, *at first*, and filled with air, which communicates with the exterior atmosphere. Place a slight membrane, E F, across it, which can be moved up and down the tube, so that, except for friction, it would be displaced if the pressures of the air above and below it were in the least degree unequal. At present there are two equal and contrary pressures on the two sides of E F, arising from the weight of the column of air above E F. For if the pressure from underneath were less than that from above, E F would move downwards, and *vice versâ*. Now cover the end B D of the tube, so that the air in E F D B shall have no communication with the exterior air. The membrane, E F, still remains at rest; that is, the air E F D B, without being pressed by the exterior atmosphere through the section B D, exerts the same force upon E F from below as the exterior atmosphere does from above. This is what we mean by the *elastic force* of the atmosphere, as distinguished from the weight of the superincumbent column of air. The two being always equal, may easily be confounded; we only wish to impress upon the reader, that this repulsive force of the particles of air, of which we know nothing but its effects, is a counterbalancing force from within, so to speak, to the pressure from without, and is greater or less according to the less or greater nearness of the particles, as we shall proceed to exemplify.



To get a more distinct idea of the superincumbent pressure on E F, suppose the air to be entirely removed from above E F, so that the membrane must be held down in order to prevent the uncounterbalanced force beneath from driving it up, and exhibiting the phenomena of the air-gun. Let a liquid, mercury for example, be poured into the tube, until there is no longer any occasion to hold down E F, or until the weight of the mercury will just counterbalance the pressure of the air from below. In the average state of the atmosphere, this will require about thirty inches of the tube above E F to be filled with mercury. Now let half the mercury be removed, that is, let it only stand fifteen inches above E F. This is not sufficient to counterbalance the pressure from beneath, and the membrane will rise to twice its height above B D, that is, the air will now occupy twice the space which it did before. But this will not happen immediately, for it will settle at first at something less than the height we have mentioned, and attain that height by degrees. The reason would be manifest if a thermometer were placed in the space E F B D; for it would be found that the thermometer would fall when the expansion began, and would gradually regain its original height as the membrane acquired its full distance from B D. Similarly, if the quantity of mercury were doubled and made to stand at sixty inches above E F, the pressure on E F would be greater than that from beneath; the membrane would descend, the thermometer *rising* at the same time; and by the time the thermometer again indicated the same temperature as at first, the membrane E F would stand at half its original distance from B D. If any other quantities of mercury were added or taken away, similar results would be found, so soon as the alteration of temperature was balanced by the surrounding atmosphere, which, in the first case, imparts heat to the apparatus, and, in the second, receives heat from it. Thus, if only one-third of the mercury were left, the air would overbalance it until it had expanded into three times its dimensions. If the mercury were increased five-fold, the air would never furnish a counterpoise until it was reduced to one-fifth of its former dimensions. This remarkable law, which holds generally for *dry* air and all gases, may be thus expressed: *at the same temperature*, the elastic forces of two portions of air (or, which is the same thing, the weights of mercury they will balance) are in direct proportion to the densities, or in inverse proportion to the spaces occupied by these portions. Recent investigations, however, have shown that this law of Boyle or Mariotte, by whom it was discovered, is not *strictly* true for any gas.

The very great pressure of the atmosphere is illustrated by the following experiment. Two hollow hemispheres are loosely placed one upon the other as in the figure: the lower communicates by a tube, in which is a stop-cock, (open for the present,) with the exhausting apparatus of an air-pump. At present there is no impediment to lifting the upper from the lower except its weight; the pressure of the air from within counterbalancing that from without. But if the air be withdrawn from the interior, and the stop-cock closed so that the apparatus can be unscrewed from the air-pump without allowing the air to enter, it will require an enormous force to separate the two hemispheres. If the diameter of the circle be fourteen inches, the least force that will separate them will be equivalent to more than a ton. Such being the external pressure, it may appear extraordinary that the human body is capable of supporting it without being crushed to atoms. The pressure on the body is computed at several tons. But the cause of wonder is purely imaginary. In the words of Dr. Robison, 'the human body is a bundle of solids, filled or mixed with fluids, and there are few or no parts of it which are empty. All communicate either by vessels or pores; and the whole surface is a *sieve*, through which the insensible perspiration is performed. The whole extended surface of the lungs is open to the pressure of the atmosphere; everything is therefore in equilibrio; and if free or speedy access be given to every part, the body will not be damaged by the pressure, however great, any more than a wet sponge would be deranged by pressing it any depth in water.' (*Mechanical Philosophy*, vol. iii. p. 541.)



The temperature of air, as already noticed, influences its elastic force. We have every reason to conclude, that the principal properties of this and all other gases are a consequence of the presence of heat, though we do not know what the latter is. It is probable that air would become, first liquid, and then solid, if it could be made sufficiently cold. Like all other substances, air gives out heat when it is compressed, that is, raises the temperature of surrounding bodies, and *vice versâ*. This is strikingly illustrated by the fact that tinder can be set on fire when the air in which it is contained is suddenly and violently compressed.

From careful experiments it appears, that air and all other gases, as well as vapours, and also all mixtures of gases and vapours, obtain an increase of elastic force for every increase of temperature, and expand, therefore, if expansion be possible, in the vessel which contains them. The quantity of this expansion, when the temperature passes from the freezing to the boiling point of water—that is, from 32° to 212° of Fahrenheit's, from 0° to 80° of Reaumur's, and from 0° to 100° of the Centigrade, thermometers—was formerly estimated at 375 parts out of a 1000 of the bulk which the gas had at the freezing-point. And this dilatation is uniform—that is, whatever expansion arises from an increase of 12° of temperature, half as much arises from an increase of 6°, twice as much from one of 24°, and so on. Dalton, in England, and Gay Lussac, in France, discovered this law nearly about the same time: the formulæ in which they expressed it were slightly different; but for upwards of thirty years, it was believed that 'all gases, whatever be their density, and the quantity of water which they hold in solution, and all vapours, undergo the same dilatation by the same change of temperature.' Rudberg, Pouillet, Regnault, and Magnus, have investigated this subject more recently; but their experiments have not established the truth of Gay Lussac's law. In the first place, it is found that dry air does not increase in bulk by .375 of its volume at 32° F., when the temperature is raised to 212° F. A mean of all the experiments gives the increase, or, as it is called, the coefficient of dilatation between the freezing and boiling point of water at ·36666 or $\frac{11}{30}$ of the volume at 32° F. But in Fahrenheit's thermometer there are 180°, in Reaumur's 80°, and in the Centigrade, 100°, between the fixed points of the scale; hence, the amount of expansion for one degree on these thermometers is $\frac{1}{500}$, $\frac{1}{220}$, and $\frac{1}{273}$, respectively. If we call this fraction a, the volume at the freezing-point v, and the temperature at which the volume is sought t, this latter will be $v\ (1 + a\,t)$, a and t depending on the thermometric scale employed. By common arithmetic the expansion between any two points of the scale may thus be easily found.

Next, the researches of the philosophers mentioned above have shown, that all gases do not 'undergo the same dilatation by the same change of temperature,' as Gay Lussac thought. For hydrogen and carbonic acid the coefficients are about the same as that for air, while for cyanogen and sulphurous acid, they are considerably greater.

But there is another point on which recent experiments have proved that Gay Lussac's law is only an approximation to the truth. The coefficient of expansion of air from the freezing to the boiling point, is ·3666 under the ordinary barometric pressure; but it does not remain the same under all pressures, or of whatever density the air may be. The following table from Regnault will show that the coefficient increases with the pressure, and does not remain constant, as was formerly supposed:—

Temperatures by Centigrade Thermometer.

Pressure at 0°. Millimetres.	Pressure at 100°. Millimetres.	$1 + 100a$.
109·72	149·31	1·36482
174·36	237·17	1·36513
266·06	395·07	1·36542
374·67	510·35	1·36587
375·23	510·97	1·36572
760·00	.. ..	1·36650
1678·40	2286·09	1·36760
1692·53	2306·23	1·36800
2144·18	2924·04	1·36894
3655·56	4992·09	1·37091

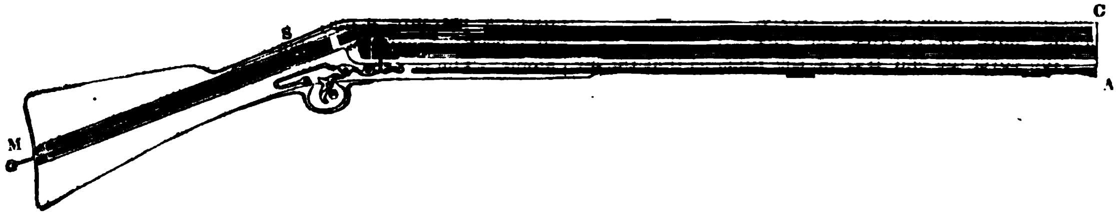
The pressure is given in millimetres of mercury, each of which is equal to ·039 of an English inch. If the pressure at 0° be $109^{\mathrm{mm}}\cdot72$, it will require to be increased to $149^{\mathrm{mm}}\cdot31$, in order that the volume may remain the same, when the temperature rises to 100° C.; the coefficient in that case is ·3648 of the volume at the freezing-point. Other gases are found to be subject to the same law: the coefficient becomes greater as the pressure is increased.

Air is peculiarly useful as a thermometrical substance, in consequence of its large coefficient. The absolute dilatation of mercury is small; and when that fluid is enclosed in an envelope, whose rate of expansion may vary with the degree of heat, as well as with the kind of glass employed, the indications of the thermometer cannot always be received with perfect confidence. But the expansion of air is so much greater than that of glass, that these small variations have scarcely any influence upon the indications of an air-thermometer, corrected for the expansion of its envelope.

On the properties of air with regard to other bodies, we may notice, that the boiling-point of water depends on the presence of air in that fluid. When water is, as far as possible, deprived of air, the boiling-point, even under a very feeble pressure on the surface of the water, has been known to rise above 130° Centigrade. The effect of a thin film of air between the surface of a glass tube and the mercury in which it is immersed, will be considered under the article BAROMETER.

In this article we have considered only the chemical and mechanical properties of air. The constitution of the whole mass will come under the article ATMOSPHERE. To complete the subject, refer to OXYGEN, RESPIRATION, COMBUSTION, VENTILATION, ACOUSTICS, AERODYNAMICS; and also to Turner's *Chemistry*, eighth edition, p. 199; Dixon, *Treatise on Heat*, Part I.; and the various articles on the subject in the *Encyclopædia Metropolitana*.

AIR-GUN. An instrument for projecting bullets, in which the moving power is the rush of condensed air allowed to escape, instead of the formation of gases arising from the ignition of gunpowder. The air-gun and the common gun are therefore the same in principle, and it is only necessary to describe the peculiarities of its mechanism.



We have given above the section of one of the earlier species of air guns.

In the stock of the gun is a condensing syringe, the piston of which is M S, by means of which air is condensed into the cavity C S, which has a valve opening inwards, just behind the bullet K. The barrel, K A, is open, and the bullet (which should just fit the barrel) is inserted in the usual way. The trigger, O, opens the valve behind the bullet, and permits the rush of the condensed air, which propels the bullet forward. The moment the finger is withdrawn from the trigger, the air closes the valve, and remains, somewhat less condensed than before, for the next discharge.

The same principle has been variously applied. In the magazine air-gun, there is a reservoir of bullets, in a channel under the barrel, one of which is turned in by a cylindrical cock pierced by a tube, which in one position is a continuation of the reservoir of bullets, and in another, of the barrel. Thus by turning the gun upside down and turning the cock, a bullet falls into it from the reservoir, which, on returning the cock, is of course in the barrel. In some air-guns, the cavity containing the condensed air is a hollow copper ball, which can be screwed on to the gun after condensation. The *air-cane* is so called because it is usually in the form of a walking-stick. The handle contains the condensed air, and can be unscrewed and filled by a separate condensing syringe. There is some mention of an instrument similar in principle to the air-gun among the ancients; and it is said that Ctesibius, a celebrated mechanical philosopher, who lived, B.C. 120, at Alexandria, constructed an instrument, in which the air, by its elastic force, discharged an arrow from a tube. (Montucla, *Histoire des Mathématiques*, vol. i. p. 267.) The invention, such as we have described it, is ascribed to Marin, a native of Lisieux, in France, who is said to have presented an air-gun to Henry IV.

No power, but only a convenient adaptation of power, is gained in an air-gun, since the condensation of the air requires force. If the arm which condenses the air into the cavity could, without exertion, follow the bullet, and employ its force only in pushing the latter onwards, it would communicate the velocity which the bullet would receive from the gun, before as much force had been expended as would be required for the condensation; for the whole force employed in overcoming the friction of the piston would be saved. This consideration will be more fully discussed in the article MACHINE.

The elastic force of the gas produced from gunpowder is stated by Dr. Hutton to be about 1000 times that of common air, at the moment when it is produced. And the velocities which are produced by different forces are not as the forces themselves, but as the square roots of the forces. Attending to this consideration only, a compression of forty *atmospheres*, as it is called,—that is, a condensation of forty equal bulks of air into one,—would give a velocity bearing to that of gunpowder the proportion of the square root of 40 to that of 1000, or one-fifth. But there is another circumstance to be attended to. The gas generated from gunpowder quickly expands itself into many times its first dimensions, thereby diminishing its elastic force in the same proportion; whereas, if the cavity be large, the expansion of the air in the cavity, when it has also filled the barrel, will not materially alter its elastic force. Attending to this, we find, by a rough calculation, that, from the preceding supposition, we might expect to have more than half the velocity of gunpowder. The air-gun has never been used in war, on account of its expense, and the force which must be exerted to condense the air. The latter objection has disappeared since the use of steam: a few very small and portable engines kept constantly at work would provide ammunition for a large army. For great guns, the use of condensed air has never, to our knowledge, been attempted: in fact, the air-gun itself has always been considered as a toy, unless in a very few cases, where it has been the instrument of private and cowardly revenge.

AIR-PUMP. A philosophical instrument for removing the air out of a vessel. We shall also include under this head the apparatus for forcing more air into a vessel, better known by the name of the Condensing Syringe, as the two differ very slightly in their main principle and simplest construction.

fig. 1.

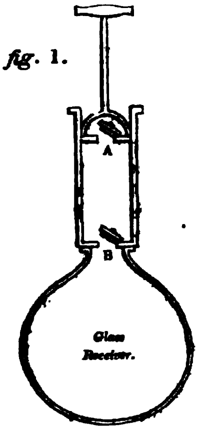
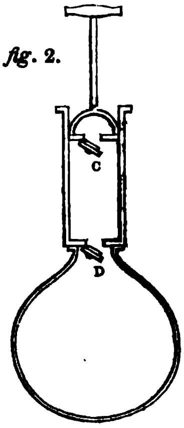


fig. 2.



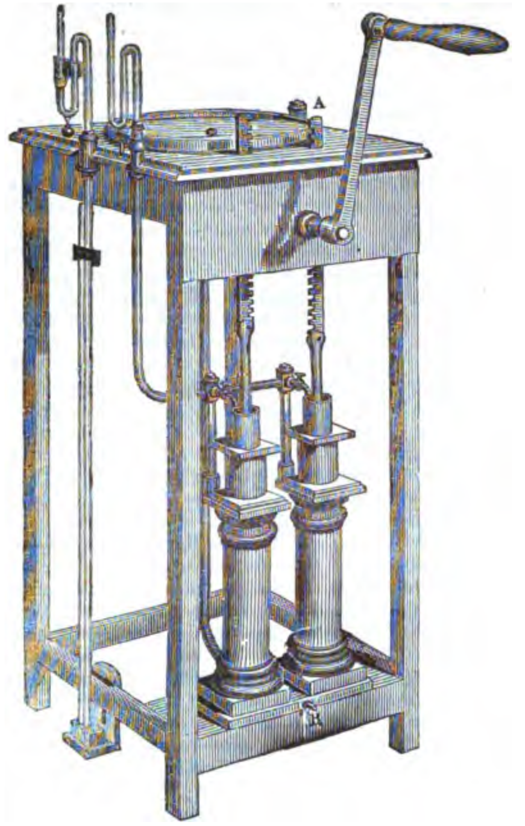
Above we have the sections of the simplest forms of an *exhausting* and of a *condensing* syringe. Both consist of a tube closed at one end, excepting an orifice to which a valve or lid is attached. A piston, with a rod and handle, enters at the other end, and can be moved up and down the tube. The piston is not entirely closed, but has a valve opening the same way as the other valve. Both are attached to vessels, the air of which is to be rarefied or condensed. In fig. 1, or the exhausting syringe, both valves open upwards; or let air only *out* of the vessel and the piston: in fig. 2, or the condensing syringe, both open downwards, or let air only *into* the vessel and the piston.

Let the whole content of each vessel be, for example, six times that of the tube of the syringe, and let both pistons be pushed down. We first take the exhausting syringe. The instant the piston begins to rise, there is no air between A and B, the valve A is kept shut by the pressure of the exterior air, while the air in the vessel, pressing on B from underneath at the rate of about fifteen pounds to the square inch, raises it, and the air in the vessel is thus distributed between the vessel and the tube. If we call the tube one *measure*, the vessel is six *measures;* so that the air which occupied six measures now occupies seven, or is only six-sevenths of its former density. When the piston is returned again, the air in the tube is compressed, but cannot return into the vessel, because B does not open inwards. By the time the piston has returned through one-seventh of its descent, the equilibrium between the air in the tube and the external air will be re-established; and by the time the piston has descended so much farther that the additional elastic force acquired from compression will suffice to lift the valve A, the latter will open, and the air will rush out. This continues until the piston has quite returned to H. That is to say, after every stroke of the piston, the air in the vessel has only six-sevenths of the density which it had before the stroke, since the air contained in six measures is expanded into seven by the rise of the piston. Therefore at the end of the second stroke, the density is $\frac{6}{7}$ of $\frac{6}{7}$ or $\frac{36}{49}$, that is, 36 measures of common air would weigh as much as 49 of the air we have now got inside the vessel. At the end of the third stroke the density is $\frac{6}{7}$ of $\frac{36}{49}$, or $\frac{216}{343}$. Without going farther, suffice it to say, that at the end of the twentieth stroke, the density of the rarefied air is about $\frac{1}{25}$; and at the end of 100 strokes, it would take about five million of measures of the rarefied air to weigh as much as one of common air. But long before this time a limit would be put to the exhaustion, in the present state of the apparatus. The air in the vessel cannot escape into the tube unless it has force sufficient to lift up the valve B; which after a certain number of strokes will not be the case, for the elastic force of the air diminishes in the same proportion as its density, being at first fifteen pounds to the square inch; so that by the time the density is reduced to $\frac{1}{480}$, the valve, if it present a surface of one square inch, will not rise, if it be so heavy as half an ounce. Let us, then, suppose B to be fastened to the piston by a loose string, so long that it becomes tightened just before the piston reaches its greatest height. The string will then open the valve, and the rarefaction will take place as usual.

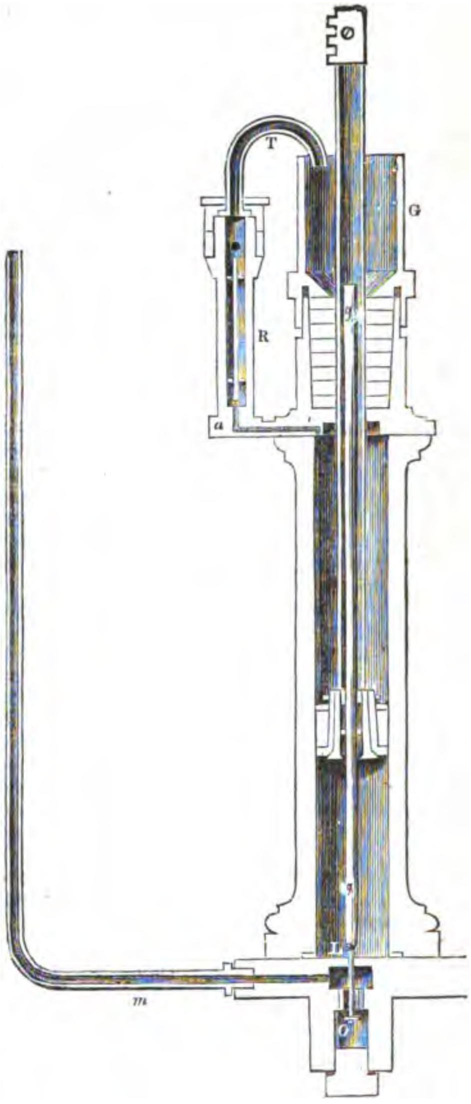
The condensing instrument will now be easily understood. Let the piston be raised, the valves will then be open; but the moment the piston begins to descend, the rush of air outwards will shut C, and the whole of the air in the tube will be forced into the vessel, which admits it, since D opens inwards. If this be done quickly, so that hardly any air escapes, seven measures of air, after the stroke, will occupy the space filled by six measures before it, so that the density of the air in the vessel will be $\frac{7}{6}$; or six measures of condensed air will weigh as much as seven of common air. When the piston returns, air rushes in through C, and presses the valve D, which nevertheless, unless made too heavy, does not open, because it is pressed with a greater force from within. In every succeeding stroke an additional measure of common air is added to the stock already contained in the vessel. At the end of the second stroke the density is $\frac{8}{6}$; at the end of the third $\frac{9}{6}$, and so on. Every succeeding stroke will be more difficult; for the air contained between C and D in the descent of the piston, will not force D open, until it is more compressed than the air within the vessel. Also the condensation increases only in arithmetical progression, while the corresponding rarefaction in the exhausting syringe takes place in geometrical progression. It would take 30,000,000 of strokes, all but one, to produce a condensation, the corresponding rarefaction to which is gained in a hundred. It is needless to say that no materials we could put together would bear such a pressure, and no force we could exert would create it.

The exhausting syringe we have described, is, in principle, the common air-pump. We shall now proceed to describe Cuthbertson's air-pump, containing the most recent material improvements.

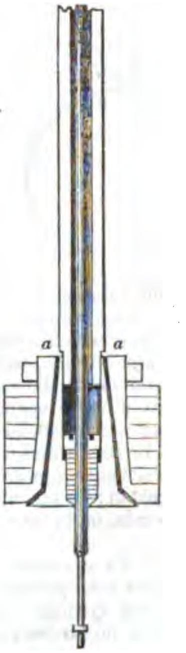
The circular plate at the top is metal ground to a perfect plane surface, on which is placed an inverted glass jar, from which the air is to be exhausted, called the receiver, the bottom of which is also carefully ground: so that if the plate be slightly smeared with grease and the receiver placed upon it, the junction of the two is air-tight. The hole in the middle of the plate is the end of a tube, which extends vertically downwards until, curving at the bottom, it passes through the front beam below the barrels, with the interior



of each of which it communicates. These barrels are exhausting syringes, the construction of which will presently be more particularly described: they are worked by rack-work, communicating with a cog-wheel and handles, space for the racks to play being cut in the upper wood-work of the apparatus. On the left are the gauges for ascertaining the degree of exhaustion obtained, and at A is a place for a PEAR-GAUGE. See also SYPHON-GAUGE, as we shall here only describe the most common, the barometer-gauge. The box attached to the under beam on the left contains mercury, out of which rises a tube and a graduated scale, as in the barometer. This tube passes through the higher wood-work, and also ends in the orifice which is in the middle of the plate, so that the communication being free, the air in the receiver, and that in the tube above the mercury, are in the same state. Hence as the air is rarefied, the external air will force some mercury up the tube, and the height to which it has risen will shew the degree of rarefaction. For example, suppose that the common barometer being 30 inches high, the *barometer-gauge* of the air-pump stands at 20 inches. If the vacuum were complete, the barometer-gauge would be a common barometer, and would stand at 30 inches: but as it stands only at 20 inches, the pressure of the air in the receiver is equivalent to 10 inches of mercury, or one-third of that of the exterior air. Therefore the density of the air in the receiver is one-third of that of the exterior air, or two-thirds of the air have been removed.



The following cut shews a section of the piston rod, as well as of the barrel. The tube *m* comes from the receiver, and air can be admitted by it into the barrel when the rod *gg* is raised. The rod *gg* passes into the piston-rod (which is hollow) and works stiffly in it, being however unconnected with it except by friction. This rod consists of two parts, above and below L, the latter of which is not thick enough to fill the orifice in which it plays. But when the piston descends, the conical juncture of the thicker and thinner parts is brought upon this orifice, and shuts it close. After this, and during the rest of the descent, the hollow piston-rod slides downwards upon the rod *gg*. As soon as the piston begins to ascend, the rod *gg* is raised with it, owing to the friction, so far as the nut o will let it rise, after which the piston-rod slides up *gg*. We have here the lower valve of the exhausting syringe, shut during the descent of the piston, open during the ascent, and not opened by the force of the air from underneath, so that the functions of the string which we supposed in our first exemplification are performed. A little higher up the barrel we find the piston, as better shown in the adjoining figure. The external part is a partial piston not connected with the piston-rod, but fitting closely to the barrel. The piston-rod, when rising, fits this exactly, renders it air-tight, and causes it also to rise. But when the piston-rod is descending, it will not cause the descent of the exterior, and, as we have called it, partial, piston, until the projecting shoulders *aa* (in the figure) come upon it; and, as these shoulders do not go all the way round, the piston in descending is not air-tight. This apparatus supplies the place of the upper valve, being air-tight in the ascent, but not so in the descent. Looking above the piston, we find that its rod works in metal shoulders, the interval between which is occupied by stiff leathers. The space above the leathers opposite to G is filled with oil, which is communicated slowly to the leathers, and also to the barrel beneath. From the latter, however, it is immediately expelled by the rise of the piston, which forces it, as well as the air in the barrel, through the channel *aa*. The oil and the air then force up the rod in the cavity R, which rod, working in collars, answers the purpose of a valve The



oil is there lodged until it is collected in sufficient quantity to flow again into the reservoir at T. The air escapes into the exterior atmosphere.

Having shown that we have here an under valve shut during the descent, and open during the ascent; with an upper valve open during the descent and shut during the ascent, we need not repeat the manner in which the rarefaction is produced. We have only further to notice, that a branch from the main tube which enters the receiver is carried through the under wood-work in front, and emerges at B. It is here stopped by a screw; but when the operator desires to restore the air under the receiver, he opens this screw, upon which the communication between the exterior atmosphere and the receiver is restored, and the air rushes in. In the perspective figure, a cross bar, in which the upper parts of the barrels are enclosed to strengthen them in their position, is omitted for clearness.

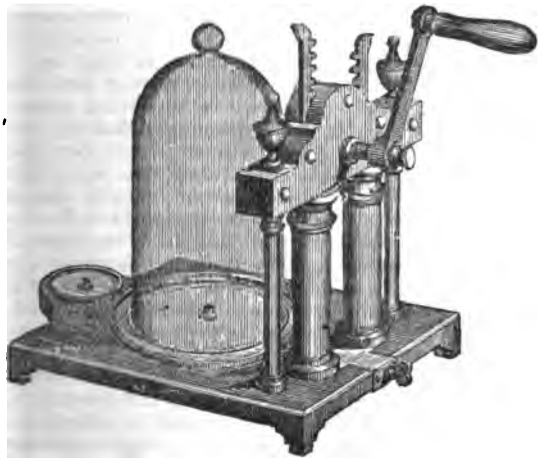
The following experiments are among the most common of those shown with the air-pump:—1. If the receiver be open at both ends, and the upper orifice be stopped by the hand,—on exhaustion, the pressure of the exterior air will prevent the removal of the hand. If a piece of bladder be tied tight over the orifice, as the exhaustion proceeds, the bladder will be pressed inwards, and will finally burst with a loud noise. The pressure of the air is also proved by the experiment of the hemispheres, described in the article AIR.

2. The weight of the air is proved by exhausting a copper ball furnished with a stop-cock, which is shut before the ball is removed from the air-pump. It will then be found to weigh less than before the exhaustion was made.

3. The presence of air in various substances may be detected. A glass of liquid placed under the receiver will give out bubbles of air as soon as the exhaustion begins. A shrivelled apple will be restored to apparent freshness by the expansion of the air which it contains; but will resume its original appearance when the air is allowed to return.

4. The elasticity of air may be shown by placing a bladder under the receiver, not distended, and the mouth of which is tied up. On exhausting the receiver, the air contained in the bladder will expand it more and more, as more of the pressure from the exterior is removed; and the bladder will finally burst from the interior pressure. If a hole be made in the smaller end of an egg, which is placed under the receiver, the small bubble of air, which is always found in the larger end, will, by its expansion, force out the contents of the egg.

The first vacuum was made by Torricelli (see TORRICELLI, BAROMETER), but the first air-pump was constructed by Otto von Guericke, who exhibited it publicly at the Imperial Diet of Ratisbon in 1654. It was an exhausting syringe, attached underneath a spherical glass receiver, and worked somewhat like a common pump. The syringe was entirely immersed in water to render it air-tight. Shortly afterwards, Boyle constructed an air-pump in which the syringe was so far improved that the water could be dispensed with. He also first applied rack work to the syringe. The second syringe and the barometer-gauge were afterwards added by Hawksbee, and several minor improvements were made by Gravesande and Smeaton. All the alterations which have been made since the time of the invention, however important, relate to the mechanism only, and not to the principle on which the pump acts.



We give, in the preceding column, a drawing of a more portable and less expensive species of air-pump, which, after what we have said, will need no description.

The small plate behind the receiver is for another small receiver in which a gauge is placed. This gauge is nothing more than a common barometer, which falls with the diminution of pressure from the air in the receiver, in the same way as the common barometer when the pressure of the exterior air is lessened by a change of weather.

For further details see Hutton's *Mathematical Dictionary*, *Encyclopædia Metropolitana*, article 'Pneumatics.' Lardner's *Cyclopædia*, article 'Pneumatics.' Biot, *Traité de Physique*, i. 127.

AIR, in music, signifies *Melody;* the terms are synonimous; it being understood that by both words is meant succession of single sounds in measured time.

The etymology of this word is very uncertain. The *Della Crusca Dictionary* quotes Redi, who died in 1698, as the first who used the term in a musical sense; but had the compilers of that ponderous work been more diligent in their research, they would have discovered that an eminent writer of their own country, Zarlino, in his *Istitutioni Harmoniche* (*Venetia*, 1589), had employed it more than a century and a half earlier. It is found in Morley's *Introduction* and in Bacon's *Essays*, both of which were published in 1597; and, about the same time, Shakspeare introduced it in his *Tempest*.

The term *air*, as employed in music, is most likely not derived from any word that bears the same meaning, but had its origin, we have ventured to surmise, in a pure metaphor, which owed its birth to the perception of a certain resemblance between elemental air and melody (or musical air) in the qualities of lightness and buoyancy, elemental air occupying the upper part of our sphere, as melody occupies the upper part in music. And here it is necessary to our hypothesis to state, that the term *air* certainly was not applied to musical purposes till long after harmony, or music in parts, was commonly practised, and treated as a most important branch of the art.

Rousseau says that the name of *air* is given to all melodies, to distinguish them from recitative. M. Suard, in the *Encyclopédie Méthodique*, mildly censures this opinion, and, with some hesitation, offers the following definition:—a piece of music, composed of a certain number of melodious phrases, united in a regular symmetrical form, and terminating in the key in which it began. Sulzer has followed M. Suard; so has Pietro Lichtenthal; but, without objecting to his definition, we consider the common and simple one the best,—namely, that succession of single sounds, regulated by the laws of musical rhythm, which constitutes what, in homely language, is called a *tune*. [See RHYTHM.]

Air is, allowedly, the most important of the constituents of music. A composition may be replete with learned and ingenious harmony, may abound in fugue, in imitation, and all the contrivances of science, but without good melody will never appeal to the heart, and seldom afford any gratification to the ear. Haydn carried this opinion so far as to say, 'Let your air be good, and your composition, whatever it may be, will possess beauty, and must certainly please.' Air is in music what design and outline are in the sister art of painting: harmony is the filling up, and the colouring. (See Marcello's *Preface to his Psalms*, quoted in an article on Ancient Greek Music, in No. V. of the *Philological Museum*.)

The Greeks had many kinds of airs, which they called *nomes*, or songs; and we learn from the work of Philodemus on Music, recovered from the ruins of Herculaneum, that every trade and occupation had its Νομοι, or appropriate airs, which were played or sung to the workmen while they laboured.

The various kinds of airs, instrumental as well as vocal, will be found under their different heads. [See ALLEMAND, BARCAROLLE, &c.] In music composed for the theatre, and which is constantly introduced into the concert-room, are the following varieties of air, designated by Italian denominations, viz.—

1. The *Aria di Carattere* (*characteristic air*), which is distinguished by force and energy of expression, and by dramatic effect.

2. The *Aria Parlante* (*speaking air*), which is rather declaimed than sung, and is best suited to the *buffo*, or comic performer.

3. The *Aria di Cantabile* (*singing air*), a tender, pathetic air, calling forth the expression and taste of the singer.

4. The *Aria di Bravura* (literally, *air of courage*, or a *dashing* air), an air in which the performer displays his powers of execution, and seeks rather to astonish than please.

AIR-BLADDER, in ichthyology, a peculiar organ with which the great majority of fishes are provided, and by which they are enabled to adapt the specific gravity of their bodies to the various pressures of the superincumbent water at different depths. Generally speaking, the specific gravity of the muscles, cartilages, &c., or, if we may be permitted to use the expression, of the flesh, of fishes, differs in no sensible degree from that of the element in which they reside; but it will be observed, that this specific gravity cannot be altered at the option of the animal: hence arises the necessity of some peculiar contrivance to enable the individual to adapt itself to the varied and rapid change of circumstances, to which fishes, above all other animals, are particularly subject. This important object is accomplished by means of the organ usually called the air-bladder, because it serves as a receptacle for a certain quantity of air, by the increase or decrease of which the alteration in the animal's weight, compared with that of the surrounding fluid, is accomplished. The vessel itself is composed of a lengthened sack, sometimes simple, as in the common perch, sometimes divided into two or more compartments, by a lateral or transverse ligature, as in the trout and salmon, and, at other times, furnished with appendices, more or less numerous according to the particular species. In all cases, it is composed of a thick internal coat of a fibrous texture, and of a very thin external coat; the whole being enveloped in the general covering of the intestines.

The modifications of this organ are infinitely varied in different genera and species of fishes. In the greater number of instances, it has no external opening, and the air with which it is found distended is believed to be produced by the secretion of a certain glandular organ, with which it is in all these cases provided. In fresh-water fishes, the air-bladder communicates sometimes with the œsophagus, and sometimes with the stomach, by means of a small tube; and it is observable, that in the greater number of these instances, in which it has a direct external communication with the intestines, the secreting glands above-mentioned do not exist; thus giving us strong reason to believe that its functions and uses are not uniformly the same in all the different classes of fishes. A very limited number of species, among others the common eel, have air-bladders, not only opening by an external duct, but likewise provided with secreting glands; and thus occupying an intermediate station between the two larger classes, at least as far as the nature and functions of this organ are concerned.

In general, all fishes which enjoy great powers of locomotion, and have occasion to pass through various degrees of superincumbent pressure in their rapid transitions from the surface to the bottom of the ocean, are provided with this important organ; and so indispensable is it in their economy, that those which, for the sake of experiment, have been deprived of it, have sunk helpless to the bottom, and there remained incapable of moving, or even of maintaining their equilibrium. But to fishes whose habits and organization confine them either to the surface of the water or to the bottom of the sea, and which, therefore, do not require to pass through different depths, or to encounter different degrees of pressure, the possession of an air-bladder is by no means so essentially requisite. Accordingly we find, that all the different species of rays and pleuronectes or flat fish, such as skates, soles, turbots, brills, &c., which live only upon the coasts and sand-banks at the bottom of the ocean, as well as the mackerel and others which find their food entirely at the surface, have no air-bladder; and so small is the relation of this otherwise important organ to the general conformation of fishes, that we sometimes find it present in one species, and wanting altogether in another of the same genus.

Some zoologists have supposed, that the air-bladder may be connected with the respiration of fishes, and have adduced facts in support of this opinion, which certainly render it extremely probable. At present, however, nothing certain is known upon the subject. Fishermen are well acquainted with the nature and functions of the air-bladder, or, as they most commonly call it, the *swim*. They are accustomed to perforate this vessel with a fine needle in cod, and other species which require to be brought fresh to market, sometimes from a very great distance. By this operation, the confined air is allowed to escape, and the fish constrained to remain quiet at the bottom of their well-boats, where they live for a very considerable period. Cod-sounds, which are brought in great quantities from Newfoundland, are nothing more than the salted air-bladders of these fishes. The Iceland fishermen, as well as those of America, prepare isinglass of a very excellent quality from cod-sounds, though they are not acquainted with the method of clarifying it, which the Russians practise in preparing that article from the sound of the sturgeon. [See Isinglass.]

AIR-CELLS, in plants, are cavities in the leaves or stems, or other parts, containing air. In water-plants they have a very definite form, and are built up of little vesicles of cellular tissue, with as much regularity as the walls of a house; they, no doubt, enable the plant to float. Their anatomical structure frequently exhibits one of the most beautiful of microscopic objects. In plants which do not float, their form is less definite; they often appear to be mere lacerations of a mass of cellular substance, and their object is unknown; well-known instances of their presence are the chambers in the pith of the walnut-tree, and the tubular cavities in the stem of the bamboo, and other grasses.

AIR-PLANTS are so called because they possess the power of living for a considerable time if suspended in air without being in contact with any substance from which they can absorb food. It is, however, a mistake to suppose that these plants are naturally suspended freely in the air; and that such a situation is that in which they will thrive; they will only exist in air for a shorter or longer period, according to the species and to other circumstances, but in the end they will perish.

There are two different tribes to which the name of air-plants has been applied; of which one, containing the moss-like *Tillandsia usneoides*, which hangs in festoons from the branches of trees in the hot damp forests of tropical America; and the fragrant *T. xiphioides*, which adorns the balconies of the houses in Buenos Ayres, is called by botanists *Bromeliaceæ;* the other, abounding in species of the most different nature and appearance, is named *Orchideæ*. It is to the latter, almost exclusively, that the gardener has hitherto turned his attention, and that the following remarks apply.

Not very many years ago, the cultivation of air-plants of the *Orchis* tribe was supposed to be attended with insuperable difficulties; and of the many hundreds of beautiful species that are found in foreign countries, scarcely any were known in Europe, except from drawings, bad descriptions, and imperfect dried specimens. The method of growing them was so entirely unknown, that no one ever expected to preserve a species beyond a few months after its importation. The application of physiological principles has, however, at length overcome all difficulties to so great a degree, that *orchideous* air-plants have become comparatively common in the hot-houses of our public and private gardens. Here, too, they flourish in all their natural freshness, and they are sometimes to be seen suspended in the drawing-rooms of the richer inhabitants of this country, as they long have been in the houses of the Chinese; a purpose for which the surpassing beauty and delicious fragrance of many render them particularly well adapted.

The native country of these curious plants is wherever a climate is found in which heat and moisture are in excess. Within the tropics in Asia, Africa, and America, in damp and shady forests, by the side of fountains, within reach of the spray of waterfalls, perched upon the branches of trees, or clinging to rocks and stones by means of their long and writhing roots,—creeping among moss, rearing their flowers in the midst of brakes and other moisture-loving tribes,—in all such situations they are found in abundance. But in those regions where the heat is accompanied by periodical dryness, as the open plains of India, and the sandy deserts of Arabia and Africa, they are almost entirely unknown. The principal stations for them are the woods of Brazil and Peru, the lower mountains of Mexico, the West Indies, Madagascar, and the adjoining islands, the damp jungle of Nipal, and the whole of the Indian Archipelago; in Java alone nearly three hundred species have been discovered. In that country they are described as overrunning the trees by thousands in mountain forests choked up by huge climbers and a rich undergrowth of gigantic grasses, while not a ray of sunlight can enter to dispel the damp and gloom.

Such are the conditions under which air-plants, of the kind now described, naturally thrive; 1. high temperature; 2. diffused light, like that of a shady grove, and not direct solar light; 3. a great degree of dampness; and, 4. a perfect freedom from stagnant water round their roots: for on the trunks of trees or on stones and rocks no water can lodge, and all the moisture they receive must necessarily be in the form of vapour or of falling rain. And it is to circumstances of this nature that the gardener has chiefly to attend. Damp, shade, heat, and good drainage will be his objects; the three former will cause him no trouble, but the latter will require him to alter entirely his usual mode of cultivation. Instead of considering in what kind of soil his air-plants are to be placed, he will endeavour to dispense with soil, and to supply its place with bits of rotten wood, chopped moss in very small quantities, fragments of half-baked pottery, such as garden-pots, and the like.

These are the points which enable modern gardeners to obtain a certain degree of success. But equal at least in importance to all of them is a circumstance of which they are only just beginning to be aware, namely, that air-plants and all other tropical plants require a season of repose and cessation from vigorous growth. If a gardener were to be told that he ought to keep his vines or his peaches growing incessantly without any season of rest, he would consider his adviser either a madman, or an ignorant pretender; and yet he himself commits the same capital error with his hothouse and greenhouse plants. He is incessantly endeavouring to maintain the perpetual spring of the poets, and he wonders that his plants are sickly and barren. This arises from misunderstanding the well-known fact, that there is no winter in hot countries. It is true that in equatorial regions there is neither frost nor snow, and that in many climates there is no cold season—but it does not, therefore, follow that plants have no season of repose. The fact is, that within the tropics, or in those latitudes where frost and snow and periodical cold are unknown, the season of rest is the *dry* season. At this time of the year vegetation is arrested by a parching air and a fervid sun; the current of life in the trees of the forest becomes languid, herbs lose their stems and disappear, leaves drop from the branches, scarcely a blossom can burst through the hard scaly rind that encompasses it, and all nature wears an air of desolation; plants are then in a state of rest analogous to that to which they are subjected by the winters of Europe. But after a season rain begins to fall, at first gently, as if to excite the nascent buds and to prepare them for the rapid development which they are presently to undergo; as it becomes more abundant, the dry and heated ground reeks with the ceaseless showers; the whole country is enveloped in vapour; grass and herbs start up in the fields and clothe them with verdure, leaves burst forth upon the trees, flowers expand—and the air-plants, which had hung during the dry season from the branches like withered, shapeless things, are roused from their slumber, fill themselves with moisture, and rapidly participate in the general force of vegetation.

This it is to which the gardener should attend; it is this which explains the difference between the success of one cultivator and another; and it is to a knowledge of this, taken in conjunction with the circumstances before explained, that we owe the remarkable improvement that has taken place in the mode of cultivating these plants in Great Britain.

For further information upon this subject, see Dr. Lindley's *Observations in the Transactions of the Horticultural Society*, vol. i., New Series, p. 42, and the latter volumes of the *Botanical Register*. [See Orchidaceæ.]

AIR-VESSELS, in plants, are what botanists call spiral-vessels. It is supposed by some that these are the only parts through which air is conveyed into the vegetable system, and it has been proved that, in some cases at least, the air that they contain consists of a larger proportion of oxygen than atmospheric air. But it is doubtful whether the action of these vessels is more than local, and it is certain that air has tolerably free access to many parts, as the leaves, for example, by means entirely independent of the spiral vessels. [See Tissue of Plants.]

AIRE, a river which rises on the north side of Malham, a village in the parish of Kirkby in the West Riding of Yorkshire, and about six miles east of Settle. The source of this river is a sheet of water about a mile in circumference, called Malham Tarn. From this basin the stream rushes in a torrent down a highly picturesque rocky chasm, and falls through a distance of 150 feet to the valley of Airedale. Flowing then in a south-east direction for about thirty miles, it passes through Leeds, where it becomes navigable; and twelve miles farther on, at Castleford, a village three miles north-west of Pontefract, it forms a junction with the river Calder. The united stream holds then an easterly course to the immediate vicinity of the market-town of Snaith, when it runs nearly north-east for five miles to its confluence with the river Ouse, a little below the village of Armin. Thus augmented, the stream then takes the name of the Humber, and flows past the town of Kingston-upon-Hull into the German Ocean.

AIRE AND CALDER NAVIGATION. [See Calder.]

AIRE, a town in the former province of Artois, and the present department of Pas de Calais (Straits of Calais), stands on the Lys, (which joins the Scheldt at Ghent,) and is about nine or ten miles S. E. of St. Omer, with which it communicates by a canal. It is a neat town and well paved, but situated in a low marshy soil. It is adorned with fountains, which are so many natural jets; the water, on digging to the depth of 150 feet, rises rapidly to the surface. The chief trade of the town is in linens and fustians: it also makes tiles and soap. Aire is a fortified town of the third class, and of considerable importance for defence; its population is above 9000. Aire was the birthplace of Mallebranche. It is in 50° 38′ N. lat., 2° 23′ E. long.

There is another town of the same name in the department of Landes, on the River Adour; but it is now a place of small importance, with a population of above 4000. This place was once the residence of Alaric, king of the Goths; and is the ancient *Vicus Julii*, or *Atures*. It is in 43° 43′ N. lat., 14′ W. long.

AISLE, or **AILE**, (in Architecture,) indirectly from the Latin word *ala*, a wing, through the French *aile*, which has the same signification. In French, this term is applied to the outlying and returning ends of a building, which we distinguish by its English equivalent, *wing;* such are the columned ends of the front of the Post-Office, and the advanced flanks of the Pimlico palace in London. We apply the term aisle to the lateral divisions or passages of the interior of a church,—those parts which lie between the flank walls and the piers, pillars, or columns, which flank the nave, or grand central division,—when the structure is so arranged. Sometimes, but incorrectly, with reference to modern churches and chapels in this country, the mere passages or corridors which run between, and give access to the pews, are called aisles. Still more incorrectly, some writers, and even ecclesiastical writers, have called all the longitudinal divisions of the body of a church, aisles, thus including the nave under a designation which belongs only to its adjuncts and accessories.

The division of a church into what we term nave and aisles arose simply out of the difficulty which existed of spanning a great breadth with a roof without some intermediate support; and thus the greater Constantinian churches or basilicas of Rome were built with four rows of columns, forming five longitudinal divisions; that is, with two aisles on each side of the nave. This was imitated in subsequent structures, and the metropolitan churches of Milan and Paris were built in five divisions, or with four aisles, as they exist at the present time. That the custom of arranging the interiors of churches with aisles, continued long after the necessity for using the props which form them ceased, may be rendered clear by reference to the following fact. Most of our cathedrals and greater churches in this country are of later date than the roof of Westminster Hall, which, without intermediate support, spans a greater breadth than most of them can boast of; and yet they are, as a general rule, all divided into nave and aisles.

In some English books, though perhaps in none of the present century, this term will be found written without the a—*isle*.

AISNE, in France, one of the many streams whose waters ultimately swell the current of the Seine. It rises just to the west of a chain of hills which form the western boundary of the basin of the Meuse; and, after a course of above 150 miles, first to the north by west, and then to the west by south, joins the Oise, just above Compiègne. It flows past St. Menehould, Vouziers, Rethel, (just below which it becomes navigable,) and Soissons. The chief commodities floated down it are wood for fuel, and timber. It has been attempted, but in vain, to unite the Aisne to the Meuse by a canal. This river gives name to a department which lies between those of Ardennes and Marne on the east, and of Somme and Oise on the west; and is bounded on the south by that of Seine and Marne, and on the north (except where it touches the frontier) by that of Nord. It contains 2830 square miles, and had, in 1851, a population of about 558,989 persons. It sends four deputies, and is subdivided into five arrondissements. It includes portions of the ancient Picardy, Isle of France, and Champagne; and is traversed by the Oise in the north, the Aisne in the centre, and the Marne in the south. Various tributaries of these streams water it, and the Sambre, the Somme, and the Escaut (Schelde) also rise in this department. The surface generally consists of undulating plains; there are no hills more than 500 or 600 feet above the level of the sea. The most fertile parts are the high table lands. Chalk in the south, rock suitable for millstone, building stone, slates and turf, &c. are found in this department. The quantity of forest land is considerable, and the oil of the beech mast brings in, in some years, as much as 20,000*l.* The agricultural produce of the department is abundant. The inhabitants export two-thirds of their harvest; and more oxen, horses, and sheep, compared with the extent of the district, are reared than in most other departments. Excellent cheese is sent to different parts of France. The vine is not cultivated to any great extent.

Among the manufactures are that of glass at Nouvion-en-Thiérache, Folembray, and St. Gobain (the last of which places is known for its mirrors); cotton, at Guise on the Oise (population, 3300); and linens, cottons, shawls in imitation of Cachemire, soap, and vitriolic acid, at St. Quentin. The chief towns are Laon, capital of the department; St. Quentin, on the Somme; Soissons, on the Aisne; Château-Thierry, on the Marne (population, 5380); and Vervins, 20 miles N.E. of Laon (population, 2590). To these may be added La Ferté-Milon, the birthplace of Racine, on the Ourcq.

There are several canals, the most important of which is that of St. Quentin, connecting the Somme and the Escaut. A branch-railway from Creil to St. Quentin, connects the department with Paris.

AIX, a considerable town of France, in the department of the Bouches du Rhone, (mouths of the Rhone,) situated just to the north of the River Arc, in a plain surrounded with hills which produce good oil, wine, and fruit. The town owes its origin and its name to the Romans; for the Proconsul, C. Sextius Calvinus, having defeated the Salluvii, a Gallic tribe, founded a colony here about 120 B.C., and gave it, on account of its medicinal springs, the name of Aquæ Sextiæ (the waters of Sextius)—whence the name of Aix. These springs have been discovered in modern days, and identified by medals and inscriptions dug up: the water is clear, light, and moderately warm, without much taste or smell; and is now in small repute for its virtues. From altars of the god Priapus discovered near, it has been thought the Romans ascribed the efficacy of the springs to his influence. There are now few remains of antiquity at Aix. In the middle ages, this town was the residence of the Counts of Provence.

Aix is a handsome place; the streets are straight and well paved and lighted; and the public buildings handsome. It is surrounded by a wall, but is not fortified, and has eight gates. Among the public buildings may be mentioned the cathedral, a noble structure, which suffered less during the revolution than the other religious edifices, of which there were previously a great number. Among the chief ornaments of the cathedral are the baptistery constructed with the remains of a Roman temple;—and the gate of carved walnut tree, which is a curious specimen of the state of art at the commencement of the sixteenth century. The town-hall, though situated in a narrow street, is built with some taste; and contains a collection of articles of antiquity, and a library which is occasionally open to the public. The clock tower, near the fountain in the market-place, was erected in the middle ages, and is remarkable for machinery which puts in motion some figures when the clock strikes. The '*palais*,' an ancient building, contains several large halls, in one of which the parliaments of Provence formerly met. It occupies one side of the 'Place des Prêcheurs'—a square of 500 feet, planted with elms, and adorned with a jet d'eau in the centre. But the finest public place in the city is the 'Orbitelle,' a *cours* or promenade, planted with avenues of trees, and adorned with fountains.

Aix possessed, previous to the revolution, a university, founded in 1409 by Pope Alexander V.; and has now many institutions for the promotion of learning, which, with its valuable libraries and collections of the objects of art or science, public or private, render it an eligible place of study, and have obtained for it the title of the 'Athens' of the south of France. It possesses an academy and schools of theology and law. The public library, one of the richest in France, contains 100,000 volumes. Amongst the charitable institutions are three well-conducted hospitals, those of La Trinité, La Charite, and Hôtel Dieu—the last for lunatics. It is the seat of an archbishopric, of a cour d'appel, and of some other public boards. The procession of the Fête Dieu, one of the relics of the religious ceremonies of the middle ages, is still kept up; though the friends of religion did little service in reviving it after its abolition at the Revolution. It is a singular masquerade, in which the clergy and the municipal officers take part.

The population of Aix in 1851 was 24,255. The manufacture of cotton articles is carried on to some extent, though the activity in this is said to have declined. An important branch of industry is the rearing of silk-worms, and the manufacture of silk. The *sweet-oil of Aix* enjoys a European reputation; and the success with which the fruits and vegetables of Italy have been acclimatised, has become a source of riches to the inhabitants.

Aix is in 43° 32′ N. lat., and 5° 27′ E. long., of Greenwich. It is 478 miles S.S.E. of Paris, and 19 N. of Marseilles.

AIX, a small town of Savoy, with about 3000 inhabitants. It is a place of great antiquity, as is proved by the Roman remains that have been found there, but owes its present importance to two hot springs, which annually attract a great number of visitors. Their temperature is from 112° to 117° Fahrenheit. In the time of the Romans, it was called Aquæ Allobrogum, and Aquæ Gratianæ, or Domitianæ, and its inhabitants, according to an ancient inscription, were called Aquenses. The origin of the name is the Celtic term *Ac*, 'water,' which is the same word as the Latin Aquæ. The town stands in a pleasant and healthy valley, on the east side of the Lake Bourget, and at an elevation of 823 English feet above the level of the sea. It is seven miles N. by E. of Chambéry, the capital of Savoy, and was included in the French department of Mont Blanc in the year 1810.

AIX-LA-CHAPELLE, called by the Germans Aachen, is now the chief city of the district of Aix-la-Chapelle, one of the six divisions or governments of the Prussian Rhein-Provinz. It stands in 50° 47′ N. lat., 6° 3′ E. long., and 75 miles E. by S. from Brussels, the capital of Belgium. The situation of the city is agreeable: it stands on uneven ground, surrounded by hills of moderate elevation, generally covered with wood. The style of building is on the whole pretty good, and the ramparts, which serve as promenades, add to the convenience and beauty of the place. The town-hall, which stands in the market-place, is an old building in the Gothic style. It contains the Coronation-hall, 162 feet long, in which thirty-seven German emperors and eleven empresses were crowned. The walls have been decorated with fresco paintings of scenes from the life of Charlemagne. There are to be seen in the building the portraits of Napoleon and Josephine, by David, presented to the city by the Emperor himself; and those of the plenipotentiaries that attended the congresses held here in 1748 and 1818.

The 'Chapel' was in existence as early as the time of Pepin, in 765. It was rebuilt by Charlemagne about 796, and forms the nucleus of the present cathedral. It is in the form of an octagon, and in the Byzantine style. In the centre, a stone with the inscription 'Carolo Magno' marks where the emperor was buried. The tomb was opened by Otto III. in 1000; and again, in 1165. The marble chair, on which the body of the emperor was found seated, was afterwards used at the coronations. The imperial insignia were removed to Vienna in 1795. The remains of the great emperor are preserved in the sacristy of the cathedral. To the right of the town-hall, stands the Granus-tower, said to be a remnant of Roman times; and to the left, the Clock-tower. The new hospital, immediately outside the town, is also worth seeing.

Aix was once a great city. Charlemagne conferred extraordinary privileges upon its citizens: they were free from servitude and taxes all over the empire. The city possessed also the rights of asylum: 'The air of Aix made all free, even the banned.' In the middle ages it numbered 100,000. Though no longer what it was, it is still a considerable place; and being now a principal station of the Rhine-Belgian Railway, is rapidly rising into importance as a manufacturing town. The population is upwards of 47,000, and it is annually frequented by many thousand visitors. The principal articles of manufacture are cloth, and needles and pins. The blue cloths made here are said to be driving the English fabrics out of the American market. This branch of industry occupies 15,000 in the town and neighbourhood. The manufacture of needles has been in existence for 200 years; they are reputed equal to those of England.

The Latin name of Aix-la-Chapelle is said to be Aquisgranum; and the foundation of the first known town on this spot is most generally assigned to Severus Granius, a commander among the Belgæ, under Hadrian; he is supposed to have founded the town about A. D. 125. The remains found in modern times undoubtedly show that it was known to the Romans. Though the place had probably been at least the occasional residence of the Frank kings before the time of Charlemagne, the political importance of the city certainly does not date earlier than his time. Charlemagne is said to have resided there regularly after 768, whenever he was not engaged in war. He built a palace, on the ruins of which the present town-house stands, and several baths. In the market-place is a fine spring, and a gilded bronze statue of the great emperor, who did so much to beautify this place of his favourite residence. The fountain has a bronze basin, 24 feet in circumference.

In 882, the Normans ravaged the city. From 1794 to 1814, it belonged to France, during which time it was the capital of the department of the Roer.

Though reduced in rank from an imperial city, once the first in the empire, Aix-la-Chapelle still maintains some importance, and attracts many visitors to its mineral waters, which have given the place its name. The word *Chapelle*, signifying chapel or church, has reference, it is supposed, to the cathedral which Charlemagne commenced in 796. The hot springs have a temperature of about 143° Fahrenheit, and contain a large portion of sulphur: eight bathing-houses are provided for the accommodation of strangers. That called the Emperor's Spring is the strongest impregnated with sulphur, and most used by invalids. These waters, like others of the same kind, are both used for bathing in and are drunk by invalids. (See Mønheim, *Die Heilquellen von Aix-la-Chapelle, Burtscheid*, &c. Aix. 1829.)

About 500 paces east of Aix-la-Chapelle, on the slope of a steep hill, is the little town of Burtscheid, with about 5000 inhabitants. This has both hot and cold springs without any sulphur in them. Of the two hot springs, the principal has a temperature of 172° Fahr., being the highest in Germany. These springs send forth such a copious stream of water, that they form a considerable brook called the Warm Brook, which, with the addition of other streams, forms the Worm, a tributary to the Roer; the Roer flows into the Maas. In the neighbourhood, on an eminence, stand the ruins of the old castle of Frankenberg. This town manufactures and polishes needles, and also has fabrics of woollen cloth. See LOWER RHINE. [See Cannabich's *Geographie.* Ersch and Gruber. &c.]

Treaty of, 1668. A treaty was concluded at Aix-la-Chapelle between France and Spain, on the 2nd of May, 1668, by which an end was put to a war between those powers, arising out of the following circumstances:—On the death of Philip IV. of Spain, in 1665, Louis XIV. thought proper to make a claim to certain possessions of Spain, comprising the Spanish Netherlands (now Belgium) and Franche Comté, alleging the right of his wife Maria Theresa, notwithstanding her formal renunciation of all claim to those provinces on her marriage. To enforce his demand, he declared war in 1667, and by the spring of 1668 the whole of Franche Comté and much of the south and west of Belgium were in his power.

The preservation of the Spanish Netherlands was considered by Holland essential to her security as a barrier against France; and by her influence an alliance with England and Sweden was formed to induce the Spanish court to listen to terms of accommodation, rather than to provoke further aggression on the part of France. The two powers were soon brought to acquiesce, and Aix-la-Chapelle was the place of a congress, which ended in a treaty. France consented to restore to Spain the whole of Franche Comté, on condition of being allowed to retain her conquests in the Netherlands. A portion of these states, including the towns of Lille, Armentières, and Bergues, has ever since formed part of France; the other provinces were restored to Spain by the treaty of Nimeguen in 1678, when Franche Comté was given to France, in whose possession it still remains.

Treaty of 1748. A congress was opened at Aix-la-Chapelle in March, 1748, between France, England, Holland, Austria, Spain, Sardinia, and Modena, in order to adjust the political interests of those powers, which had suffered from a war arising out of the failure of the male branch of the house of Austria, by the death of Charles VI. in 1740. Five princes had started forth to dispute the succession with Maria Theresa, the daughter of the late emperor. France sided with the elector of Bavaria, the chief claimant, and England aided Maria Theresa.

In the course of the war, the Elector of Bavaria seized upon Upper Austria and Bohemia, and was crowned emperor in 1742, while, in the mean time, Maria Theresa gained possession of Bavaria, and soon after recovered Bohemia. The king of Prussia occupied Silesia, and compelled the queen formally to renounce all right to it. England fought with little success in Europe, but she gained the celebrated battle of Dettingen, and in America took Louisberg and Cape Breton. In India, she lost Madras which the French took. France had great success in the north, but was beaten out of Italy.

All parties at length wished for peace, and each sent a plenipotentiary to Aix-la-Chapelle to treat on the terms. It being found impracticable to accord so many divided interests, France, England, and Holland agreed to sign a separate treaty on the 18th October, and to gain subsequently the assent of the other powers; all of whom, except Spain, came successively into the terms of the treaty.

The provisions of several former treaties were confirmed, stipulating the balance of power in Europe, the independence of Switzerland, the free navigation of the Rhine, the security of the Protestant succession in England, and the disunion of the French and Spanish crowns. All the conquests made by the contracting powers were restored, and the state of affairs in the Indies was to remain as it was before the war.

The terms of this treaty produced much dissatisfaction both in France and England, and the vagueness of the last stipulation gave rise to the seven years' war, which began in 1755.

Congress of 1818.—The occupation of France by foreign troops had continued nearly three years, when the submission of the French to the new political arrangements seemed to warrant the allied sovereigns in delivering the nation from its burden before the expiration of the term of five years, originally provided by the treaty of 30 Nov. 1815. The emperors of Russia and Austria, and the king of Prussia, repaired to Aix-la-Chapelle in September 1818, and the plenipotentiaries of Great Britain and France were sent thither by their respective governments. The Conference was opened in September, and a treaty was signed on the 9th of October, by which it was stipulated that the foreign troops should evacuate France on or before the 30th November following.

In pursuance of this arrangement the cantonments in France broke up on the 17th November, and the territory was free before the end of the month. It was settled by the same treaty (Art. 4), that the sums remaining due by France to the allied powers, amounted to 265 millions of francs; of which 100,000,000 should be liquidated on the evacuation of the territory, and the remainder paid by nine monthly instalments, beginning with the 6th January, 1819.

AJACCIO, the chief town of the island of Corsica, and the capital of this department. It has about 11,046 inhabitants. It stands on the western coast of Corsica, on the northern side of the gulf of Ajaccio, and is surrounded by high mountains, which shelter it from the northern and easterly winds. The port is spacious and commodious. The town consists of two broad streets intersecting each other at right angles, and other inferior streets and lanes which are very narrow and dirty. Napoleon Bonaparte was born here the 15th of August, 1769. The register of his baptism is to be seen in the books of the parish. The house in which he was born is one of the best in the town, and forms one side of a little court branching out of the *rue Charles*; it is eagerly visited by all the strangers that land on the island. Ajaccio is a bishop's see, and has a cathedral. The climate of Ajaccio is extremely mild, owing to the situation of the place being open only to the west and south; there is no winter deserving the name, and the fall of a few flakes of snow is an extremely rare occurrence. The cactus, the myrtle, and the palm tree grow freely in the open country. The summer is very hot, hardly any rain falling for six months; and the climate is considered unhealthy from the beginning of July till the end of September. A fine and fertile plain called Campo di Loro extends from the recess of the gulf between two ranges of high mountains, of which Monte Rotondo and Monte dell' Oro are the highest summits. The former is 8764, and the latter 8698 feet high. Snow is to be seen on them even in summer. The trade of Ajaccio is in oil and wine; and it also carries on a coral fishery about the straits of Bonifacio, and on the north coast of Africa. Ajaccio contains a college, a library of about 14,000 volumes, a botanical garden, and an agricultural society. Ajaccio is sixty miles S.W. of Bastia, 8° 44′ E. long. 41° 55′ N. lat.

AJAN, the name by which an almost unknown tract of the coast of east Africa is designated. It extends from near Magadozo, which is included within the limits of Zanguebar, northwards to Cape Guardafui, a distance roughly estimated at about ten degrees of the equator. But the extent of the coast of Ajan cannot be accurately determined, as the name itself is very indefinite. The southern coast is sandy, barren, and low; but the northern is higher about Cape Delaqua and Cape d'Orfui. Between these two capes there is a deep bay. D'Orfui has 'a bluff point towards the sea, and is backed by lofty and singular-shaped mountains' (Salt). It is in N. lat. 10° 30′, E. long. 51° 12′. Cape Guardafui, the most eastern part of Africa, is also a bold promontory with high mountains in the background; it is in N. lat. 11° 50′, E. long. 51° 22′. No great river is described as entering the sea on the coast of Ajan. The neighbourhood of d'Orfui is inhabited by a tribe of Somaulis. (See Salt's Abyssinia.)

The name Azania occurs in the *Periplus*, and comprehends not only the modern Ajan, but the coast of Zanguebar as far as Quiloa; provided this place be the Rhapta of the Periplus.

Rhapta is the most southern point described on this coast by the author of the *Periplus*, but Ptolemy mentions the promontory of Prasum as lying still farther south than Rhapta. The *Periplus* was certainly not written later than the middle of the second century, and at this period we find the Arabs carrying on a brisk trade with the natives of Azania, and intermarrying with them. This coast was at that time almost entirely under Arab influence; Rhapta traded with Muza (near the present Mocha), and sent ivory, rhinoceros horns, tortoise shell, &c. (See Vincent's *Periplus of the Erythrean Sea;* and the *Periplus*, Hudson's *Min. Geog.* vol. i.)

AJAX. Son of Telamon, and third in direct male descent from Jupiter, was one of the most renowned heroes of the Trojan war. According to Homer and Pindar, he was next in warlike prowess to Achilles. He is said by later poets to have been invulnerable: but as in the case of Achilles, this story is not found in Homer. It is fully told by Pindar, Isth. 6. Hercules going to Ægina to invite Telamon to join him in besieging Troy, found the hero at table. Being offered a cup of wine, to make a libation, he prayed to Jupiter that Telamon, who was then childless, might be gifted with a son, whose body should be as invulnerable as the skin of the Nemean lion, and whose spirit should be of corresponding temper and fortitude. An eagle appeared on the instant, which he accepted as a sign that the prayer was heard, and directed that the child should be named Aias, (the Greek form of the name Ajax), from *Aietos*, the Greek name of an eagle. Returning to Ægina after the birth of the child, Hercules made him invulnerable by wrapping him in the lion's skin, which he always wore. One place, however, (as in the case of Achilles,) remained unprotected, where there was a hole in the skin, through which Hercules slung his quiver. Telamon, being banished from Ægina by his father Æacus, for killing his brother Phocus, retired to the island of Salamis, and was chosen king. During his father's life, Ajax led the forces of Salamis to Troy, in conjunction with the Athenians: unless we admit the story that Pisistratus, in order to strengthen the claims of Athens to the possession of the island, interpolated the line of the second book of the Iliad, (558,) which says that Ajax placed his ships alongside of the Athenians. Of the adventures of Ajax before the Trojan war we can give no account. His chief exploits, recorded in the Iliad, are his duel with Hector, in the 7th book, when the Trojan prince challenged any of the Greek army to single combat; and his obstinate defence of the ships, in the protracted battle described in the 13th, 14th, 15th, 16th, and 17th books. In the funeral games of Patroclus he contended for three prizes; in wrestling with Ulysses, single combat with Diomedes, and throwing the quoit; but without obtaining the prize in any. Blunt in manners, rugged in temper, and somewhat obtuse in intellect, his strength and stubborn courage made him a most valuable soldier, but no favourite; and his confidence in these qualities induced him to despise divine aid, by which he roused the anger of Pallas, the author of his subsequent misfortunes. After Achilles's death, the armour of that hero was to be given as a prize to him who had deserved best of the Greeks. Ajax and Ulysses alone advanced their claims; the former depending on his pre-eminence in arms, the latter, on the services which his inventive genius had rendered: the assembled princes awarded the splendid prize to Ulysses. Ajax was so much mortified at this, that he went mad, and in his fury attacked the herds and flocks of the camp, mistaking them for the Grecian leaders, by whom he thought himself so deeply injured. On recovering his senses, and seeing to what excesses he had been transported, he slew himself; and it was observed by Grecian superstition, that the gifts which Hector and Ajax interchanged after their duel proved fatal to both. Hector gave Ajax a sword, which was the instrument of his death: Ajax gave Hector an embroidered belt, the same with which Achilles bound him to his chariot. The hyacinth is said to have sprung from his blood, as before from that of Hyacinthus: and in the spots which ornament it, fancy traced the letters Ai, Ai, which signify Alas, Alas; and at the same time compose part of the Greek form of Aias. This catastrophe is the subject of that noble tragedy of Sophocles, Ajax the Scourge-bearer, so named because the hero is described as cruelly scourging a ram, which he mistakes for Ulysses, before putting him to death. The rivalry of the chiefs is related at length in the 14th book of Ovid's Metamorphoses. Allusion is also made to it in the xith Odyssey. The circumstances of his death are differently told by other authors; but it is not necessary here to do more than notice the discrepancy, very common in these semi-historical tales. The Greeks honoured him with a splendid funeral, and raised a vast tumulus on the promontory of Rhæteum, corresponding in position with that of Achilles, on the opposite promontory of Sigeum. He left a son named Eurysaces, who succeeded Telamon on the throne of Salamis. It is said that Philæus, son of Eurysaces, resigned the sovereignty to Athens, on condition that he might be admitted as a citizen of that state. Through him, Miltiades was descended from Ajax. The Æacidæ, or descendants of Æacus, were held in high reverence as demigods in Attica. One of the tribes was named Aiantis, after Ajax; who, in conjunction with Telamon, and other heroes of the race, was solemnly invoked to the assistance of the Athenians, before the battle of Salamis; and they were believed to have obeyed the call. See *Herod.* viii. 64, 65.

AJAX. Son of Oileus, another distinguished leader in the Trojan war, remarkable for swiftness of foot, and skill in using the bow and javelin. He fills a less important part in the Iliad than his namesake, though he is distinguished by his defence of the ships in company with Ajax, son of Telamon. His notoriety is chiefly derived from events subsequent to the close of the Iliad. At the sack of Troy he offered violence to Cassandra in the temple of Pallas. Indignant at the profanation, the goddess raised a tempest, which wrecked his vessel on its voyage home, and many others of the Grecian fleet. Ajax escaped to a rock, and might have been preserved, but that he blasphemously defied the gods, and said he would escape in spite of them: whereupon Neptune cleft the rock with his trident, and tumbled him into the sea, where he perished. (Od. iv. 502.) Virgil relates his death differently, Æn. i. 39. Some authors say that the charge of violating Cassandra was a fiction of Agamemnon's, who wished to secure her for himself.

AJEMEER, or AJMEER. [See RAJPOOTANAH.]

AKBAR (i. e. *the Great*), the son of the Mogol Emperor Humayun, was born on the 14th of October, 1542, at Amerkote, in the great sandy desert east of the Indus; and, on the death of his father, succeeded him in the government of Delhi, in the fourteenth year of his age, (Feb 15th, 1556). Feeling diffident on account of his youth and inexperience, he conferred the temporary dignity of *khan* *baba* (*i. e.* regent and parent, or protector) on Beiram Khan, a Turkoman, and one of the most distinguished officers of the Mogol court, who had already rendered important services to Humayun against the Afghans. The aid of an experienced minister and military commander was of particular importance for the youthful sovereign, as the empire, about the beginning of his reign, was much disturbed, partly by revolts in the interior, and partly by a long continued contest with an Afghan pretender to the throne, Mohammed Shah Adily. The general of the latter, Hemoo, a Hindu by birth, had taken Agra, and had now actually seated himself on the throne of Delhi, with an army of 100,000 horse around him. So doubtful were the Mogol nobles, in Akbar's army, of the possibility of subduing Hemoo, that they even proposed to quit India entirely, and to remove the seat of government to Kabul. This measure was, however, rejected by Beiram Khan, who insisted on an immediate attack upon Hemoo. The result was, that Hemoo was defeated in a decisive battle near Paniput, (Nov. 5, 1556,) in consequence of which Akbar and Beiram Khan entered Delhi without opposition. The Mogol dynasty was thus re-established mainly through Beiram Khan's courage and presence of mind: but several arbitrary measures pursued by Beiram Khan excited the jealousy of Akbar, and he removed him from office. Beiram Khan quitted the court, and made a revolt in Malwa. Akbar sent an army under Pir Mohammed Khan against him, before whom Beiram Khan retreated to the Panjab, and afterwards into the mountains of Sewalik; where he was at last obliged to surrender, (December, 1560.) Akbar pardoned him, and even assigned him a sum of 50,000 rupees (5000*l.*) annually for his support. Beiram Khan was proceeding on a pilgrimage to Mecca, when he was murdered near Puttun in Guzerat, (January, 1561.)

In 1561, Akbar accomplished, through his general Pir Mohammed Khan, the recovery of Malwa from the hands of its usurper Baz Bahadur. Soon afterwards, Shir Khan, a son of Mohammed Shah Adily, advanced from Bengal with an army of 40,000 Afghans to support his title to the throne of Delhi, but was defeated by a comparatively small army of the Mogols.

In 1564, Akbar had again to quell a rebellion in the interior of his empire, which had been excited in Behar and Jooanpur by the Usbek chiefs, Assuf Khan Herwi, Khan Zeman, and Sekander Khan. Shortly afterwards (1566), Akbar was obliged to proceed with an army to the Panjab, where his own brother, Mohammed Hakim Mirza, had usurped the government; and another disturbance was, at the same time, excited in Guzerat by the sons of Mohammed Sultan Mirza. The Usbeks were vanquished after a desperate conflict (June 6, 1566): Khan Zeman, and many other chiefs, suffered death; and it was not till July, 1567, that the Mogul army returned to Agra. In 1572, Akbar invaded the province of Guzerat, where he met with vigorous opposition from the sons of Mohammed Sultan Mirza, but eventually succeeded in expelling them; and he prevailed on the king of Guzerat, Mozaffir Shah, to reside as a pensioner at Agra. In 1575, Dawud Khan, the ruler of Bengal, excited a war in that direction: he was subdued by Akbar's generals, Raja Todar Mal and Monayyim Khan, and the kingdom of Behar and Bengal became finally annexed to Delhi.

In 1579, Akbar's brother, Mohammed Hakim Mirza, occupied the Panjab a second time; but he was defeated by an army sent by Akbar, and reduced to submission. He died in 1583. In the same year, Akbar caused the fort of Allahabad to be built at the confluence of the Ganges and Jumna. About the same time, Mozaffir Khan fled from Agra to Guzerat, in order to make an attempt to regain his dominion. But he was beaten in a sanguinary battle, near Ahmedabad (Jan. 29, 1584), by Mirza Khan, the son of Beiram Khan, and also failed in several successive attempts undertaken for the same purpose. In 1585, Akbar's presence was required in the Punjab, where the Afghans had cut off all communication between Kabul and India. He appointed Kuwar Khan Singh as governor of Kabul, while he himself held his court at Lahore, in order to restrain the Afghans and the Usbeks, who still fomented disturbances in the northern provinces. In 1590, Akbar's son, Mirza Khan, invaded and conquered Sind. Soon after, Mozaffir Shah, the king of Guzerat, was defeated and taken prisoner; and Murad Mirza went as governor to Guzerat, whence he subsequently proceeded to the Deckan.

In 1595, civil disturbances broke out in Ahmednagar, or Ahmednuggur, in consequence of which the interference of Akbar was requested. His son, Murad Mirza, besieged Ahmednagar; and a negotiation, which was ultimately entered into, secured to Akbar the possession of Berar, while Ahmednagar remained in the hands of its former sovereign, Burhan Nizam Shah the Second. Murad Mirza died in 1599; and some years afterwards, also, another of Akbar's sons, Daniel Mirza. Grief for the loss of the latter accelerated Akbar's own death, which occurred on the 13th of Oct. 1605.

The above sketch of the reign of Akbar is abridged from the account given by Ferishta, (Briggs' *Translation*, vol. ii. p. 182—282,) who quotes as his authority a detailed *Memoir of Akbar's Life and Government*, written by his minister Abul Fazl. Notwithstanding his being almost continually occupied with enemies abroad, and revolutionary movements at home, Akbar found time to cultivate the arts of peace, and devoted his attention, with the utmost anxiety, to whatever appeared calculated to promote the happiness of his empire. The mildness of his character, his strict impartiality to the different classes of his subjects, the magnanimity which he showed to his enemies, and his great personal courage, are mentioned with praise even by the Jesuits who visited India during his reign; and the memory of his many amiable virtues still survives among the Hindu as well as the Mohammedan population of India. He encouraged trade and commerce, reduced taxation, and kept a strict watch over the conduct of the officers of his government. But what still more distinguished him was his spirit of toleration, a virtue seldom possessed by Mohammedan sovereigns, which led him to show the same benevolent attention to the interests of all his subjects, whether they professed his own or the Hindu religion. In his endeavours to advance the prosperity of his empire, Akbar was powerfully assisted by his celebrated vizir Abul Fazl, [see ABUL FAZL,] who, besides the memoir of Akbar's reign already referred to, wrote an excellent statistical and political account of the state of the Mogol empire during his administration. This, which is one of the most remarkable works in Oriental literature relative to India, will be noticed in a separate article. [See AYIN-I-AKBARI.]

AKENSIDE, (MARK,) a poet of considerable reputation in the last century. He was the son of a butcher at Newcastle-upon-Tyne, and born November 9, 1721. His parents were Presbyterians, and intended to bring him up as a minister of that persuasion. With this view they sent him, in 1739, to the University of Edinburgh: but he soon turned his attention to the study of medicine, and after remaining three years in the Scottish capital, went to Leyden; where he finished his education, and took the degree of M.D. in 1744. It should be mentioned to his honour, that having been assisted, while he was destined for the ministry, from certain funds set apart by the English dissenters for the education of their clergy, he repaid in after-life the money which had been thus bestowed upon him. His principal poetical work, the only one by which he is now much known, the *Pleasures of Imagination*, appeared in 1744. It excited considerable attention, and on the whole was received with great applause. The first place in which he settled, after his return to England, was Northampton; but he found no encouragement to remain there, and soon removed to Hampstead, and thence finally to London. Here he acquired several professional honours, but he never obtained any large share of practice. He received the degree of M.D. by royal mandate, from the University of Cambridge, and thus became qualified to be a fellow of the College of Physicians: he was also elected one of the physicians of St. Thomas's Hospital. He died June 23, 1770, aged forty-nine. His principal medical work is a treatise *On Dysentery*, 1764: he also contributed several papers to the *Philosophical Transactions*, and to the *Medical Transactions*, published by the College of Physicians.

The 'Pleasures of Imagination' is written in blank verse, with much power of versification and splendour of language. The subject and design of it cannot be more briefly given than in the author's language: it is to give a view of the various pleasures founded on the exercise of the imaginative powers, 'so that, whatever our imagination feels from the agreeable appearances of nature, and all the various attainments we meet with, either in poetry, painting, music, or any of the elegant arts, might be deducible from one or other of those principles in the constitution of the human mind, which are here established and explained.' As a philosophical work, the reader is not likely to derive much benefit from it; but its poetical merits are considerable. Dr. Akenside pro posed entirely to rewrite the poem; but death interrupted him when he had only completed the first and second books, with portions of the third and fourth. Both the original and the amended poem are contained in the quarto edition of Akenside's *Poems*, 1772, published by his friend Mr. Dyson. For a fuller account of it, the reader may consult an Essay by Mrs. Barbauld, prefixed to the duodecimo edition of 1795, in which his genius is characterised as lofty and elegant, chaste, classical, and correct, not marked with strong traits of originality, not ardent, nor exuberant.

Of his other poetical works, the principal are the *Hymn to the Naiads*, and two books of *Odes*. Many of these are written on political subjects, in which he took a great interest, and are distinguished by zeal in the cause of liberty. In consequence, he was accused of republicanism, a charge which has often been employed as a topic of abuse, and that with very considerable success. Akenside was well read in the literature and especially in the philosophy of Greece; and he has employed images, drawn from this source, with an unsparing, and rather a pedantic hand. [Kippis's *Biog. Britan.* Barbauld's *Essay.*]

AKERBLAD, (JOHN DAVID,) a late Swedish scholar, who distinguished himself by his researches in Runic, Phœnician, Coptic, and Hieroglyphic literature. He enjoyed in early life an opportunity of travelling over several countries in the East in consequence of being appointed Secretary to the Swedish embassy at Constantinople. While holding this appointment, he made a journey to Jerusalem, in 1792. In 1797 he visited the Troad. Some years after he was appointed Chargé d'Affaires to the King of Sweden in France. He spent his last days in Rome, where he was supported by the bounty of the late Duchess of Devonshire, and other admirers of his talents; he died in that city at an early age, on the 8th of February, 1819. The following are the titles of some of his publications: *Lettre à M. Silvestre de Sacy sur l'Ecriture cursive Copte*, published in the *Magasin Encyclopédique* for 1801. *Inscriptionis Phœniciæ Oxoniensis, nova Interpretatio*, Paris, 1802; thirty-one pages, octavo. *Lettre sur l'Inscription Egyptienne de Rosette, adressée à M. Silvestre de Sacy*, Paris, 1802; seventy pages, octavo. *Notices sur Deux Inscriptions en Caractères Runiques, trouvées à Venise, et sur les Varanges; avec les Remarques de M. d'Ansse de Villoison*, Paris, 1804; fifty-five pages, octavo. *Inscrizione Greca sopra una lamina di Piombo trovato in uno Sepolcro nelle vicinanze d'Atene*, quarto, Roma, 1813. He was preparing a new and enlarged edition of this work at the time of his death. *Lettre sur une Inscription Phénicienne trouvée à Athènes*, Rome, 1817; twenty-three pages, quarto. M. Akerblad is said to have been able to speak as well as read various eastern and European languages. He was a corresponding member of the French National Institute, and a member of several other learned societies.

AKERMANN, AC-KERMAN, or AKEIRMAN, a fortified town in the Russian province of Bessarabia, near the outlet of the Dniester into the Black Sea: 46° 12′ N. lat., and about 30° 22′ E. long.

The town stands on a point of land which projects into the *liman* or gulf of the Dniester, and is defended on the land side by deep ditches, and in the parts bordering on the gulf by a thick wall. The town and port, which is a good one, are commanded by a castle on an eminence. The population, about 26,000, including the suburbs, consists chiefly of Greeks, Armenians, and Jews, who carry on some trade. Fish, which is caught in abundance in the gulf of the Dniester, and salt from the salt lakes of the district of Akermann, form the principal articles of commerce. A short time ago, a fair was established here. Akermann contains a handsome Armenian church, with some mosques and Greek churches. The streets are dirty and the town ill-built.

Treaty of, is the convention concluded in September, 1826, between Russia and Turkey. By this treaty, the terms of which may be considered as having been dictated by Russia, Turkey agreed to confirm in all its parts the treaty of Bucharest, (concluded in 1812,) to permit the two principalities of Wallachia and Moldavia to be governed by native boyars, elected by the divan of each, to restore the former privileges of the Servians, and finally, to pay the claims of Russia on account of losses incurred by the Barbary corsairs, and to allow that power the liberty of navigation and commerce in all the states of the Sublime Porte, and especially free passage of the Straits of Constantinople. By these conditions the important provinces of Moldavia Wallachia, and Servia, may be regarded as having been released from all but a nominal dependence on the Porte, and made over to the protection, if not to the sovereignty, of Russia.

ALABA'MA, one of the southern states of the North American Union, bounded on the north by Tennessee, on the east by Georgia, on the south by part of the territory of Florida and the Gulf of Mexico, and on the west by the state of Mississippi. It derives its name from one of the rivers called ALABAMA. It lies between 30° 10′ and 35° N. lat., and between 85° and 88° 30′ W. long. Its extreme length from north to south is about 330 miles, and its greatest breadth from east to west 300 miles. The area included between these limits is 50,722 square miles, or 32,462,080 acres, of which 4,435,614 were improved in 1850. Alabama originally belonged to the state of Georgia. In 1798, the country, including the present states of Mississippi and Alabama, was formed into a *territory;* and the part of Florida between Pearl and Perdido rivers being taken possession of by the United States in 1812, and annexed to this territory, immigration into it immediately commenced. During the years 1813 and 1814 it was harassed by the attacks of the Indians, who were reduced to submission by General Jackson. In 1817, the west portion of the territory became the 'state of Mississippi,' and the east the 'territory of Alabama'—which, by an act of Congress, March 3, 1819, was admitted into the Union as a separate state. Since that time the population has rapidly increased, as is shown by the following statement:—

In 1810, the entire population was under 10,000.
″ 1816, it was 29,683.
″ 1820, ″ 127,901, including 41,879 slaves.
″ 1830, ″ 308,997, ″ 117,294 ″
″ 1840, ″ 590,756, ″ 253,532 ″
″ 1850, ″ 771,671, ″ 342,890 ″

The federal representative population in 1850 was 634,514, which number includes three-fifths of the blacks. The rate of representation, which is continually changing, was in the above year one member for about 90,000; which gives seven representatives for Alabama. (When the surplus population is *more than half* the number required to send one, an *additional* member is returned.) Alabama, like each of the other United States, returns two members to the Senate.

Surface and Coast-line.—The sea-coast of Alabama is very limited when compared with the extent of the state. It commences on the Gulf of Mexico, at a point about midway between the mouths of the rivers Pascagoula and Mobile, and running eastward, terminates at the outlet of the Perdido. The real coast-line, not including the shores of the Bay of Mobile, is about 50 miles in length.

The general direction of the great rivers of Alabama is from north to south, which indicates a gradual rise of the country from the sea-coast towards the north. The southern portion of the state, bordering on the Gulf of Mexico, is low and level throughout a space of 50 or 60 miles. From thence the ground rises gradually into the interior, and begins to be hilly about 33° N. lat. The greatest elevation lies still further north, and is formed by the termination of the Alleghany Mountains. This range, terminating in the north-east of the state, sends off a branch traversing it from east to west, and bending a little to the south, which forms the water-shed between the Tennessee and the remaining rivers, which, as we have already stated, all flow south to the Gulf of Mexico. The range of mountains which traverses the northern part of Alabama is of no great elevation—in fact, it consists rather of high hills than of mountains.

Rivers.—The principal rivers of this state are the Mobile, the Alabama, the Tombigbee, the Tuscaloosa or Black Warrior, the Coosa, the Tallapoosa, the Tennessee, the Chattahoochee, the Perdido, the Cahawba, and the Conecuh.

The Mobile unites and conveys to the sea the collected waters of the rivers flowing from the northern and western portions of the state. It is immediately formed by the union of the two rivers Alabama and Tombigbee, at the southern extremity of Clark county. After a course of six miles, it divides into two channels, of which the western and largest retains the name of Mobile, and the eastern is called the Tensaw. The Mobile flows southward, passes the town of the same name, and enters the spacious Bay of Mobile, after a course of 50 miles. The bay is about 35 miles long, and varies from 3 to 15 in breadth. It communicates with the Gulf of Mexico by two channels, separated by Dauphin Island. The eastern or main channel has about 18 feet of water. The river Mobile is navigable by large steam-boats.

The Tombigbee rises in the north-east angle of the state of Mississippi, in the county of Tishemingo, and after a southern course of 100 miles, enters the state of Alabama 5 miles below Columbus, a town in Mississippi, where it becomes navigable. After entering Alabama, it flows in a S.S.E. direction until it is joined by the Tuscaloosa or Black Warrior—a river nearly as large as it—at Demopolis. The Tuscaloosa rises in the north-east corner of Alabama, and is formed by the Mulberry fork and the Locust fork, which unite near the southern extremity of Walker county. The river after the junction of these streams flows S.W., passing Tuscaloosa, the former capital of the county, and Eutaw, to its junction with Tombigbee. From the point of confluence with the Black Warrior, the Tombigbee flows southward, passing through fertile alluvial plains and savannas, which are mostly occupied by cotton plantations, and unites with the Alabama about 50 miles above Mobile Bay. The Tombigbee is about 450 miles in length, and is navigable for large steam-boats to Columbus, which is about 360 miles from the mouth of the Mobile; whilst smaller boats ascend 50 miles further to Aberdeen. The Black Warrior is navigable 150 miles above Demopolis, which is nearly the whole extent of the main stream. Large steam-boats ascend from Mobile to Tuscaloosa, a distance of 300 miles.

The Alabama is formed by the Coosa and the Tallapoosa. The Coosa is formed by the confluence of the Etowah and the Oostenaula, which unite at Rome, in Georgia; it flows S. by S.W. for a distance of 350 miles. The Tallapoosa rises in Paulding county, Georgia, and has a very tortuous course of 250 miles, in a south-westerly direction. The two rivers unite 10 miles north from Montgomery, the capital of the state. The Alabama flows in a general western direction past Montgomery, and as far as Cahawba, where the river of the same name falls into it, which rises in the east border of Jefferson county, and flows S.S.W., through the principal coal-field of the state. The Alabama is about 300 miles long. Large boats can ascend to Wetumpka, which is 460 miles above Mobile. Between Rome and the Ten Islands—a distance of 180 miles—small steam-boats can navigate the Coosa; but the navigation is interrupted between the Ten Islands and Wetumpka by numerous shoals.

The Alabama, like most of the American rivers, differs very considerably in its volume of water at different seasons, but it is navigable throughout the year. The navigation is not obstructed by ice, as in the northern rivers; nor by snags, as in many of the rivers in the south. The river flows through a region occupied by plantations of cotton, extensive savannas, and forests of valuable timber.

The rivers of Alabama are highest in the spring of the year, and it is not uncommon for them to rise eighty or ninety feet above low-water. The banks, when they present a recent surface, exhibit a beautiful appearance, striped with alternate layers of gravel and different coloured clays. The clays commence about 20 feet above low-water. The layers are of different thickness, from one inch to several feet, and of various colours, from red and deep blue to a delicate white. Steam-boats were first introduced on these rivers in 1820.

The Chattahoochee rises in the northern part of Georgia, and is part of the boundary-line between Alabama and Georgia. It forms with Flint River the Apalachicola, and is navigable for steam-boats to the Falls of Columbus, above 350 miles. The Perdido separates Alabama from Florida.

The Tennessee runs through the northern part of this state. It enters Alabama on the east, running S.W.; it then runs W.N.W., and again enters the state of Tennessee. It flows into the Ohio, in Kentucky. The part of the state north of the river is called Tennessee Valley. This river is navigable for large steam-boats 280 miles, to Florence, in Alabama, which is below the Mussel Shoals, where the river spreads out from one to three miles in width, with a rocky bottom, and is so shallow, that boats can neither ascend nor descend except at highwater during floods. About the year 1840, a canal 12 miles long was constructed around the shoals on the north side of the river, but the locks were made too short to admit even the smallest steam-boats that navigate the river. It was therefore abandoned, and the channel has been filling up ever since. Steam-boats may ascend the Tennessee and Holston to Knoxville, in the state of Tennessee, 500 miles above the shoals.

Pensacola Bay is entirely within the limits of West Florida; but as this territory here only consists of a comparatively narrow slip along the gulf, the sources and the main body of the streams that enter Pensacola Bay are within the state of Alabama. The main stream that discharges into Escambia Bay (one of the upper bays of Pensacola Bay) is the Escambia; but the chief branch of this river is the Conecuh, though the name of the Escambia prevails in the lowest part of their united course.

The alligator abounds in the Alabama and Tombigbee rivers.

Soil, Products, &c.—Besides the Alleghany or Appalachian range, there are no other eminences which can be dignified with the name of mountains. In the northern part, the country is hilly, with elevations of 300 or 400 feet above the valleys; in the middle, it is also hilly, with some tracts of open land or prairies. The south part, which borders on the Gulf of Mexico, throughout a space of 50 or 60 miles in extent, is low and level, covered with pine and cypress. The coast of Alabama appears at present to be receiving no increase, but, on the contrary, some diminution from the action of the waves. The forest trees in the middle and northern divisions are post, black, and white oak, hickory, poplar, cedar, chestnut, pine, mulberry, &c.; the elm flourishes on the river-banks. The chief wild animals are the deer, bear, wolf, panther, fox, &c.; the rattlesnake abounds in this state. The soil is various, but the greater part of it is excellent. 'In the south, it is generally sandy and barren; and a part of the high lands are unfit for cultivation. A large portion of the country which lies between the Alabama and Tombigbee, of that part watered by the Coosa and Tallapoosa, and of that on the Tennessee, consists of very excellent land. On the margin of the rivers (in the southern part) there is a quantity of cane-bottom land of great fertility, generally from one-half to three-quarters of a mile wide; on the outside of this is a space which is low, wet, and intersected by stagnant water; next to this river-swamp, and elevated ten or fifteen feet above it, succeeds an extensive body of level land, of a black rich soil, with a growth of hickory, black oak, post oak, poplar, dogwood, &c. After this come the prairies, which are wide-spreading plains, or gently waving land (resting on a soft limestone rock, abounding in shells), clothed with grass, herbage, and flowers, and exhibiting in the month of May the most enchanting scenery.'—(*Encyclop. American.*) There is generally wood enough on the prairies to fence them. It is arranged in lines and clumps on the lower and moister portions, dividing them into open spaces of several hundred acres. The soil is of variable depth, and rests on a uniform bed of limestone. In some places the rock juts out on the surface, where it easily decomposes. There is a great deficiency of water, and what there is of it is very bad: good water can be obtained by boring to the depth of 300 or 400 feet, and in many cases this water rises to the surface. The long-moss region commences below 33° N. lat. The moss hangs in festoons from the trees, giving to the forests the most dark and gloomy aspect. It is much used for making mattresses.

Cotton is the great staple product, of which Alabama raises more than any other member of the Union. The land produces from 400 to 1800 pounds of seed-cotton to the acre. In 1850, the cotton crop was 225,771,600 pounds, nearly double the produce for 1840; the greater part of it is carried to Mobile—that from the Tennessee Valley only being taken to New Orleans. The land is tilled almost entirely by slaves. Besides cotton, Alabama produces large quantities of Indian corn, oats, livestock, sweet potatoes, and butter; a considerable amount of wheat, rye, rice, wool, hay, pease, beans, Irish potatoes, fruits, market vegetables, and sugar; also some tobacco, barley, buckwheat, wine, cheese, grass-seeds, hops, flax, and silk. According to the census of 1850, the corn produce was 294,064 bushels of wheat; 28,754,048 bushels of Indian corn; 2,965,697 of oats. There were also 8,242,000 pounds of sugar, and 83,428 gallons of molasses, produced in the same year. The exports of Alabama in 1851 amounted to 18,528,824 dollars; imports, to 413,446 dollars. Little attention has as yet been paid to manufactures in Alabama; the articles manufactured are for the most part those of ordinary necessity. Cotton manufactories are multiplying. The number of vessels built in the year 1851 was five, which were small, being only 355 tons burden. The tonnage owned amounted to 21,327

Alabama is rich in mineral treasures, particularly in coal, iron, lime, and marble. Iron ore is found in several places, and fossil coal abounds on the Black Warrior River; beautifully variegated marble is found in abundance on the Cahawba, and in other places. Gold also has been found, but not in sufficient quantities to render the business profitable.

Climate.—The mean temperature of the state is about 60° F. Although the summer continues longer, yet the heat is very little greater than in the north part of the United States. In the years 1850-51, the maximum temperature of the summer months at Eutaw was 104°; minimum, 60°: for winter, they were 82° and 18°. June is the hottest month in the year. The fig and peach arrive at great perfection below 34° N. lat., and the climate and soil are well adapted to the grape. The fruit-trees blossom between the middle of January and 1st of March, according to the elevation of the place. Snow neither falls deep nor lies long; a thin sheet of ice sometimes covers the stagnant waters at the coldest period; the rivers are very seldom frozen over. The climate is healthy, except in the bottom land bordering on the rivers. In the elevated country it is delightful, the heat of summer being tempered by the breezes from the Gulf of Mexico. The prevailing diseases in low situations are intermittent and bilious fevers. Mobile has been several times ravaged by the yellow fever, but it has not been severe of late years.

Indians.—The *Cherokees* formerly occupied the north-east corner of the state, and extended into Georgia and Tennessee; the *Creeks*, the east, with part of Georgia; and the *Chickasaws* and *Choctaws*, the west, extending into Mississippi. These tribes have all emigrated to the west of the Mississippi, where a large tract of country has been ceded to them by the United States in exchange for their own. The Cherokees have been considered the most civilised of all the American Indians. They have a written and printed language, the alphabet of which was invented by a native Cherokee; it consists of eighty-five characters, and may be called a *syllabic alphabet*. It is said that an active Cherokee boy may learn to read in a day, and not more than two or three days are ordinarily requisite: he has only to repeat successively the names of the several letters, so that when he has learned his alphabet, he can read his language. There are remains of mounds and roads in the state, respecting which the present Indians have no traditions.

Counties and Towns.—There are in Alabama 52 counties. The towns of principal importance are Mobile, Montgomery, Huntsville, Tuscaloosa, Florence, and Wetumpka. Mobile, the commercial metropolis of the state and capital of Mobile county, is situated on the right bank of the Mobile River, immediately above its entrance into the bay of that name, 1033 miles from Washington, 165 miles N.E. from New Orleans, and 330 miles by water S.W. from Montgomery. N. lat. 30° 41′ 48″; W. long. 87° 59′. In 1813, Mobile came into the possession of the United States, when it contained only 300 inhabitants; in 1840, the population was 12,672; and in 1850, 20,515. It is situated on a level sandy plain, about 15 feet above the level of the bay. The streets are wide, and much attention has recently been paid to planting shade trees. On the south and west sides of the town there are dry sandy pine hills, which afford agreeable and healthy retreats during the hot season. Mobile is the seat of Spring Hill College, founded by the Catholics, which has a library of 7000 volumes. The back country is dependent on Mobile for a market. Its principal export is cotton; next to New Orleans, it has the greatest cotton-market in the United States. The exports of cotton for the year ending 1st September 1852, amounted to 549,499 bales. Great quantities of lumber are also shipped from Mobile: in 1851, 6,816,054 feet of lumber were exported.

There is daily steam-communication with New Orleans, *via* lakes Borgne and Pontchartrain. A railway of 450 miles is in course of construction from Mobile to the mouth of the Ohio, connecting with the central railway of Illinois, and intended to form part of the direct route from the Gulf of Mexico to the great lakes. There is another railway in progress to connect Mobile with Columbus, in Georgia.

Montgomery, the capital of the state and seat of justice of the county of the same name, is situated on the left bank of the Alabama, 330 miles by water, 197 miles by road from Mobile, and 839 miles from Washington. It is connected by railway with Atlanta, in Georgia, and will soon be so with Mobile Bay. The public records and offices were removed from Tuscaloosa to Montgomery in 1847. About 75,000 bales of cotton are shipped from this town annually. In 1850, the population was 4935; in 1853, it was estimated at 7000.

Huntsville is the capital of Madison county, on the line of the railway between Winchester and Alabama, about 10 miles north of the Tennessee River. Its population in 1853 was about 4000.

Tuscaloosa, capital of Tuscaloosa county, on the left bank of the Black Warrior, at the falls and head of steam-boat navigation, 125 miles N.W. from Montgomery; N. lat. 33° 12′, W. long. 87° 42′. It was till 1847 the capital of the state, and is still a principal town, remarkable for its literary institutions and its active trade. It is the seat of the University of Alabama, founded in 1831, which has 9 professors and 135 under-graduates. The situation of the town is healthy and pleasant, being on an elevated plain of several miles in extent. There are cotton and iron manufactories carried on in the vicinity, and large quantities of cotton are shipped to Mobile. A branch-railway is projected to connect this town with the Mobile and Ohio line. In 1853, the population was 3500.

Florence, capital of Lauderdale county, is situated at the head of navigation on the Tennessee River, just below the Mussel Shoals. It is the principal shipping port for the produce of the county, and of part of Tennessee. Its population in 1853 was 1500.

Wetumpka is situated on the river Coosa, at the head of navigation, and is the principal market for the cotton produce in Coosa county and in several other counties. Thirty thousand bales were shipped at that port in 1851. In 1853, it had a population of about 3500.

Government.—By its constitution, adopted in July 1819, the legislative power is vested in two branches, a Senate and House of Representatives, which together are styled the *General Assembly of the State of Alabama*. The Senate consists of 33 members, elected for four years, and of these one-half go out every two years. The House of Representatives consists of 100 members, elected for two years. Both senators and representatives are elected by the people. Members of both Houses receive each four dollars per day. The legislature meets biennially, in the city of Montgomery, on the second Monday of November. The executive power is vested in a governor, who is elected by the people for two years, and is eligible four years out of six; he possesses a qualified negative on legislative acts; and the pardoning power, in cases of treason, the consent of the Senate is necessary. In case of his death, absence, &c., the President of the Senate acts as governor; the salary is 2500 dollars. The qualifications required for members of the legislature are—citizenship, two years' state, and one year's district residence. A senator must be twenty-seven years of age; a governor must be thirty years old, a native citizen, and must have resided four years in the state. A voter must be twenty-one years of age; one year's state, and three months' district residence are required. Blacks in all cases are excluded. Two-thirds of the General Assembly may propose amendments to the Constitution, which, if ratified by the people at the next election, and by two-thirds of the subsequent legislature, become valid.

Judiciary.—The Judiciary consists—1. Of a Supreme Court; 2. Of a Court of Chancery; 3. Of nine Circuit Courts; 4. The City Court of Mobile.—The Supreme Court consists of one chief and four associate judges, elected by a joint vote of the two Houses of the General Assembly for six years, who receive each 2250 dollars per annum. The Supreme Court has appellate jurisdiction only, and holds its sessions at the seat of government, on the first Monday of January and June of each year, to decide on cases appealed from the lower courts. The Court of Chancery consists of three chancellors, for the three chancery divisions of the state—the southern, middle, and northern—who are elected in the same way as the judges, and receive a salary of 1500 dollars. The Circuit Courts have original jurisdiction in all civil and criminal causes in the state. Two sessions are held each year in every county. The City Court of Mobile holds three sessions in the year, and has concurrent jurisdiction with the Circuit Courts, except in real actions. The judges of this court receive 2000 dollars per annum. They, together with the judges of the Circuit Courts, and the judges of probate—who are also clerks of the court, and registers of deeds for their respective counties—are elected by the people for six years. The judges are removable by impeachment, and by the governor on the address of two-thirds of the General Assembly—the judge must be heard in defence. The other public officers are—the Secretary of State, Comptroller of Public Accounts, State Treasurer, and Attorney General; the first three receive a salary of 1000 dollars, the last 425 dollars, with fees.

Laws.—The laws in this state differ but little from those of the other states of the Union. The punishments are fine, imprisonment in the county jail, standing in the pillory, branding, whipping, and death by hanging. The crimes punishable with death are murder, treason, rape, man-stealing, slave-stealing, arson, robbery, burglary, counterfeiting, and forgery. The penitentiary system has not yet been introduced into this state. The consequence of making so many offences capital is, that many go unpunished, or are pardoned by the executive. Very severe laws have been passed against *duelling;* killing in a duel is wilful murder, and as such punishable with death. Members of the General Assembly, officers of government, civil and military, and attorneys at law, are required to take the duelling-oath.

Education.—The constitution declares, that 'schools and the means of education shall for ever be encouraged in this state.' By an act of the Congress of the United States in 1819, one section of land (640 acres) was granted to the inhabitants of each township in the state for the use of *schools;* and seventy-two sections, or two entire townships, for the support of a *seminary of learning*, which were vested in the legislature of said state, to be appropriated solely to the use of such seminary by the said legislature.* In conformity with the above grant, an institution, styled the *University of the State of Alabama*, was incorporated by the legislature of the state in December 1820. In 1821, two trustees from each judicial circuit were elected by joint vote of both Houses. The governor of the state is, *ex officio*, president of the Board of Trustees. They hold their office for three years. All the university lands were vested in these trustees, to be sold at public auction: such as were not sold were to be let on rent. The funds of the university consist of the proceeds of these lands. It has now an annual income o 15,000 dollars. The university is located about one mile east of Tuscaloosa, in a fine healthy situation. In 1852, it had 9 professors, 135 students, and 8000 volumes in its library. There are, besides, three other colleges in the state: Spring Hill College, in Mobile; La Grange College, at La Grange, belonging to the Methodists, with 5 professors, 96 students, and 3900 volumes in the library; and Howard College, at Marion, belonging to the Baptists, with 6 professors, 88 students, and a library of 2200. There are numerous academies and grammar-schools in the state, but, nevertheless, the people are but imperfectly educated. In 1850, there were 127,390 children in Alabama, and of these only 35,039 were at school. There were in the same year 1235 churches; 505 of which were Baptist, 531 Methodist, and 150 Presbyterian.—[Lippincott, Grambo, & Co.'s *Gazetteer of the United States.* 1854.]

ALABA'MA River. [See Alabama.]

ALABASTER, a white stone used for ornamental purposes. The name is derived from Alabastron, a town of Egypt, where there appears to have been a manufactory of small vessels or pots, made of a stone found in the mountains near the town. These vessels were employed for containing certain kinds of perfumes, used by the ancients in their toilets, and with which it was the custom to anoint the heads of their guests, as a mark of distinction, at their feasts. There are in Horace many allusions to this custom. In like mauner Mary, the sister of Lazarus, poured upon the head of our Saviour, as he sat at supper, 'very precious ointment' from an *alabaster*-box.

The terms ἀλάβαστρον among the Greeks, and *alabastrum* among the Romans, were applied to those vessels, even when they were not made of the white stone; for although they may have imitated the original form of the vessels made at Alabastron, they appear from Theocritus (Idyl. xv.) to have been sometimes made of gold. They were of a tapering shape, and without handles; and from this circumstance Adam, in his Latin Dictionary, gives as the etymology of Alabastrum—α, *without*, and λαβὴ, *handle;* a derivation which certainly cannot be assigned to it consistently with the formation of the Greek language.

It appears from a passage in Demosthenes, (Oration on the Embassy, chap. 68,) that one of the brothers of Æschines, the orator, was employed in painting these alabaster-boxes. Pliny says, (lib. xxxvi. 12, and xxxvii. 54,) that the stone, which he calls alabastrites, was got from Thebes; but Mannert (*Geographie der Griechen und Römer*) places the town of Alabastron in Heptanomis, or Middle Egypt, in the hills between the Nile and the Red Sea, about thirty English miles east of Acoris; and states, that the stone of which the alabastra were made was brought from Mons Alabastrinus, about thirty miles S. E. of the town. Mr. James Burton, who has been long resident in Egypt, has determined the site of Alabastron to be latitude 27° 43′, longitude 31°, not far from the east bank of the Nile, a few miles south of the ruins of Antinoë.

There are two kinds of white stone to which antiquaries and artists give the name of alabaster: the one is a *carbonate* of lime; the other is gypsum, or *sulphate* of lime. Many of these ancient perfume vessels are made of the compact crystalline mass deposited from water holding carbonate of lime in solution, which is found in many places in almost every country. When the deposition takes place on the ground, it forms what mineralogists call a *stalagmite*, from a Greek word signifying a drop, and it is often composed of layers distinguishable by different degrees of translucency, giving the stone the appearance of the striped agates, called onyx, (see Agate.) Hence, according to Pliny, the alabastrites was sometimes called onyx. But it is easy to ascertain of which of the two kinds a vessel is composed, for *carbonate* of lime is hard, and effervesces if it be touched by a strong acid; but *sulphate* of lime does not effervesce, and is so soft that it may be scratched with the nail. The term alabaster is now generally applied to the softer stone. This last, when pure, is a beautiful semi-transparent snow-white substance, easily worked into vases, lamps, and various other ornaments, but it is seldom found in masses large enough for statuary; and, indeed, artists would be unwilling to execute any great work in a material so very liable to injury. The finest quality known is found in the neighbourhood of Volterra in Tuscany, and it is cut into a variety of works of great taste and beauty at Volterra, Florence, Leghorn, and other places in that part of Italy, which are sent all over the world, and sold at very reasonable prices.

Alabaster is found in Derbyshire and Staffordshire, and is manufactured into small ornaments and toys at Derby, which are also to be bought in London. The natural history of the stone will be treated of under the head Gypsum, the general term under which all varieties of sulphate of lime are usually classed by mineralogists.

ALABES, in Ichthyology, a genus of fishes belonging to the order Malacopterygii, and family Apodes. This genus, which consists of a single species of small size, a native of the Indian Ocean, resembles in most respects the common conger-eel (Muræna) of our own seas.

ALAIS, a town in Languedoc, chief town of the arrondissement of Alais, in the department of Gard, in the south of France, situated on the left of the river Gardon, about 25 miles from Nîmes, with which it is connected by railway; N. lat. 44° 7′, E. long. 4° 4′; population, 17,831. Alais was formerly the capital of the district of Cévennes, and lies at the foot of the Cévennes Mountains, in the centre of a very productive coal-field, through the working of which, and of the iron-mines, it has doubled its population since 1819. It possesses a civil tribunal, a tribunal of commerce, a council of Prud'hommes, a communal college, a public library, a consistorial Calvinist church, and a school of master and working miners. It is the centre of a great trade in raw and wrought silk, besides possessing other manufactures—as of gloves, vitriol, earthenware, and glass. It has also a considerable trade in corn, wine, olives, and cattle.

Alais was in former times a stronghold of the Protestants, but it was taken from them in 1629 by Louis XIII. It suffered much during the dragonnades (so called from the dragoons employed in persecuting the Protestants) in the reign of Louis XIV., who made it the seat of a bishop; and after the revocation of the Edict of Nantes, built a citadel in it. It has sometimes been erroneously said that Alais is the same with the Alesia mentioned in Cæsar's *Commentaries.* The Alesia of Cæsar is St. Reyne, about 23 miles south of Châtillon sur Seine.

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* A township contains 23,040 acres, is six English or American miles square, and is subdivided into thirty-six equal divisions or square miles, by lines crossing each other at right angles; these divisions are called sections; each section contains 640 acres.

ALAKANANDA, a river of Hindostan, which rises in the Himalaya Mountains. This river is considered sacred by the Hindoo inhabitants: it flows from north-east to south-west, through the province of Gurwal, receiving in its course the waters of the Mandakini, the Pinden, the Mandacoki, the Birke, and the Dauli, all streams of inconsiderable size. The last mentioned of these tributaries, which proceeds from the base of the highest ridge of the Himalaya chain, forms the remotest source of the Ganges. At Devaprayaga (*the junction of the gods*), a small town in 30° 9′ N. lat., and 78° 33′ E. long., and 12 miles to the westward of Serinagur, the Alakananda forms its junction with the river Bhagirathi, when the united streams receive the name of the Ganges. At a short distance before it reaches Bhadrinath—a much-frequented temple, 80 miles north from Almorah, the capital of Kumaon—the Alakananda is not more than 20 feet wide, and its actual source is concealed under an accumulation of perpetual snow. At Devaprayaga the width of the river is increased to 140 feet: during the rainy season it rises from 45 to 50 feet above its lowest level.

The Alakananda contains a great number of fish, four or five feet long (the *Cyprinus denticulatus*), which are held in reverence by the Brahmins; and, being fed by them daily, become so familiar as to take bread from the hand. *Asiatic Researches*, and MS. Documents at the India Board, quoted in Hamilton's *East India Gazetteer*.

ÅLAND ISLES (pronounced Oland), a small archipelago at the entrance of the Gulf of Bothnia, consisting of three groups, of about 80 inhabited and 200 uninhabited islands. The archipelago derives its name from that of the principal island, which is about 18 miles long by 14 broad, and has a surface of about 7 square leagues, the area of the whole being perhaps about 100 square leagues. These islands are situated about 25 miles from the coast of Sweden, and 15 from that of Finland. The inhabitants are of Swedish origin, and number about 15,000; the islands are called by the Finns Ahvennanmaa.

The islands of Aland are nodules of granite, covered over with a scanty layer of soil. They are separated from each other by narrow channels, and the passage between them is more like an excursion on a lake than on the deep sea. It is rarely possible to see far in any direction; the view is bounded either by fresh green meadows, with short-legged cattle and sheep; by nice-looking villages, surrounded by kitchen-gardens; or by bare cliffs of red granite, abounding in felspar, among which stretch hazel shrubs, or thin stunted woods of pine. Besides their crops and flocks, the inhabitants have an abundant supply of fish to satisfy their wants. The fish abound all round the sea-coast, as also in the inland lakes and the little rivers which flow from the hills, and which, from their number, have caused the name Aland (country of rivers) to be given to the principal island.

These islands are invested with historical interest. Aland Isle, according to tradition, had its own kings in the olden time. Since the beginning of the eighteenth century, the archipelago has often changed masters, belonging at one time to Sweden and at another to Russia. The latter power has held them since 1809, when a Russian expedition took them by surprise, having crossed over from Finland on the ice in winter. In August 1854, the islands were taken from the Russians by an Anglo-French force, when the fortifications of Bomarsund, on Aland Island, were destroyed, 2000 of the garrison having been previously taken prisoners. This strong fort, which was said to be able to contain 60,000 men, was situated on the shore of the anchorage of Ytternaes, which is capable of containing the whole Russian fleet.

ALARCON, JUAN RUIZ DE, a Spanish dramatic writer, who lived about the middle of the seventeenth century. Though an author of great merit and well-deserved reputation, very little is known of his life. Nicholas Antonio says, that he believes him to have been born at Mexico, of Spanish parents, and that he was both an actor and a dramatic writer, scarcely equalled by any of his contemporaries, for purity of diction, elegance, fluency, and copiousness. The following plays were published in his lifetime. *La industria y la suerte*; *Las paredes oyen*; *El semejante á sí mismo*; *La cueva de Salamanca*; *Mudarse por mejorarse*; *Todo es ventura*; and *El desdichado en finjir*. *Ganar amigos*; *Los empeños de un engaño*; *Quien engaña mas á quien*; *La verdad sospechosa*, and several others appeared after his death.

It is by the *Verdad sosoechosa* (suspicious truth) that he is best known to us. Corneille, who translated it into French under the title of *Le Menteur*, speaks of it in the highest terms. 'The argument,' says he, 'is, in my opinion, so ingenious and so well treated, that I have said many times that I would willingly give two of my best plays to have the merit of the invention of this. I have seen nothing equal to it either in the ancients or moderns.' Molière in one of his letters to Boileau says, that he is greatly indebted to *La Verdad sospechosa*. 'When it was performed,' says he, 'I had already a wish to write, though I was not decided on what subject; my ideas were confused, but this work fixed them.'

Alarcon is undoubtedly one of the best dramatic writers of the genuine Spanish school. His plots are ingenious, and conducted in a masterly manner, his characters highly romantic. He is not so fertile as Lope in his productions, but is more correct and equal; he is as pure and elegant in his diction as Calderon, but less metaphysical; and, in general, more free from the extravagance of Gongorism, so prevalent in his age. All his compositions have more or less a moral tendency; and it is our opinion, that if the Spaniards would aim at the possession of a real national drama, it is Alarcon whom they ought to study as their model. [See Nicoláo Antonio, *Bibliot. Hispan.*; Martinez de la Rosa, *Obras*.]

ALARIC. One of the most eminent of those northern chiefs who successively overran Italy, during the decline of the western empire, and the first of them who gained possession of imperial Rome. He learned the art of war under the celebrated emperor of the East, Theodosius, who curbed the depredations of the Goths, settled them in different provinces of the empire, and recruited his armies from the youth of the nation. But they threw off the yoke, as soon as the powerful hand which had imposed it ceased to hold the sceptre, and Alaric, born of one of the noblest families of the nation, was chosen by his countrymen as their leader. Under his guidance, the Visigoths, the division of the Gothic nation to which he belonged, issued from Thrace, where they had been settled, and overran Greece, A.D. 396. Alaric took Athens, but, instead of treating it with severity and destroying its edifices, as has sometimes been asserted, it is most probable that he did very little damage to its works of art, although he carried off such as were moveable. The Goths were soon compelled by Stilicho to evacuate tha country; and to return into Epirus. From time to time they entered into a temporary reconciliation with the empire, and took engagements in its pay; but as they were inconstant and arrogant, and the Greeks were timid and fraudulent, this state of friendship was never of long duration. About the year 398, Alaric, on the ground of his high military character, was proclaimed king of the Visigoths; and just about the same time Arcadius, the successor of Theodosius in the Eastern empire, alarmed at his repeated successes, attempted to identify his interests with those of the Empire by declaring him master-general of the eastern Illyrian prefecture. Thus he commanded a large part of the vast country situated between the Danube, the Adriatic, and the Black Sea. The Visigoths who obeyed his orders were thoroughly organized as an army, but as yet had few claims to the civil character and stability of a nation. They threatened both empires equally at the same time, and sold their alliance to each alternately. Alaric at last determined to make his way into the empire of the West, for the purpose of establishing a kingdom by conquest.

We cannot trace minutely the motions of the Gothic army. Early in the year 403 it appeared before Milan, which was immediately evacuated by the Emperor Honorius. Besieged in the fortress of Asta, he was on the point of surrendering, when Stilicho came to his assistance, with an army hastily recalled from the frontiers of Gaul and Germany. On Easter-day, A.D. 403, was fought the battle of Pollentia. The testimony of historians varies as to the event of it; but the advantage seems to have been on the side of the Romans. It is certain, however, that in a subsequent battle near Verona, Alaric was completely defeated by Stilicho; and was compelled by the voice of his people to accept terms which his pride would have rejected,—to ratify a treaty with the empire of the West; and to retire from Italy with the remains of his once powerful army. (See Claudian, *De Bello Getico*.)

After his retreat from Italy, Alaric concluded a precarious peace with Honorius, and even entered into his service, being nominated master-general of the Illyrian prefecture. In this capacity, he was required to enforce the claims of the court of Ravenna to certain provinces held by the eastern empire: but his efforts were ineffectual; and at the end of a few years, when his army was recruited by the German youths who were attracted by his fame, he renewed his design of establishing himself in Italy. Claiming an extravagant reward for the services which he had performed, he plainly intimated that war would be the consequence of a refusal. The demand was made in the year 408. The emperor was then at Rome, and it was debated in the senate what steps were proper to be taken. The majority were for war; but by Stilicho's advice, it was determined to buy off the enemy, by a contribution of four thousand pounds weight of gold. One of the senators exclaimed, in the language of Cicero, 'This is not a treaty of peace, but a contract of slavery.' The minister maintained the demand to be nothing more than just, as Alaric had remained three years in Epirus for the service of Honorius. While the Visigoths were at the foot of the Alps, the cowardly and weak Honorius procured the assassination of Stilicho, the only man who could still have defended the empire. His son and almost all his officers were murdered along with him. Those Visigoths who were serving in the pay of the empire had left their wives and children in the Roman cities: they were all massacred at the same time. All the treaties concluded by Stilicho with Alaric were annulled; and the court of Ravenna seemed to take pleasure in provoking an enemy whom it was unable to resist. Alaric crossed Venetia without encountering any Roman soldiers; with the rapidity of a traveller who meets with no obstruction, he advanced under the very walls of Rome, and formed the siege. An application for terms was made on the part of the Romans, with an intimation that if once they took up arms they would fight desperately. Alaric returned this pithy answer: 'The closer hay is pressed, the more easily it is cut.' He demanded all the wealth of Rome. The ambassadors asked what he would leave to the inhabitants—'Their lives.' He at length, however, consented to retire, on condition of receiving a heavy ransom. But Honorius, although he had taken no measures for the defence of his capital, constantly refused to ratify all the treaties by which it might have been saved. This obstinacy was mistaken by him for a noble pride; but it had disastrous consequences, for it brought back Alaric. He laid siege to Rome a second time in 409. The imposing name of the Eternal City seemed to inspire the barbarian with involuntary respect. He endeavoured to save it from the consequences to which he was otherwise pledged, by erecting a new emperor in the person of Attalus, præfect of the city; but the weakness of Attalus rendered it necessary for the Visigoth conqueror to undo the work of his own hands; and Honorius was reinstated on a powerless throne. A treacherous attack on the Goths at Ravenna, while the conferences were still open, exhausted the patience of Alaric. The city was a third time besieged; and Alaric entered at midnight on the 24th August, 410, when he gave the town up to be pillaged for six days, but with orders to his soldiers to be sparing of blood, to respect the honour of the women, and not to burn buildings dedicated to religion. After the limited period of plunder and vengeance, he hastened to withdraw his troops, and to lead them into the southern provinces of Italy. But he died in the course of a few months, after a very short illness, while besieging Cosenza in Calabria. His death produced a temporary reconciliation between the Visigoths and the emperor. His wife's brother, Ataulphus (Adolph), was chosen as his successor by the unanimous suffrage of the army. Ataulphus was a friend to peace, and wished for nothing beyond a settlement in the empire and the hand of Placidia, the sister of Honorius, who had been the captive of Alaric. He obtained both those objects; but in a short time was assassinated by one of his equerries. Zosimus.—Claudian.—Jornandez, *De Rebus Geticis.*—Gibbon, ch. xxix. xxxi.

ALATAMA'HA, a large river of Georgia, (one of the States of the North American Union), entirely comprised within the limits of that State. [See Georgia.]

ALAUDA (Lark), a genus of granivorous birds, of which upwards of sixty species have been enumerated, though the pipits, among which is our titlark, be excluded. Linnæus, Latham, and Illiger, included the latter among the larks, on account of their longish hind claw; but their slender bill, and several other circumstances, sufficiently distinguish them.

Adhering, then, to this distinction, we characterize the larks by the hind-claw, which is like the fore-claws, somewhat straight and longer than in the pipits and the wagtails. The bill is straight, and rather short and strong, the upper mandible being arched without any notch, and not longer than the under. The nostrils, situated at the base of the bill, are oblong, and protected by small plumes and bristles directed forwards. The feathers on the back part of the head can be raised up at the will of the bird into the form of a crest.

Various species of larks are found in all parts of the globe, and are everywhere distinguished by their vigilance and their singing. They are peculiarly birds of the fields, meadows, and other open places; the conformation of their feet, except in a few instances, such as the woodlark, has not adapted them to perch upon trees. They accordingly always build on the ground, making in general a rather slight though neat nest, and laying about five eggs, usually of a greyish white, with specks of a brown colour. They frequently rear two broods of young during the summer.

They are almost all birds of passage; for even in Britain, where some remain during the winter, the greater number flock together and migrate, either southwards or to the seacoast. During these migrations immense numbers of them are caught in nets for the table, particularly on the Continent, where small birds are more sought after for this purpose than in Britain.

We shall give particular details of the several species under Lark.

ALAVA, one of the old Basque Provinces in Spain. (See Basque.)

ALBA (FERNANDO ALVAREZ DE TOLEDO, Duke of), General of the Imperial army, and Minister of State of Charles V., was born in 1508. He was the son of Don Garcia, and grandson of Don Fadrique, or Frederic, who was first cousin of King Ferdinand the Catholic, and the second Duke of Alba de Tormes. His father lost his life in an engagement against the Moors at Gelvez. His grandfather superintended his education, which was calculated to fit him both for the field and the cabinet. He entered very young into the service of the Emperor, and accompanied him in his expeditions to Algiers, Tunis, and Pavia. He afterwards followed him to Hungary; and it is said that the emperor promoted him to the first rank in the army, more as a mark of favour than from any consideration of his military talents. His reserved disposition, and the peculiar bent of his mind to politics, had at first given an unfavourable idea of his talents as a general. On the Emperor wishing to know his opinion about attacking the Turks, he advised him rather to build them a golden bridge than offer them a decisive battle. Through his wise measures, however, the emperor obtained a complete victory over Frederic of Saxony at Muhlberg, where the elector was made prisoner. He was tried by a court-martial, of which the Duke of Alba was president, and was condemned to death. The duke, it is said, urged the emperor to carry the sentence into execution; but this was not the object of Charles. Alba subsequently commanded at the siege of Mentz.

About 1556, Pope Paul IV. had deprived the house of Colonna of their states, and added them to the territory of the Church. The French favoured the Pope; and the Duke was ordered by Philip II. to proceed thither against the united French and papal army. Having obtained the title of Lieutenant of all the Austrian dominions in Italy, with unlimited power, he entered the Italian territory. In this important mission he fully answered his master's most sanguine expectations. Immediately upon his arrival, he obliged the Count of Brisac to raise the siege of Ulpian; placed Milan in a state of security; and, proceeding to Naples, where the Pope by his intrigues had caused serious disturbances, he restored tranquillity, and secured respect for the Spanish authority. He then entered the papal states, and made himself master of the Campagna of Rome, with a determination to humble both the Pope and the French; but having received fresh orders from his court, he was obliged to conclude an honourable treaty of peace with the Pope, not without telling his master that timidity and scrupulousness were incompatible with the policy of war. This proud warrior, before whom the bravest trembled, was subjected to the humiliation of asking the Pope's pardon; and, as he himself confessed, was so struck with awe at the ceremony, that he could scarcely utter a word.

About 1560 the Flemish provinces of Spain began to manifest symptoms of discontent. Philip, being a bigoted Catholic, was determined to maintain the Roman religion in all its purity throughout his dominions. He disliked the Belgians as much as his father had been well-disposed towards them; and his whole conduct was calculated rather to alienate than to gain their affection. He attempted to destroy their liberty and privileges, and establish the Inquisition, at any hazard. When one of his ministers represented to him, that if he did not abolish the inquisitorial edicts, he exposed himself to the risk of losing the states, he answered, that he 'would rather have no subjects at all than have heretics for his subjects.' A rebellion was the result of this ungenerous policy. When the news of the revolt reached Spain, the king summoned a council of state, and asked the opinion of his ministers as to the measures to be adopted towards the refractory provinces. The Duke of Feria objected strongly against the adoption of violent measures. The Duke of Alba, on the contrary, was for severity. Philip remained a moment perplexed between these two advisers; but soon decided in favour of the opinion that most accorded with his own.

Alba was furnished with troops and money, and invested with unlimited powers, for the purpose of crushing the liberties of the Belgians. He set sail from Spain in 1567, and landed at Genoa, where he strengthened his army with some Italian troops, and proceeded to Brussels. On his arrival, the country which, through the mild and conciliatory measures adopted by the amiable regent, Margaret of Parma, was comparatively tranquil, became full of alarm. Events proved that the fears of the people were not unfounded. The Prince of Orange fled to Germany, and in vain urged the Counts of Egmont and Horn to do the same. Alba summoned a council of state to his house, to consult about the best means of restoring tranquillity and repressing sedition. The two counts came as councillors, when Alba seized them, with the secretary, Cassenbrot, and put them in prison. The princess-regent, seeing herself deprived of her authority, retired to Italy, and left the government of the country in the hands of the Duke.

Immediately upon the imprisonment of D'Egmont, Alba instituted a council, composed of twelve judges, whom he named 'Judges of the Tumults;' by his victims they were called the *Court of Blood*. He was himself president. He summoned the Prince of Orange, and all the other nobles and citizens who had fled from the country, to appear before his tribunal, under the penalty of confiscation of their property. All the prisons were filled with victims, who were speedily condemned and executed. The principal cities were fortified and filled with soldiers; and a country, which had hitherto enjoyed all the benefits of rational liberty, under one of the mildest governments of Europe, was now converted into a military camp. More than thirty thousand persons sought refuge in the neighbouring countries. All the laws which curb the strong, and protect the weak, were virtually abolished: there was no other rule but the will of the tyrant.

The Prince of Orange had collected an army in Germany, with which he advanced into Friesland, and defeated a body of Spaniards at Groningen. The news of this reverse exasperated the Duke. He hurried the trials of the Counts of Egmont and Horn to a speedy conclusion. They were condemned and beheaded; and the secretary of D'Egmont was torn alive by four horses. The Prince of Orange was desirous to give battle to the Spaniards, but the Duke avoided an engagement; and by his prudent movements, without losing a single man, he caused the patriot army to disband. Alba returned to Antwerp to carry on the fortifications of the citadel. The works were soon finished; and in the middle of the fortress the Duke caused his own statue, in brass, to be erected. This statue represented him in full armour, and at his feet, a two-headed monster, referring allegorically to the nobility and the people. The whole was supported by a pedestal of marble, with the following inscription:—'In honour of the Duke of Alba, for having restored the Belgians to their allegiance to the king and the church, and the country to tranquillity, peace, and justice.' This insult was greater than a nation could endure. It was so revolting, that it alienated even his friends; and from that moment his dictatorship was virtually ended. His fall was hastened by the cruelty practised towards the inhabitants of Haarlem, where he caused more than two thousand persons to be executed, after having led them to expect forgiveness if they surrendered.

He now began to encounter misfortunes and disappointments on every side. His health was in a weak state; the greater part of Holland had openly revolted, and proclaimed the Prince of Orange stadtholder; his armies had ceased to be invincible; and he earnestly requested to be recalled. In December, 1573, he published a general pardon, and left a country which he had rendered desolate; in which he had delivered into the hands of the executioners eighteen thousand victims, and kindled a war which raged for thirty-seven years, and cost Spain the blood of her best troops, immense treasures, and the final loss of some of her richest provinces. The first act of his successor's authority was to demolish his statue; so that nothing remained in Flanders after his departure but the memory of his cruelty.

On his arrival in Spain, far from being well received at court, he was sent as a prisoner to his castle of Uceda. Four years after his arrest, Henry II. of Portugal died, leaving no rightful heir. Philip II. of Spain put in a claim, which he enforced by the sword. Alba was now summoned from his retirement, and at the head of twelve thousand men entered Portugal by Elvas. In two weeks he placed Philip in possession of the crown of Portugal. Three years after, 1583, he died at Lisbon at the advanced age of seventy-four.

The Duke of Alba was, undoubtedly, the ablest general of his age. He was principally distinguished for his skill and prudence in choosing his positions, and for his rigid enforcement of the strictest discipline in his army. He often obtained by patient stratagem those advantages which would have been thrown away, or dearly acquired by a precipitate encounter with his enemy. Being at Cologne, and avoiding, as he always did, an engagement with the Dutch troops, the Archbishop urged him to fight. 'The object of a general,' answered the Duke, 'is not to fight, but to conquer; he fights enough who obtains the victory.' During a career of so many years' warfare, he never lost a battle. The firmness, energy, and caution, of such a character as Alba, surrounded as he was by all the evil circumstances which belong to intolerance and despotism, were only instruments to render the bigot and tyrant more dangerous and odious. Under more favourable states of society, they might have produced a just and benevolent statesman. [See Mariana, *Hist. de Esp.* Bentivoglio, *Guerr. di Flandr.* Do Campo, *Hist. de Portugal.*]

ALBA LONGA, ALBANO, ALBAN MOUNT and **LAKE**. The old fabulous traditions of ancient Rome speak of the city of Alba as being founded by Ascanius, son of Æneas, about 400 years before the foundation of Rome itself. They also give a succession of kings of Alba, from Ascanius down to Numitor, grandfather of Romulus. But this story evidently cannot be considered as historical. There can be little doubt, however, that Alba was a powerful city long anterior to the founding of Rome. Niebuhr considers that it was the centre of a confederation, distinct from that of the Latins, but allied with it. The site of Alba was formerly supposed to be a narrow ledge between the lake and the mountain, on the south-eastern bank of the former, where stands the convent of Palazzola. But Sir William Gell has established that the true site of Alba is above the town of Marino, stretching along the north-eastern margin of the lake. The citadel most probably stood on the site of the convent, and not on that of the village of Rocca di Papa, as was formerly believed. Alba was engaged in a war with Tullus Hostilius, king of Rome, to terminate which the famous combat of the Horatii and Curiatii was resorted to. Owing, however, to some subsequent treachery of the Albans, the Roman king razed Alba to the ground, and removed its inhabitants to Rome, where they settled on the Cœlian Hill. This is at least Livy's narrative: but Niebuhr has strong doubts about the time, as well as the manner, in which Alba was destroyed; and it appears that the territory of Alba was taken possession of in the first place by the Latin confederacy, and not by Rome. There seems to be no question that many of the inhabitants of Alba, after its fall, came to settle at Rome: the afterwards celebrated family or *gens* of the Julii were among those who referred their origin to Alba. The city was never rebuilt. During the empire, there arose a town called *Albanum*, on the western side of the lake. The nucleus of this town was formed by the villas of the Roman aristocracy, many of whom resided here. Each villa was called an *Albanum*. The most conspicuous was the villa of Pompey, which became at length a residence of the emperors. Domitian constructed a Prætorian camp at Albanum; and it is supposed by some, that the town was formed around it. Many remains of this town are at present found; the most remarkable are those of the amphitheatre of Domitian.

Under Urban VIII., in the seventeenth century, the Roman nobility began again to frequent the neighbourhood of the Alban Lake, and the town of *Albano* arose on or near the site of *Albanum*. It stands at a short distance from the lake, about fifteen miles from Rome, on the high road to Naples, within the territory of the Church. It consists chiefly of one long street, with several palaces of the Roman nobles; it is the seat of a bishopric, as it has been since the middle of the fifth century, and contains 6400 inhabitants. Above the town, are the fine villa and gardens of Prince Barberini. The country around is delightful and salubrious, being raised high above the unhealthy plains of the Campagna. The wines of Albano maintain their ancient reputation. On the banks of the Alban Lake is Castel Gandolfo, the country residence of the Popes, and further on is the pretty town of Marino; at a short distance from the latter is the abbey of Grotta Ferrata, inhabited by Greek monks of the Order of St. Basilius, and supposed to stand on the ruins of Cicero's Tusculan villa: fine avenues of shady trees lead to these several places. The Alban Lake is above six miles in circumference, and its surface is 985 feet above the level of the sea; the shore is high, lined with trees, and covered with gardens and orchards; the water is clear, and its depth very great—some accounts say 1000 feet. An emissary, designed to prevent the sudden overflowings of the lake which threatened the plain below, was constructed by the Romans in the year 358 after the foundation of the city; and it remains unimpaired to this day—a striking monument of the genius and perseverance of that extraordinary people. They bored the mountain for the space of a mile and a half, mostly through the solid rock: the tunnel is from 7 to 10 feet high, and about 4 feet wide. It was completed in less than one year. The water of this emissary flows into the Tiber below Rome. The Alban Mount, above 3000 feet high, towers far above the surrounding hills, commanding the whole Campagna, or Latium, and forming the most striking feature of the horizon of Rome. 'The road which we took,' says Mr. Eustace, in his Tour, 'leads along the Alban Lake, and climbs up the declivity to the village of Rocca di Papa. Above that village is a plain called *Campo di Annibale*, because that general is said, I know not upon what authority, to have been encamped there for some days. The hollow sweep formed in the mountain beyond this plain has given it the modern appellation of *Monte Cavo*. Above this plain we proceeded through the woods that clothe the upper region of the mountain, and sometimes on the ancient pavement of the Via Triumphalis that led to its summit. From this grove came the voice that commanded the continuation of the Alban rites; and on the summit stood the temple of Jupiter Latiaris, where all the Latin tribes, with the Romans at their head, used to assemble once a year, and offer common sacrifice to the tutelary deity of the nation.' Roman generals, who failed to obtain the honours of a triumph from the senate, sometimes alleviated their disappointment by going through the forms of a triumph on the Alban Mount. This practice commenced with C. Papirius Maso. Livy, in speaking of the refusal of a triumph to Cicereius, adds: 'In monte Albano, *quod jam in morem venerat*, ut sine publica auctoritate fieret, triumphavit.'—*Livy*, xlii. 21. In the beginning of last century, ruins of the temple were found; these were destroyed in 1783, for the purpose of rebuilding the church and convent of the monks of the Passion, who now occupy the spot.

The Alban Mount is in the Roman poetical mythology what Mount Ida is in that of Homer—the seat of the gods who watch over the destinies of the fated city. The view from the summit is truly magnificent, extending inland over a gradation of wooded hills, as far as the barren and notched ridge of the Sabine mountains to the east, and Mount Soracte to the north; the latter rising alone over the plain through which the Tiber and the Anio slowly wind their course: farther westward the view is bounded by the rampart of Mount Cimino, the country of ancient Veii. Between these great outlines lies a vast undulated tract of country, whose softly-swelling slopes sink gradually towards the west, and merge at last into the blue line of the sea; the shore of which, girt with a dark stripe of woods, relieved here and there by white watch-towers, spreads without interruption before the eye for a space of more than sixty miles, from Civitavecchia to Antium, embracing the double mouth of the Tiber, the marshes of Ostia, the ruins of Ardea, Lavinium, and Laurentum,—the whole scenery, in short, of the last six books of the *Æneid*, as well as that of the first struggles and achievements of infant Rome. Hovering over the silent, dusty plain below, where immense farms now occupy the place of former cities, the eye, following the greyish lines of aqueducts and roads, is led to rest on the hundred domes, and towers, and palaces of modern Rome—St. Peter's ball and cross rising proudly above the rest; the whole encircled by a narrow zone of gardens and vineyards, like an oasis in the midst of the desert.

. The Alban Mount is of volcanic formation; and the basin of the Lake of Albano, as well as that of the neighbouring smaller Lake of Nemi, are evidently extinguished craters. The whole of this delightful region is healthy, well cultivated, and thickly inhabited. It is a convenient place of resort for the nobility and gentry of Rome in summer, and especially in the autumn. [See Piranesi, *Antichità di Albano e di Castel Gandolfo*, and Gell's *Topography of Rome*.]

ALBANI, a patrician Roman family, originally from the town of Urbino. One of its members, Cardinal Gian Francesco Albani, was raised to the papal see in 1700, when he assumed the name of Clemens XI. Since that time the Albani have been classed among the Roman princes, and have furnished the Church of Rome with a succession of cardinals, who have been in general men of taste and abilities, and have exercised considerable influence at the papal court. Cardinal Alessandro Albani, in the last century, was known as a patron of the arts, to which he devoted his fortune. During the course of fifty years he enriched his villa outside of Porta Salaria with a magnificent collection of statues, marbles, relievos, and other precious objects of art, which rendered the Villa Albani one of the most interesting spots about Rome. When the French republican army invaded Rome in 1798, this villa was stripped of all its treasures; Cardinal Albani having shown himself averse to France, and having urged the pope to form a league with the other Italian states to oppose the French arms. The cardinal, however, escaped to Naples. After the death of Pius VI., Cardinal Albani repaired to the conclave at Venice, which elected Pius VII., and soon after died at an advanced age. The lay representative of the Albani family is possessed of the estate of Soriano near Viterbo, and of other domains in the papal states. [See Clemens XI.]

ALBANIA, a country of European Turkey, stretching along the coast of the Adriatic and Mediterranean Seas. It is difficult to define the exact limits of Albania, but the following account is, perhaps, nearly correct. It is bounded on the N. by the mountainous district of Monte Negro, (from which the river Moroka divides it,) and by the ridges which connect this district with the great central chain, anciently known by the name of Scardus. The eastern boundary is uncertain. It nearly coincides, however, with the line of the mountains running southward from lat. 42°, not far from the 21st meridian, east from Greenwich. From lat. 40° it runs S.W. and meets the sea-coast a little to the northward of Prevesa. Albania thus has Hertsek, or Turkish Dalmatia, with the territory of Monte Negro on the N.W.; Bosnia and Servia on the N.; Roumili or Roumelia on the E. and S.E., and the Mediterranean Sea on the W., along which the coast runs for more than 200 miles. It will be seen to coincide with the southern parts of ancient Illyria, and the northern of Epirus. These are the limits of Albania properly so called, (*i. e.* of the country in which the Albanian language is the vernacular tongue), and they exclude the districts of Joánnina, Arta, Kónitza, and Paleo Pogóneana; but as these districts formed part of the territories of the late Ali Pasha, in whose times this country has been most frequently visited, and as they will hardly come into any of the great territorial divisions of Turkey, they will be spoken of as parts of Albania in this article. The eastern frontier must then be considered as advanced to the ridge of mountains, between the river Aspropotamos [see Achelous] and the river of Arta; and southward to the gulf of Arta. Albania is a mountainous region; ridges intersected by deep ravines cover the southern part of the country: the northern part is not so well known, having been less visited by travellers. The Acro-Ceraunian mountains, now called Khimára, after running north-west nearly parallel to the coast, form a bold headland just at the entrance of the Adriatic. The rugged rocks heaped one upon another, with their summits hidden in the clouds, and their base washed by a sea continually agitated, were regarded with apprehension by ancient navigators. The hills of Zagori running S.E. near the frontier of Albania and Macedonia, have flat summits spreading into extensive plains. A semicircular chain of lofty mountains, once known by the name of Scardus, and now called Gliubotin and Nissava Gora, incloses the basins of the Moroka and the Drin; and a continuation of it runs southward, under the denominations of Tzumerka and Metzovo, uniting with the ancient Pindus; but Pindus itself cannot be considered as within the limits of Albania, &c. The character of this range is hardly determined. It is doubtful if it forms a continuous chain, or an elevated ridge, crowned at different distances by lofty hills. The mountains of Khimára and Tzumerka are not less than 4000 feet above the level of the sea.

The rivers of Albania are not of any great size or importance. They flow from the eastern frontier into the Adriatic or the Mediterranean. The Moroka and Paskola unite their streams, and pass through the lake of Skutari (Skódre), or Zenta, into the Adriatic, assuming between the lake and the sea the name of Boyana. The general direction of the Moroka is S.; of the Paskola S.W.; and the distance from the source of the Moroka to the mouth of the Boyana, following the winding of the stream, and including the length of the lake Scutari, is more than 100 miles. Two streams, one, the black Drin, flowing in a northerly direction, or from L. Okhrida (ancient Lychnitis); the other, the white Drin, proceeding from the mountains on the frontier, and flowing S., meet and run westward into the Adriatic. The windings of this stream, measured from either source, render its course equal to about 150 or 160 miles, and make it the chief of the Albanian rivers. Farther to the south, we meet with the Skombi (ancient Genusus), the Beratina, or Krevasta (ancient Apsus), and the Boiussa or Voiussa, in whose modern appellation we may trace the ancient one of Aous or Æas. This last-mentioned stream is about 130 miles long; but these measurements, founded on the most recent maps, must, in the present state of our knowledge, be received with caution. The river Calamas, the ancient Thyamis, falls into the sea opposite Corfu; and farther to the south we have the ancient Acheron, and the little river of Arta, which falls into the gulf of Arta on the north side. The principal lakes are those of Scutari or Zenta; of Okhrida, the ancient L. of Lychnitis, of Joánnina, which has been confounded with the ancient Acherusia; and of Butrinto. Of these, the second, according to the map published by the Society for the Diffusion of Useful Knowledge, is the largest: that of Joánnina is given by Hobhouse as 10 or 12 miles long, and 3 broad.

The climate of Albania in the lower regions is, perhaps, about as warm as that of Italy, but droughts, and sudden and violent north winds, render it less agreeable. In the part which lies south of lat. 40°, and which corresponds to the ancient Epirus, the climate is colder than in Greece. The spring does not set in before the middle of March: in July and August, the oppressive heat often drains the streams and rivers, and withers the plants and grass: September is the time of vintage; and the rains of December are succeeded by frosts in January, which, however, seldom last long. The country is in general healthy. Tertians indeed prevail at Joánnina in spring and autumn, owing, probably, to the vicinity of so large a sheet of stagnant water as the lake on which the town stands.

Of timber trees may be mentioned many species of oak, among them the *quercus cerris*, with its broad indented leaves, and large hairy-cupped acorn, affording timber of good size and quality; and the Vallonea oak (*quercus ægilops*), the acorns of which are deeply set in a thick scaly cup used in dyeing, and supply an article of export from many parts of Turkey: the plane, the cypress, the ash, the cedar, the pine, and the larch may be added. The last three appear in the mountains of Pindus, together with the chestnut; the three which precede them are mingled on the sea-coast with the laurel and the lentisk. The wild vine and the elder are also frequent on the mountains, and the woods and wastes nourish the Amphilochian peach, the Arta nut, and the quince. The cultivated fruits are the olive, which might be rendered more productive by better care; the vine, the pomegranate, the orange, the lemon, the mulberry, and the fig. The agricultural produce consists of barley, oats, maize, and other grains, tobacco, and cotton; some portion of it is exported. The horses are spirited and active, but not large; asses are also used; the oxen are ill-shaped and stunted; flocks of sheep and goats[*] are numerous. Considerable numbers of all these animals were, and probably continue to be sold into the Ionian islands. The dogs which Mr. Hobhouse saw on his road from Arta to Joánnina, were not unlike the true shepherd breed in England; but were larger, (being nearly as big as mastiffs,) with sharper heads and more curled and bushy tails.

Fowls and eggs are abundant. Mr. Hobhouse, in one of his journeys through the country, speaks of these two, with wine, being his constant meal. Among the wild beasts are the bear, the wolf, and the jackal. The lakes abound with water-fowl.

The inhabitants of Albania consist chiefly of Greeks and Albanians properly so called, with some few of other nations intermingled with them. We shall here confine ourselves to the Albanians, who have attracted considerable attention in modern times, from the celebrity of the late Ali Pasha, and from the accounts of them given in the travels of Mr. (now Sir John) Hobhouse in 1809, and of Dr. Holland in 1812 and 1813, and in the *Researches in Greece* of Col. Leake, who resided in Albania a short time previous to the date of Mr. Hobhouse's journey. These writers, with M. Malte Brun, we have taken as our chief guides, and we refer to their works for more particular information. It may be mentioned, that the two men who have attained the greatest eminence under the Turkish sway in modern times have been Albanians; viz., Bairacter, whose successful rebellion placed the present Sultan Mahmoud on his throne, and Mohammed Ali, Pasha of Egypt, who has nearly expelled him from it.

The Illyrians were probably the original stock from which the Albanians sprung. Ptolemy mentions a tribe of *Albani*, in the district with a town called Albanopolis; but they appear to have been insignificant, and till the 12th century we lose sight of them. At that period we read of their town under the name of Albanon, Arbanon, or Elbanon, and it is said to have commanded the passes from the country around Lychnitis to the coast. From this people, the Byzantine Greeks gave to the inhabitants of these mountains, who spoke the same dialect, the name of Ἀλβανῆτες (Albanetes), Ἀλβάνοι (Albanoi), or Ἀρβανῆτες (Arbanētes); and to the country that of Ἀλβανία (Albania), Ἀλβανητια (Albanētia), or Ἀρβανητία (Arbanētia). Hence the European names of the country. The Albanian, however, calls himself Skipitar, and his native land Skiperi.

The hypothesis of the Albanians being descended from the Illyrians, cannot receive confirmation from comparing it with the old Illyrian tongue, because we know nothing about the latter. Still the Albanian language, whatever may be its basis, has received accessions from the Greeks, the Romans, the Goths, the Sclavonians, the Franks, and the Italians; with whom, at different times, the Albanians have been connected and intermingled.

Some writers have assigned to the Albanians a different origin; supposing them to be the descendants of the Albani of Asia, who dwell between the Euxine and the Caspian seas, and who may (it is conjectured) have retired before the advance of the Sclavonian nations, that for some centuries followed the track marked out by the Huns, when they broke into Europe. Mr. Hobhouse, who adopts the above hypothesis, describes the modern Albanians as a mixture of Greeks, Romans, Goths, Vandals, Spaniards, Italians, Bulgarians, and Ottoman Turks, and supposes (though we believe it to be a mere supposition) the basis of their language to be the Sclavonian. Pouqueville asserts the existence of a belief among the Albanians themselves that they are descended from the French; and Meletius, a geographer of the last century, says they are descended from Celts who crossed over from Iapygia, now the Terra di Otranto, in the kingdom of Naples.

In the ninth and tenth centuries, Albania was included in the great Bulgarian kingdom, established south of the Danube, of which Lychnitis was the capital. In a subsequent period we find the Normans of Sicily and Tarento in permanent possession of some places on the coast. Durazzo was at once their depôt and place of shelter. On the capture of Constantinople by the Franks [A. D. 1204], Michael Angelus, a bastard of the family of the Comneni, founded, what was called the Despotate (Δεσποτατον, Lordship), a principality, comprehending the ancient Ætolia.

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[*] The milk of these animals is made into cheese, a small quantity of which is exported; and their skins serve to hold wine (to which, however, they impart a strong flavour); the flesh of the kids is considered equal to lamb.

Acarnania and Epirus, including the towns of Joánnina (which became the capital), Arta, and Nepakto (or Naupactus). The despots were sometimes tributary to the emperors of Constantinople, at other times independent, or even hostile. The town of Albanon was, in 1257, subject to a governor sent by Theodore Lascaris II. emperor of Nice, (one of the sovereignties which sprung up on the above-mentioned capture of Constantinople;) but as the Albanians preferred the sway of the despot, the governor retired. It was probably about this time that the Albanian name was extended to all those mountaineers of Illyricum and Epirus, who were united by community of language and manners; and, as it should seem, they constituted a separate and independent community, which formed alliances at will with the Greek emperors, the Franks, or the despots of Epirus. Durazzo was in their hands, but Berât, in the heart of their country, was subject to Constantinople.

In the fourteenth century the power of the Albanians was so far increased as to lead them to attempt conquests distant from their mountains, but they could not retain their acquisitions. Some of their northern towns were taken by the Venetians; and the nation ultimately bowed to the supremacy of the Turks. The valour of the celebrated George Kastrióte, or Castriot, called by the Turks Iskander (Scanderbeg), could only delay the subjugation of his countrymen. He died in 1466 or 1467; and the Turks completed the conquest of Albania in 1478. The people, indeed, were never entirely subdued, nor does it appear probable that the sultan ever had more authority than at present, when he cannot appoint a governor who is not a native of the province: but the conquest, though imperfect, was the cause of considerable changes. In the days of Castriot the Albanians were Christians, and most of them continued to be so till the middle of the seventeenth century. They are now half Mohammedan, but their conversion is probably owing to policy, that they may attain to high dignities; and their adherence to the usual practices of the Moslems is by no means of a rigid character. They intermarry with Christian women, and the children are divided between the opposite creeds of their father and mother, the boys going to the mosque, and the girls to church. Their laxity is a subject of ridicule to the more consistent Turks. The Albanians of the coast are mostly Christians, and some of them of the Latin church.

The Albanians are about five feet and a-half high, muscular and straight in their persons. Their activity and the tight girdles which they wear render them small round the loins: they have broad full chests, long necks, long oval faces, with prominent cheek bones, and flat raised foreheads, arched eyebrows, blue or hazel (rarely quite black), lively eyes, thin straight noses, thin but open nostrils, and small mouths, furnished with good teeth. Their complexions are white in youth, but get tinged or dusky in old age. They wear mustachios, but shave off the rest of the beard. Their features show a mind unsubdued by slavery, and their stately walk and carriage may be denominated a strut. The women are tall, strong, and not ill-looking; but their appearance indicates wretchedness, ill usage, and hard work. They are not so early marriageable as the women in southern Greece, but they retain their looks longer, and give birth to children at a more advanced period of life.

The dress of the better sort consists of an outer mantle, made of coarse woollen stuff, bordered and variously figured with red threads, which, falling loosely from the shoulders behind, reaches as low as the knees; of two vests (the rich sometimes adding a third), the outer one, open, the inner, laced in the middle and richly figured; of a broad sash or belt, with one or two pistols, the handles of which are often long, and curiously wrought with silver; of a coarse cotton shirt, the lower part descending from beneath the belt like a highland kilt, with drawers of the same materials; and of variously coloured stockings, or high socks, and sandals. They wear also a small red skull-cap, and metal greaves or coverings for the knees and ancles. The most remarkable part of an Albanian's dress, is the capote or cloak, a coarse shaggy garment, either of a gray or white wool, or black horse hair, with open sleeves, and a square flap or cape behind, which serves sometimes for a hood. The richer Albanians often add to their dress a shawl tied on the head like a turban.

The dress of the common people is usually composed of materials which once were white; but the clothes of an Albanian, owing to his scanty wardrobe (which rarely contains more than two shirts), and to his habit of sleeping dressed on the ground, present a very unsavoury appearance. They are, in fact, very filthy in their persons, and infested with vermin, which they brush from their clothes without shame for themselves or consideration for others. The poor seldom wear their sandals.

The Albanians are fond of ornaments. They wear silver chains round the neck with amulets, silver snuff-boxes, or watches, with shagreen cases, at the end. Of one ornament in particular they are very proud and careful. It is a copper, or sometimes a silver pencase, a quarter of an inch thick, (some say as much as an inch and a half,) and ten or eleven inches long, with an inkstand at one end. This they often wear in their girdles, adorned with a silver chain, even when unable to use it. The poor all carry at least one pistol in their girdles; and are especially proud if they can have the handle of silver, being comparatively careless about the barrel or the lock.

The dress of the women is fantastical, but they are more cleanly than the men. The women at Cesarades, a town which Mr. Hobhouse passed through, were chiefly clothed in red cotton, but he never observed this colour elsewhere. Their heads were wrapped in a shawl, so arranged as to look like a helmet and crest, with clasps under the ears. At Ereeneed, a place not far from that last mentioned, the garments of the women were of white woollen, and the younger ones wore a kind of skull-cap composed of silver coins. Their hair also, which fell down in long braids, was strung with money, so that the young girls thus carry their portions (as they collect them) on their heads.

The food of the Albanians consists of wheaten or barley bread, but principally of cakes of boiled or roasted maize; of goats'-milk cheese, rice, butter, eggs, dried fish, and vegetables. The proportion of animal food is but small. On holidays they kill sheep, or kids, or fowls. Their diet is usually spare; but this arises from parsimoniousness, as they will eat voraciously when they can do it at the cost of others. They all drink wine, as well as rackee, a spirit distilled from grape husks and barley, and not unlike whiskey. They drink also abundance of cold water, (and that when they are hot, without finding any inconvenience,) some coffee, the Italian rossoglios, the liqueurs of Corfu and Cephalonia, and a little milk. The wine, made in quantities and kept in casks in Joánnina and other large towns, is mixed with fine resin, lime, and water. The resin is to impart strength, but is counterbalanced by the water; the lime is intended to refine the liquor. This process, however, imparts a harsh flavour.

Their habitations are for the most part very neat. The cottages have seldom more than one floor and that of mud, which is regularly swept, and is quite dry. The rooms are commonly two, one of which is appropriated to the store of maize in the stalk, and of grapes which are sprinkled with salt. The fire is made on the floor, and as they have only a hole to serve as a chimney, it is not surprising that their apartments are sometimes smoky. Their furniture is very simple. A large circular tray of thin iron or tin, is used for eating on, and is kept well scoured and very bright. They have also a pan to mix meal in, a wooden bowl or two, some horn spoons, jars for oil and wine, and a small copper coffee jug. A brass lamp, three or four white rush mats, and a block of wood about a foot high, serving as a stand for the eating tray,—all which articles, as well as those previously mentioned, are kept in a deal cupboard or wooden chest,—complete the list of an Albanian's domestic utensils.

Their houses are detached with a garden to each. The house in which Mr. Hobhouse lodged, at Ereeneed, had belonging to it a tobacco patch, a vineyard, and a fruit and vegetable garden, all surrounded by a stone wall. The house was in an inner yard, so walled as to form a sort of fortification, with holes in the wall, placed at regular distances, and said to be intended for guns.

Their villages have a green with a large tree for holiday sports. On this green is the circular paved threshing-floor, where the corn is trodden out by horses, who are fastened by a cord to the post in the centre of the floor, and driven round, sometimes to the number of eight or nine abreast.

A distinguishing feature in the character of the Albanians is their nationality. Their answer, when asked what they are, is not, as in other places, 'I am a Mohammedan,' or 'I am a Christian,' but 'I am an Albanian.' In fact, their independence and love of country have almost entirely removed that distinction between the professors of the two religions which prevails so much in other parts of the Turkish empire. The laxity of and Mohammedan portion of this singular people has been already noticed. Their nationality accompanies them when they leave their native land. In foreign parts they will go out of their way to visit a countryman, although he may be personally a stranger to them.

They are proud of their prowess; and, indeed, they are a nation of warriors, being all capable of using the sword or the long gun. The latter (and, indeed, the sabre too) is to be found in almost every cottage. The imperfection, however, of its make (for the locks are usually rude, and the barrels thin and badly manufactured), and the coarseness of the powder, render it far from an efficient weapon, and prevent the Albanian from acquiring much skill as a marksman. As all carry arms, it is difficult to distinguish the peasant from the soldier.

Although the poorer classes among the Albanians will not steal, or, at any rate, are less addicted to theft than the same classes among other people, yet open robbery, upon a large scale, is not considered disgraceful. Men will commonly, in reference to a past event, speak of it as occurring when they were robbers. It is impossible to avoid observing the strong points of comparison between the habits of the ancient Greeks, among whom robbery and piracy on a large scale were honourable professions, and those of the inhabitants of modern Greece, and other parts of European Turkey. Early in the summer, bandits leave the towns and villages in which they have passed the winter, and, forming large bands of two, five, or seven hundred, or even a thousand men, retire to the tops of some mountains—those of Metzovo, for instance—and there live in caves or in the open air; making Greece, however, and not Albania, the scene of their depredations. The shepherds are often in league with them, and their flocks supply these predatory bands with meat; they procure bread from the peasantry. A gentle tap at the cottage door is heard in the stillness of the night, and the well-known word 'Psomè' (bread), informs the inmate of the nature of an application with which he immediately complies. These robbers are very cautious in making their attacks. They lie quietly in wait, and suffer their prey to get quite into the midst of them. If the party to be attacked is strong, they fire without rising from their covert until either they are repelled, or have obliged their victims to cry quarter. The prisoners are gagged, bound, and plundered; and, if wealthy, detained until they are ransomed. If there is no expectation of resistance, the robbers start up from their place of ambush without firing. Resistance is frequently, however, made with success: the assailed getting behind stones and returning the fire of their opponents,—who are very slow, unless they have great advantage in number, in attacking with the sabre.

The population of Albania has always been of a warlike character. They were the soldiers of Pyrrhus, one of the most formidable opponents whom the Romans encountered; and under Scanderbeg they arrested for awhile the tide of Turkish conquest. At present, under the denomination of Arnauts, they rank among the flower of the Ottoman army, and are found as mercenaries in all parts of Turkey and in the Barbary States. They take the field without baggage or tents, and are far more active than the generality of the Turkish soldiery. Abstemious in their habits, a ration of one or two pounds of wheat or maize flour, with a few black olives or salted pilchards, suffices for their wants. While daylight continues, they are engaged in wrestling or other warlike exercises. If wounded, they leave their corps and go home to get cured, after which they return to the field. Many of them know how to set a bone in their rude manner; and they will even attempt some of the more delicate operations of surgery. They follow the profession of arms till they become decrepit. Besides the annual resort of the robbers to the mountains already mentioned, the migrations of some of the shepherds require notice. These, with their flocks, their horses, their moveable houses, their goods, their wives and children, remove at the commencement of summer to the mountains, and return when the approach of winter renders the milder climate of the plains more desirable.

Their agricultural skill is not great. Their plough is of simple construction; and in time of harvest they reap their corn, though with little skill, and they never mow it. The business of sowing and reaping is left to the women and to the aged. The young men fell timber or dress the vines: nor are they averse to the occupation of shepherds, as it enables them to indulge that idleness to which, when not engaged in war, they are so prone. Their indolence, however, does not give them that grave and torpid air which distinguishes the Turks.

They look upon the female sex as cattle, make them labour, and beat them: yet all marry who can; marriage being in itself a sign of wealth. Mr. Hobhouse witnessed a nuptial procession at Joánnina, during his abode in that city. The marriage had taken place in the morning, and the bride had returned to her own apartments, in the harem of Ali Pasha, where, while unmarried, she had been a slave. In the evening, the bridegroom, a Christian Albanian, an officer in Ali's service, went to fetch her, being accompanied by a party of men, some with fiddles and others with lanterns of coloured paper. On the return, the bridegroom with his party went first; then came six young girls, splendidly dressed, two of them carrying infants. After these followed a woman, in still richer attire, bearing a small red trunk, in which was the portion given by Ali to the bride, as having been attached to the harem. The bride herself came next, bearing, in dress and in rigidity of muscle, a closer resemblance to the wax figure of Queen Elizabeth, in Westminster Abbey, than to anything else. Her face was painted, and her high cap studded with pieces of gold money.

Most of the Albanians speak Greek, which is also the common written language in use among them, for their own vernacular tongue is unwritten. Very few of them, even though Mohammedans, can speak Turkish. The Greeks of Joánnina, of the better sort, are well instructed in the manners and languages of Christendom; and that town once furnished a residence to travellers both safe and agreeable. At the present moment the town is in a most ruinous condition, having suffered a great deal at the time of Ali's assassination in 1820, and having been plundered five times since by the Albanians. (*Sketches in Greece*, &c. London, 1833.)

Dancing is one of their most common amusements. The musical instrument in general use among them is a kind of guitar, with three strings, a long neck, and a small round base. They strike the chords, not with the hand, but with a piece of quill, half an inch long. Its sound, as may be supposed, is monotonous. It is just sufficient as an accompaniment to their songs and to mark time.

A distinction of character may be observed between the Albanians of different districts. In the northern part of the country, which is better adapted for cavalry, the national character is alloyed by the dulness of the Bulgarian. It is in the narrow vales and on the barren mountains of the south that we must look for that character in its full development. There the hardy natives, ignorant of horsemanship, and constituting an irregular infantry of the hardiest and most active character, are constantly seeking to be engaged in war; and, when their own feuds do not open to them a field, they seek employment as mercenaries with the Pashas of other provinces. They may be compared, in point of character, with the independent mountaineers of Greece, whom they excel in evenness of conduct, in prudence, and in faithfulness to employers; while they surpass them, also, in avidity, selfishness, and avarice. The same activity, keenness, and enterprise, and the same hardy, patient, laborious habits, mark both races.

The Albanians have few arts or manufactures. A considerable number of capotes are exported annually; and they produce some embroidery on velvet, stuff, and cloth, for which the country enjoys a better reputation than any other part of European Turkey; but this is the work of the Greeks of Joánnina, who are an industrious people, rather than of the Albanians. The physicians in large towns are Greeks, but the surgeons are commonly Albanians: their practice is, however, of a very inartificial and somewhat violent character.

The country is under the government of the different Turkish Pashas in whose territories it lies,—as those of Joánnina, Scutari, Okhrida, Avlóna, and Delvino. But in a country of such character, and inhabited by such a people, the power of the Pashas, unless wielded by a hand like that of Ali, may be regarded as very small. The local authorities are constituted very differently in different places. Here a district or town is under the control of one man, bearing the Turkish title of Bolu Bashe, or the Greek title of Capitan, or else some designation borrowed from Europe: here an Aga or Bey becomes a petty chieftain of he villagers; while in other places, as in the town of Arvro-Castro, there are no local authorities. (See Hobouse's *Travels.*) How far this state of things has been ffected by the overthrow of Ali Pacha, we have not at preent any means of learning. The authority quoted in the preceding page leads us to suppose that Albania is in a most disorderly condition.

The population of a country such as Albania cannot be estimated with any tolerable accuracy. Upper Albania, beginning either at Delvinaki or Tepellene, is generally more populous than the districts to the south. The population of Ali's dominions was estimated, by Dr. Holland, at 2,000,000; but these dominions stretched far beyond Albania, regarded even in the wide extent in which we have been speaking of it. We do not see how any calculation worth trusting can be made.

The trade consists mainly in the exchange of natural productions for the manufactures of nations more refined. Oil, wool, wheat, maize, and tobacco, are sent to the ports of the kingdom of Naples, or to the Ionian Isles and Malta; and sheep, goats, cattle, and horses, to the Ionian Islands. Cotton-wool and timber are exported from the Gulf of Arta; but the cotton is brought chiefly from Thessaly, and the timber from ancient Acarnania, on the south side of the Gulf. The manufactured goods which they export are capotes; gun and pistol stocks, mounted in chased silver, plain and gilt; and embroidered velvets, stuffs, and cloths. They import some coffee and sugar from Trieste; knives, sword-blades, gun-barrels, glass, and paper from Venice; and gold and silver thread, for embroidery, from Vienna. French and German cloth, of coarse, thin texture, ill dyed, and altogether inferior to the worst English cloth, is sent from Leipsic, probably through the medium of Greek houses at Trieste. Caps are brought in from Trieste, Leghorn, and Genoa; and various articles from the Ionian Isles and Malta, which being landed at the ports of Prevesa, Sallora, Avlóna, and Durazzo, are conveyed on horseback to the great annual fair of Joánnina. (See Hobhouse's and Holland's *Travels*; since which time things may have changed.) Linen, velvet, gunpowder, fire-arms, and iron wares, are also imported. The want of ready means of communication is a great impediment to traffic. Goods are conveyed by pack-horses; four or five of which are attached to each other by cords, and guided by one man. The vigorous government of Ali, by the suppression of robbers and the construction of roads, afforded facilities for internal traffic which did not previously exist.

The revenues of the late Ali Pasha arose from a land-tax, irregular in its assessment, but averaging probably ten per cent. of the produce; an arbitrary tax on cities and towns, depending on the necessities and will of the Vizier; duties on exports and imports; the assumption of a right to all property when there are no male heirs, founded on the general custom of the Turkish empire; a tax on decisions upon litigated property, equal to about ten per cent. of the value of the property; requisitions, on particular places, to aid in buildings or other works carried on by the government; and a partial monopoly of the corn trade. The actual contribution to the imperial treasury at Constantinople is not known. Ali had immense private revenues, and also considerable hoards of treasure.

The Albanians, as might be expected from their imperfect civilization and their peculiar habits, are divided into tribes, each having its proper designation, and distinguished in some particulars from the adjacent tribes. The most northern, and, if we may judge from the extent of country occupied by it, the largest tribe is that of the Ngége, Guegues, or Red Albanians, who inhabit the country watered by the branches of the Drin. The Mirdites, from whom Scanderbeg arose, and who owe to their priests a degree of civilization which distinguishes them favourably from their neighbours, appear to be a subdivision of these. Southward from the Ngége, are the Tóske. The Liápe, notorious for poverty, dirt, and pilfering; and the Tzámi, succeed these as we advance towards the south; and other tribes, either detached from the more important ones, or else entirely unconnected with them, occupy small portions of the country. (See *Leake.*) Among these, the people of the district of Khimára may be noticed for their indulgence of revenge, which they regard as a sacred duty, and which converts their different villages or towns into hostile stations. Some Bulgarian, and some Wallachian colonies may be found scattered along the eastern frontier of Albania. This division by tribes is purely Albanian, and was probably in use before the Turkish conquest. Upon that event, several of the chief towns, as Délvino, Berát, El Basán, Avlóna, Skódre, and others, became the seats of Turkian provincial governments.

Some notice of the chief towns of Albania will be found in the articles under their respective names. No one of them can be designated as the capital; for the country is not under the government of one Pasha. Joánnina, which is indeed beyond the boundaries of Albania strictly so called, is the most important: and after it may be mentioned Skódre, Okhrida, Berát, Durazzo (the ancient Dyrrachium), Délvino, Argyro Castro, Avlóna, Prevesa, and Arta. Parga was, till delivered up to the Turks, a town of considerable size, having 8000 inhabitants. These were Christians of the Greek and Latin churches. The people of Antivari and Dolcigno are chiefly Mohammedans. Their situation on the coast leads them to become sailors, and they are the only Albanians who have any acquaintance with shipping. They enter into the service of the Barbary States, or follow piracy at home. This last is the case, at least, with the people of Dolcigno, which has a town with 6000 inhabitants.

Albanian colonies are to be found in different parts of Turkey and Greece, especially in the ancient Attica, Bœotia, Argolis, Elis, and Laconia; but these are labourers. The warlike character of the nation is retained only by those who remain at home; and in the Morea the language is nearly lost, while in the Attic villages it is retained; these being probably colonies of later date. The people of Hydra are descended from Albanian colonists, but are scarcely distinguishable from their neighbours. But the most remarkable colony is in Calabria, where the Albanians settled upon the Kastrioti receiving a Neapolitan dukedom. Their descendants, when Mr. Swinburne travelled in 1780, amounted to 100,000, and retained the Albanian dress. The women could only speak Albanian. The men could, however, speak the Calabrese also; and their original language seemed to be gradually yielding to that of their adopted country. There are also Albanian colonies in the Abruzzi. [See ABRUZZI.]

ALBANO (FRANCESCO), was born at Bologna, March 17, 1578, and was destined by his father, a respectable silk-merchant, to follow his own profession; but his uncle, who happened to be a man of taste and a judge of art, perceiving in the youth such indications of genius for painting as to warrant the expectation of future eminence, prevailed on his father to change his intentions, and he accordingly was placed under the tuition of Denys Calvert. Guido Reni was studying at the same time under that master, a circumstance extremely fortunate for young Albano, with whom Guido formed a strict intimacy; and being more advanced in art, he was enabled to afford him effectual assistance in his studies. The two youths quitted Calvert, and placed themselves under Ludovico Carracci, whose school began about this time to be conspicuous in Lombardy, and under that great master they pursued their studies with an emulation advantageous to both. Having made considerable proficiency in the principles of the eclectic school, Guido proceeded to Rome, whither he was followed by Albano, whose talents soon excited attention in that metropolis of art. Annibale Carracci had been employed to ornament the chapel of San Diego, in the National Church of the Spaniards; but being disabled by illness, he recommended Albano to continue the work, which he finished so successfully as to obtain universal applause. He was next employed by the Marquis Giustiniani to embellish his villa at Bassano, where he painted the story of Neptune and Galatea, and the Fall of Phaeton. He executed also, in the Verospi palace, several mythological subjects, chiefly from Ovid, which exhibit great learning, taste. and ingenuity. His fame now began to spread throughout Italy, and he was invited by the Duke of Mantua to his court, where he remained a considerable time, and painted several pictures. Two from the story of Diana and Actæon, and Venus and Cupid, were considered particularly successful.

Among the large works executed by Albano, after his return to Rome, are an altar-piece in the church of St. Sebastiano, representing the martyrdom of that saint; and a picture of the Assumption, painted in conjunction with Guido. Some subjects are also in the tribune of Madonna della Pace. The best, at Bologna, are the Resurrection, in Santa Maria de Galeria; the Baptism of Christ, in San Gregorio; and in San Bartolomeo, the Annunciation. It is on his small pictures, however, that Albano's reputation is chiefly founded. He had neither power of conception, nor vigour of execution adequate to the performance of large works. Some of those last-mentioned, however, are tolerably successful, having been painted while he was fresh from the impression of the school of the Caracci, or excited by immediate competition with Guido; but the natural bent of his mind was towards subjects of feminine and infantine softness, to high finishing, rather than bold effect. All his latter works are small and elaborate; they became extremely fashionable during his day. Yet even in his favourite class of compositions, Albano is by no means entitled to high praise. It is strange that in his delineations of infantine character, studied from models immediately before him, (his own children,) and in the familiarity of domestic intercourse, he should not occasionally have caught some of those happy accidents, those momentary graces of action and expression, which children, when free from constraint, continually exhibit. But Albano's grace is entirely conventional. This species of affectation, however, has always had its admirers, and Albano is extolled for it by Malvasia in a ludicrous strain of criticism; 'Albano did not,' says he, 'feign Cupid heavy and sleeping as Guido did, but represented him majestically seated on a throne, &c.' The same artificial character pervades the landscape backgrounds of Albano. There is, nevertheless, in these landscapes, an occasional association of classical imagery which has an agreeable effect. Albano was well acquainted with antique sculpture, but displays no indication of such knowledge in his male figures; his women and children are better drawn. He might have become a good colourist, but for that anxious and elaborate mode of finishing which impairs the brilliancy of his tints, and gives his flesh the appearance of ivory. With all these deficiencies, the pictures of Albano have an originality, or rather a peculiarity, by which they are immediately recognized. There are, at Burghley-house, the seat of the Marquis of Exeter, some tapestries from his designs. Three of his pictures; viz., the Three Marys at the Sepulchre, and two Holy Families, are well engraved by Sir Robert Strange. Albano died Oct. 4, 1660.

ALBAN'S, St., a borough-town in Hertfordshire, situated close to the site of the ancient Verulamium (Verulam), being separated from it by the small river Ver, a feeder of the Colne. Verulamium was probably at first a British town and then a *municipium* under the Romans; a term which implies that its inhabitants possessed some of the privileges of Roman citizens. The Roman road, called by the Saxons the WATLING STREET, was also called Werlaem Street, because it first went direct to Verulam, passing close under its walls. (See Gibson's *Camden*, vol. i. 79.) Verulam was the scene of dreadful slaughter in the great rebellion under Boadicea, who destroyed here and at Londinium (London), and at other places, about 70,000 Roman citizens and their allies. The town was, however, restored, and continued to be a principal Roman station while that people possessed this island. Here an eminent citizen, Alban, is said to have suffered martyrdom in the persecution under Dioclesian. In his honour a monastery for one hundred Benedictine monks was erected in 793 by Offa, king of Mercia, one of the Saxon kingdoms established in Britain.

Ulsinus, or Ulsig, the sixth abbot, may be regarded as the founder of the modern town of St. Alban's; for he (about A.D. 948) erected three churches on the three principal roads leading to the monastery, laid out a place for a market, and encouraged the people of the neighbourhood to build by supplying them with money and materials. In the years 1455 and 1461, during the wars between the rival houses of York and Lancaster, two fierce battles were fought in the neighbourhood of the town;*. which must have been growing into considerable importance, as it obtained a charter of incorporation from Edward VI., A.D. 1553, and the elective franchise (which had been very long suspended) was restored before that time.

The town is well situated on the summit and northern declivity of a small hill, the abbey church being at a point where the three principal streets meet. It is well paved and lighted, and has a supply of good water. The part on the old line of the north road (which runs through the town) is narrow, and has many ancient houses. The other parts are more spacious and well built; and the new line of the north road is adorned with neat villas and one of the most commodious inns in the county. The principal churches are—the Abbey Church, a rectory in the patronage of the mayor and burgesses; St. Peter's, a vicarage in the patronage of the Bishop of Ely; and St. Michael's, which is on the opposite or S.W. side of the Ver, and contains the monument of Bacon, who bore the title of Viscount St. Alban's there are also several dissenting meeting-houses. The grammar-school was founded by Edward VI.; there is besides a Blue-coat school, supported by some property in the funds, and by subscription, for educating about thirty-five boys in the principles of the established church, and clothing them; and also a girls' school, supported by the Grimston family. There are several alms-houses; the principal, called Marlborough-buildings, or simply 'the Buildings,' for thirty-six persons, half of each sex, were built and endowed by Sarah, Duchess of Marlborough. Some remains of the walls of Verulamium are still discernible.

But the principal object in St. Alban's is the abbey church, which is part of the ancient abbey, purchased by the inhabitants of Edward VI. for a parish church, at the price of 400*l.* and a fee farm rent of 10*l.*, which last payment was in 1684 redeemed for 200*l.* The abbey itself had been granted by Henry VIII. to Sir Richard Lee, upon the seizure of the religious houses by that unscrupulous tyrant. The church is built in the form of a cross. It is in length more than 600 feet from E. to W., including a chapel at one end; and the extreme breadth is more than two hundred at the intersection of the transepts. From the intersection arises a square tower, divided by bands into three stages, and crowned by battlements and a spire, both of later date than the tower itself, which is one of the most perfect parts of the building; an advantage which it probably owes to a thick coat of plaister which once covered it. The vast extent of the church gives it an imposing appearance; but the effect is somewhat diminished, upon a nearer approach, by the heterogeneous materials of which it is composed; viz., Roman tiles from Verulam, flints, bricks, &c. The architecture, too, is far from uniform: the pointed arch and the round are to be seen on opposite sides; and, indeed, so great is the variety, that the style of every age may be traced in succession from the time of the Normans to that of Edward IV The most central parts are the most ancient. The choir is separated from the nave by St. Cuthbert's screen. There is also, a richly-carved screen over the altar; and several remarkable monuments, including those of Humphrey, Duke of Gloucester, and of the Abbots Ramryge and Whethamsted. The church suffered considerably during the Parliamentary war from the prisoners confined in it, and from the rapacity or zeal of the parliamentary troops. On the 3rd of February, 1832, a part of the wall on the south-west side fell down, and in its fall did considerable injury. This accident was the occasion of a subscription for the preservation of the building, and it has since been thoroughly repaired.

The gateway of the abbey is still standing; it contains the entrance to the house of correction on one side, and the goal for the liberty of St. Alban's on the other. The revenue of the abbey at the dissolution is estimated to have been 2510*l.**—a large income at that time. The abbot possessed also many privileges, and had a grant of precedence over all other abbots, from Pope Adrian IV. (Nicholas Breakspeare), the only Englishman who ever sat in the chair of St. Peter.

The population, according to the census of 1851, was 7000. The Borough of St. Alban's, which, since the census of 1851 was taken has been disfranchised (in 1852), comprised the Abbey Parish, part of the parish of St. Peter, also part of the parishes of St. Michael and St. Stephens, as fixed by the Boundary Bill Act of 2 and 3 Will. IV. c. 64. The poorer people are chiefly employed in making straw-plat, or in a silk-mill and a cotton-mill which have been established here. It has a market on Saturdays; and two annual fairs, one on the 25th and 26th of March, and a cattle and holiday fair on the 10th, 11th, and 12th October. There is a statute fair for hiring servants on the 29th September.

The borough returned two members to parliament before it was disfranchised in 1852, for systematic bribery carried on amongst the electors. It is governed by four aldermen and twelve councillors, one of whom is mayor. The goal delivery is four times a year, the town having a separate jurisdiction. The family of Beauclerc takes the title of duke from this town, and the family of Grimston that of earl from the ancient town of Verulam.

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* In the first of these, Henry VI. fell into the hands of the Yorkists, and in the last was rescued by his wife, Margaret of Anjou.

* So Stow and Speed: 2100*l.* Dugd.

St. Alban's is 20 miles N.W. by N. of London, and 12½ W. by S. of Hertford. [See Chauncy's *Hertfordshire; Newcome's History of St. Alban's; Boundary Reports.*]

ALBANY, LOUISA (COUNTESS OF), daughter of Prince Stolberg Gedern, in Germany, was born in 1753, and married in 1772 to Charles James Edward, called the young Pretender, grandson of James II. They resided at Rome, and had a little court, by which they were addressed as king and queen. In 1780, Louisa left her husband, who was much older than herself, and with whom she did not agree, and retired to a convent. She afterwards went to France; but upon her husband's death in 1788, she returned to Italy, and lastly settled at Florence. She was then secretly married to Count Alfieri, the Italian poet, who died at her house in 1803. She, however, went by the name of Countess of Albany, as the widow of the last of the Stuarts, up to the time of her death, which happened at Florence in the year 1824. She was fond of literature and of the arts, and her house was resorted to by the most distinguished persons at Florence, natives as well as foreigners. She caused a fine monument to be erected by Canova, in 1810, in the church of Santa Croce, to the memory of Alfieri. [See ALFIERI.]

ALBANY, a district situated at the eastern extremity of the colony of the Cape of Good Hope, in South Africa. This district at one time formed part of that of Graaf Reynet.

Albany is bounded on the north and north-east by the districts of Somerset and Victoria—its natural boundary in those quarters being the Great Fish River. On the east and the south it is bounded by the Indian Ocean; and on the west by the district of Uitenhage—its natural boundary on that side being the Bushman River. It contains, according to the government survey, 1792 square miles, or about 1,200,000 acres of surface, of which, in 1849, about 3200 acres were in crop. The district was formerly inhabited by the tribe of Ghonaqua Hottentots; but this race, whose numbers are now very much diminished, has retreated into Caffraria, leaving the European settlers in possession of the territory.

The Great Fish River, which flows round the border of the district to the north and east, rises in the Sneeuwbergen, or Snowy Mountains, and falls into the Indian Sea, in 33° 30′ S. lat., and 27° 20′ E. long. The Portuguese formed a settlement on its banks soon after 1498, when the commander of their Indian fleet gave his own name to the river, calling it Rio d'Infante. This settlement was soon abandoned, owing, it is said, to the constant and harassing inroads of the natives. The entrance to the river is obstructed by a bar of sand formed at its mouth; but within this, the depth of water is sufficient to float ships of the largest size.

The only river in the district of Albany which has a port, is the Kowie. The mouth of the river, however, is unfortunately barred by a large accumulation of sand, which renders its entrance dangerous even to small vessels. Attempts have been perseveringly made to deepen the channel, but with very little success.

The general appearance of the country is agreeable, being diversified by hill and dale, and in many places ornamented by timber trees, so as to wear the appearance of an immense park. Numerous springs and rills are met with in the valleys; and aloes, euphorbias, and some other succulent plants, are commonly found in such situations. The soil in many places produces an abundant spontaneous crop of coarse sour grass, to which the district owed its old Dutch name of Zuurveldt (Sour Field.) The cereal grains and pulse grown in Europe, as well as most culinary vegetables and artificial grasses, succeed well on the plains; while the slopes of hills are adapted to the culture of the vine. The vineyards and gardens of the district occupied in 1849 about 560 acres.

Lions, wolves, and the Cape leopard, are met with in this district, but are not in sufficient numbers to render them formidable enemies to the settlers: neither are buffaloes to [illegible] found in any great numbers; and elephants, which formerly abounded, are now less frequently seen.

The most important part of the trade of Albany consists in the traffic carried on by licensed traders with the native tribes beyond the boundary-line of the colony. This trade is carried on through a very wide extent of country in the Caffre territory. The principal articles procured are hides, horns, and ivory, together with a considerable number of live cattle. In return for these, they give blankets, woollen-cloths, iron, and various tools and utensils made of that metal. In consequence of the extent of pasture-land, particularly in the northern district called Upper Albany, the improvement of the growth of wool is an object of importance to the colonists of the district. Many manufactories have been established in the towns.

The chief town is Graham's Town. It is situated on the banks of the Great Fish River. In 1820, when 4000 British settlers arrived at Albany, this town was but a little village, which had risen up around a military station, formed by the officer whose name it bears. It now contains upwards of 6000 inhabitants, and is in point of importance the second town in the colony. It is situated in a flat uninteresting district, surrounded by low rocky sandstone hills. There is an excellent road connecting it with Port Elizabeth, Uitenhage, George, Zwellendam, and Cape Town.

[For further particulars, see CAPE OF GOOD HOPE.]

ALBANY, a river, fort, and district of British North America. The district forms a part of the Hudson's Bay Territory, and lies westward of James Bay. [See HUDSON'S BAY TERRITORIES.]

ALBANY, a town and port on King George's Sound, in Western Australia. The town is in 35° S. lat., 117° 52′ E. long. [WESTERN AUSTRALIA.]

ALBANY, the seat of legislation for the state of New York, is situated on the west bank of the Hudson River, 42° 39′ N. lat., and 73° 44′ 49″ W. long., 145 miles north from the city of New York, 164 west by north from Boston, and about 370 north-east from Washington. The city is situated partly on a low alluvial flat which runs along the margin of the river, and partly on a plateau which rises, to the west of the flat, about 220 feet in the distance of a mile. It consists of an old and a new part, the former exhibiting an irregularity which seldom appears in American cities, whilst the latter part has wide and regularly built streets. One street of considerable length runs parallel to the river, from which, at different points, streets strike off at right angles in a westerly direction, ascending the slope which leads up to the plateau. The principal of these streets is State Street, which, though at first narrow, widens out into a breadth of 150 feet, and continues of this breadth to its western extremity, where it terminates in a square, containing the Capitol and several other public buildings. The Capitol is a substantial and handsome stone building, 115 feet long and 90 feet wide; the walls are about 50 feet high, consisting of two stories, and a basement story of 10 feet. The columns, pilasters, and other decorations, are of marble, from Berkshire, in Massachusetts. The edifice is crowned with a dome, on which stands an image of the goddess Themis. It is on the west side of the square. On the east side of the square is the state-hall, a marble edifice, containing the government offices, and the city-hall, also of marble, with a gilded dome. There are about forty churches in Albany, several of which are excellent buildings. By far the most magnificent ecclesiastical erection is the Catholic Cathedral, which stands on an eminence, and is the most prominent object to one approaching the city from the south and east.

Albany is distinguished for her educational and literary institutions. In 1852, was founded the University of Albany, 'intended to be national in its character, and of a higher order than any similar institution in the country; its object is to furnish the graduates of American colleges the means of completing their education without going abroad. Its departments are of law, medicine, scientific and practical agriculture, civil and mechanical engineering, the mechanic arts, physical geography, political economy, history in its relations to civilisation, chemistry in its application to the arts, and astronomy.'—Lippincott, Grambo, & Co.'s *Gazetteer.*

The Albany Medical College, founded in 1839, has one of the best medical museums in the country, and a select library of 3000 volumes, of which 500 are accessible to the students free of charge. It had in 1852, 8 professors, 114 students, and 58 graduates.

The Albany Academy for boys, and the Female Academy, are well-equipped institutions. Both are incorporated; and the former, which fits for college or business, had in 1853 394 pupils, whilst the latter had 300 pupils.

In 1844, there was established a Normal School, under the control of the state, 'for the instruction and practice of teachers of common schools in the science of education and the art of teaching.' There are besides these establishments the Albany Institute, a scientific association, with a valuable mineralogical cabinet, and a library of 5000 volumes; and the Young Men's Association, with a library of 8000 volumes. There are 11 public schools, giving gratuitous education, which have libraries containing together 8000 volumes. The State Library, open to the public, contains 27,000 volumes. The old State-house building now contains the Agricultural Rooms, the Geological Rooms, and the State Museum of Natural History.

Albany, from its central position, is a place of great and increasing trade. It is at the head of the sloop-navigation of the Hudson, and can be reached by vessels of 80 tons. There is daily communication by water between it and New York, except during the severest part of the winter. It is connected with New York, Boston, Buffalo, and other towns, by railways; and communicates by means of canals with Lake Erie, Lake Ontario, and Lake Champlain. In this way it forms a kind of natural entrepôt between New York and a vast extent of interior country, comprising the Canadas, part of Ohio on the one side, and parts of the New England States on the other. The Erie and Champlain canals unite eight miles north of Albany, and thence run in one channel to the large basin at Albany. The tonnage of property arriving at Albany by canal in 1852, amounted to 1,019,307 tons; the tonnage cleared was 177,084 tons. 'One of the most important articles in the commerce of Albany is lumber. The clear pine of Michigan and Canada, the oak, cherry, and poplar of Ohio, the common pine of Pennsylvania and New York, meet here, furnishing probably the largest lumber-market in the world.' Agricultural produce also is an important part of its exports. There is a great variety of manufactures in Albany, which it is useless to particularise. It has ten newspaper offices, and ten banks. Its population in 1850 was 50,763.

Albany was originally a Dutch fort, erected in 1612 or 1614, called Fort Orange, and is therefore the oldest town in the United States, except James Town, on the James River, which dates from 1607. Somewhat later, it took the name of Williamstadt, which it retained till 1664, when the colony fell into the hands of the English. Its present name is derived from James II., to whom, when Duke of York and Albany, Charles II. granted the proprietorship of the colony.

Albany is also the name of the county of which Albany is the chief town.—Lippincott, Grambo, & Co.'s *Gazetteer of the United States.*

ALBATROSS (*Diomedea*), a genus of web-footed birds, comprising three species,—the albatross of China (*D. fuliginosa*, Latham); the yellow and black-beaked albatross (*D. chlororynchos*, Latham); and the common albatross (*D. exulans*, Linnæus). The genus is principally distinguished by the following characters: a very strong, hard, long beak, which is straight to near the extremity, when it suddenly curves. The upper mandible appears composed of many articulated pieces, furrowed on the sides, and crooked at the point; the lower mandible smooth and cut short; the nostrils lateral, and placed, like small rolls, in the furrow of the mandible; the feet short; the three toes long and completely webbed; the wings very long and narrow. The name Albatross is a word apparently corrupted by Dampier from the Portuguese *Alcatraz*, which was applied by the early navigators of that nation to cormorants and other large sea-birds. Grew wrote the word Albitros, and Edwards, Albatros.

[Albatross Diomedea exulans.]

The common albatross is the species which is most frequently met with in the seas of Southern Africa. It is the largest sea-bird known. On account of its size and colour it is often called the Sheep of the Cape,—a name under which it is found in several voyages. The top of the head is a ruddy grey; the rest of the plumage is white, with the exception of several transverse black bands on the back, and a few of the wing feathers. The feet and membrane are of a deep flesh colour; the bill a pale yellow.

The weight of this bird has been variously stated from twelve to twenty-eight pounds; and a similar difference appears to exist in authors with respect to the distance between the extremity of the extended wings. Forster says above ten feet,—Parkins, eleven feet seven inches,—Cook, eleven feet; another says twelve feet; a specimen in the Leverian museum measured thirteen feet; and Ives (p. 5) mentions one, shot off the Cape of Good Hope, which measured seventeen feet and a half from wing to wing. Dr. Arnott, in his Physics, says,—'How powerful must be the wing muscles of birds which sustain themselves in the sky for hours together! The great albatross, with wings extending fourteen feet or more, is seen in the stormy solitude of the Southern Ocean, accompanying ships for whole days without ever resting on the waves.'

We can, from this circumstance, readily understand the extensive range in which the albatross is found; not being confined, as Buffon imagined, to the Southern Ocean, but being equally abundant in the northern latitudes, though Forster says he never observed it within the tropics. These birds are seen in immense flocks about Behring's Straits and Kamtschatka about the end of June, frequenting chiefly the inner sea, the Kurile Islands, and the Bay of Pentschinensi, whereas scarcely a straggler is to be seen on the eastern or American shore. They seem to be attracted thither by vast shoals of fish, whose migratory movements the albatrosses follow. On their first appearing in those seas, they are very lean, but, from finding abundance of food, they soon become fat. Their voracity is so great, that they will often swallow a salmon of four or five pounds weight, and then, being half choked, and unable, in consequence, to move, the natives easily knock them down with a stick.

They do not, however, confine themselves to fish, but will prey on any other sea-animal; and Cook's sailors caught them with a line and a hook. The Kamtschadales take them by fastening a cord to a large hook, baited with a whole fish, which the birds greedily seize. Their usual food, however, seems rather to be fish-spawn and small *mollusca*. M. Querhoënt never found in their stomachs anything besides a thick mucilage.

Notwithstanding their strength, they never venture to attack other sea-birds, but are, on the contrary, attacked by the gulls. Several large grey gulls,' says Cook, 'that were pursuing a white albatross, afforded us a diverting spectacle: they overtook it, notwithstanding the length of its wings, and they tried to attack it under the belly, that part being probably defenceless: the albatross had now no means of escaping but by dipping its body into the water; its formidable bill seemed to repel them.'

Their flesh is tough and dry; but the Kamtschadales take them for the sake of their entrails, which they blow and use as buoys for their nets. They employ the wing bones, also, which Edwards says are as long as their whole body, for tobacco pipes.

ALBEMARLE (DUKE OF). [See MONK.]

ALBEMARLE, a county in Virginia, bordering on the east side of the Blue Ridge, and partly watered by the James River and its tributary the Rivanna. It is remarkable for the natural beauty of its scenery and its general salubrity. The county town is Charlottesville, which had a population of about 2600 in 1853, and is the seat of the University of Virginia. Near this town is Monticello, formerly the seat of President Jefferson, which contains his tomb. [See CHARLOTTESVILLE.]

ALBEMARLE SOUND is an inlet of the sea on the eastern coast of North Carolina. It is sixty miles in length, and its breadth varies from four to fifteen miles. The waters of the Roanoke and Chowan rivers fall into this Sound, which may be considered as the estuary of those streams. Both these rivers are navigable. The first named of them is navigable as far as the lower falls at Weldon, which are about 150 miles distant from the mouth of the river. The whole length of the Roanoke is 250 miles. The Chowan River is navigable for sloops for fifty miles—its whole length. Albemarle Sound communicates with Currituck Sound to the north, and Pamlico Sound to the south, by narrow inlets. The water is nearly fresh, and not affected by the tide wave of the sea, from which it is separated by a narrow island. A navigable canal, cut through the Dismal Swamp, connects the waters of the Pasquotank, which fall into Albemarle Sound, with those of Elizabeth River, whence a communication is obtained with Chesapeake Bay.

ALBERONI (CARDINAL GIULIO) was born in the state of Piacenza, in May, 1664. He was bred to the church, and became curate of a country parish. The Duke of Vendôme, who commanded the French army in Italy during the war of the Spanish succession in 1702-4, happening to be in the states of Parma, and being in want of corn for his troops, sent for Alberoni. The curate had become personally known several years before to Campistron, the poet, one of the Duke's followers, when the latter, travelling through Italy, and being stripped by robbers in the same neighbourhood, was kindly taken home by him and his wants supplied. Alberoni, who was a man of natural abilities and quickness, rendered himself useful to the French general; on which account, however, he became obnoxious to the opposite, or imperial party. When Vendôme was recalled from Italy, he took Alberoni with him, and obtained for him a pension of one thousand French crowns from Louis XIV. Alberoni followed the Duke into Spain, where the war was then raging in Catalonia. Vendôme employed Alberoni in his negotiations with the court of Philip V., where at that time the Princess des Ursins enjoyed the greatest influence. Alberoni found favour with the princess, whose intriguing mind was congenial to his own, and he became her confidant. Through her means he was constituted agent of the Duke of Parma at the court of Madrid; in which capacity he was instrumental in bringing about the marriage of Philip V. with Elizabeth Farnese, daughter of the Prince of Parma. He set off for Parma to stipulate the marriage-contract in the king's name. In the mean time, the Princess des Ursins having understood that the character of the future bride was not so mild as it had been represented by Alberoni, and that she was likely to endanger her own influence at court, prevailed on the king to despatch a courier to Parma, with orders to Alberoni to suspend the negotiation. The courier arrived on the eve of the day appointed for affixing the signatures. Alberoni, it was said, by threats or bribe, prevailed upon the man not to make his appearance until the day after. The marriage-contract was signed in December, 1714, and the new queen set off for Spain. The first favour she asked of her husband, in writing, was to dismiss the Princess des Ursins from court. The latter, who had set off from Madrid to meet her, received an order from Philip to quit Spain immediately. The new queen, in gratitude to Alberoni, had him appointed a member of the king's council, Bishop of Malaga, and, lastly, prime minister of Spain. He now devoted all his energies to rouse Spain from the state of weakness into which she had fallen during the preceding century, and make her act a principal part in the affairs of Europe. Alberoni was not scrupulous about means. In violation of the peace of Utrecht, he suddenly invaded the island of Sardinia, which had been secured to the emperor, and afterwards, in like manner, conquered Sicily,—the Duke of Savoy being then at peace with Spain. All Europe was astounded at this new war stirred up by Alberoni: England, France, and the emperor, resented his conduct; and an alliance was formed against Spain in 1719. Alberoni defied them all: he favoured the Pretender, in order to find employment for the English at home; he tried to excite disturbance in France, especially among the Protestants in the south, by claiming for Philip V. the regency of that kingdom during the minority of Louis XV.; and he even corresponded with Ragotski of Transylvania, and with the sultan, in order to divert the attention of the emperor. The latter sovereign was, in consequence, obliged to recall Prince Eugene, in the midst of his successful campaigns against the Turks, and to conclude with the latter a disadvantageous peace at Passarowitz. The clamour against Alberoni, on account of these intrigues, was universal. Pope Clement XI., who had been induced by Philip V. to make Alberoni a cardinal, was loud in his remonstrances against him. The fall of Alberoni was resolved by the allied powers as the only means of restoring peace to Europe. The Duke of Parma was prevailed upon to use his influence with the court of Spain, and especially with the queen, who being already weary of the haughty, overbearing tone of the cardinal-minister, induced Philip V. to write with his own hand an order for Alberoni's deposition, and his banishment from the Spanish territories. This happened at the end of 1719, after Alberoni had been minister about three years. Alberoni repaired to Italy, where he had transmitted large sums of money. Orders had been given by the Pope for his arrest, which Alberoni, however, evaded. A process was instituted, at the same time, against him at Rome, which he also contrived to protract. Pope Clement XI. having died in March, 1721, Alberoni suddenly repaired to Rome to attend the conclave, to the astonishment of the people, who crowded to see this famous personage. The new-elected Pope, Innocent XIII., quashed the proceedings against him.

Some time after, Alberoni was sent as legate to Romagna. But he had not yet totally forgotten his habits of intrigue; and being now unable any longer to disturb the peace of Europe, he contrived to embroil the diminutive republic of San Marino, which unfortunately was placed in the neighbourhood of his government. Under the pretence of remedying some discontents, he entered the town of San Marino, and called upon the citizens to swear allegiance to the Pope. Some ran away, others refused, and the rest complied through fear. The Pope, however, disapproved of Alberoni's conduct, and sent another legate, who reinstated the republican government. This occurred at the beginning of 1740. Alberoni, after this, retired to Piacenza, his native country, where he lived in affluence, and built a large religious house. He remained in retirement, forgotten by the world, till the 26th of June, 1752, when he died at the advanced age of eighty-eight.

Alberoni left a quantity of MSS., from which a work, called his *Political Testament*, published at Lausanne in 1753, was said to be derived. He is remarkable as one of the most prominent examples of that class of statesmen who rose to power by the most pitiful intrigues; and who, being uncontrolled by public opinion, thought their own ambition and their pretended zeal for their despotic masters a sufficient motive to plunge the people of Europe into continual wars, in which they had no real interest; and whose effects have so long retarded the natural progress of mankind in civilization by the efforts of peaceful industry.

ALBERT DURER. [See DURER.]

ALBERT I., Duke of Austria, and afterwards Emperor of Germany, was the son of Rudolf of Hapsburg, the founder of the imperial Austrian dynasty. Albert married the heiress of the former Dukes of Austria. After his father's death in 1291, he assumed the imperial title, in opposition to the votes of the electors, who had chosen Adolphus of Nassau. After several years' war between the two competitors, Albert defeated Adolphus, who was killed in battle in 1298. Albert then ascended the imperial throne, and received, after many difficulties, the confirmation of the Pope Boniface, VIII. He was next engaged in wars with the Bohemians, whose country he attempted to conquer, but without success. Soon after this, the Swiss forest cantons revolted, on the 1st of January, 1308, against Albert's lieutenants, whose government was arbitrary and oppressive: this was the beginning of the Swiss confederation. [See SWITZERLAND.] Albert, full of indignation, came with troops to chastise them: he advanced as far as Baden in Aargau, where he summoned his vassals and held a council for the reduction of the revolted cantons. On the 1st of May, 1308, Albert left Baden to return to Rheinfelden, where the Empress Elizabeth was. As he crossed the river Reuss at Windisch in a boat, he was separated from the greater part of his suite, his nephew, John of Hapsburg, and three other noblemen only, crossing over with the emperor. John, who had lately come of age, had been importunate with his uncle to restore to him his father's estates in Suabia, which Albert seemed determined to keep in his own possession. The nephew, despairing of justice, had formed a conspiracy with the three noblemen already mentioned, and as the party landed on the opposite bank of the Reuss, the conspirators fell upon the emperor and murdered him, in sight of his attendants on the other side of the river, who could give their master no assist once. Albert expired in the arms of a poor countrywoman who happened to pass that way. The murderers fled; two of them were afterwards taken and executed, as well as a number of other persons, mostly innocent, who were suspected to have been concerned in the conspiracy. Agnes, Albert's daughter, and Queen of Hungary, carried her vengeance for her father's death to a most dreadful extent. Nearly one hundred noble families, and one thousand persons not noble, of every age and sex, were involved in this inhuman proscription. The executions lasted several months. After this butchery, Agnes built a monastery on the spot where Albert had been murdered, which was called *Königsfelden*, and here she shut herself up for the rest of her days. The remains of this monastery and church are still to be seen, as well as the apartments which Queen Agnes occupied. Königsfelden is on the high road from Basle to Baden and Zürich in Switzerland, and in sight of the Castle of Hapsburg, from whence the House of Austria originally sprung.—Johann Muller, *Geschichte der Schweitzer*.

ALBERT II., King of Hungary and Bohemia, and Duke of Austria, succeeded Sigismund as Emperor of Germany in 1438. He held a great diet at Nuremberg, in which the *Vehmic* or secret courts were suppressed. He died the following year, as he was preparing to take the field against the Turks who were ravaging Hungary.

ALBERT, Archduke of Austria, son of the Emperor Maximilian II., was made a Cardinal and Archbishop of Toledo. He was appointed by Philip II., in 1596, governor of the Low Countries, and succeeded the Duke of Parma in the difficult task of carrying on the war against the Dutch, who had revolted from Spain. He resigned the cardinalship and married Elizabeth of Austria, daughter of Philip II., who brought him Flanders and Franche Comté as her dowry: he thus became sovereign, nominally at least, of the Belgic provinces. In July, 1600, he fought the battle of Nieuport against the Dutch under Maurice of Nassau: this engagement, in which Albert was defeated, decided the independence of Holland. Albert next besieged Ostend, which he took after a long and murderous siege, in which one hundred thousand men are said to have lost their lives on both sides. In 1609, Albert concluded a truce with the Dutch for twelve years, before the expiration of which he died, in 1621. He left no children; and the dominion of Flanders reverted to Spain.

ALBERT, Prince of Mecklenburg, was called to the throne of Sweden in 1364, by the nobility who had deposed King Magnus. The partisans of the latter, joined with Haquin, King of Norway, carried on the war for several years; at last Magnus formally gave up the crown to Albert in 1371. Waldemar, King of Denmark, dying in 1376, his daughter Margaret, widow of Haquin, King of Norway, became queen of both Denmark and Norway, and soon after the Swedes, being dissatisfied with Albert, who favoured his German countrymen at their expense, offered to Margaret the crown of Sweden. After several more years of war, a decisive battle was fought at Talkoping in West Gothland, in which the queen's forces defeated Albert, and took him prisoner in 1388. Peace, however, was not re-established in Sweden till 1395, when Albert consented to give up his claims to the crown. He then retired into Mecklenburg, where he died. Margaret of Waldemar thus united the three northern kingdoms under one sceptre.

ALBERT, Margrave of Brandenburg, and first Duke of Prussia, was born in 1490. He was elected, in 1511, Grand Master of the Teutonic order, who held dominion over Prussia proper, that part of the present kingdom of Prussia which borders on the Baltic Sea. He fought against Sigismund, King of Poland, for the defence of his order, who had been for ages at war with the Poles. Peace was made in 1525 at Cracow, in which Albert managed to have the duchy of Prussia secured to himself and his descendants as a fief of the crown of Poland, thus laying aside the rights of the order. Albert some time after embraced the Protestant faith, and married a Princess of Denmark. One of his descendants, Frederick William, elector of Brandenburg, threw off the allegiance of Poland, and his son, Frederic I., changed the title of duke into that of King of Prussia in 1701. [See Brandenburg.]

ALBERTI, (LEON-BATTISTA,) a distinguished mathematician, but more celebrated as an architect, and hardly less so as a philosopher, poet, painter, and sculptor. He was of the ancient and noble family of the Alberti of Florence, in which city he was born about the year 1400,—Milizia says, in 1398. He was nephew of the Cardinal Albert of the Alberti, and he himself became a canon of the metropolitan church of Florence, having adopted the clerical profession it is understood, that he might have leisure to give himself up to useful learning. To his father Lorenzo, (Laurence,) he was indebted for great care and attention in his education; and hence study became so much the habit of his life, that he is said never to have spent an hour in idleness, nor even to have passed a day without reading. Having devoted much of his attention to the acquisition of the principles of architecture, by the observation and admeasurement of the remains of ancient edifices in various parts of Italy, and the study, it may be presumed, of the writings of Vitruvius, Alberti became distinguished among the promoters of the then new style, which has been called a restoration of the ancient and classical. This he practised in all the works on which he was employed, but not always with the effect which the admirers of the style require. When at Rome, Alberti was employed by the then Pope, Nicholas V., to repair the ancient aqueduct of the Aqua Vergine, and to construct the fountain in which one of its conduits issues. This is the great Fontana di Trevi, which stands at the foot of the Quirinal; but the structure was so much decorated by Salvi in the pontificate of Clement XII., that not a vestige now remains of the design of Alberti, or of its former simplicity. It is understood that Alberti was commissioned by Pope Nicholas to rebuild the Vatican Basilica, but that he had hardly commenced his preparations for the construction of an immense tribune, beyond the upper end of the ancient structure, when the pope died, and the undertaking was for that time abandoned. For the same pontiff he had made a design for covering the bridge of St. Angelo, so as to protect those who passed over it, in their way to and from St. Peter's, from the intense heat of the sun; but it was never carried into execution.

At Florence, Alberti succeeded to the direction of several works which had been commenced by Brunelleschi and left unfinished at his death. He designed and executed in Florence, of himself, the Palazzo Rucellai, the choir and tribune of the church of the Annunciation, which latter he made in the manner of an ancient circular temple; and some attribute to Alberti, but, it would appear, without sufficient reason, the principal front of the church of Sta. Maria Novella. At Mantua, for the Duke Lodovico Gonzaga, he executed several edifices; the most important and most meritorious of which was the church of St. Andrew, the interior of which, however, has been very much injured by later alterations and additions. But the most esteemed architectural work of Alberti is the church of St. Francis at Rimini, which he was employed to decorate by Sigismondo Malatesta, lord of that city. This he did by removing, as much as he could, the picturesque peculiarities of a fine old church of the middle ages, and substituting the commonplaces of the Italian style of his time in their stead.

At the early age of twenty, Alberti had composed the comedy *Philodoxios*, in which he imitated the style of the Latin comic poets so nearly as to impose upon Aldus Manutius, the younger, who himself edited, printed, and published it, as from an original and recently-discovered manuscript. Alberti tried to introduce the Latin rhythmus into Italian poetry, but did not succeed. He wrote a work on sculpture —*Della Statua*—which was followed by another on painting —*De Pictura*—which he calls '*prædilectissimâ et nunquam satis laudatâ arte*; but his last and most esteemed work is his treatise on architecture, *De Re Ædificatoria*. This was not published until after his death, when it was edited by his brother Bertrand, and, at his own desire, dedicated to Lorenzo de' Medici, who had been his kind and constant friend in life. Milizia says of it, that 'it is a work excellent for architects, though overloaded with useless erudition.'

Alberti was highly estimable as a man and a member of society. He is reported to have been amiable and generous: to have never disagreed with his competitors, because he did not dispute for profit with them. He lived peaceably, esteemed as his merit deserved, and died in his native city at an advanced age, though the exact period of his death is not known. The monument of his family yet exists in the church of the Holy Cross (*della Santa Croce*) in Florence, under which it is probable that he too lies buried.

ALBERTUS MAGNUS, so called because his family name was *Groot*, which, in Dutch, means 'great.' The admiration of an ignorant age transformed into a laudatory epithet the sirname, which had been latinized in conformity to the then prevailing fashion. He was born in Suabia in 1205, and entered the order of Dominicans. Pope Alexander III. invited him to Rome and bestowed on him several dignities, with the bishopric of Ratisbon, which he afterwards abdicated, and returned to live at his convent at Cologne as a plain monk. He there gave public lectures which were much frequented by the principal scholars of the age. Thomas Aquinas was among his disciples. Pope Gregory X. called him to the general council held at Lyons in 1274, where several important decrees were passed for the reformation of the church, and concerning the future elections of popes, for which purpose the conclave or council of cardinals was then first instituted. Albert died at Cologne in 1282, aged 77. He was a most prolific writer; his works, collected and published at Lyons in 1651, fill twenty-one thick folios. But most of these have been long since forgotten. His physics were taken chiefly from Aristotle, and his Arabian commentators. The *Historia Animalium* is, perhaps, the most remarkable for the time in which Albert lived, and he seems to have had access to ancient authorities which have since been lost. Several prodigies have been absurdly attributed to Albert, among others, that of having constructed a head of brass which had the faculty of answering questions. There are also collections of supposed *secrets*, which have erroneously been published under his name; among others, one, *De Secretis Mulierum et Naturæ*, printed at Amsterdam in 1655, which is believed to have been written by one of his disciples.

ALBIGENSES, a religious sect which appeared in the South of France in the twelfth century, and was the object of long and cruel persecutions and wars. The denomination of Albigenses has been used by historians and other writers in two senses, and often indiscriminately. In its more restricted and appropriate sense, the Albigenses were a branch of the Cathari, who were themselves the descendants of the Paulicians, a branch of the Manicheans, from the East; and who, being persecuted by the Greek emperors and clergy, took refuge during the eleventh century in Italy, from whence they spread into the South of France, Spain, and other countries. They were called, in Italy, Cathari, or *pure;* also Paterini, from a place in Milan where they held their meetings; and Gazari, from Gazaria or Lesser Tartary, the country from which they came; they were called, in France, Bulgares for a similar reason; and afterwards Albigenses, from Albiga, Albi, the town where their tenets were condemned by a council in 1176. But the Cathari were divided into two sects, one of which held the old Manichean doctrine of two eternal beings, one the God of Light, who was also the Father of Jesus, and the other, the Principle of Darkness, who was the creator of the material world. This sect was also called Albanenses. The other division of the Cathari believed in one eternal principle, the Supreme God and Father of Christ, by whom the *first matter* was created; until the *Evil Being*, after his rebellion against God and his subsequent fall from heaven, arranged this original matter according to his own fancy, and gave it its present form and attributes. They believed that human bodies in particular were the production of the evil principle. The Albigenses belonged to this latter sect, which was also called Bajolenses or Bagnolenses. They had bishops, vicars, and deacons; they preached abstinence, mortification, and celibacy; their community, however, was divided into two classes, the *Consolati*, or comforted, who lived in perpetual celibacy, abstained from meat and wine, and practised other austerities; and the *Confederates*, who, being unable to endure this mode of existence, lived apparently like the rest of the world, but bound themselves to enter before their death into the class of the 'Comforted,' by a ceremony of inauguration. But, in the more extended sense, the name of Albigenses was given in the twelfth and thirteenth centuries, not only to all the Cathari indiscriminately, but also to the other sects which existed in the South of France at the time, including the Waldenses, who were very distinct in their tenets from the others, and had no taint of Manicheism in them. They all agreed, however, in considering the authority assumed by the Popes in spiritual matters, as well as the discipline and ceremonies of the Roman Church, as unlawful and erroneous. Pope Innocent III. sent two legates, Peter of Castelnau and one Rainier or Raoul, both Cistercian or Bernardine monks, as his legates to France, in order to extirpate all these heresies. Dominic, a Spaniard, and the founder of the order of Preachers, returning from Rome in 1206, fell in with the legates, and volunteered his services in the same cause. These champions, who, without asking for the advice or the concurrence of the local bishops, and upon the sole authority of the Pope, inflicted capital punishment on those heretics whom they could not convert by argument, were called, in common discourse, *Inquisitors;* but the famous tribunal of that name was not established until 1233 by Gregory IX., who entrusted it to the Dominicans. In 1208, Castelnau, one of the legates, who had become odious by his severities, was murdered near Toulouse; and Innocent III. on this proclaimed a regular crusade against the Albigenses, and against Raymond VI., Count of Toulouse, who supported them. All the French barons were summoned to take the field; and Simon, Count of Montfort, was appointed chief of the expedition, under the direction, however, of Arnald, Abbot of the Cistercians, and the Pope's new legate. The war began in 1209, and lasted many years, attended by circumstances of the greatest ferocity. At the taking of Beziers a general massacre of the inhabitants began. The legate being asked by some of the military leaders how they were to distinguish the Albigenses from the orthodox Catholics, of whom there were many in the town,—'Kill them all,' was the reply; 'God will find out his own.' Montfort lost his life at the siege of Toulouse, in 1218, and Raymond, his adversary, died in 1222. The war, however, was resumed by the sons of the two antagonists; until Pope Honorius III., alarmed at the successes of Raymond VII., induced Lewis VIII., King of France, to take the field in person. At last the Count of Toulouse, pressed on all sides, made peace with the king in 1229. This was a mortal blow to the Albigenses. The Inquisition was now permanently established at Toulouse to try those heretics who had escaped the sword. Raymond himself died some years after; and in him the house of the Counts of Toulouse became extinct, and its territories reverted to the French crown. The extermination of the Albigenses in the South of France was complete; the country was devastated; and the language and poetry of the Troubadours became also extinct, the bards themselves being obliged by the terrors of the Inquisition to fly to other lands. See *General History of Languedoc;* Paris, 1730: and Mosheim's *Eccl. History*. Among recent writers on the subject are, Fauriel, *Croisade contre les Alb.;* Paris, 1838. Faber, Lond. 1838. Hahn, *Geschichte der Ketzer im Mittelalter:* Stuttg. 1845.

ALBI'NOS, a word of Portuguese origin, by which the Portuguese voyagers denominated the white negroes whom they found on the coast of Africa. These negroes were also termed *Leucæthiopes*,—a term signifying white negroes. Both names are now used, but the former popularly, to designate individuals who exhibit characters similar to those observed in the white negroes, among whatever race or in whatever country the variety may arise.

These singular beings are distinguished from other individuals of the human race by remarkable characters, which are invariably the same among whatever people or under whatever external circumstances the variety is found. Their most striking peculiarities consist in the colour of their skin and in that of their hair and eyes.

Their skin is of a pearly whiteness, without any admixture whatever of a pink or a brown tint. In the snow-white skin of the fairest European woman there is always some tint of a pink or brown colour, but in the Albinos the skin is wholly destitute of either tinge, and is of a dull pearly whiteness. It is often not soft and smooth in proportion to its whiteness, as is generally the case with the blonds of the European race; but, on the contrary, is rough, dry, and harsh, sometimes to such a degree that it has been compared to the skin of persons labouring under the disease called *lepra*, or leprosy.

The whiteness of the hair always corresponds to the whiteness of the skin. Not only the hair of the head, but also that of the eyebrows, eyelashes, beard, and even the soft down that covers the external surface of the body, has the same unnatural whiteness. And this whiteness of the hair is not like the soft, snowy whiteness of the hoary hair of old age, and still less like the delicate yellow or flaxen tint of the fair-haired European woman, but is rather like that of the white horse.

With this whiteness of the skin and hair is connected a still more striking peculiarity,—namely, a disagreeable redness of the eyes. That part of the eye called the iris is of a pale rose colour, while the pupil is intensely red: in a word, the eye is exactly similar to that of the white rabbit and the ferret

In all persons there is a correspondence between the colour of the skin and that of the hair and eyes; and the close connexion of those parts, in regard to colour, is strikingly illustrated in the Albino,—in whom the colouring principle common to them all is absent, and in whom this deficiency of colour is never found in one of these parts singly.

Some inconvenience certainly arises from the conformation of the eye peculiar to the Albinos. A strong light cannot be borne, and even the full glare of day appears to excite some degree of uneasiness. Hence the eyelids are usually more drawn over the ball of the eye than is common with other persons, and the eyes are generally weak, tender, and watery; while vision is more agreeable and more perfect in twilight. But the inconvenience of an ordinary degree of light, and the advantage of imperfect darkness, have been exaggerated.

The physical, intellectual, and the moral qualities, associated with this singular conformation of the body, have not been stated with distinctness and accuracy. It would seem that the Albino is both physically and mentally somewhat weaker than other men. All accounts agree in representing his physical strength as inferior to that of persons of the ordinary conformation. Saussure, in his *Voyage dans les Alpes*, expressly states, in relation to two boys whom he examined with much attention at Chamouni, that, when they were of a proper age, they were unable to tend the cattle like the other children; and that one of their uncles maintained them out of charity, at a time of life when others were capable of gaining a subsistence by their labour. Wafer, the old voyager, in his account of the Indian Albinos in the Isthmus of Darien, while he represents them as being as nimble in the moonlight as the other Indians, states that they are not so strong and lusty. But in what degree their intellectual powers are confined, or whether indeed there be any decided inferiority, we have at present no means of forming an accurate judgment.

It would seem that there is a greater tendency to the formation of this variety in some parts of the world than in others. It is more common among the African and the Indian tribes than among the European people. In the Isthmus of Darien, and in some of the oriental islands, it is so frequent that some writers have conceived that those persons form a distinct and peculiar tribe; but for this opinion there is no foundation. Mr. Bowdich, however, states that the king of Ashantee, who seems to have considered persons of this description as a great curiosity, and to have indulged his taste for collecting them in a truly oriental manner, had assembled about him nearly a hundred white negroes. Blumenbach states that he has himself seen sixteen Albinos in various parts of Germany; and examples have been not unfrequently found in Denmark, England, Ireland, France, Switzerland, Italy, the Grecian Archipelago, and Hungary*. It is common in both sexes, but it would appear to be somewhat more frequent in males than in females.

In order to form a just conception of the anatomical conditions on which the peculiar character of the Albino depends, it is necessary to understand the structure of the skin, and in part, also, that of the eye. The human skin is composed of three distinct parts, the *cuticle*, or the scarf skin; the *cutis vera*, or the true skin; and a third substance interposed between these two parts termed the *corpus* or the *rete mucosum*. The cuticle or the scarf skin is the external covering of the body. It is commonly conceived to be altogether destitute of blood-vessels, nerves, and absorbents; that is, it is supposed to be wholly insensible and inorganic; while the cutis vera or the true skin is highly organized, abounding with blood-vessels, nerves, and absorbents, and is acutely sensible. The cuticle then is an insensible covering or sheath, every where spread out over the exquisitely sensible cutis in order to defend the latter, and to soften and modify the impressions made upon it by external bodies. Now among all the varieties of the human race in all climates, both the cuticle and the cutis are colourless, or nearly so; but there is interposed between them the substance already mentioned under the name of the corpus or the rete mucosum, on which the colour of the body depends. This substance is not distinguishable as a distinct body in the European and the other white varieties of the human race; at least the most careful anatomists declare that, with all the pains they have taken to discover it, they have been unable to demonstrate its existence. But in the Negro, the Caffre, the Malay, and so on, the existence of this substance as a distinct body is clearly demonstrated. In these tribes it assumes the form of a black or exceedingly dark membrane interposed between the cuticle and the cutis. This membrane is about as thick as the cuticle itself and even thicker in the Negro, and its colour is darker on the surface next the cutis than in that next the cuticle. By dissection, especially when aided by a slight degree of putrefaction, it is easily separated both from the cuticle and the cutis. It is this membrane which is termed the rete mucosum, and it is this which is the seat of the different shades of colour of the human race. It is composed of a delicate cellular tissue containing a dark substance on which its colour depends. Every variety of tint with which the human skin is dyed, whether it be white, yellow, red, brown, or black, and every intermediate shade of colour, from the snowy whiteness of the most delicate European female to the deep ebony or jet black of a Gold-coast Negress, depends on the darkness or the lightness of the colouring matter contained in the rete mucosum. Now in the Albino, this substance, if it exist at all, is wholly destitute of colouring matter, and hence the dull pearly whiteness of the skin. The colour of the hair is generally admitted to depend on the colour of this same rete mucosum; and hence, when this membrane is wholly deprived of colour, the hair is reduced to its simple organic ground work, and is also destitute of colour.

But the peculiar redness of the eye is owing to the absence of the colouring matter from certain membranes of the eye. The posterior surface of the iris, and the surface of the membrane of the eye termed the choroid coat, are both, in the natural state, covered with a dark-coloured pigment termed the *pigmentum nigrum*. The blood-vessels that enter into the composition of the iris and the choroid membrane are exceedingly numerous; but when the eye is natural, these blood-vessels are concealed by the black pigment of which we have just spoken. When, however, this pigment is absent, there is nothing to conceal these vessels from the view; they are soon filled with red blood, and they are so numerous as to give to these parts of the eye the appearance of intense redness. In the Albino, the colouring matter of the eye, like that of the skin, is wholly absent, and the eye appears intensely red because the blood-vessels of the most highly vascular part of the organ are left entirely naked and exposed to the view.

Such is the modification of the organs so singularly affected in this curious variety of the human species. But of the cause of this peculiar affection of the organs in question we are wholly ignorant; and the speculations of Buffon on this subject afford a striking example of the absurdities into which men, even of acute minds, fall when they substitute conjecture for investigation, or deem it consistent with the spirit of philosophy to place trust in fancy, when they are without knowledge. Thus, assuming that white is the primitive colour of nature, he says, that this colour may be varied by climate, food, and manners, to yellow, brown, or black; that these colours may, under certain circumstances, return to the primitive colour, but so much altered, that it has no resemblance to the original whiteness, because it has been adulterated by the causes that have been assigned. Nature, he tells us, in her most perfect exertions, made men white; and this same nature, after suffering every possible change, still renders them white; but the natural or specific whiteness is very different from the individual or accidental. It is useful, occasionally, to recur to what was formerly considered, and is still sometimes considered, as an explanation of the phenomena of nature.

Some writers represent the peculiarities which distinguish the Albinos as altogether the result of disease. They found this opinion on the roughness and harshness of the skin, on the tenderness of the eyes, and the comparative physical weakness of these individuals. But the harsh and almost leprous appearance of the skin, though sometimes found, is by no means universal; the tenderness of the eyes arises from the increased sensibility of the organs in consequence of the abstraction of the dark-coloured substance by which, in the natural state, they are defended from the light; and, even admitting it to be a fact, which, however, does not appear to be fully established, that these persons are physically weaker than other men, it would not follow that this weakness is the result of disease. As far as can be judged from external appearance, and from their accounts of their own feelings, the white Negroes appear perfectly healthy; and we know that European Albinos exhibit not a single mark of any disease whatever. It is also certain that domestic animals which exhibit varieties perfectly analogous to those of the human Albinos are free from disease, as is familiarly known with respect to the sheep, pig, horse, cow, dog, cat, rabbit, &c.—for the Leucœthiopic constitution occurs both in domestic and in wild animals: it has been observed not only in the sheep, pig, horse, &c. but also in the mouse, ferret, monkey, squirrel, rat, hamster, guinea-pig, mole, opossum, martin, weasel, roe, fox, rhinoceros, elephant, badger, beaver, bear, camel, buffalo, and ass; and even in the crow, blackbird, canary-bird, partridge, common fowl, and peacock. It is remarkable, however, that it has never been seen in any cold-blooded animal. In all the mammalia and birds just enumerated, the nature and characters of the deviation seem to be perfectly analogous to those of the human Albino. The pure whiteness of their skin and other integuments, and the redness of the iris and pupil, mark the same deficiency of colouring matter. A white mouse, possessed by Blumenbach, exhibited the same inability to bear the light which has been observed almost universally in the human examples: the animal kept its eyelids closed even in the twilight.

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* See Lawrence's Lectures on the Natural History of Man, &c., p. 262.

ALBI'NUS (BERNARD SIEGFRIED), one of the most celebrated anatomists of the eighteenth century, was born at Frankfort, in the year 1697. He gave early promise of extraordinary ability which he did not disappoint in his riper years. From his father, who was professor of the practice of medicine in the University of Frankfort, but who subsequently filled the chair of anatomy at Leyden, then the most celebrated school of medicine in Europe, his son imbibed a taste for the art which he afterwards pursued with such splendid success. The position of his father afforded him the advantage of studying from his early youth under the greatest masters of the age—Boerhaave, Ruysch, and Rau—and after completing the usual course of education at Leyden at a very early period, he visited France, where he formed an intimate acquaintance with Winslow and Senac. So well did he avail himself of these opportunities of acquiring knowledge, that his attainments gained him the respect and friendship of each of these eminent men, and by their influence, and more especially by that of Boerhaave, he was elevated, at the age of twenty, to the anatomical professorship of Leyden. This chair he occupied without interruption and with extraordinary celebrity for the space of half a century. He is said to have taken great pains with his lectures, and to have possessed the happy art of communicating whatever knowledge he possessed in a clear and interesting manner to his pupils. He was a most laborious and indefatigable dissector; and excelled in making anatomical preparations, and especially in the art of injecting, the mode of performing which he had probably learned from his master Ruysch. But the circumstance by which he was most distinguished was the application of painting to the illustration of anatomy. When not occupied in teaching, his hours were devoted to the careful dissection of different parts of the body, the faithful representation of which he secured by engaging the most excellent painters that he could procure, and by constantly superintending and directing their drawings. In this manner he obtained admirable drawings of the muscles and bones of the human body, the arteries and veins of the intestines, and the bones of the fœtus. But though he surpassed all other anatomists in the description, no less than in the delineation of the bones and muscles, and added much to anatomical science by the originality of his observations, yet he did not disdain to edit the works of his illustrious predecessors, but published correct and elegant editions of the works of Harvey, the *Anatomy* of Vesalius, and of Fabricius of Acquapendente, and the fine *Anatomical Plates* of Eustachius. By this means he directed the attention of his contemporaries to what was most valuable in the labours of those who had preceded him in his favourite pursuit. The circumstance most to be regretted in his public life was the bitter controversy in which he engaged, respecting a claim to a discovery to which neither was entitled, with the illustrious Haller, who had been his domestic pupil. The field of science is not yet wholly free from contention and strife; but it is gratifying to observe that in the present day among the cultivators of philosophy, in all its departments, there is no example of such rancorous hostility as was frequent in a former age. (For a list of the works of Albinus, see Watt's *Bibliotheca Britannica*, vol. i. p. 14, *a*.)

ALBION, the oldest name by which the island of Great Britain was known to the Greeks and Romans. Great Britain and Ireland were known by the general appellation of the Britannic Islands, while the former was designated by the particular name of Albion or Alwion, and the latter by that of Ierne, Iouernia, or Erin. Cæsar does not use the word Albion: his name for England is Britannia. Pliny says (iv. 16), 'the name of the island *was* Albion, the whole set of islands being called Britannic.' The word *Albinn* is still the *only* name by which the Gaels of Scotland designate that country; and the word signifies in the Gaelic language *white* or *fair* island. The word *alb* itself is not now in use in the Gaelic, but is probably the same root that we find in the Latin adjective *alb-us*, and in the word 'Alps.' *Alb*, however, is found in Armstrong's Gaelic Dictionary. The termination *i*, *inn*, or *innis*, signifies 'island.'

The name of 'Albion' was probably given to England by the Gaels of the opposite coast, who could not fail to be struck with the chalky cliffs that characterize the nearest part of Kent. Settlers from Gaul probably came over to Britain; and their descendants, as we presume the Gaels of Scotland to be, though now confined to the northern part of the island, still retain among them the name of Albinn, by which the whole country was once designated. [See ENGLAND. See *Thoughts on the Origin, &c. of the Gael*, by James Grant of Corrimony. Armstrong's *Gaelic Dictionary*.]

ALBION, NEW. The name given by Sir Francis Drake to the province of California and part of the adjoining north-west coast of North America, visited by him in 1579; but subsequently limited by Humboldt, and other modern geographers, to that portion of the continent between 43° and 48° N. lat. It is now included in the territories of Oregon and Washington, U. S. [See OREGON in *Suppl.*] The following notice refers to it before it began to be visited by fur-traders, and peopled by settlers.

After Drake's visit, this region remained for a long time unexplored. Cook was there during his third voyage in 1778; but it was not until April, 1792, that the coast was minutely surveyed by Vancouver. The part of the country inland, which was most particularly described by this navigator, was in the neighbourhood of Port Discovery, in the supposed strait of Juan de Fuca, and the position of which is stated by Vancouver to be in 48° 7′ N. lat., and 122° 40′ W. long. He represents this country as being of a moderate height near to the shore, but bounded on the east by mountains covered with snow, to which the land from the water's edge rises in a pleasing diversity by hills of gradual ascent, covered with pines to their very summits. The soil he found to be, for the most part, a light sandy loam, in several places of considerable depth, and abundantly mixed with decayed vegetables. The forest trees, which appeared to grow very luxuriantly, consisted principally of silver pines, the Turamahac and Canadian poplar, arbor vitæ, common yew, black and common dwarf oak, American ash, common hazel, sycamore, sugar maple, mountain and Pennsylvanian maple, American alder, and common willow. These trees were for the most part encumbered with a luxuriant growth of underwood. Vancouver considered that the country was capable of high improvement in an agricultural point of view. The spontaneous productions, which he found in the vicinity of the woods, were nearly the same and were growing in equal luxuriance with those under a similar parallel in Europe. He found but few esculent vegetables; the white or dead nettle and samphire were most common: he likewise observed the wild orache, two or three sorts of wild pease, and the common hedge mustard. The two last-mentioned species were found to be excellent of their kind. He likewise gathered some gooseberries and roses.

The only living quadrupeds seen, were a black bear, two or three wild dogs, a few rabbits, several small brown squirrels, rats, and mice, and the skunk, the effluvium from which is described as being most intolerably offensive. Aquatic birds were seen on the coast in great numbers. Among them were some species of the tern, the common gull, the sea-pigeon of Newfoundland, curlews, sandlarks, shags, and black seapies, like those found on the coasts of New Holland and New Zealand. The number of birds in the woods was not great: a few spruce partridges were seen, and of smaller birds but very few either in number or variety of species. Some considerable numbers of white headed and brown eagles, ravens, crows, American kingfishers, and woodpeckers, were observed about the water-side; and a bird, with light-brown plumage, of the crane or heron species, was frequently seen; its eggs, which were considerably larger than those of a turkey, were of a bluish cast and had a pleasant taste. These birds, whose bodies were about the size of the largest turkey, were not less than four feet high when standing erect. Some blue and some nearly white herons of the common size were also seen.

Only a few reptiles were observed, and none of them were troublesome. A small common black snake, a few lizards and frogs, together with a variety of common insects, were the only animals of this description noticed.

The mineral productions generally found were iron ore, quartz, agate, common flints, and compounds of siliceous, with calcareous, magnesian, and argillaceous earths.

The native inhabitants of the coast were not numerous. They adorned their persons with paint, in the same manner, but not to so great a degree, as the inhabitants of Nootka, whom they much resembled in their general appearance. Some few of those seen by Vancouver wore dresses made with bark, others were dressed in the skins of animals, of the species usually found in the north-west part of North America, while the greater number were clad in woollen garments,—and the whole were made with a considerable degree of neatness. Those people further showed their desire of considering their personal appearance by their fashion of wearing the hair, which was generally combed and tied behind.

Their spears and arrows were fashioned similarly to those of the inhabitants of Nootka: they were generally barbed and pointed, sometimes with flint, agate, or bone, but more commonly with thin flat iron. It is remarked as an extraordinary circumstance by Vancouver, that, in their purchases, they were more ready to part with weapons pointed with iron, than with others. Their bows were all made of yew, and of superior construction. They were strengthened, some with a strip of an elastic hide, others with the skins of serpents, neatly and firmly affixed to the wood by means of a cement, the adhesive property of which is described as being so great that it is impossible to effect a separation between the two substances without destroying both. This cement is not affected by either damp or dry weather. The bowstring is made of the sinews of marine animals.

The inhabitants did not remain long in any one spot. Several deserted villages were seen, the huts being made of a few crossed sticks, which could be covered with mats; and these latter the natives easily carried with them in their migrations.

These people had a curious method of disposing of their dead, by depositing the bodies of adults in canoes, and those of children in baskets, which are then suspended between two trees, about twelve feet above the ground. In some of the baskets were found small square boxes containing food. It is probable that the course thus described is followed only with the bodies of persons of consideration among the tribes, as great numbers of skulls, ribs, &c., of human bodies, were seen promiscuously scattered about the shore. Some bodies were found, which appeared to have been then recently deposited in the earth, and slightly covered over; rendering it probable that the bones found on the beach had originally been thus deposited, and had become uncovered by the washing of the sea.

The natives were uniformly civil and friendly in their deportment to their European visiters, without manifesting the least sign of fear or suspicion. Their language is said to be wholly different from that spoken by the inhabitants of Nootka.

Port Discovery, already mentioned, is described as a safe and convenient harbour, with exceedingly good holding-ground, and free from rocks, but rather deep. It is a mile and three-quarters wide at the mouth, and ten or eleven miles long. The entrance is formed by low, projecting points, extending on each side from high woodland cliffs, and corresponding with points proceeding from an island lying off the mouth of the harbour, and to which, from its position, Vancouver gave the name of Protection Island. A stream of very fine water discharges itself into the harbour about five miles from its mouth. (Vancouver's *Voyage.*)

ALBOIN, one of those northern princes who established kingdoms in Italy upon the ruins of the Roman empire. He was the son of Audoin, king of the Lombards, (see Lombards,) one of the bravest, the most proud, and the most free of the German nations. Tracing their origin from Scandinavia, they were settled, at the time of which we speak, about the middle of the sixth century, in Pannonia. Here they became engaged in hostilities with the rival monarchy of the Gepidæ; and in the early stage of this contest, Alboin, then a youth, signalized his courage strength, and skill in arms, and the prince of the Gepidæ fell by his hand. After his accession to the Lombard throne he became enamoured of Rosamond, daughter of Cunimond, king of the Gepidæ, and brother of her whom he had slain, and sought her in marriage. His suit being rejected, he carried her off by force. War in consequence broke out afresh; and the Gepidæ, supported by a Roman army, were strong enough to compel the restoration of the princess. But the love or resentment of Alboin led to the renewal of hostilities: he obtained the assistance of the Avars; the Romans abandoned the Gepidæ to their fate; they were defeated with great slaughter (A. D. 566), and their name and nation passed away. Cunimond fell by the hand of Alboin, and Rosamond became the bride of the victor; whose savage temper led him to fashion the skull of the deceased monarch into a drinking-cup, long preserved as a trophy by the Lombard princes.

In the year 568 Alboin led the Lombards into Italy. Narses, the imperial general, long the protector of Italy and scourge of her northern invaders, is reported to have invited him to this step. Be this as it may, the death of Narses removed the man best qualified to oppose such an enemy; and when Alboin crossed the Julian Alps (the Tyrol), he overran the whole inland district of Italy, to the gates of Rome and Ravenna, without meeting with an army in the field. Milan opened its gates on the 4th of September, 569. Before Pavia he was detained more than three years; and in anger he vowed to put all the inhabitants of every age and sex to the sword. The city yielded at length to famine. As he entered the gate his horse fell and could not be raised again from the ground; and the humanity of one of his attendants, who interpreted this accident as a token of Heaven's wrath against his bloody design, induced him to countermand the intended massacre. Delighted with the situation, he fixed his abode at Pavia, and it remained for some ages the chief city of the Lombard dominions.

By the justice and mildness of his government, Alboin secured the affections of his people; and it is possible that, had not his reign been limited to the short space of three years and a half, he might have mastered the whole peninsula. The conquest of the Lombards was in some sort the epoch of the regeneration of the people. Independent principalities, communities, and republics began to be formed on all sides; a principle of life was infused into the country, which had been so long buried in lethargic slumber. The series of monarchs who succeeded Alboin were long distinguished by their prudence, and by making the laws their rule of conduct.

Alboin's life was terminated by domestic treachery. Having drunk deep at a feast with the chief of his countrymen, he called for the cup of victory, the skull of Cunimond; and when it had passed round the circle, ordered it to be carried to Rosamond, with his request that she would taste the wine, and rejoice with her departed father. The queen obeyed, but she determined on revenge. One evening, when Alboin, oppressed by wine and sleep, had retired to his chamber, she unbolted the door to her paramour, the king's armour-bearer, after she had herself fastened his sword to the scabbard. Alboin was the best and bravest of the Lombard warriors; but, unarmed and surprised, he fell an easy victim. His valour, generosity, and successes were celebrated in the songs of the German nations even to the age of Charlemagne. Paul Warnefrid, *De Gestis Langobardorum.*—Muratori.—Gibbon, chap. xlv.

AL BORAK, the name of an imaginary animal, on which, according to the Mohammedan tradition, the Arabian prophet performed his journey from the temple at Jerusalem through the heavens. It is conceived by them to have been of a middle stature and size, between that of a mule and of an ass, and to have received its name in allusion to the shining whiteness of its colour.

ALBORNO'Z, GIL CARRILLO DE, was born at Cuenca, about the beginning of the fourteenth century, of a noble and wealthy family. He was educated at Saragossa under the care of his uncle, Don Zimeno, Archbishop of that church, and studied law at Toulouse. King Alphonso XI. made him one of his privy council and Archdeacon of Alcántara. At the earnest request of the king, the chapter of Toledo elected him archbishop of that city. In 1340 he accompanied the king in his expedition against the Moors to Tarifa, and saved his life in that engagement. Three years after he was at the siege of Algesiras, was dubbed a knight by the king himself, and sent with an important mission to France. Alphonso was succeeded by his son, Peter the Cruel, with whom Albornoz could not enjoy the same degree of favour. This worthy prelate strongly remonstrated with him about his amours with Maria de Padilla, but the king, far from listening to his admonitions, endeavoured to sacrifice him to the vengeance of his favourite. Albornoz sought refuge in Avignon, where Clement VI., who at the time occupied the papal see, received him with the greatest demonstrations of esteem and respect, and created him a cardinal. Upon this he renounced the archbishopric of Toledo, saying, 'I should be as blameable in keeping a wife with whom I can no longer live, as King Peter is for abandoning his lawful wife in order to live with a mistress.' In 1353 he was appointed legate, and entrusted with the important mission of the reconquest of the papal states. With a handful of men, and the pledging of his own plate and jewels, he set out from Avignon. Upon entering Italy, he treated the inhabitants with so prudent a policy, that he gained them over to his side. He obtained a passage through Tuscany, and interested in his favour the republic of Florence. He then entered the papal states, and by the exertions of Cola di Rienzi, whom he brought from Avignon, and by publishing indulgences for the faithful and excommunications against the rebels, caused the Romans to flock to his camp. He entered Montefalco and Montefiascone in triumph, gained over Gentile Magliano, the tyrant of Ferno, and reduced to obedience the Malatesti. In 1357 an intrigue raised against him at Avignon made the pope recall him; but the truth being discovered, the order was countermanded, and Albornoz, proceeding in his conquest, defeated Francesco Ordelafi of Forli, the most powerful of all the petty tyrants of Romagna, and after a long war placed the popes in possession of their state, not acquired by the old titles of worm-eaten parchments, but by the right of conquest. When Urban V. came to Italy, Albornoz went to meet him at Viterbo, and the pope called his legate to give him an account of his administration. The cardinal ordered a cart loaded with old keys and locks to be brought into the court of the house, and showing it to the pontiff, said, 'I have spent all my funds in placing your Holiness in possession of all the towns and castles, the keys of which I present to you.' The pope, sensible of his ungrateful mistrust towards a man who had done so much for him, embraced him cordially, and always after entertained for him the greatest esteem. Having been appointed legate of Bologna, he gave to that city a new constitution, and at his own expense founded there a college for the Spaniards. This college is composed of a rector, thirty students, and four chaplains, all Spaniards; one Portuguese only may be admitted. They are all subject to the rector, in civil as well as in criminal matters, and all enjoy the same privileges as the nobility. Cardinal Albornoz died at Viterbo, in 1364. The pope felt his loss so deeply, that for the space of three days he would not see any body. The remains of the cardinal were conveyed to Toledo, where he desired to be buried. The pope granted a plenary indulgence, as in the day of jubilee, to every person who should assist in carrying the litter in which the body was conveyed; and the people accordingly flocked in great numbers from towns and villages to meet the funeral procession of the illustrious deceased, and the body was literally carried upon men's shoulders from Viterbo to Toledo. Albornoz left behind him a work, which is extremely rare, *On the Constitution of the Roman Church*, printed at Jesi, in 1473. Sepulveda, a collegian of Bologna, published a short account of the life of Albornoz, in Latin, at Bologna, 1623, without mentioning dates. Mariana, in speaking of this celebrated personage, expresses himself in the following terms: 'at all periods of his life he was equally inflexible in matters of justice, a despiser of riches, constant, without weakness in moments of difficulty, and it is hard to say, whether he was more noted for his prudent government in time of peace, or for his skill and valour in war.' [See Mariana; Garibay.]

ALBOURS or ALBURZ. [See Elburz.]

ALBUERA, a village in Spain, on the left bank of a small river of the same name, which falls into the Guadiana. The village is situated on the main road from Seville to Badajoz, and is about thirteen miles south-east of that fortress. On the 16th of May 1811, Albuera was the scene of a desperate conflict between a French army, under Marshal Soult, and an allied force of British, Portuguese, and Spanish, under Marshal Beresford. Soult was advancing from Seville to compel Beresford to raise the siege of Badajoz, and the latter prepared to receive him at Albuera. The allied army consisted of 30,000 troops (but of these little more than 7000 were British), of which 3000 were cavalry and 38 guns. Soult commanded 19,000 chosen infantry, with 4000 cavalry, and 50 guns. The position of the allies was on a ridge parallel to the river, with the British in the centre above the village, and the Spaniards on the right wing. The French, on the other side of the river, were concealed by the woods. Soult commenced by an attempt to force a bridge leading to the village; but this was only to draw away the attention of the British from the real point of attack. Fifteen thousand men and forty guns crossed the river opposite to, or rather above, the extreme right of the Spaniards, and gained a position, which not merely promised an easy victory, but threatened the retreat of the allies. Thus Beresford found it necessary completely to change his front when the battle was already commenced, for nearly the whole of the French force was directed upon the right flank, and not a British soldier was there. The Spaniards could not be induced to advance against them; and the first division of the British that was brought before the French troops suffered so severely, that Beresford was already meditating a fatal retreat, when Colonel Hardinge took upon himself to order the advance of the remaining British infantry. This order was nobly obeyed; and at the very moment when the victory seemed to be in the hands of the French, the British infantry advanced, and not giving the French time to open their heavy masses—for they had imprudently charged in column—drove them, with tremendous slaughter, from their position. This movement decided the day. The French, protected by their superior cavalry, re-crossed the river, and the allies remained masters of the field. The loss of the French in killed and wounded was 8000; that of the allies, 7000, besides 500 unwounded prisoners who remained in the hands of the French. The whole brunt of the battle had fallen upon the British, of whom not more than 1800 out of 7000 were left standing. Had Soult repeated the attack on the following day, nothing could have saved the allies, as Beresford himself confessed; but the French general was deceived by the bold front which Beresford presented, and commenced a retreat on the 18th, leaving part of his wounded to the generosity of the British The victory of Albuera added little to the reputation of Beresford; but never was better evidence given of the stubborn courage of British infantry. (Napier's *War in the Peninsula*, vol. iii.)

ALBUFERA, this is an Arabic word, compounded of the article *al* and *boheira*, the diminutive of *bahr*, a lake. It is therefore properly a common term, and actually is applied to several lagoons on the coast of Spain. The most important is Albufera de Valencia, which, commencing five or six miles to the south of that city, covers a surface twelve miles in length, from north to south, and four in breadth. A narrow strip of land separates it from the sea, with which there is a communication by a small opening. It abounds in wild-fowl and fish, and is a source of considerable revenue. This revenue, in 1808, was attached to the crown; and was afterwards given to the Duke of Wellington as a reward for his services during the war with France. It is almost superfluous to say that the neighbourhood of these lagunes is generally the seat of intermitting fevers.

ALBUM, a Latin word signifying any thing white. The prætor's album was probably a board, either having the surface or the letters white, on which the acts and edicts of that functionary were inscribed and publicly exhibited. The opinion of some writers who have supposed that it was the room or place where such notices were hung up is undoubtedly erroneous. Among the later Latin authors we read of the album of the judges, the album of the senators, and even the album of the citizens, which seem to have been books or registers in which the names of persons of those orders were enrolled. In the middle ages we find album, and albus, and albo, (as an indeclinable noun,) used for a register of saints, a muster-roll of soldiers, or, in general, any list or catalogue of names. Album, also, sometimes signifies a letter or epistle, in allusion to the white surface of the paper or parchment. (See the *Glossaries* of Ducange and Carpentier.) An album, in modern times, is a book appropriated usually to receive the signatures or other manuscript contributions of authors, travellers, or any other persons of whom it is thought worth while to collect such memorials; but sometimes, also, merely as a repository of drawings, prints, verses, and other miscellaneous fragments. On the continent the note-book of a tourist, in which he makes on the spot his memoranda of places and occurrences, is often called his album; but such a use of the word is not, we believe, known in this country.

ALBU'MEN, from the Latin word *Albumen*, the white of an egg. The peculiar substance designated by this term, forms a constituent principle of organised bodies. It is common to plants and animals; and its essential properties are found to be the same from whichever kingdom of the organised world it is derived.

Vegetable albumen occurs in the sap of trees; in the seeds of the cereal grasses, as wheat and oats; and in the juices of many vegetables, as the potato, turnip, carrot, cabbage, &c. To demonstrate its presence in any plant, it is necessary to grate it down, and treat the pulp so obtained with water. The whole is filtered through muslin, to retain fibrous matter; and the milky liquid which passes through the filter, on being allowed to stand at rest, deposits the matter held in suspension (principally starch), and leaves a clear liquid above. On heating this fluid, the albumen separates in stringy masses. Potatoes are the most convenient, and, at the same time, the best vegetable which can be employed for this purpose.

Albumen exists much more abundantly in animals than in plants. White of egg affords an example of albumen in its purest and most concentrated form. It is present in considerable quantity in the blood, the juice of flesh, the brain, and the nerves. It is also a constituent of the liver, kidneys, spleen, pancreas, and of all glands. The quantity of albumen in the juice of flesh varies much, according to the age of the animal. The flesh of young animals often yields as much as 14 per cent., whilst that of old animals as little as 1 to 2 per cent.

Albumen, whether its source be animal or vegetable, possesses the same composition and properties. White of egg consists entirely of albumen held in solution in water, and combined with a small quantity of saline matter. It is, therefore, nearly pure albumen. In this state it is a thick glairy fluid, denser than water, insipid, without odour, mixing readily with cold water, in a large quantity of which it is completely dissolved. Exposed in this fluid form to atmospheric air, it runs rapidly into putrefaction; but if a thin layer of it be exposed to a current of air it dries and is converted into a solid, hard, and transparent substance resembling horn, and in this condition it may be preserved for any length of time without change.

The most remarkable character of albumen is the property it possesses of changing from a fluid to a solid state on the application of heat. This process is termed coagulation. If the white of an egg be exposed to a heat of about 134° of Fahrenheit, white fibres begin to appear in it; if the heat be raised to 160°, the fluid substance is converted into a solid mass; if the heat be still further increased to 212°, it dries, shrinks, and assumes the appearance of horn. In proportion as albumen is diluted with water, it requires a higher temperature to coagulate it; but if water hold in solution only the one-thousandth part of its weight of albumen, the water is rendered opaque by boiling. Before coagulation albumen is abundantly soluble in cold water; after coagulation it is no longer soluble in water.

But heat is by no means the only agent capable of coagulating albumen. Fluid albumen is changed into a solid by alcohol, and one of the readiest modes of obtaining solid albumen is to agitate white of egg with ten or twelve times its weight of alcohol. The alcohol unites with the water which held the albumen in solution, and the albumen is precipitated under the form of white filaments.

Albumen is also coagulated by creosote, tannic acid, or infusion of galls, and the stronger acids, sulphuric, hydrochloric (muriatic), nitric, and metaphosphoric; but not by acetic, common phosphoric, and pyrophosphoric acids. It is likewise precipitated by the metallic salts—ferrocyanide of potassium, bichloride of mercury, sulphate of copper, acetate of lead, &c. Bichloride of mercury (corrosive sublimate) is so delicate a test, that if a single drop of a saturated solution of corrosive sublimate be added to water containing only the two-thousandth part of albumen, it will occasion a milkiness in the liquid. If a slight excess of the mercurial solution be added to the albuminous liquid, and heat applied, the precipitate which falls on being dried is found to contain in every seven parts, five of albumen.

Electricity also coagulates albumen. If an albuminous fluid be exposed to a current of galvanic (voltaic) electricity, soda will appear at the negative wire; while the albumen will coagulate around that which is in connection with the positive pole of the battery.

The chemical composition of albumen has been determined by many observers; and they agree in considering that whatever be its source, albumen has the same composition. The following table of analyses will exhibit this more clearly. The first, by Mulder, is of albumen in general, and may be reckoned the most exact:—

	Albumen. (Mulder.)	Egg Albumen. (Scherer.)	Blood Albumen. (Scherer.)	Vegetable Albumen. (Jones.)
Carbon,	53·5	55·000	55·461	54·74
Hydrogen,	7·0	7·073	7·201	7·77
Nitrogen,	15·5	15·920	15·673	15·85
Oxygen,	22·0	22·007	21·665	21·64
Sulphur,	1·6			
Phosphorus,	0·4			
	100·0	100·000	100·000	100·00

The presence of unoxidised sulphur in albumen is easily shown by the blackening of a silver spoon introduced into a boiled egg, and by the production of a black précipitate when a little albumen is boiled in caustic potash, and afterwards treated with acetate of lead.

Albumen is associated with fibrine and caseine under the general term of the *albuminous* group. They are likewise called the *sanguigenous* compounds, from their power of forming blood; and the *plastic* elements of nutrition, from their supplying the material out of which organised animal tissues are formed. Fibrine and caseine are very distinct from albumen, so far as appearance is concerned; but in chemical composition they are nearly identical, so much so, that any one of the three can pass into the other; for instance, the albumen present in the egg becomes, when the latter is being hatched, converted partly into fibrine of flesh. The fibrine of flesh, when partaken of as food, passes into albumen in the system of every animal; and the caseine of milk undergoes the same change when it has served as an article of diet. [FIBRINE and CHEESE (CASEIN).]

Albumen, from its property of coagulating by heat, is used to clarify syrups and other liquids. The albumen, as it is rendered solid by the application of heat, entangles all the substances not held in solution by the fluid, and carries them with it to the surface in the form of scum. [ISINGLASS.]

But the most interesting application of albumen is its employment as an antidote against one of the most virulent of the mineral poisons. Corrosive sublimate, or bichloride of mercury, is scarcely second in the violence and certainty of its poisonous properties to arsenic itself. For this poison albumen is a sure and effectual antidote. The world is indebted to Orfila, the celebrated Parisian toxicologist, for this discovery. This distinguished man instituted many experiments, by which he established the fact, of which the following may serve as an example. He gave twelve grains of corrosive sublimate to a small-sized dog; the poison was allowed to act for four minutes: by this time there were unequivocal indications of the commencement of its ordinary effects. The antidote was then administered, the white of eggs being freely given. After several fits of vomiting, the animal became apparently free from pain, and in five days was quite well. Another experimentalist gave a dose of the poison to a rabbit; he allowed it to act uncontrolled; the rabbit was dead in seven minutes. He then gave a similar dose to another rabbit; he administered albumen in the form of white of eggs just as the first indications of uneasiness commenced, and in this case no serious symptom of any kind ensued. It would seem as the result of several experiments, that the white of one egg is required to render four grains of corrosive sublimate innoxious. The efficacy of this antidote has been fully established in the human subject. Several cases are on record in which this poison was taken both by accident and design, in which the immediate and free administration of the white of eggs disarmed it of all noxious influence. A man took half a drachm of corrosive sublimate, and was attacked with the usual symptoms. The white of eggs was immediately and freely administered. The symptoms were at once arrested, and the patient recovered without sustaining any material inconvenience. This remedy once saved the life of Thénard, the celebrated chemist. While at lecture this gentleman one day inadvertently swallowed, instead of water, a mouthful of a concentrated solution of corrosive sublimate. He instantly perceived the fatal error he had committed; but he was aware of the remedy. He sent immediately for eggs, which he was so fortunate as to procure within the space of four minutes. He swallowed the white of eggs freely. At the time when he began to take the remedy he had not vomited; neither did vomiting occur at all; consequently the whole of the poison must have been retained, and yet he sustained no material injury. There cannot be a doubt that without the prompt use of the albumen he would inevitably have died

ALBUMEN, in plants, is the substance which in some seeds is interposed between the embryo and their coat. It varies very much in density, and other characters, and is often the most valuable part of a plant. In the cocoa-nut, it is the meat, the milk being a fluid, uncondensed portion of it; in the coffee-seed, it is the part that is roasted; and in corn, it is that which is ground into flour. The oil of the castor-oil plant, and of the poppy, the aroma of the nutmeg, and the greasy, nutritious substance that forms chocolate, are all the produce of albumen.

This substance in the beginning is of a pulpy nature, and is the matter in which the young embryo first makes its appearance; in this state it is present in all plants, but as the embryo, for the nutriment of which it is destined, increases in size, the albumen is gradually absorbed by it, either wholly, as in the turnip, the pea, the bean, and the like; or in part only, the residue being of a consistence varying between softness, as in the poppy, and extreme hardness, as in the date palm.

Botanists find its presence in abundance, or its total or almost total absence, a character of very great importance in distinguishing the different tribes of plants.

ALBUQUERQUE, ALFONSO, (or, as the Portuguese write his name, AFFONSO ALBOQUERQUE,) the greatest of those captains who built the short-lived fabric of Portuguese empire in India, was born at Melinda, in Africa, A. D. 1452. He was the second son of Gonzalvo d'Albuquerque, lord of Villaverde, descended of a bastard branch of the royal family of Portugal. In his youth he was first esquire to king John II.; but he first becomes well-known to us in the year 1503, when, in conjunction with Francisco Albuquerque, his cousin, or uncle, he conducted a fleet to India, and secured the king of Cochin on his throne, which had been endangered by his powerful neighbour, the *Zamorin* of Calicut. These two cities were situated on the coast of Malabar, both to the south of Bombay, in lat. 9° 57′ 30″, and 11° 15′ respectively; E. lon. 76° 16′ 15″, and 75° 50′. In gratitude for their services they obtained leave to build a fort at Cochin, which, according to the Portuguese authors, is to be considered as the foundation of their national empire in the East. Francisco Albuquerque was wrecked on his voyage home. Alfonso reached Lisbon safely, July 16, 1504, and was favourably received by the king, who sent him out to India again, in 1506, in command of a squadron of five ships, composing part of a fleet of sixteen, under the orders of Tristan da Cunha. For a time the generals carried on a prosperous warfare against the Moorish cities on the eastern coast of Africa. Da Cunha, sailing for India, left Albuquerque to command in the Arabian seas; who, weary of the petty piratical warfare in which he had hitherto been engaged, conceived the project of taking the small but important island of Ormuz, in lat. 27° 8′, at the mouth of the Persian Gulf, which, being admirably situated for commerce, was at that time one of the great emporiums of the East. Accordingly he appeared before Ormuz, Sept. 25, 1507, having already in his course reduced most of the chief trading towns between the Red Sea and the Persian Gulf. The terms of his message to the prince whose territory he invaded are worthy of attention. He came, he said, not to bring war, but peace,—peace, however, to be obtained only by paying tribute to the king of Portugal, instead of the king of Persia; but then the Portuguese monarch was so great a lord, that it was better to be his vassal than to command empires. Zeifadin, king of Ormuz, was a youth, and the government was really in the hands of a eunuch, named Cogi-Atar, who underrated the advantage of being subject to the Portuguese, and plainly said that their demands were impudent and unreasonable. But their cannon proved cogent arguments; and he was obliged to submit, after the shipping and part of the town had been burnt. Cogi-Atar was deeply mortified when he saw to what a handful of men he had yielded. He concerted a revolt, which proved successful. Albuquerque was compelled to evacuate the place; and after an unsuccessful attempt to reduce it by famine, returned to the island of Socotra, off Cape Guardafui, leaving his chief purpose unaccomplished.

Being joined by three ships bound to India, he set sail for the Malabar coast, in 1508. He carried out a secret commission, authorizing him to supersede Don Francisco d'Almeida, governor of the Indies, when the period of his commission should have expired. On arriving at Cananor he informed Almeida of this; but the governor, already prejudiced against him by the reports of some officers, who had treacherously sailed away from his squadron, and thereby caused his failure at Ormuz, received him very coldly, declined either to surrender the government or to accept his services in any subordinate capacity, and finally threw him into prison, where he remained three months. The arrival of the Grand Marshal of Portugal, with a powerful fleet, restored him to liberty. Almeida returned home; and Albuquerque was acknowledged General and Commander-in-Chief in India.

This fleet was intended to act against the Zamorin of Calicut, whose long-continued hostility had made him very obnoxious to the Portuguese. The Marshal entreated Albuquerque to entrust him with the command in this service, and Albuquerque reluctantly consented; but only by halves. The fleet accordingly was divided into two squadrons. A veteran officer augured ill from this arrangement, and said that there was little good to be expected from one body with two heads. His prediction was verified: jealousy of Albuquerque, whose division had gained the start in landing, and foolhardy courage, induced the Marshal to venture too far with a small number of followers, in hopes of gaining possession of the Zamorin's palace. He succeeded in this; but the Indians rallied, and he was surrounded and slain, with most of his principal officers. Albuquerque, in attempting to rescue him, was desperately wounded; and the Portuguese were forced to return to their vessels with considerable loss, having done much injury to the town and shipping.

The commission of Albuquerque was far less extensive than that of his predecessors in the Indian government, which had extended from the Cape of Good Hope to the farthest regions of India. The court of Portugal now divided this mighty charge into three portions—one comprehending the eastern coast of Africa and the coast of Asia, from the tropic of Capricorn to Cambay; the second, Hindoostan, which was allotted to Albuquerque; the third, the rest of India east of the Ganges. Its chief object was to prosecute its conquests in the Red Sea, and to monopolize the Indian trade by destroying that carried on between India and Egypt. With this view the greater part of the reinforcements sent to the East were ordered to act in the Red Sea, under the command of George d'Aguiar; and Albuquerque thus seemed placed in a secondary command: but by good fortune and good policy he succeeded in frustrating, in some degree, the designs of the court, and contrived to gain nearly as extensive authority as his predecessors had held. Diego Lopez de Silveira, who was sent out to the eastern division with an independent command, failed in establishing a settlement at Malacca, lost some of his ships, and returned to Europe, leaving two of them with Albuquerque. D'Aguiar perished in a storm, and of his scattered ships some went to India, which Lemos, the successor of D'Aguiar, sent to demand. For some time he got nothing but fair words: at last the general, assembling a council of his officers, told them, that by the orders of his court he was to send all the succours which he could to Lemos, and that he was determined to go in person. The whole force under his command set sail from Cochin, ostensibly for the Red Sea; but before they arrived off Goa, they were met by Timoia, prince of Onor, who urged the impolicy of going to the Red Sea to attack the Caliph of Egypt. He added, that, in the absence of the prince of Goa on other wars, the present was a most favourable moment for the enterprise. The statement of Timoia was laid before a military council, and the governor gravely remarked on the inexpediency of disobeying express orders, unless on very sure grounds of advantage. It is not certain whether this scene was previously arranged with the Indian prince, or whether

Albuquerque had been sincere in his proposed intention of sailing for the Red Sea. His ambition, and jealous care of his own glory, would lead us to believe the former; and the change seems too important to be so hastily made, had it not been contemplated beforehand. In fine, it was resolved to sail to Goa; and that rich and prosperous city fell into his hands almost without resistance. His energy may be judged from the rapidity with which his enterprises were conducted. He appeared before Calicut January 2, 1510, and though severely wounded there, he entered Goa the 17th February following. But he was unable to hold it. That town, in name belonging to the Deccan, was governed by a Moor named Idalcan, who, like other powerful Indian subjects, paid little obedience to his nominal sovereign. He was absent when Albuquerque took his town, but he lost no time in collecting a powerful force, and by dint of numbers regained possession of it, and shut the Portuguese up in the citadel. Albuquerque's difficulties were increased, and in great measure produced, by the discontent, mutinous conduct, and almost treachery, of his officers. At last he was reduced to the alternative of abandoning the citadel and taking to his ships, or suffering the river to be blocked up, and all chance of escape lost. He chose the former. But the bar being impassable during the south-west monsoon, which had already set in, he was obliged to remain in the harbour, compelled by the enemy's fire constantly to shift his place, and exposed to all the evils of famine. His energy and the bravery of his troops triumphed over their embarrassments; and they maintained their ground, though not without much loss and suffering, till the navigation was again open. Finally he left the harbour August 15, 1510. The history of this siege of Goa is full of interest, and will repay the trouble of perusing it at length.

In the course of the year strong reinforcements were sent out from Portugal, and, at the same time, Lemos was recalled, and his command made over to Albuquerque. The same autumn Albuquerque attacked Goa a second time, and carried it by storm, Nov. 25. Early in the next year he meditated new conquests. A detachment of the fleet which had been sent out in the preceding year, was especially ordered to proceed to Malacca under the command of Diego de Vasconcellos. Albuquerque, as he had done before in the case of Lemos, detained this squadron for his own use; by fair means while he could; but when Vasconcellos expressed at length his resolution to proceed forthwith to his appointed destination, he hesitated not expressly to forbid his doing so, under pain of imprisonment to himself, and death to all inferior officers under his command. Vasconcellos, undeterred by these threats, set sail, but he was stopped by a superior force, and was himself sent back to Portugal, while three of his officers were put to death. It is possible that the letter of Albuquerque's commission might justify him in exacting obedience to his own orders from all persons in his government, even to the disobedience of orders received from the king. Still the act was cruel and selfish, and highly illustrative of his character. Looking to the circumstances, there can be no doubt but that the motive for it was not the maintenance of discipline, but a resolution to monopolize every opportunity of acquiring fame and power in India. As soon as Vasconcellos was removed, Albuquerque sailed himself on the expedition against Malacca, (lat. 2° 12′, long. 102° 5′ 15″,) which hitherto he had put off on different pretexts, and, with some difficulty, captured the town, which was given up to plunder. Immense wealth was obtained. The fifth of the booty, which was set apart for the king, was valued at 200,000 gold cruzadoes, exclusive of naval and military stores, among which 3000 cannon were said to have been found. In this expedition his troops amounted only to 800 Portuguese, and 200 Malabar auxiliaries: the Malayan prince is said to have had 30,000 men under arms.

Albuquerque had it much at heart to establish the Portuguese power as firmly at Malacca as at Goa. He built a citadel, coined money, established a new system of law and police, and lost no opportunity of conciliating the natives. He received and sent embassies to the kings of Siam, Pegu, and other neighbouring princes, who were deeply impressed by the rapid growth of the power of these European strangers. After remaining at Malacca near a year, he set sail for Goa. On his voyage he encountered a violent storm; his ship was wrecked, and he himself, washed into the sea, narrowly escaped with his life. He reached Cochin with the scattered remains of his squadron at the end of February, 1512. His first object was to proceed to the relief of Goa, which in his absence was hard pressed by Idalcan. But the Portuguese force in India was never large; and owing to the casualtie of war and shipwreck, and the loss of the troops left in garrison at Malacca, he was obliged to wait for the arrival o the annual reinforcements before he could bring his favour t city effectual help. Moreover he found much to be remedied and much that required his presence at Cochin, where th extortion of the principal Portuguese, and the scandalou lives of all, had very much alienated the good will of tha friendly city. Having obviated these evils as well as h could, he sailed for Goa, September 13, 1512. He wa received with lively joy; his presence soon removed all cause for disquietude, and established the power of the Portuguese more firmly than ever. He relaxed the king's dues and gave every encouragement to commerce, and Goa soon became the most flourishing city of the Portuguese dominions. It was observed, even then, that the king's revenue was increased, instead of suffering, by the reduction of duties. Idalcan and the Zamorin of Calicut, thinking further resistance hopeless, sued for peace, and the Portuguese influence was effectually and surely established along the Malabar coast from Cape Comorin to Goa.

The orders of the court were still urgent to prosecute the war in the Red Sea; and seeing India quiet, he now, in 1513, directed his efforts to the reduction of Aden [See ADEN], a considerable commercial town of Arabia. His force, much larger than usual, consisted of twenty ships, 1000 Portuguese, and 400 Malabar troops; (Barros, *Decad. II.* lib. vii. cap. 9.) but he reaped neither honour nor profit by this voyage. Repulsed at Aden, he entered the Red Sea, leading the first European *fleet* that ever sailed in its waters; but he experienced much hardship and danger from heat, want, and difficulty of navigation, and returned to India without striking a blow.

His last enterprise was a second attempt upon Ormuz, in which he succeeded (1507) without recourse to arms, by the effects of terror and negotiation; and the place remained in the hands of the Portuguese till it was taken from them in 1622, by the English and Shah Abbas. [See ABBAS.]

Albuquerque, after his first failure, vowed never to cut his beard till he had regained Ormuz, and it is said that he wore it till he could knot it to his girdle. Soon after the accomplishment of this favourite wish he fell sick, and was obliged to return to Goa. At the mouth of the Gulph he met a vessel bearing despatches from Europe. They signified his recall; that Lopez Soarez d'Albergaria was nominated his successor; and that Diego Pereira and Diego Mendez de Vasconcellos were appointed to high offices. His proud spirit was deeply hurt. 'What!' he said, 'Soarez governor! Vasconcellos and Pereira, whom I sent home as criminals, sent out again in posts of honour! I have gained the hate of men for the love of the king, and am disgraced by the king for the love of men. To the grave, miserable old man! to the grave, it is time!' He might have seen something more in this,—a just return for his unworthy treatment of Vasconcellos. His illness, aggravated by vexation, proved fatal. He died December 16, 1515, in his 63rd year. His body was conveyed to Goa, and buried in the church of Our Lady, which he had built; and in future years—a touching testimony to the uprightness of his government—Moors and Indians repaired to his tomb, as to that of a father, to implore redress from the injustice and tyranny of his successors. His bones, more than fifty years after his death, were transported to Portugal.

Albuquerque has undoubted claims to the name of a great man. To his country he rendered most important service: and if, in the irresponsibility of a distant command, he presumed sometimes to contravene or neglect the orders of his king, he was actuated by no more ignoble motive than the love of glory, and ever had in view the welfare of his country, and next to that, his own honour. As a public servant he was scrupulously honest; as governor of an obedient people, scrupulously just; though his temper was austere and arbitrary, and his punishments were awfully severe. His views as a statesman were enlarged and judicious, his skill great as a general, his courage as a soldier daring to rashness. On the other hand, where territory was to be gained to his country, or renown to himself, he was stopped by no considerations of right or wrong. The attack on Malacca admits of justification; but the capture of Ormuz and Goa were provoked by no acts of hostility, and can be sanctioned by no law but that of the longest sword. His character is well exemplified in a scheme which he is said to have proposed to the Emperor of Ethiopia for destroying the commerce of Egypt by turning the course of the Nile into the Red Sea, and thus converting that fruitful land into a barren desert. The project is called grand by historians · it is certainly great; but the very idea of such an impossible undertaking throws some discredit upon the General's knowledge. And it seems never to have occurred either to them or to him, that there would have been any moral guilt in blotting out from the earth a fertile, populous, and extensive country, to gratify the grasping thirst for monopoly of a second-rate European kingdom.

The second decade of Barros's *History of the Portuguese Conquests in the East* is entirely occupied by the transactions of which we have here given a short sketch, from the sailing of Da Cunha and Albuquerque to the death of Albuquerque. Those who do not read Portuguese may consult Maffei, *Historia Indica;* Lafitau, *Hist. des Conquêtes des Portugais dans le Nouveau Monde;* and the *Modern Universal History.*

ALBURNUM, in plants, is that part of the stem of trees which timber-merchants call *sapwood.* It is the newly formed, unchanged wood lying immediately below the bark, and is always of a very light colour. It is the principal channel through which the crude sap is conveyed from the roots into the leaves, and is, therefore, an indispensable part in all exogenous trees. [See Age of Trees.] It consists of little besides vegetable tissue; in which respect it differs from *heartwood* or *duramen*, which is vegetable tissue combined with solid secretions, the nature of which varies with species. It is probably on the latter account that heartwood is so much more durable than sapwood; for all vegetable tissue is in itself equally perishable, and it only ceases to be so in consequence of the presence of secretions of a less destructible character.

While many plants have the alburnum and heartwood distinctly separated, there are others, technically called whitewooded trees, which consist of nothing but alburnum This arises from their not forming any solid secretions which can give durability to the central parts; hence all such trees are quickly perishable, and are generally unfit for any but temporary purposes.

ALBY, or **ALBI**, a town in France, the capital of the department of the Tarn, and upon the left or south bank of the river which gives name to the department. It is an archiepiscopal see, and perhaps the worst built of all places of similar rank in France. It is not, however, without objects worthy of notice. The cathedral of St. Cecile is the chief building of the town. It is a Gothic edifice of brick, remarkable for boldness and elegance; founded 1282, and completed 1512. The tower is 295 feet high. The interior is adorned with old *fresco paintings* on the roofs and walls, some of which are of the fourteenth century. On the banks of the Tarn stands a building, at first the residence of the counts of the Albigeois, subsequently the episcopal palace, but which is now the residence of the prefect. The village of Châteauvieux, on the side towards Montauban (the west), forms a suburb of the town. Albi possesses a fine promenade planted with trees, called La Lice, just outside the city, formed by a terrace, and commanding a view of the adjacent country. The number of inhabitants was 12,594 in 1851; there are manufactures of coarse linen cloths, blankets, candles, canvas, tools, &c. A library of 14,000 volumes, a museum of natural history, and a society of rural economy, trade, and statistics, contribute to the improvement of the place. There is also a theatre. Albi is 350 miles south of Paris: 43° 55′ N. lat., 2° 8′ E. long.

The arrondissement of Albi consists of 8 cantons, 91 communes, and contained 92,167 inhabitants in 1851. The neighbourhood of the town, formerly the district of Albigeois, is fertile in corn, grapes, plums, and saffron; many sheep are fed; and a considerable trade is carried on in dried fruits, wine, and coarse cloth. This district is well wooded.

The name Albigeois, abovementioned, is derived from the Latin form of the name of the town, *Albiga*,—from which, likewise, it is said, the early reformers of this part took the name of Albigenses; whether from their prevalence in this neighbourhood, or because their opinions were condemned at the council of Albi, is uncertain. Some, however, derive the name Albigenses from Albigesium, the general denomination of Narbonese Gaul in the middle ages.

ALCA (*Cuvier*), the auk, a genus of web-footed seabirds, which has a singularly-formed bill, being very broad when viewed laterally, straight towards the base, but much curved towards the point. Both the mandibles are hal covered by projecting feathers, and furrowed near the point. The upper mandible is crooked, and the under forms a projecting angle. The nostrils are towards the middle of the sides of the upper mandible, being very narrow and almost closed by a membrane covered with feathers. The legs are short, and placed far back, so that the birds when standing have their backs nearly perpendicular. There are only three toes fully webbed, the back toe being wanting. The claws are somewhat pointed. The wings are short, and the first quill is as long as the second, or perhaps a little longer.

There are only two species known, the great auk and the razor-bill, both natives of the British Isles.

ALCÆUS, one of the most celebrated lyric poets of Greece. Of his compositions, once so much admired, nothing but fragments remain, consisting for the most part only of a few lines, or even words. These have been preserved in quotations by later authors. Among them we find two passages, which Horace evidently has imitated, in the two first stanzas of the eighth, and the two first stanzas of the fourteenth, odes of the first book. Horace makes frequent mention of him, and always in terms of the highest admiration. Alcæus was a native of Mitylene, in Lesbos; and wrote about the forty-fourth Olympiad, or B.C. 600: being the contemporary and countryman and, it is said, the admirer also, of the celebrated poetess Sappho. Of his life but one anecdote worth relating is preserved, that, in a battle with the Athenians, he threw away his armour, (a mortal disgrace according to Greek notions of honour,) and sought safety in flight: a species of nervousness to which great poets seem to be addicted, to judge from the similar mishaps of Archilochus and Horace. The victors dedicated his armour in the temple of Athene, at Sigeum. From Alcæus, the Alcaic, one of the most beautiful of lyric metres, derives its name. His poems, we learn from Quintilian and Horace, were more severe and elevated in style and subject than those of most of the followers of the lyric muse: of the fragments preserved, however, many are in praise of wine. The most striking is one which has been finely expanded by Sir W. Jones. Alcæus aspired to be the poet of liberty; and directed the full vigour of his genius against Pittacus, who had raised his power above that of his fellow-citizens, or in Greek language, made himself *tyrant* of Mitylene. The best collection of the fragments of Alcæus is in the Cambridge *Museum Criticum*, vol. i. p. 421, and in Gaisford's *Minor Poets.*

Other persons of the name of Alcæus are named by ancient writers. We shall only mention two,—an Athenian tragic poet, and a comic poet who contended with Aristophanes for the prize, when he produced the *Plutus*, Ol. 98-1. B.C. 388.

ALCAIDE or **ALCAYDE**, a Spanish word derived from the Arabic *káyid* from the verb *káda*, which means to *head.* The *alcaide* was formerly the governor of a fortress or a castle, and also the keeper of a jail. This name is frequently mistaken by foreigners for that of *alcalde.* The offices of these two functionaries, however, differ very widely, as the one is a military officer, and the other a civil magistrate. (Covarrubias. *Diccionario de la Academia.*)

ALCALA′, a very common name in the southern parts of Spain, where the empire of the Arabs was of the longest duration. It is derived from the Arabic *El-Calaat*, which means a castle.

ALCALA′ DE HENARES, a town of Spain, in New Castile, situated in a fine plain on the river Nares or Henares, whence it derives its name. About a mile from its present situation, stood an ancient Roman colony, at the confluence of the small rivers Camorma, Camormilla, and Torote, and probably to this circumstance it owed its name of *Complutum, quasi Compluvium*, or a '*flowing together.*' This town was destroyed about the year 1000 of the Christian æra. The present city was rebuilt in 1083, and surrounded with a strong wall. It is also called Alcalá de San Justo, on account of the saint of this name having suffered martyrdom there under the the prætor Dacianus. The Moors possessed it until the beginning of the twelfth century, when it was conquered by Don Bernardo, archbishop of Toledo. It was celebrated for its university, which was founded in 1510, and richly endowed by Cardinal Ximenez de Cisneros. The plan was taken from that of Paris, and embraced the study of divinity, law, astronomy, and languages. It was in this university, and at the expense of its founder, that the famous

Polyglot Bible was edited. This work contained six volumes folio, and embraced four languages—namely, Hebrew, Greek, Latin, and Chaldee. It is not of much critical value. The expense of the edition was enormous, being upwards of 50,000 ducats. The acquisition of seven Hebrew manuscripts alone cost 7000 gold crowns; and the most eminent philologists of the age contributed their talent to this undertaking. The university had nineteen colleges. It has been removed to Madrid, since which the place has much decayed. The cathedral is a fine Gothic building, in imitation of that of Toledo. In the college of St. Ildefonso is seen the sepulchre of Cardinal Ximenez, wrought in alabaster, with his reclining statue upon it, by Domenico Fiorentino. In the cathedral and the other churches are found excellent paintings by Arco, Sevilla, Carducio or Carducho, Ribera, and Gonzalez. The environs of Alcalá are pleasant and productive. Its climate is mild, but rather cold in winter, owing to the want of trees and the elevation of the city, which is about 2000 feet above the level of the sea. This city is the birthplace of the Emperor Ferdinand, the brother of Charles V., of Cervantes, of the poet Figueroa, of the historian Solis, of the famous divine Teodoro Beza, and several others.

The population is upwards of 5000. Alcalá is in 40° 29′ N. lat., and about 3° 25′ W. long. (See Miñano, *Dicc. Geografico-Estadistico de España.* Ponz, *Viage de España.* Mariana. Madoz, *Diccionario Geografico, &c., de España.*)

ALCALA′ LA REAL, a town in the province of Jaen, on the Gualcoton. The district around is productive in wine and fruits; it has an elevation of more than 2700 feet above the sea, and is the highest part of the country between the Guadalquivir and Grenada. This territory separates the small streams that run southward to the Genil from those that run northward to the Guadalquivir. Alcalá has an abbey, two churches, a convent, and an hospital; its population is 6848. It lies about eighteen miles W.S.W. from Jaen. General Sebastiani defeated the Spaniards under Areizaga near Alcala, (January 28, 1810,) in consequence of which Grenada opened its gates to the conqueror. (Napier's *Peninsular War*, iii. 115.)

ALCALDE, in Spain, is a judge appointed by the government, or elected by the towns to administer justice within the district under his jurisdiction. The word is a corruption of the Arabic *El-Cadi*, which means judge or governor, or, according to Alcalá, from *Cahid*, which comes from the root *calede*, to preside. There are several denominations of *alcaldes*. The *Alcalde de alzadas* is a judge appointed by the government or the lord of the district, to whom the parties may appeal from the decision of the *Alcaldes pedaneos* or justices of the peace. The *Alcaldes de casa y Córte*, is a bench of judges, who singly or jointly try all criminals within the court and twenty miles from it, or sixty, in cases of robbery. From the decisions of one of these *alcaldes* an appeal may be made to their tribunal. When the king travelled, one of these *alcaldes* was formerly obliged to assist the *mayordomo* in fixing the price of provisions on the road. In the *chancillerias* of *Valladolid* and *Granada* the criminal judges are called *Alcaldes de Crimen* to distinguish them from the civil ones called *Oidores*. The limit of their respective jurisdiction is the Tagus, *i. e.* those of *Vulladolid* take cognizance of all criminal cases on their side of the Tagus, and those of Granada on the other.

The *Alcalde Mayor* is a judge appointed by the king or by the lord of the town to act as an assessor to the *Alcaldes* or *Corregidores*, who are not men of the law. The *Alcaldes Pedaneos* are elected by the people yearly; they preside at the common-council or *Ayuntamiento*, and act as magistrates. The parish-officers are also called *Alcaldes*, and are distinguished by appellations expressing their office, such as *Alcaldes de Barrio*, or parish, *de Calle*, of the street, *de Noche*, of the night, because they patrol and watch during the night. As there is no jury in Spain, all the judges both give the verdict and pronounce the sentence. It is, however, worthy of observation, that in the *fuero* of Toledo granted in 1083, it was ordered that all the cases should be tried by the book of the judges, in the presence of ten individuals of the most worthy and most wise of the city elected annually, who were always to sit at court with the judge. A sort of jury existed formerly in the Balearic islands, but so beneficent an institution no longer remains in any part of the peninsula. (*Diccionario de la Acad.* Garibay. Covarrubias.)

ALCAMO, a city of Sicily, situated in a district of the same name in the province of Trapani. The city is built in a beautiful spot under Mount Bonifacio, about twenty-five miles S.W. from Palermo, and a league from the Gulf of Castello a Mare; it is considered healthy, and has a population of about 15,000. In the neighbourhood is the site of the ancient Segesta or Acesta, where are the ruins of a theatre and of other buildings. The present town contains towers and other edifices of Moorish origin, and seems to have been founded by them. The first Italian who attempted to write poetry in the *lingua volgare* was a native of Alcamo; some fragments of his poem are to be found amongst the ancient Italian authors under the title of *Ciullo d'Alcamo.* Ciullo lived and died about the end of the twelfth century.

ALCA′NTARA (signifying in Arabic *the bridge*), a fortified town in Spanish Estremadura, on the southern bank of the Tagus, near the frontier of Portugal, 39° 44′ N. lat. about 6° 43′ long. It lies 55 Spanish leagues (about 230 miles) by the road W.S.W. from Madrid, but in a straight line not so much as 170 miles. The number of inhabitants is about 3300. Under the Romans, Alcantara bore the name of Norba Cæsarea, and was distinguished by a beautiful bridge of six arches over the Tagus, built in the reign of Trajan. When the Arabians became masters of this part of the peninsula, the Roman name was exchanged for Al-cantarat-al-seif, (see Edrisi, translated by Conde, p. 49,) *the Bridge of the Sword;* and hence the modern name. The position of the town upon the Tagus has always made it important in a military view, and in the year 1809, (June 10,) during the French war, the bridge was destroyed under an order of the British general. When this order was issued, the French were acting on the offensive, and a British detachment was stationed at Alcantara to break off the communication, should the French attempt a passage. Soon after, the state of affairs changed, the allied army began to advance, and the French in their turn wished to impede the movements of the former. Aware of the order under which the British officer was prepared to act, for by some error this order had not been countermanded, they made a false attack, which produced the effect they desired, and thus was the bridge of Trajan sacrificed, after having stood for seventeen centuries. Before the separation of Portugal, Alcantara enjoyed a considerable commerce on the Tagus, but this has altogether disappeared. (Napier's *Peninsular War.*) Alcantara and Alcantarilla are the names of several unimportant towns in Spain and Portugal. There is also an Alcantara in Brazil.

ALCANTARA, THE KNIGHTS OF (la Caballeria de Alcántara), a military and religious order of Spain, so called from the town upon the Tagus. About the year 1156, Ferdinand II. received from his father the kingdom of Leon with Galicia and Asturias. Of the first of these, a large portion was in possession of the Moors, especially the valley of the Coa (the river which passing near Almeida runs northward into the Douro). In this state of things, two brothers, with a body of knights from Salamanca, seized a hermitage in this valley called San Julian del Pereyro, which they converted into a fortress. Their efforts from thence against the Moors were equally distinguished by courage and success, and accordingly, in the spirit of the age, they were constituted by the Bishop of Salamanca a half religious, half military order of knights, under the rule of Saint Benedict; and the institution was confirmed by the Pope Alexander III., in 1177. When Alcantara was recovered from the Moors in 1213 by Alonzo IX. of Leon, the defence of it was at first assigned to the Grand-master of Calatrava. But it was not easy for the same person to guard two points so distant as Alcantara on the Tagus and Calatrava, near the sources of the Guadiana; and, therefore, under certain restrictions, the defence of the former was transferred to the knights of San Julian del Pereyro This title was soon absorbed in that of Alcantara. Thirty-seven masters in succession commanded the noble order of Alcantara; and, like those of Calatrava and Santiago, they were at times almost too powerful for the monarchs of Spain. In 1494 or 1495 Ferdinand, the husband of Isabella, who had already assumed the command of the other two orders, prevailed upon Juan de Zuñiga, son of the Duke of Arévalo, to resign the grand-mastership of Alcantara. From that time the dignity has remained in the crown of Spain. A full account of the order has been given by Radez de Andrada in his *Chronicles of Alcantara*, and by Zapater in his *Cister Militante.*

ALCARRAZAS. [See Cooler.]

ALCARRIA, a district of Spain on the northern boundaries of New Castile. It is bounded on the east by Molina, on the south by the mountains of Cuenca and La Mancha, on the west by the territory of Alcalá de Henares, and by the mountains of Cogolludo, Jadraque and Sigüenza on the north and north-west. According to the signification of its name, which comes from the Arabic, and means a collection of farmhouses, its population consists of a multitude of small villages, the largest of which are Guadalajara, Huete, Brihuega, and Cogolludo. The territory is mountainous, but very productive, through the industry of its inhabitants. Its thick forests of oak supply Madrid with charcoal. It produces also wines, the best of which are those of Sacedon and Payos. The lofty hills enclose beautiful and fertile valleys, watered by innumerable rivulets, which spread fertility and abundance throughout the plains. The olive likewise enriches it with its fruit. Both the mountains and the valleys are covered with nutritious herbs, which supply with food the numerous flocks of Merino sheep, that in the summer months leave the scorched plains of Estremadura to seek the green and rich pasturages of the mountains of Castile. The shepherds of that part of Spain are persuaded that the fineness of the Merino wool would be lost if they were kept in the same place all the year round, and thus they make their cattle travel to the south in winter, and back to the north in summer, from which circumstance they are called *ganados transhumantes* or travelling cattle. The valleys of Alcarria as well as its mountains abound in flower-plants on which the bees feed, that produce the famed Alcarrian honey. The meat, game, and fish are of exquisite flavour. The inhabitants of Alcarria are, by far, richer and happier than their neighbours. It is true that very few large proprietors are found, but every one has some landed property, which he himself cultivates, and mendicity is here unknown. They are simple, industrious, and robust. The men are employed in cultivating the ground, and the women preside over the household concerns, and spin hemp and flax, with which they provide their families with clothing. Besides the brooks which spring from the mountains of Alcarria, the Nares or Henares, the Tagus, the Tajuña and Guadiana, cross and water its grounds. There are also in this district many springs and baths of mineral waters: the best known are those of Trillo and Sacedon. Its industry is confined to some manufactures of paper. (Miñano, *Diccionario Geográfico*.)

ALCEDO, a Spanish officer, best known to the world by the publication of a *Geographical and Historical Dictionary of America and the West Indies*. Of his private history we have met with no trace, except that it may be inferred from the dedication of his work that he was a South American by birth; and it is stated in the title-page that he was Captain in the Royal Spanish Guards. His work was originally published, in five small quarto volumes, at Madrid, 1786-9. It was immediately suppressed by the government, from jealousy at the mass of information concerning their Spanish settlements thus communicated to the public; and is now, in the original form, of extreme rarity. An English translation, however, has been published by G. A. Thompson, Esq., with additions and corrections, in five quarto volumes, 1812-15.

ALCE'DO (*Linnæus*), king-fisher, a genus of birds of which the characteristics are,—the bill long, straight, quadrangular, thick, and pointed; the tongue short, fleshy, flat, and slightly arrow-shaped at the point; the nostrils at the side of the base of the bill running obliquely, and nearly closed by a naked membrane; the legs with the shank (*tarsus*) short; the feet with three toes forward, the outer joined to the middle one as far as the second joint; the inner one similarly joined as far as the first joint. The hind toe is broad at the base. The wings have the first and second quills nearly equal, but these are shorter than the third, which is the longest in the wing.

There is only one species of king-fisher indigenous to Britain, but more than sixty species have been described by naturalists, chiefly natives of Asia and Africa, and all distinguished by the splendid colours of their plumage.

ALCES. [See ELK.]

ALCESTER, written also *Aulcester*, *Alencester*, *Alnacester*, *Alceter*, *Awseter*,—not to mention several other variations,—and commonly pronounced *Aulster* or *Auster*, and by some of the inhabitants, in Camden's time, *Ouldcester*, a parish and market town in the western part of the county of Warwick, situated at the confluence of the Arrow and the Alne, from which last it takes its name. It is 103 miles N.W. from London, and 16 miles W.S.W. from Warwick. Alcester is a place of great antiquity, and the name would indicate that it had been a Roman station; a supposition which is confirmed by the great numbers of Roman coins and other remains which have been found on the spot. It has been held by some to be the ancient Mandnessedum but this is more probably Mancetter on the Anker, in the north-east of the same county. Alcester has been generally supposed to be the Alauna of Richard of Cirencester. It stands on the old Roman way, formerly called Ykemild Street, and still popularly known as Ickle Street. An abbey was founded here in 1140 by Ralph Boteler of Oversley, on a piece of ground about half a mile to the north of the town surrounded by the Arrow on the north and east, and by a moat on the other two sides. It was hence called the Church of our Lady of the Isle. Dugdale, in his *Antiquities of Warwickshire*, (published 1656,) says that, by that time, the ruins of this abbey had been dug up and the ground sown with corn. Nevertheless, traces of this very ancient abbey of the Benedictines are still visible there. The abbey, although at one time possessed of a considerable revenue, had, by means of alienations, become so poor about the middle of the fifteenth century, that it was found necessary in 1465 to unite it to the neighbouring abbey of Evesham. The letters-patent issued by Edward IV. for this purpose, state that 'there then was not, nor of a long time had been, any monks to bear the abbot company.' The spot on which the abbey stood is still called the Priory Cross (or, according to Britton, the Priory Close). Leland in his *Itinerary* says: 'The town hath been a great thing. Some say there hath been three parish churches in it.' He remarks that, although it stands now chiefly on the Arrow, it must, as its name denotes, have anciently extended eastward to the Alne. It was formerly very famous for its wheat-fair. The manufacture of needles was also formerly very extensively carried on; in 1814, 600 persons were employed in it; this trade has much declined. Alcester is not noticed in Domesday Book, nor is there any written record of its existence before the reign of Henry I. It contains many old houses. The church was rebuilt in 1732, with the exception of the tower, which is much older, and has tombs of Sir Fulke Greville and his lady, and of the Beauchamps. Near the church, on the western bank of the River Arrow, stood Beauchamp Court, the residence of the Beauchamps and the Grevilles. Ragley Hall, the seat of the Marquis of Hertford, is about two miles from Alcester on the south-west. Alcester has a handsome town-house, in which courts are held by the Marquis of Hertford, the lord of the manor. A free-school was founded here in 1594 by Walter Newport, in a field south from the town. The population of the town in 1851 was 2027; of the parish, 2878. Alcester is the seat of a Poor-law Union, which contains 22 parishes, with an aggregate area of 59,430, and a population in 1851 of 17,482. The Alcester Union Workhouse, situate in Oversley, contained 55 persons in 1841, and 112 in 1851. Alcester is in the hundred of Barlichway, and the living is a rectory in the diocese of Worcester; patron, the Marquis of Hertford.

ALCHEMY, the pretended art of making gold and silver. The name appears to be derived from the Greek χημεια, chemistry, but the *al* prefixed to it denotes the probability of the Arabic origin of the imposture. Another, and subsequent object of alchemy was the preparation of a universal medicine. Those alchemists who were supposed to be skilled in the art were termed *adepts*, or *the adepts*.

In the opinion of the alchemists, all the metals are compounds, the baser of them containing the same constituents as gold, but mixed with various impurities, which, being removed, the common metals were made to assume the properties of gold. The change was effected by what was termed *lapis philosophorum*, or the philosophers' stone, which is commonly mentioned as a red powder possessing a peculiar smell.

It is not quite certain either at what period or in what country alchemy arose; and different opinions on the subject are expressed by authors. Dr. Thomson (*History of Chemistry*, vol. i. p. 14) supposes that it originated among the Arabians when they began to turn their attention to medicine, after the establishment of the Caliphs; or that, if it had been previously cultivated by the Greeks, as there is some reason to suppose, it was taken up by the Arabians and reduced by them into regular form and order. This conclusion is rendered extremely probable, on account of the prefix of the Arabic article *al*.

Hermes Trismegistus is generally mentioned as one of the earliest alchemists; but the writings bearing his name are undoubtedly spurious. In 1692, Dr. Salmon, in his *Clavis Alchymiæ*, published a translation of the *Tractatus Aureus* attributed to Hermes, with the works of some other alchemists. The translation is accompanied with notes which rival the original in absurdity. The word *hermetic*, still in common use, is derived from Hermes. Geber, an Arabian physician who lived in the seventh century, is one of the earliest alchemists whose works are extant; but some doubt of their genuineness is entertained. Dr. Thomson (*History*, vol. i. p. 15) remarks, that though the principles which lie at the bottom of alchemy were implicitly adopted by him, he does not attempt to make gold artificially, nor admit the possibility of converting the baser metals into gold. In Dr. Salmon's work, however, the following passage occurs, translated from Geber's *Alchemy of Sol*. 'Whatever metal is radically citrine, and brings to equality and cleanses, it makes gold of it; from whence we discern, that copper may be transmuted into gold by artifice,' &c. &c.

Geber also treats of the *Medicine, Tincture, Elixir, or Stone of the Philosophers in general*. Dr. Johnson supposes that the word *gibberish*, anciently written *geberish*, was originally applied to the language of Geber and his tribe; many of the quotations given by Salmon would certainly justify the etymology. Although it is also apparent that Geber was an alchemist in the most comprehensive sense of the word; and although his works abound with the most absurd and mystical phrases, yet his chemical labours were directed to the improvement of medicine. He has also described and depicted various furnaces, crucibles, alembics, aludels, and other useful chemical apparatus, of which he was probably the inventor; and he treats of distillation, sublimation, calcination, and various other chemical operations.

Omitting any mention of less celebrated alchemists, we proceed to notice Albert Groot, usually called Albertus Magnus, a German, who was born at Bollstaedt in 1282. He was acquainted with all the sciences usually taught in that age, and his works were published at Leyden in 1651, in twenty-one folio volumes, among which are seven tracts on alchemy. According to Dr. Thomson, Albertus, in his treatise *De Alchemia*, gives an account of all chemical substances known in his time; was well acquainted with chemical apparatus, and with the methods of purifying the precious metals. He imagined that the metals were composed of mercury and sulphur, and accounts for the diversity of them, by the difference in the proportion of their constituents and their purity. His writings are in general plain and intelligible. Thomas Aquinas is asserted to have been the pupil of Albert: he wrote three works on alchemy which are said to be always obscure, and often unintelligible; the word *amalgam*, signifying a compound of mercury and another metal, occurs, and probably for the first time, in his writings; which contain also some other terms, still used in chemistry.

The alchemist next to be mentioned is Raymond Lully, who was born at Majorca in 1235. He was a very singular person; he travelled to various kingdoms to preach Christianity, and died in 1315, on his passage from Africa, where he had been on this service.

Lully is stated to have been the scholar and the friend of Roger Bacon; his reputation as an alchemist was very high, and his works, which are generally obscure, amount to nineteen. He obtained nitric acid by distilling a mixture of nitre and green vitriol, observed its power of acting upon metals generally, and of dissolving gold when mixed with sal-ammoniac. He appears also to have known various other chemical compounds, and their action upon each other.

Roger Bacon, frequently called Friar Bacon, a Franciscan monk, was born at Ilchester, in Somersetshire, in 1314. Notwithstanding the great learning and scientific acquirements of Bacon, he was deeply imbued with the mystery of alchemy; this is the more remarkable, because he exposes the absurdity of believing in magic, necromancy, or charms. His chemical and alchemical writings amount to eighteen, a list of which may be seen in Dr. Thomson's *History of Chemistry*, vol. i. p. 35. Bacon appears to have been acquainted with the composition of gunpowder, and, by some, he is thought to be the inventor of it. It was, however, probably introduced into Spain by the Moors; and, Bacon, from his acquaintance with Arabic, might have acquired information of its composition from some writing in that language. Bacon has hinted at his knowledge of the ingredients of gunpowder, in his *Epistola de Secretis Operibus Artis et Naturæ et de Nullitate Magiæ*, in the following enigmatical sentence: 'Sed tamen salis petræ Luru. Vopo. Vir Can Vtriet sulphuris; et sic facias tonitrum et coruscationem, si scias artificium.' Saltpetre and sulphur being distinctly named, we have only to suppose charcoal to be concealed under the enigmatical terms quoted, and then all the substances contained in gunpowder are mentioned as capable of producing thunder and lightning when properly used.

It is not to be wondered at, in a barbarous age, that one who was skilled in so many sciences should be accused of witchcraft; we accordingly find, that Bacon was imprisoned on this charge, and narrowly escaped starvation, or being burnt as a magician. The real ground of his offence appears to have been his exposure of the immorality of the priesthood. He died either in 1284 or 1285; his *Opus Majus*, edited by Dr. Jebb in 1733, and the *Epistola*, already quoted, are the works of this author most worthy of perusal. In the list of Bacon's works already referred to, there are several professedly on alchemy. Dr. Salmon has translated one which is not among them, called *Radix Mundi*; another work on alchemy, called *Speculum Alchemiæ*, mentioned in the list above referred to, is also translated by Dr. Salmon.

Arnoldus de Villa Nova was not only an alchemist, but an astrologer and magician. He is said to have been born, in 1240, at Villeneuve, a village of Provence: he was educated at Barcelona, which place he was obliged to leave in consequence of foretelling the death of Peter of Aragon. When he left Barcelona, he went to Paris, and travelled through Italy; and afterwards taught in the university of Montpelier. He acquired high reputation as a physician; and was well skilled in several languages and in the sciences of his time.

He wrote about twenty different works, some of which are professedly on alchemy: the book entitled *Rosarium* is probably the most curious, it being intended as a compendium of the alchemy of the day. The second part of this work, which professes to treat of the art of making the philosophers' stone, is stated to be quite unintelligible. Like his predecessors, he considered mercury as a constituent of metals; and professed that he could increase the philosophers' stone at pleasure. He died in the year 1313, on his way to visit Pope Clement V., who lay sick at Avignon.

Raymond Lully and Arnoldus de Villa Nova are stated to have inspired men of all ranks with a taste for alchemy: Pope John XXII. was one of them: he professed and described the art of transmuting metals; and boasts, in the beginning of his book, that he had made two hundred ingots of gold, each weighing a hundred pounds.

The fourteenth century produced a considerable number of alchemists,—as Nicholas Flammel, Pierre le Bon of Lombardy, the monk Ferrari in Italy, Cremer, abbot of Westminster, the disciple and friend of Lully, John Daustein and Richard, in England, practised and wrote upon hermetic philosophy. The work attributed to Flammel is generally reckoned spurious. The fifteenth century was more productive in adepts even than the preceding. About 1408 flourished John Isaac Hollandus, and his countryman of the same name, who were either brothers or a father and son. They were born in the village of Stolk, in Holland. Few circumstances are known respecting them. They wrote several treatises on chemistry, which are remarkable for clearness and precision, considering the time at which they appeared. In the opinion of Boerhaave, they were very distinguished chemists. Paracelsus and, subsequently, Boyle repeated many of the experiments contained in their works; they related, however, principally to the transmutation of metals. In this century was born George Ripley, who was canon of Bridlington, in Yorkshire: he published a work, called *Medulla Alchymiæ*, which is translated by Dr. Salmon, in his *Clavis*. This work is replete with the same sort of unintelligible jargon which usually abounds in such productions. He wrote another work, in rugged rhyme, called the *Compound of Alchemie*, which was dedicated to Edward the Fourth.

Basil Valentine, a Benedictine monk, of Erfurt, in Germany, was born at the latter end of the fourteenth century; and, with the exception of Paracelsus, he was, perhaps, the most famous professor of the hermetic philosophy: but he possessed, at the same time, very considerable merit as a chemical experimenter, and was much occupied in the preparation of chemical medicines. He first introduced antimony into medicine: his work on this subject is entitled *Triumph-wagen Antimonii*, which was translated from the German into Latin, under the title of *Currus Triumphalis Antimonii*, by Kerkringius, in 1671. In this book he strongly advocates the chemical sect; and treats the practice and theories of his opponents with great severity, because they are unable to prepare their own medicines: 'they know not whether they be hot or dry, black or white; they only know them as written in their books, and seek after nothing but money. Labour is tedious to them, and they commit all to chance; they have no consciences, and coals are outlandish wares with them; they write long scrolls of prescriptions, and the apothecary thumps their medicine in his mortar, and health out of the patient.'

Basil Valentine was of opinion that the metals are compounds of salt, sulphur, and mercury, and that the philosophers' stone was composed of the same ingredients. He was acquainted with many of the properties of several metals, and with the effects they were capable of producing by their chemical agency. He was, however, more particularly informed with respect to antimony, and knew most of the preparations of it which at present exist in the pharmacopœias of Europe. Twenty-three different publications have been ascribed to Basil Valentine, but it is uncertain how many of them were written by him. His works contain the first accurate mention of the nitric, muriatic, and sulphuric acids, with intelligible directions for preparing them; and he was acquainted with a very considerable number of metallic salts and compounds.

We have now mentioned the principal writers on alchemy. There arose, however, from time to time, various authors, who appear to have been rather believers in the possibility of the transmutation of metals than pretenders to have accomplished it. A list of alchemists, from Hermes, who is represented as having flourished nearly 2000 years before the Christian æra, down to Mathieu Dammy, in 1739, may be seen in the *Encyclopédie Méthodique:* it is copied from Dufrenoy's *Histoire de la Philosophie Hermétique*. This list contains names which are more familiar as chemists than as adepts; such, for example, as Paracelsus (who applied the philosophers' stone, not to the making of gold, but to the preparing of medicines), Libavius, Van Helmont, Glauber, and Kunckel.

To these believers in the art may be added Bergmann, a celebrated chemist of very late date, who, after summing up the evidence for and against the possibility and probability of transmutation, observes, respecting the numerous relations that have been given by writers of apparent veracity, that, 'although most of them are deceptive, and many uncertain, some bear such character and testimony, that, unless we reject all historical evidence, we must allow them entitled to confidence.'

The later Peter Woulfe, who was a Fellow of the Royal Society, and died in 1805, is reported to have been a believer in alchemy. His name is associated with chemical operations on account of the apparatus which bears his name, but which had been previously described by Glauber.

The last person, at least in this country, who professed to convert mercury into silver and gold, was Dr. Price of Guildford: he is said to have convinced some persons of the possibility of the transmutation; his experiments were to have been repeated before competent judges, but he prevented detection and exposure by destroying himself with laurel water. This happened in 1782.

For an account of that mysterious substance, the philosophers' stone, by which the wonders of transmutation were worked, and a detail of the process for preparing it, given in the words of an adept, we refer the reader to Dr. Thomson's *History of Alchemy*, p. 23.

Dr. Thomson states, that the philosophers' stone, prepared by the elaborate process above referred to, could hardly have been anything else than an *amalgam of gold;* and 'there is no doubt,' he adds, 'that amalgam of gold, if projected into melted lead or tin, and afterwards cupellated, would leave a portion of gold; all the gold, of course, that existed previously in the amalgam. It might, therefore, have been employed by impostors to persuade the ignorant that it was really the philosophers' stone; but the alchemists, who prepared the amalgam, could not be ignorant that it contained gold.'

In the *Memoirs of the Academy of Sciences* for 1772, M. Geoffroy published an account of the various modes in which the frauds of the adepts were carried on; some of these we shall mention. He observes that, instead of the mineral substances which they pretended to transmute, they put oxide (*chaux*) of gold or silver at the bottom of the crucible, the mixture being covered with some powdered crucible and gum-water, or wax, so that it might look like the bottom of the crucible. On other occasions, they made a hole in a piece of charcoal, filled it with powdered gold or silver, and closed the hole with wax; or they soaked charcoal in a solution of these metals, and threw the charcoal, when powdered, upon the material to be transmuted. They used, also, small pieces of wood, hollowed at the end, put filings of gold or silver into the cavity, and stopped it with fine sawdust of the same wood, which, on burning, left the metal in the crucible. Sometimes they whitened gold with mercury, and made it pass for silver or tin; and the gold, when melted, was exhibited as gold obtained by transmutation. They had a solution of nitrate of silver, or of muriate of gold, or an amalgam of gold and silver, which, being adroitly introduced into the crucible, furnished the necessary quantity of metal. A common exhibition was to dip nails into a liquid, and to take them out apparently half converted into gold: these nails consisted of one-half iron, neatly soldered to the other half, which was gold, and covered with something to conceal the colour, which the liquor removed. Sometimes they had metals made of gold and silver soldered together; the gold side was whitened with mercury, dipped into some transmuting liquid, and then heated; the mercury being dissipated, the gold portion of the metal appeared.

Bergmann, in his *Essays*, vol. iii. p. 93 (*History of Chemistry during the Middle Ages*), has given a number of cases in which gold had been supposed to be formed by the use of the philosopher's stone. They were unquestionably the results of some of the abovementioned tricks; but Bergmann states it as his opinion, that some accounts of transmutation are 'entitled to a greater degree of credit' than others. 'For, doubtless,' he adds, 'if a person, who has no faith in the changes of alchemistry, should obtain by chance a small piece of the philosophers' stone, and, on making the experiment alone in his closet, procure a quantity of gold heavier than the stone, will it not be difficult to explain in what manner he was liable to be deceived?' Before the difficulty is required to be explained, the fact must be placed on incontestable evidence.

The question has sometimes been asked, whether the labours of the adepts have been favourable or otherwise to the progress of chemical science? This question we should be inclined to answer in the negative, on account of the disrepute into which the jargon of their writings and the frauds of their experiments must have brought, not only their authors, but the science which they abused. On this subject, Dr. Thomson, however, remarks (*History*, p. 30), 'As the alchymists were assiduous workmen—as they mixed all the metals, salts, &c., with which they were acquainted, in various ways with each other, and subjected such mixtures to the action of heat in close vessels, their labours were occasionally repaid by the discovery of new substances, possessed of much greater activity than any with which they were previously acquainted. In this way they were led to the discovery of sulphuric, nitric, and muriatic acids. These, when known, were made to act upon the metals; solutions of the metals were obtained, and this gradually led to the knowledge of various metalline salts and preparations, which were introduced with considerable advantage into medicine. Thus the alchymists, by their absurd pursuits, gradually formed a collection of facts, which led ultimately to the establishment of scientific chemistry.' It may be also stated in favour of the alchemists, that phosphorus was discovered by an adept of the name of Brandt, at Hamburgh, in 1677: this he procured from urine, while searching for some substance capable of transmuting silver into gold.

Gibbon (*Decline and Fall*, vol. ii. p. 137), speaking of alchemy, says that, 'congenial to the avarice of the human heart, it was studied in China as in Europe, with equal eagerness, and with equal success. The darkness of the middle ages insured a favourable reception to every tale of wonder; and the revival of learning gave new vigour to hope, and suggested more specious arts of deception. Philosophy, with the aid of experience, has at length banished the study of alchymy; and the present age, however desirous of riches, is content to seek them by the humbler means of commerce and industry.'

ALCIBI'ADES, the son of Cleinias, was one of the most distinguished statesmen and generals of Athens, during the eventful period of the Peloponnesian war. Descended on both sides from the most illustrious families of his country, born to the inheritance of great wealth, endowed with extraordinary beauty of person, and with mental qualifications no less brilliant, it seemed evident from his early youth that he would exert no slight influence over the counsels and the fortunes of Athens. This marked him out to Socrates, as one on whom his moral influence might be exerted with beneficial results. The faults of Alcibiades were those of a spoilt child of fortune: he was fickle, selfish, overbearing, and extravagant. But these faults clouded, not concealed his nobler qualities. Passionately fond of show and splendour, a frequent victor in the Olympic games, and possessed of a more criminal notoriety as a favoured suitor among the most dignified matrons of Athens, he never lost sight of more manly objects of ambition; and he met the proffered friendship of Socrates with eagerness, as the surest means of acquiring that mental cultivation which at Athens was the best, though not the only key to political power. The philosopher soon acquired over his wayward pupil that influence which he seems to have exercised over all who came within his circle; and the close intimacy which arose between these opposite characters, was cemented by a singular reciprocity of benefits. In a battle fought near Potidæa, Socrates saved the life of Alcibiades, and the latter repaid the obligation by a similar service at the battle of Delium. But the influence of Socrates was insufficient in this case to work a permanent change of character; and the political life of Alcibiades proves that he had not profited much by the moral instructions of his master.

He became an orphan at an early age, and was placed under the wardship of his uncle Pericles. After the death of Pericles, Alcibiades being then but a child, Nicias and Cleon succeeded to a divided influence in the state: but with increasing years, Alcibiades was naturally regarded as one likely to take a leading part in politics, and he was not slow to assert the influence which seemed his due. At first he was inclined to cultivate the goodwill of Sparta; between which, and his own family, an ancient hereditary friendship had existed: but the Spartans, whose national character was utterly alien from that of the impetuous and volatile Athenian, chose rather to connect themselves with Nicias. Alcibiades readily changed his politics, when he found that, in that connexion, he could not be the leading man, and became as violent in enmity, as he might have been in friendship to Sparta, had his advances been more favourably received.

His first opportunity of thwarting the wishes of Sparta, and his first prominent appearance in public life, occurred in the year 421 B.C. A truce had been concluded between Sparta and Athens; but considerable difficulty arose in executing the terms of the treaty: much dissatisfaction arose in consequence at Athens; and it seemed a good opportunity to engage the people in a connexion with Argos, always jealous of Sparta, and then at the head of a strong confederacy of Peloponnesian states. Ambassadors arrived from both these cities at the same time; the Argians to solicit Athens to join their alliance; the Spartans with ample power to settle all disputed points: for it was of first-rate importance to them to prevent a junction between Athens and Argos. The prospect of accommodation with Sparta was far from suiting the views of Alcibiades; and he was not scrupulous as to the means by which it might be prevented. The ambassadors came with full powers to settle all points in dispute, and had made a statement to this effect before the council of five hundred. But before they were introduced to the general assembly of the citizens, Alcibiades persuaded them, that on account of the grasping temper of the Athenians, it would be better not to state the full authority with which they were vested. They followed his advice, to the great astonishment of Nicias, his party, and the whole council; and were in turn equally surprised when Alcibiades attacked them violently, reproached them with prevarication, and made an animated appeal to the people in favour of the Argian alliance. After some hesitation, his proposition was agreed to; and thus Athens was placed at the head of the principal confederacy of Peloponnesus, and Alcibiades became the leading political character, not only of Athens, but of Greece. His age at this time is not certainly known, but it was from five-and-twenty to thirty. Thucydides calls him 'still young.' In 419, he was made Strategos, or chief military officer of Athens, and during the next three years he took a prominent and active part in the complicated struggle of intrigue and war carried on in Peloponnesus during that period. It is said by Plutarch, but apparently on uncertain report, that he was principally concerned in the detestable massacre of the Melians.

About this time the Athenian people were chiefly influenced by three men, each of whom was the leader of a strong party; Alcibiades of the war, or anti-Laconian party, Nicias of those who wished for peace, and a sincere accommodation with Sparta. The third, Hyperbolus, a mob-orator of the meanest class, influenced a large proportion of the poorest citizens, who were numerically formidable in the general assembly. This man threw out no obscure hints of the expediency of banishing Alcibiades, as a person dangerous to the commonwealth from his wealth, power, and ambition; and in the divided state of parties he might, perhaps, have effected this, had not Alcibiades been assisted by Nicias, who dreaded and detested Hyperbolus as cordially upon political, as Alcibiades upon personal grounds. By their united efforts sentence of exile, under the form called ostracism, was passed on Hyperbolus. But the coalition lasted only till this was accomplished. Diametrically opposite in temper, as well as in politics, these rival statesmen could not bear divided power; and that Alcibiades might be supreme, it was necessary to excite some war in which his own versatile talents might find scope for their display, and by which the cupidity of the Athenians for both gain and glory might be gratified.

Such an opportunity was afforded by an embassy from Egesta, a small town in Sicily, which had become opposed to Syracuse, by far the most powerful city of that island. The Syracusans, a Dorian people, were attached to the Spartan interest, although hitherto they had interfered little in the affairs of Greece proper. But they had trenched materially on the independence of the Ionian cities of Sicily; and it was a plausible argument for taking part against Syracuse, that if no power remained capable of balancing hers, she might, at some future period, be inclined both by temper and by blood to unite with Lacedæmon against Athens. Alcibiades proposed, therefore, to send an armament to protect the Egestans, and to take any further measures which might strengthen the Athenian interest in Sicily. The measure was in vain opposed by Nicias, and a decree passed, that a powerful fleet should be despatched thither. This was done; and the armament which sailed from the Peiræus B.C. 415, under the joint command of Nicias, Lamachus, and Alcibiades, was the most splendid that ever left a Grecian port. Popular enthusiasm was strongly excited; the undertaking seemed to promise wealth and victory, and neither public nor private expense was spared to make the equipment as complete as possible. There sailed from Athens 100 ships, containing, besides their crews, 2200 heavy-armed Athenian citizens; and the tale of 134 ships, and 5100 heavy-armed soldiers, besides slingers and bowmen, was made up by the allies and subject-states. But on arriving in Sicily, it was found (as probably Alcibiades well knew) that little help could be had from the Egestans. Nicias was for returning, Lamachus for laying siege at once to Syracuse. Alcibiades proposed to enter into negotiation with all the cities except Syracuse and Selinus, in the hope of securing a powerful party in the island, before commencing hostilities with those two states. This plan was finally adopted; and had the genius of Alcibiades continued to direct it, this unfortunate expedition might perhaps have terminated gloriously for Athens. But party-strife at home led to his recall, and of the two generals who remained, Lamachus, a mere soldier, Nicias timid, and disinclined to the whole business, neither was qualified to execute the plan of their enterprising colleague. But we must return a little in the order of time, to explain the cause of Alcibiades' recall.

It was usual to place a square block of stone, surmounted by a head of Mercury, before the doors of temples and houses in Athens, a relic of more simple times in which the presence of the god was expected to guard the entrance from violence. Of these Hermæ, as they were called, from the Greek name of the god, the greater part were defaced in one night. The next morning anger and tumult spread through the city. The act was generally believed to bode ill to the important expedition to Sicily, then in preparation; it was even thought to indicate a design to overthrow the democracy. High rewards were offered for any information concerning the guilty persons; and it came to light that a party of intoxicated young men had been concerned in the mutilation of a few statues some time before. Alcibiades was implicated in this charge, which, however, was entirely distinct from the act which had given such alarm and offence. But this, and his other irregularities, gave a colour to the accusation, which his enemies laboured to fix on him, of having contrived the mutilation of the Mercuries. He came forward freely and eagerly to court an immediate trial, urging the inexpediency of sending out any man in a command of high importance with such a charge hanging over his head. But the oligarchal party at present possessed the ear of the people, and it did not suit their purpose either to grant this reasonable request, or to deprive him of the command. No immediate investigation was made, and a vote was obtained that he should proceed on the voyage. But the agitation was kept up, and rose to an extraordinary height during his absence, and the influence of his enemies was powerful enough to procure that decree of recall of which we have spoken. Alcibiades obeyed the summons, and quitted the fleet in his own trireme; but believing that his death was resolved, he disappeared at Thurium in Italy, in company with other accused persons, and betook himself first to Argos, then to Sparta.

By the injury which he did to his country after his exile, Alcibiades proved how much he might have done for her benefit, had the command of her yet unbroken resources been continued in his hands. Restrained by no principle of patriotism (a feeling not very common in Greece, where no party hesitated to call in foreign arms to strengthen their own hands), he yet felt it necessary, in offering his services and counsels to Sparta, to make some apology for this step, and, as given by Thucydides, it is a very lame one:—'I love not my country as wronged by it, but as having lived in safety in it. Nor do I think that I do herein go against any country of mine, but that I far rather seek to recover the country I have not. And he is truly a lover of his country, not that refuseth to invade the country he hath wrongfully lost, but that desires so much to be in it, as by any means he can he will attempt to recover it.'—(Thucyd., vi. 92.) The value of his services was soon shown. The Athenians had laid siege to Syracuse, and it seemed probable that it would fall into their hands. But at his suggestion a Lacedæmonian force commanded by a Spartan general was sent to Syracuse; and in consequence of their timely aid the besieging force was totally destroyed. He also advised attacking the Athenians more vigorously at home, and at his suggestion Deceleia, a town of Attica, within fifteen miles of Athens, was fortified and permanently occupied by a Lacedæmonian garrison. Hostile and injurious as this conduct was, his professions of patriotism probably were so far sincere, that he was actuated by no love for Sparta, and no hate for Athens, though altogether careless of all national or individual misfortune, so long as he promoted his own views of returning home in power and authority, and not as an arraigned criminal.

It was the general belief of Greece, that the maritime ascendency of Athens was utterly destroyed by the ruin of the Sicilian armament. The Ionian cities, which had felt the harshness of her command, and for the most part contained a strong oligarchal party, eagerly seized the favourable opportunity of revolt. The Persian satraps, or governors of provinces, on the coast of the Ægean, were also eager to crush a power which, in addition to old grudges, maintained against the barbarians the integrity and independence of many valuable Grecian cities, which otherwise would probably have passed into Persian hands. It so chanced that, B.C. 412, Tissaphernes, satrap of Lydia, and Pharnabazus, satrap of the Hellespontine provinces, both sent to invite the alliance of Sparta. It is not necessary to detail the intrigues by which Alcibiades caused the former to be preferred; at the same time it was determined to support Chios and Erythræ in a proposed revolt. The usual supineness of the Spartan government nearly prevented this important blow being struck, nor would the design have been accomplished but for the activity of Alcibiades, by whom Chios, Erythræ, Clazomenæ, Teos, and Miletus were induced to revolt from Athens, and a treaty, by no means honourable to Sparta, was concluded with Tissaphernes.

In the annual change of Spartan magistrates at the end of the year, those who had been most closely connected with Alcibiades went out of office, and were succeeded by the party of Agis, one of the reigning kings, who had perso reasons for looking on the Athenian refugee with no friend eye. [See AGESILAUS.] The connexion with Persia was utterly repugnant to the principles of Lycurgus's institutions; the terms of the late treaty with Persia were highly objectionable; and in addition to those reasons for disliking the course of policy suggested by Alcibiades, there was ground to suppose that he who had been so ready to ruin his country, would not scruple to betray the interest of his adopted home, and there was something like a certainty that he would betray them if the direction of affairs were taken out of his hands. To prevent this, recourse was had to a measure not unfrequent in Spartan councils, and the Spartan general in Asia received instructions to have Alcibiades assassinated. Aware of his danger, Alcibiades left the camp, and repaired to Tissaphernes. Probably it was his aim from the first to establish an independent interest with the satrap, so as to make himself the channel which should turn Persian gold at pleasure into the treasury of Sparta or Athens, and thus obtain sufficient consequence to prescribe to either party the terms on which his services might be purchased. It was with this view that he recommended to the satrap a line of policy, which should give no decisive advantage to either of the contending parties. By the ruin of Athens his services would become useless to Sparta; by the relieving Athens from the fear of Sparta his restoration to his home would become hopeless.

The exertions of Athens, ever since the fatal expedition to Sicily, had been wonderful, and her success proportionate; but they had nearly drained her treasury, and it seemed impossible to hold out much longer against Sparta, backed by the wealth of Persia. It was probably the knowledge of this which guided the policy of Alcibiades, and induced him to hold out hope of an alliance with Persia, on terms which a few years sooner would have been rejected with scorn. These were, his own restoration, coupled with the establishment of oligarchy. The negotiation was commenced with the citizens in the Athenian army, then quartered in great strength at Samos. A large proportion of the trierarchs, or captains of ships, who, under the Athenian system, were men of wealth, were favourable to the change. When they had secured a decided majority in the army, it was resolved to send delegates to Athens, to acquaint the people with the proposals of Alcibiades, and the opinion of the army that they should be accepted. The deputation succeeded in reconciling the people to the change with singular rapidity, and in return a body of ten commissioners was sent out to treat with Alcibiades and Tissaphernes. But whether the former thought the revolution thus brought about unfavourable to his private views, or that he found it impossible to make Tissaphernes fulfil the expectations of assistance, which he had held out as the price of his return, he so managed matters that the commissioners broke off the conference in anger, convinced that at all events Alcibiades meant nothing friendly to them. Still the revolution proceeded. By the new constitution, the supreme authority was vested in a body of five thousand select citizens, and a council of four hundred was appointed to supersede the old council of five hundred. The council was nominated, but not the select body. No one dared to complain, for the practice of secret murder was carried to a frightful extent, and those who did not favour the government were satisfied to remain quiet, when they saw the numbers who were daily slain without inquiry or notice on the part of the magistrate. But in the absence of the leading oligarchists, the temper of the army at Samos changed. Thrasybulus and Thrasyllus, two officers of high character, but subordinate rank, were appointed to take the command; an oath of adherence to the democracy was exacted from all, and as the general assembly at Athens had been dissolved, the citizens in the army assumed the supreme power, and considered the resolutions of their own assembly as the acts of the commonwealth. One of their first measures was to recall Alcibiades, and appoint him their general. In this capacity he did his country the signal service of preventing a civil war between the oligarchy at home, and the army, who were on the point of sailing to Athens to restore the old constitution by force. Meanwhile a schism had arisen, which led to the desired event without confusion or bloodshed. The violent oligarchists were suspected, and with good reason, of a plot to deliver the city into the hands of the Peloponnesians; a cry was raised to uphold the authority of the five thousand against the four hundred; the supreme authority was vested in the former body, who were appointed to be taken from such citizens upon the muster-roll of the heavy-armed foot as were then in Athens; and one of its first acts was to decree the restoration of Alcibiades, and all who had absented themselves from Athens on account of the mutilation of the Mercuries. This revolution and counter-revolution were comprised in the year 411, four years after the recall and condemnation of Alcibiades.

The promises of Persian assistance, which Alcibiades had made so confidently, were not fulfilled. Tissaphernes had learnt so much from his wily counsellor, that he was as unwilling to break entirely with the Spartans, as formerly with the Athenians. But the able conduct of Alcibiades, seconded by Thrasybulus and Thrasyllus, soon brightened the prospects of the Athenians. At Cynossema (411) the Peloponnesian fleet was defeated; at Abydos, in the same year, a further success was obtained; at Cyzicus (410) a still more brilliant victory was gained, in which every ship of the Peloponnesians was taken or destroyed. In the two following years a train of equally important successes marked the ability with which the Athenian affairs were conducted. Chalcedon, Byzantium, and the whole Hellespont and Propontis were regained to the alliance or subjection of Athens; and thus the control of the Euxine, and the power of levying duties on all ships passing the straits, a very lucrative branch of revenue, was recovered. Alcibiades had hitherto abstained from visiting Athens, though the decree against him had been reversed for four years. He now probably thought that his brilliant successes ensured a favourable reception, and he led home his victorious armament in 407. He was received with distinguished favour, elected commander in chief, with a new title, and apparently with greater powers than those belonging to the office of strategos, and soon found an opportunity of gratifying the people, by conducting the annual procession from Athens to Eleusis, under safeguard of the army, which had never ventured to traverse the country since the establishment of a Laconian garrison in Deceleia.

After staying four months in Athens, he returned to the scene of action. The Athenians seem to have thought that he could command success at will, and grew angry that no brilliant success immediately waited on his arms. The defeat at Notium, where his second in command gave battle during his absence, contrary to his commands, completed their alienation. He was superseded, and the command vested in a board of ten. It is not said that any steps were taken against him, but he evidently thought it would be unsafe to return to Athens, and retired from the fleet to the Thracian Chersonese, where he had large possessions. Here the history of his public life ends, and of his future history few certain notices are preserved. He still resided in the Chersonese in 405, and endeavoured to prevent the defeat of Ægospotamoi, which he foresaw from the negligence and incompetence of the Athenian commander; but his interference was disregarded. Athens was taken in the following spring, and Alcibiades, thinking himself no longer safe in the Chersonese, retired into Bithynia, with the intention, it is said by Plutarch, of repairing, like Themistocles, to the Persian court, to request assistance in restoring the independence of Athens. During his abode in Asia, his house was surrounded and set on fire by a body of armed men. They dared neither enter the house, nor await the assault of Alcibiades, supported only by his servants, but overwhelmed him with missile weapons. He appears to have died in 404, being then at least forty-four years of age.

The intellectual eminence and moral depravity of Alcibiades are alike placed beyond the reach of doubt. His conduct however subsequent to his recall seems to have been unexceptionable; and the ingratitude of his countrymen was justly punished by the issue of the war. The rashness and petulance of his youth were tempered by experience, and his measures appear to have been equally vigorous in execution, and prudent and mature in conception. Singularly gifted with the faculty of adapting himself to all men, it was observed that, when at Sparta, he equalled the Spartans in austerity of manners; in Asia surpassed the pomp of the Persians themselves; and he is said, by Plutarch, to have been materially indebted to his powers of pleasing in society, which were such, that 'no man was of so sullen a nature but he would make him merry, nor so churlish but he would make him gentle.' Had he been suffered to retain the direction of the counsels of Athens, there can be no doubt but that the temporary fall of that city would have been long delayed, and a strong probability that the event of the Peloponnesian war would have been altogether different. (Thucydides; Plutarch, *Life of Alcibiades.*)

ALCOHOL. This word is probably of Arabic origin, and is the chemical name of what is sometimes termed *ardent spirit.* It is a fluid compound of oxygen, hydrogen, and carbon, not obtainable by direct chemical action, but produced by the vinous fermentation, during which the elements separated from combination re-unite in new proportions to form it. Alcohol is the intoxicating principle of beer, wine, and fermented liquors in general; and when they are subjected to distillation, the alcohol and a considerable quantity of water are vaporized and condensed together. The distilled products have different names and properties according to the substances yielding them: thus, brandy is obtained from the fermented and distilled juice of the grape; rum from that of the sugar-cane; whiskey, and what is termed spirit of wine, are usually obtained from barley, which is generally malted previously to fermentation.

On account of the chemical affinity existing between alcohol and water, it is not possible to obtain the former free from the latter by simple distillation, though frequently repeated; the specific gravity of the product is never less than 0·825, and the rectified spirit of wine of commerce and of the *London Pharmacopœia* has a specific gravity of 0·835.

It will be more particularly mentioned under Fermentation, that sugar, during its operation, is decomposed, and that its elements, which are the same as those of alcohol, combine to form two new compounds, viz., alcohol, the principal part of which remains in the fermented liquor, and carbonic acid, which is mostly evolved in the state of gas. Sugar is composed of twelve atoms or equivalents of each of its constituent elements, and when it is fermented, the whole of the hydrogen combines with two-thirds of the carbon and one-third of the oxygen, and with them forms alcohol, while the remaining atoms of carbon and oxygen unite to produce carbonic acid. The following table will render these changes more intelligible [Distillation]:—

1 atom sugar (grape) contains $C_{12}H_{12}O_{12}$, and during fermentation passes into—

1 atom alcohol, . .	$C_4H_6O_2$
1 〃 〃 . .	$C_4H_6O_2$
1 〃 carbonic acid, . .	$C\ \ O_2$
1 〃 〃 . .	$C\ \ O_2$
1 〃 〃 . .	$C\ \ O_2$
1 〃 〃 . .	$C\ \ O_2$
	$C_{12}H_{12}O_{12}$

So that one atom of sugar passes by fermentation into two atoms of alcohol and four atoms of carbonic acid. The above formula for alcohol $C_4H_6O_2$, may be more correctly written C_4H_5O, HO, which represents alcohol as the hydrate of the oxide of ethyle [Æther]. This is *absolute alcohol*, and many processes have been suggested for its preparation. According to M. Sœmmering, the water may be entirely separated from alcohol by the following process:—Put the spirit into an ox's bladder coated with isinglas, and expose it to a temperature of 105° to 120°; the interior of the bladder is moistened by the water of the spirit, and whilst the exterior coat dries, fresh portions of water continue to penetrate the bladder, and to evaporate from its surface, while but little of the alcohol escapes with it. Spirit put into a wide-mouthed bottle, and tied over with bladder, suffers a similar evaporation of the water and concentration of the alcohol. Geiger and Planiava assert, however, that the remaining alcohol still retains three per cent. of water. Pajot Descharmes proposed to place spirit in a flat vessel beside fragments of chloride of calcium under a closed receiver; the air contained in this soon becomes loaded with the vapour rising from the spirituous liquor, the salt combines with it, and the alcohol is gradually concentrated; some, however, is lost, being vaporised and condensed with the water. Berzelius, *Traité de Chimie*, t. vi. 448.

Dr. Graham proposed a process upon a similar principle, viz., that of placing a shallow vessel of spirit over another containing coarsely powdered lime, under a bell-glass, upon the plate of an air-pump; the air is exhausted till the alcohol begins to boil, and the lime absorbs the water only of the vapour which rises. If sulphuric acid be substituted for lime, then both the water and spirit evaporate, and are totally absorbed. *Edin. Phil. Trans.*, 1828.

Although these are curious processes, yet they are scarcely applicable on an extensive scale. The best methods depend upon adding to the spirit some substance which has affinity for the water, and none or but little for the alcohol; thus carbonate of potash is a deliquescent salt, and has consequently great affinity for water, but unlike most salts of this description, it has no affinity for alcohol, and is totally insoluble in it. When, then, dry carbonate of potash in powder is put into rectified spirit-of-wine of specific gravity 0·835, the water which it contains dissolves the alkaline salt, and forms a dense solution, on which the alcohol floats—not, however, quite free from water, for when separated and distilled, its specific gravity is reduced only to 0·815, and therefore it retains about five per cent. of water.

Caustic potash, having still greater affinity for water than the carbonate, has been recommended to be substituted for it; but it appears to alter the properties of the alcohol to a certain extent. Lime also has been used; it is to be powdered, mixed with the spirit, and put into a stopped bottle, and occasionally shaken for three or four days; after which the clear liquor is to be poured off, and cautiously distilled.

Chloride of calcium (sometimes called dry muriate of lime), which has been fused so as to render it free from water, is an extremely deliquescent salt, and is more powerful than most substances in separating water from alcohol. Mix equal weights of spirit, and pieces of the fused chloride in a stopped bottle; when the salt is dissolved, pour off the clear solution into a distilling apparatus, and continue the operation until the product is equal to half the bulk of the spirit employed. If the distillation be properly conducted, the alcohol obtained is perfectly free from water, and has the following properties. It is a limpid, colourless liquid, of an agreeable smell, and a hot pungent taste. Its specific gravity is 0·791 at 68°, or 0·794 at 60°. It has never been frozen, although it thickened a little when exposed by Faraday to 166° below zero, or 198° below the freezing-point of water. It is extremely volatile, producing considerable cold during evaporation; the degree of cold is proportional to its purity. Heat expands alcohol in a greater degree than it does water, for 100,000 volumes become 104,168 by being heated from 32° to 100°; whereas an equal bulk of water heated to the same degree is increased only to 100,908. Under the average atmospheric pressure, alcohol boils at about 173°, but in the vacuum of the air-pump, ebullition occurs at 60°, and even below it. In becoming vapour, alcohol absorbs only 0·436 of the heat required to evaporate an equal weight of water; and according to Gay-Lussac (*Ann. de Chim. et de Phys.* xv.), the density of the vapour of anhydrous (waterless) alcohol, compared with that of atmospheric air, is as 1613 to 1000. When the vapour of alcohol is strongly heated, as by being passed through a red-hot porcelain tube, it is decomposed, and there are obtained carburetted hydrogen, carbonic oxide, and a small quantity of charcoal. Alcohol, and the vapour arising from it, are extremely inflammable; it burns with a lambent flame, the colour of which depends upon the strength of the alcohol; the blue tint prevails when it is strong, and the yellow when weak. Although the flame of alcohol yields but little light, its heat is intense; it burns without any smoke, and the only products of the combustion, under common circumstances, are water and carbonic acid. When, however, alcohol is burned in the lamp without flame, in the wick of which a platina wire is kept ignited, then *lampic acid* is produced, which is also known as *acetylous* and *aldehydic acids*, and contains resinous matter, to which some of its peculiar properties are owing. There are several substances which communicate colour to the flame of alcohol: boracic acid and cupreous salts impart green; barytic salts, yellow; and the salts of strontia, an intense and beautiful red colour.

Alcohol may be fired by the electric spark, which when passed through a mixture of the vapour of alcohol and oxygen gas, causes it to take fire and explode violently. The vapour of alcohol requires three times its volume of oxygen gas to be perfectly burned, and it then yields water and twice its volume of carbonic acid gas; theoretically, 46 parts of alcohol = 1 atom, should yield 54 parts = 3 atoms of water; but according to Saussure, a larger quantity is obtained.

At low temperatures, alcohol suffers but little change by exposure to the air; the portion which does not evaporate is rendered weaker by attracting water, and it absorbs at the same time some air. According to Saussure, alcohol and water take up similar proportions of oxygen and nitrogen, but the former fluid dissolves 0·1625 of its volume of oxygen, while water takes up only 0·065; it is on this account that there is always a slight disengagement of gas when these liquids are mixed, part of the oxygen contained in the spirit being expelled by the water.

Alcohol has great affinity for, and readily mixes with water in all proportions, and during their combination heat is excited; if, for example, equal measures of water and of alcohol of specific gravity 0·825, both at 50°, be suddenly mixed, the temperature is raised to 70°, and the specific gravity of the mixture when cooled exceeds its calculated density; if, however, the alcohol be weak, then, although heat is excited, the mean density is diminished.

The following table by Dr. Steel, shows the quantity of absolute alcohol in mixtures of alcohol and water of different densities at 60°:—

Alcohol.	Specific Gravity.	Alcohol.	Specific Gravity.
100	0·79460	60	0·89528
95	0·80750	55	0·90666
90	0·82108	50	0·91791
85	0·83499	45	0·92877
80	0·84757	40	0·93916
75	0·85975	35	0·94876
70	0·87172	30	0·95743
65	0·88354	25	0·96491

Many processes have been followed for the purpose of ascertaining the proportion of absolute alcohol in any mixture of it and water. The first method resorted to was a very simple, but, at the same time, a very rude one. Some gunpowder was covered over by a measured quantity of the alcoholic liquid, and the latter ignited. If the spirit was *above proof*, then at the end of the combustion the gunpowder was dry, and took fire; but if the spirit was *below proof*, then when it ceased to burn, it left the powder wet with the water it contained, and, as a consequence, there was no explosion. The most correct process of determining the strength of a liquid, is to weigh it against an equal bulk of water. What is now called *proof-spirit*, is a mixture of nearly equal weights of alcohol and water, and its density or specific gravity at 62° should be 0·92, ranking water as 1·00; that is to say, a vessel which when filled with water would contain 100 grains of it, when filled with proof-spirit would hold only 92 grains. A hydrometer—an instrument with a weighted bulb and long index attached—serves as the most convenient guide to the excise-officer; as by noticing the depth to which the bulb sinks in the liquid, he can at once read off the strength. [See HYDROMETER.]

Alcohol is capable of dissolving the resins, and many similar bodies upon which water has no action; hence its use in varnish-making. With the fixed oils, except castor oil, it does not readily unite; but it dissolves the essential oils and camphor with great facility, and hence its use in pharmacy and perfumery. Some substances which are soluble in water are precipitated from it by alcohol—gum, for example; while on the other hand, water precipitates resinous bodies from solution in alcohol. Alcohol combines with sulphur and phosphorus, but not with the earths nor their carbonates: it dissolves sugar, soap, the oxalic, tartaric, gallic, benzoic, and some other acids. Alcohol is largely used in the preparation of various kinds of æther, as already described. The results of its action with sulphuric acid are very different according to circumstances: thus, by varying the proportions, we may procure sulphovinic acid, sulphuric ether, or olefiant gas. As it remains fluid at the lowest temperatures, it is advantageously employed in filling thermometer tubes, in experiments on artificial cold; its antiseptic properties are great, and hence its use in preserving anatomical preparations; on account of its ready inflammability, the purity, and the intense heat of its flame, it is conveniently, but not economically, employed in chemical lamps, usually termed *spirit-lamps*.

It readily dissolves ammoniacal gas; and as the caustic alkalies, potash and soda, are taken up in large quantity by alcohol, and as it does not dissolve their usual impurities, the solution, by distillation, yields these alkalies in a state of great purity. In chemical investigations, it is frequently employed to separate various salts, both of which are soluble in water, and only one in alcohol: thus sea-water contains both sulphate and muriate of magnesia; and the latter only being soluble in alcohol, it affords a ready method of separation.

The many different liquors so largely used in this and other countries, and which possess intoxicating properties, contain alcohol in greater or less quantity as a necessary constituent. The proportion of alcohol, by measure, contained in 100 parts of the better known spirits, wines, and malt liquors, is given in the following table. The numbers are those obtained by Professors Brande and Christison :—

	Brande.	Christison.
Gin, . .	57·60	..
Whisky, Scotch,	54·32	..
〃 Irish,	53·90	..
Rum, . .	53·68	..
Brandy, .	53·39	..
Port Wine, .	22·96	16·20
Madeira, .	22·27	15·49
〃 Cape,	20·51	..
〃 Red,	20·35	..
Sherry, average,	19·17	15·04
Grape Wine,	18·11	..
Hermitage, White	17·43	..
Madeira Malmsey, .	16·40	12·86
Burgundy, .	14·57	..
Champagne,	12·61	..
Hermitage, Red,	12·32	..
Hock, . .	12·08	..
Gooseberry, .	11·84	..
Orange, .	11·26	..
Tokay, . .	9·88	..
Elder, .	8·79	..
Claret, . .	..	7·72
Cider, . .	7·54	..
Perry, . .	7·26	..
Ale (Burton),	8·88	..
〃 Lond. (Edin.)	6·20	..
〃 〃 (Dorchester), .	5·56	..
Ale, Lond. average,	6·87	..
Brown Stout, .	6·80	..
Porter, London, average, .	4·20	5·36
Small Beer, Lond.	1·20	..

The proportion of alcohol in any of the above liquids cannot be correctly ascertained by the simple use of the hydrometer. The presence of saccharine, extractive and colouring matters, often fraudulently added, give the fluid a higher specific gravity, and thereby diminish its apparent alcoholic strength. In such circumstances, the liquid must be distilled in a retort or tube apparatus, so arranged that none of the alcohol will escape. About one-half of the original volume is distilled over, and its specific gravity being taken, a simple calculation will determine the strength of the liquor under examination.

ALCORAN, or ALKORAN. [See KORAN.]

ALCOVE. This term is found in most of the modern European languages, and is similarly applied throughout to a recess in a room intended for a bed, or in which a bed may be placed. It is not, however, necessarily restricted to this meaning; and in England, where such recesses are not so common in bed-chambers as they are in some other countries, and particularly in Spain and France, alcove is applied to a similar recess in a room of any kind, and yet more commonly to an ornamental covered garden-seat. What, indeed, in an ecclesiastical or public civil structure would be denominated a tribune, or an apsis, is in domestic edifices called an alcove.

The term is originally from the Arabic language, in which it means, simply, the cave, hollow, or recess; and it passed into the other European languages through the Spanish, which acquired it during the occupation of a part of Spain by the Arabs.

ALCUIN, or, as he called himself in Latin, Flaccus Albinus, was one of the most learned persons of the eighth century. He appears to have been born about the year 735, and probably in the city of York or the neighbourhood, though some authorities make him a native of Scotland. He tells us himself, he received his education at York, where he had successively for his masters Egbert and Elbert, who were afterwards successively archbishops of that see. He there acquired a knowledge of the Latin language, and some acquaintance also, it would appear, with the Greek and the Hebrew. He afterwards became himself master of the school, and taught with much reputation. He was also appointed keeper of the library which Egbert had founded in the cathedral; of the contents of which he has given us a minute and curious account in one of his poems. Being equally eminent for piety as for learning, he was likewise ordained a deacon of the cathedral; and we may mention here, that through modesty, as is stated, he never afterwards would accept of any higher rank in the priesthood. Having been sent by Elbert's successor, Eanbalde, to Rome to procure for him the pallium, Alcuin on his return passed through Parma, where the Emperor Charlemagne then was. At the invitation of the emperor he consented, as soon as he should have executed his mission, to come to France; and accordingly, in the same year, (780,) he proceeded to that country. Soon after his arrival, his patron bestowed upon him the abbeys of Ferrières in the Gâtinois, and of St. Loup at Troyes, and the little monastery of St. Josse in Ponthieu. But the principal occupation of Alcuin was as a public teacher of what was then called the *totum scibile*, or entire circle of human learning. In this capacity he was frequently honoured with the attendance at his lessons of the emperor himself, his children, and the lords of the court. The place where he principally taught was, probably, Aix-la-Chapelle, which was the chief residence of the emperor. The school thus established by Alcuin is considered by French antiquaries as the germ from which the University of Paris originated; and the example and exertions of this foreigner were undoubtedly mainly instrumental in rekindling in the country of his adoption the extinguished light of science and literature. Much of Alcuin's time was also occupied in theological controversy, and other labours connected with his clerical calling. In 796, on the death of Ithier, abbot of St. Martin of Tours, the emperor gave him that abbey also; and some time after, having obtained leave to retire from court, he established a school here, which soon became greatly celebrated. In his old age Alcuin gave himself up almost exclusively to theological studies; and besides composing many treatises in that department, copied with his own hand the whole of the Old and New Testament, introducing numerous corrections as he proceeded. This edition came to be looked upon as a standard, and many transcripts were made from it. There is still to be seen in the library of the Fathers of the Oratory of St. Philip of Neri, at Rome, a Bible, which is believed to be, as some verses written on it state, a copy given by Alcuin to Charlemagne. Alcuin died on the 19th of May, 804, and was buried in the church of St. Martin. Over his remains was inscribed, on a plate of copper, an epitaph composed by himself, of which the following are two of the lines:

Quod nunc es, fueram, famosus in orbe, viator;
Et quod nunc ego sum, tuque futurus eris.

Of the writings of Alcuin several have been printed separately, both in France and England; but the first edition of his collected works was that published at Paris in 1617, by André Duchêsne, (Andreas Quercetanus,) in one volume, folio. A much more complete edition, however, appeared at Ratisbon, in two volumes, folio, in 1777, under the superintendence of M. Froben, the Prince Abbot of Ratisbon. It contains many pieces which had never before been published, but which were found in manuscript in the libraries of France, England, and Italy.

ALCYONIDÆ, a group of *Asteroid Zoophytes*, including the genera *Alcyonium* of Linnæus, and the *Sarcodictyon* of Forbes.

A. Digitatum, often described under the generic names of *Lobularia* and *Cydonium*, is a very common marine polype, which may be found almost everywhere—on stones, shells, and other hard substances, beneath low-water mark at spring-tides, and in the deeper parts of the ocean. In the latter situation it is very abundant, and also in localities where shelter and security are afforded by rocks from excessive light, from the sweep of currents, and the agitation of the waves. It presents most commonly the form of conical cylindrical lobes, or *polypidoms*, and these bear sometimes so striking a resemblance to the human feet and fingers, as to have suggested the well-known, but rather disagreeable, appellation of the 'Dead-man's-hands,' or the 'Dead-man's-toes;' while others again, from an analogous association, have employed the not less characteristic term of 'Cow's-paps.' The polypidom varies in colour, being either of a dull white, tinged with pink, or, as we have more usually seen it, of a bright orange hue, contrasting very strongly with the little polypes scattered on the surface, which are of a semi-transparent pearly whiteness. The polypes exhibit eight tentacula; these are short, finger-shaped, and ciliated at the margins. The body is enclosed in a membraneous investment, representing the integument, and from it there passes off to the interior eight folds or septa, which, as in actinia, divide the body into a corresponding number of compartments. The oral and stomachal cavities communicate, or, in fact, are continuous with numerous anastomosing water-canals, which traverse the tough, fleshy, and fibrous mass of the polypidom, and in the substance of the fibrous matrix of the lobes, there are a number of lozenge-shaped cavities, containing a quantity of irregular crystalline spiculæ; these form a sort of rudimentary skeleton, and give strength and support to the general mass. In the early part of the summer, the polype canals are crowded with ova; these can be seen with the naked eye, and look like minute grains of white sand; ultimately, they acquire a scarlet tint, make their escape by the mouth, and by means of cilia, move actively and freely about in the water, thus resembling the locomotive gemmules of sponges in their earliest stages of existence.

A. Glomeratum; this is a species described by Mr. Hassall. It has a large and irregularly shaped polypidom, and is of a brilliant scarlet colour; but in its internal structural arrangements very closely resembles the last species. It was originally found in Dublin Bay, and has since been frequently dredged by Mr. Couch on the coast of Cornwall.

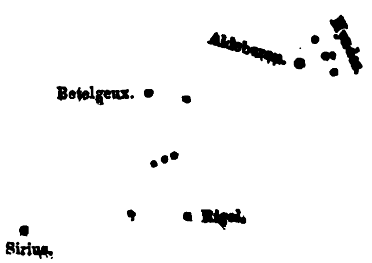
Of the genus *Sarcodictyon*, only one species has at present been detected; and to this Professor Forbes has given the name *S. Catenata.* In this zoophyte the polypes are uniserial, and the polypidoms form a stolon-like net-work of individuals.

ALDBOROUGH, a town in the West Riding of Yorkshire, in the parish of Aldborough, and wapentake of Clare, on the Ure, 16 miles N.W. from York; disfranchised by the Reform Bill; population in 1851, 538; of the parish, 2438. Aldborough is a place of great antiquity, and has been supposed by some to have been the capital of the Brigantes, the most powerful of the nations of Britain before the conquest of that people by the Romans. But however this be, the remains, which attest the former greatness of the place, go no higher than the Roman dominion. Under that people, Aldborough had the name of Isurium, which it lost upon the invasion of the Saxons, who gave it the appellation of Ald-burgh (Old Borough or Town). The ancient walls are stated by Drake (*Hist. and Antiq. of York*) to have been about a mile and a half in circuit, and enclosing a space nearly square. Many Roman antiquities have been dug up, including coins, signets, pieces of urns, &c.: and there have been found the remains of aqueducts, cut in great stones and covered with Roman tile, and of a temple built on what is called the Borough Hill; also several Mosaic pavements. The remains of Isurium have served for the pavements and the walls of outbuildings, both in Aldborough and Boroughbridge; which latter place, about half a mile to the west of the former, rose on its decline. [See BOROUGHBRIDGE.]

Three remarkable obelisks are yet remaining to the west of Boroughbridge, and are therefore nearer to it than to Aldborough; but they are connected in their origin with Isurium. Antiquaries do not agree whether they are British or Roman monuments. They are vulgarly called the Devil's Arrows, and are rough blocks of coarse rag-stone. The middle one is above 30 feet from the top to the base, which is 6 feet below the surface.

ALDEBURGH, or **ALDBOROUGH**, a market-town in the Plomesgate hundred, Suffolk, 25 miles E.N.E. from Ipswich, between the sea and the estuary of the river Alde, with a population in 1851 of 1627. Aldborough was once a town of considerable importance, but has been reduced by the encroachments of the sea, which has washed away the market-place and a whole street during the last century. The church, which is a well-known sea-mark, was in 1559 about ten times further from the sea than at present. Aldborough was disfranchised by the Reform Bill. The town is much inhabited by fishermen, pilots, and other seafaring people. It has of late years been much resorted to as a bathing-place, and, in consequence, is in a thriving condition. Crabbe the poet was a native of this town.

ALDE'BARAN, the Arabic name of a large and bright star of the first magnitude, called in modern catalogues α Tauri, situated in the eye of the constellation Taurus, whence it is called also by the Arabs *Ain al Thaur*, the Bull's-eye. It is the bright star in the group of five, known by the name of the HYADES, on which account it is called by Ptolemy *ὁ λαμπρὸς τῶν Ὑάδων*. Its light is rather reddish, and, about twenty years ago, its apparent projection on the disk of the moon, sometimes for nearly three seconds of time, when occulted by that body, attracted great attention.—[See OCCULTATION.] It is easily found in the heavens by the following directions:—If a line be drawn through the three conspicuous stars forming the belt of Orion, *towards the head*, it passes just below Aldebaran and the Hyades; if *towards the feet*, it passes through Sirius, which is about the same distance from the belt as Aldebaran. This is shown in the following diagram:—



Observations made on Aldebaran about 2000 years ago led Halley to infer what is now known as the proper motion of that and other fixed stars. We subjoin its right ascension and declination for January 1, 1800 and 1854.

Date.	Right Ascension. h.	m.	s.	North Declination.		
1800	4	24	24	16°	5′	52″
1854	4	27	32·8	16	19	42·1

Annual motion in right ascension, 8s ·4336
" " declination, . 7″ ·702

ALDER. [See ALNUS.]

ALDERMAN. This word is from the Anglo-Saxon *ealdorman* or *eoldorman*. The term *ealdorman* is composed of *ealdor*, originally the comparative degree of the adjective *eald*, 'old,' and *man;* but the word *ealdor* was also used by the Anglo-Saxons as a substantive, and as such it was nearly synonymous with the old English term *elder*, which we so often meet with in the English version of the Bible. A prior of a monastery was called *Temples-ealdor;* the magistrate of a district, *Hiredes-ealdor;* the magistrate of a hundred, *Hundredes-ealdor*, &c. In a philological sense, the terms *ealdor* and *ealdorman* were synonymous and equivalent; but in their political acceptation they differ, the former being more *general*, and, when used to express a specific degree, commonly denoting one that is lower than *ealdorman*. In both terms the notion of some high trust or office, as well as that of rank or dignity, seems to be inherent; but *ealdorman* at the same time expressed a definite degree of *hereditary* rank or nobility which *ealdor* does not so necessarily imply. Princes, earls, governors of provinces, and other persons of distinction, were generally termed Aldermen by the Anglo-Saxons. But besides this general signification of the word, it was also applied to certain officers in particular; thus there was an Alderman of all England, (*aldermannus totius Angliæ*,) the nature of whose office and duties the learned Spelman says 'he cannot divine, unless it corresponded to the office of Chief Justiciary of England in later times.' There was also a King's Alderman, (*aldermannus regis*,) who has been supposed to have been an occasional judge, with an authority or commission from the king to administer justice in particular districts: it is very possible, however, that his duties may have resembled those exercised by the king's sergeant in the time of Bracton, when there are strong traces of the existence of an officer so called, appointed by the king for each county, and whose duty it was to prosecute pleas of the crown in the king's name. Spelman, however, doubts whether the King's Alderman may not have been the same person with the Alderman of the county, who was a kind of local judge, entrusted, to a certain extent, with the administration of civil and criminal justice. Besides those above mentioned, there were also Aldermen of cities, boroughs, and castles, and Aldermen of hundreds, upon whose particular functions it would, at this distance of time, be useless to speculate.

In modern times, Aldermen are individuals invested by charter with certain privileges and duties in municipal corporations, either as civil magistrates themselves, or as associates to the chief civil magistrates of cities or corporate towns. These privileges and duties, and also the rules which regulate the election and promotion of these officers, are of course as various as the provisions of the different charters under which they act.

ALDERNEY, or **AURIGNY**, one of the islands in the English Channel, lying in the bay of Avranches formed by the peninsula of Cotantin, (which constitutes part of the department of La Manche,) in Normandy, and the coast of Brittany. It is the nearest of this group of islands to the French coast, being about seven miles west of Cape La Hogue, in Normandy, from which it is separated by the strait or 'Race of Alderney,' a channel very dangerous in stormy weather, from its conflicting currents, but safe at other times, and affording sufficient depth of water for the largest ships. The remnant of the French fleet escaped through the Race of Alderney, after the defeat of Tourville by the combined navies of England and Holland, under Admiral Russell, in 1692. Alderney is distant from Guernsey (N.E. by N.) about fifteen miles, or twenty from port to port; from Jersey about thirty-three miles from coast to coast, and forty-five from port to port; and about fifty-five or sixty miles S. by E. of Portland Bill, the nearest point of England. At present there are abundant facilities for communication with Guernsey; there are sailing vessels passing weekly to and fro, and a small steamer twice or thrice a week takes passengers and goods in about two and a half hours from Braye Harbour to St. Peter Port. The communication with Jersey is less regular.

The island is about four miles long from N.E. to S.W., about one and a half broad, and about ten miles in circuit. The S.E. coast is formed by picturesque and lofty cliffs, from 100 to 200 feet high; but as the island shelves towards the N.E., the coasts in that direction are of less elevation, and more indented with small bays, such as those of Longy or Câtel (query Châtel—Castle?) Bay on the E., and of Braye on the N.W. The last affords good anchorage; and near it is the only harbour in the island, that of Crabby, which, however, is fit for none but small vessels. The approach to the island is dangerous in bad weather, in consequence of the rapidity and diversity of the currents and the rocks and islets which surround it in every direction. Six miles, or thereabouts, to the west lies a cluster of rocks, called 'The Caskets,' included in the compass of a mile, and having, on the S.W. side, a natural harbour, in which a frigate may shelter as in a dock. The lighthouses on these rocks are three in number, and so situated as to form a triangle. They are called St. Peter, St. Thomas, and Donjon. They are enclosed in a triangular wall, and have a plot of ground cultivated within the area, in which are a few vegetables and flowers. The men who have the care of the lights keep a journal of the wind and weather; they have a telegraph, for the purpose of communicating with the agent of the Trinity House (which corporation has the charge of the lighthouses), also a little brewery and a forge. Upon these rocks, or others in the vicinity, Prince William, only son of Henry I., perished by shipwreck in the year 1120, and in 1744 the Victory, of 110 guns, was lost with 1100 men.

The old harbour of Braye, built in 1736 by Henry le Mesurier, the governor, afforded little security, as the waves rolling in from the bay often broke over the pier, and fell with violence on the other side upon the ships. The government is engaged in constructing extensive works for a harbour of refuge and a breakwater, which, when finished, will be capable of containing a considerable number of ships of the line.

The climate is mild and healthy; the soil sandy, gritty, and gravelly round the coast, but in the valleys it is very fertile, producing excellent corn and the best kind of potatoes, much superior to those of Jersey or Guernsey. In the meadows they grow rye-grass and clover, which give excellent milk and butter. The grass lands occupy about one-third of the area of the island. The land is generally elevated, but consists both of high and low tracts; a good supply of excellent water is procured in every part of the island. The Alderney cows maintain their reputation: they are easily distinguished from those of the neighbouring islands, by being remarkably small and straight in the back.

The population of Guernsey was gradually decreasing by emigration throughout the present century, until the commencement of the government works in 1847. In 1831, the population amounted to only 1045, whilst in 1851 it was 3333. The increase of the population has led to a corresponding increase of 'the town.' The inhabitants are a good deal engaged in fishing, to which their insular situation and the abundance of fish supply an ample inducement. 'The town,' which is known simply by that designation, is situated in a beautiful valley nearly in the centre of the island, with roads leading to Braye and Longy Bays. It is partly paved, but presents, as may be supposed, few buildings worthy of notice. The church is dedicated to St. Anne, and the parish is in the diocese of Winchester. The government-house is near the church. An ancient monastery at Longy Bay has been made to serve the purpose of a barrack in time of war, and a depôt for military stores and an hospital since the peace of 1815. On the heights above the Bay of Longy are the ruins of a castle which bears the name of 'Essex Farm,' from having been for a time the residence of the Earl of Essex, the favourite of Queen Elizabeth.

As the islands of Guernsey and Jersey, with their dependencies, formed part of the Duchy of Normandy, and are therefore the relics of the extensive domains which the kings of England once possessed in France, they are subject to the crown, but not, unless especially mentioned, to the acts of the legislature of this country. [See GUERNSEY.] Alderney is a dependency of Guernsey. The civil power is vested in a judge and six jurats, who are chosen by the people, and hold their offices for life, unless removed for misbehaviour. These, with twelve 'Douzainiers,' representatives of the people, form a sort of local legislature—the douzainiers having only the power of deliberating, not of voting; neither is this power possessed by the governor of Guernsey or his lieutenant, though the presence of one of these is requisite. The same judge and jurats, the eldest acting as president, with the king's procurator and advocate (the last a barrister), and the *greffier*, or registrar, nominated by the governor, constitute the court of justice; from which, however, an appeal lies to the royal court at Guernsey, and, in the last resort, to the king in council. In criminal cases, the court at Alderney only collects and transmits evidence to the superior court at Guernsey, where the sentence is pronounced and carried into execution. The local militia is composed of two companies of infantry and a brigade of artillery, amounting in all to about 150 men. The men are furnished with clothing and accoutrements at the cost of the government, but receive no pay when called out. They are excellent marksmen. The officers are appointed by the lieutenant-governor of Guernsey.

The inhabitants appear to have embraced the Protestant religion about the time of the Reformation in England: at present they are about equally divided between the Establishment and the Wesleyan Methodists, who have a chapel. Persons quite uneducated are unknown. All speak and write either French or English. The last is spoken by about half, and understood by all. There are three week-day schools—one founded by General le Mesurier's father; another for girls, established and supported by Mrs. le Mesurier, at Moriaux House; and a third, got up by subscription. There are also several Sunday-schools.

Alderney was called Riduna by the Romans. The Normans settled here at an early period: and it has been observed that the island remained under the English monarchs, who were also Dukes of Normandy, when their continental dominions were lost. Few or no antiquities are found, excepting the castle and monastery above noticed. In April 1832, seven stone coffins, one of them containing some human remains, were dug up, and have been supposed to point out the site of the ancient burial-ground of the island. There are, at different spots on the coast, two stones wrought by nature in the shape of a chair. One on the N.W. of the island, is called 'the Monk's Chair;' the other, on the S.W., commonly visited by strangers, is called 'the Lover's Seat.' It lies in 49° 45′ N. lat., 2° 13′ W. long. (*The Alderney Guide*, by Louisa Lane Clarke, &c.)

ALDINE EDITIONS. [See MANUTIUS.]

ALDROVAND (ULYSSES), the most celebrated naturalist of the sixteenth century, was born at Bologna in 1527, where he died the 4th of May 1605, at the age of seventy-eight. He was of a noble family, and on the title-page of his posthumous works he is designated a patrician; on those published by himself he is termed philosopher, physician, and professor of natural history in the gymnasium of Bologna. Nothing seems to have been recorded of his early studies, and but few incidents of his after-life. It is only known that he visited several parts of Europe in quest of knowledge in his favourite science. According to M. Aubert le Mire, he gave a painter, whom he employed in drawing specimens, a yearly salary of two hundred crowns for upwards of thirty years, and engaged as engravers, Christopher Coriolanus, Lorenzo Bennini, and others. The expenses which he incurred in this way, as well as in the purchase of specimens, exhausted his fortune; and it is reported he was so much reduced in circumstances, that having become blind in his old age, he was compelled to go into the hospital of Bologna, where he died. This, however, has been doubted; but the only grounds alleged for the doubt are, 'that it is not probable the senate of Bologna, to whom he bequeathed his cabinet and his manuscripts, and who appropriated a considerable sum to continue the publication of his works after his death, would have suffered him to want during his lifetime; while his widow even expressly mentions, in the dedication of one of these volumes, that he was honoured and upheld by the magistrates.' (*Biog. Universelle*, art. Aldrovand.) But so far from these circumstances being improbable, as this writer supposes, the whole tenor of biographical history renders it exceedingly probable that Aldrovand might have been neglected during life, and honoured after his death. In the volume published by the widow, we have found no dedication as is above stated; except we consider as such the words on the title-page, '*Ad illustrissimum Senatum Bononiensem*;' and it would surely be an extraordinary thing to construe the preposition '*ad*' into 'honoured and upheld.'

His works on natural history are comprised in thirteen folio volumes, in Latin, of which he himself only published four, namely, three upon Birds, dated 1599, 1600, and 1603, reprinted at Frankfort in 1610; and one upon Insects in 1602. In 1606, immediately after his death, his widow published a volume on Exsanguineous Animals, including Shells and Corals. The subsequent volumes on Quadrupeds, Serpents, Monsters, Minerals, and Trees, were published at the expense of the senate of Bologna, under the superintendence of the professors in the gymnasium—Cornelius Uterverius, a Dutchman; Thomas Dempster, a Scotsman; Bartholomew Ambrosinus of Bologna, and Ovid Montalbanus of Bologna.

It is difficult to procure a uniform edition of all the thirteen volumes; and the one on Minerals is rare.

The merits of the author have been, in our judgment, greatly misrepresented by writers on natural history. 'We can only,' says the writer of his life in the Biographie Universelle, 'consider the books of Aldrovand as an enormous compilation without taste and without genius, while the plan and manner of them are in a great measure borrowed from Gesner. Buffon says, with reason, that they would be reduced one-tenth if all the inutilities and things foreign to the subject were expunged. "On the subject of the cock and bull," adds this great naturalist, "Aldrovand tells us all that has ever been written about cocks and bulls: all the ideas which the ancients entertained of them; all that has been imagined of their virtues, character, and courage; all the circumstances in which they have been employed; all the tales which old women have told of them; all the miracles which they were made to perform in the mythological ages; all the subjects of superstition which they have furnished; all the comparisons which poets have drawn from them; all the attributes which have been accorded to them; all the representations of them in hieroglyphics and heraldry; and in a word, all the histories and fables which have ever been related on the subject of cocks and bulls."'

Now so far from this copiousness of illustration being an objection, it is to us one of the greatest recommendations of the works of Aldrovand, without whose aid the works of Buffon himself would have frequently been meagre and imperfect. The worst of it is, that by thus fixing on Aldrovand the character of a retailer of fables, one of his chief merits is quite thrown into the shade:—we allude to his very extensive personal observations, and his numerous dissections, with his consequent corrections of errors in preceding naturalists, particularly Aristotle, Albertus Magnus, and Gesner. It is singular that he uniformly terms Gesner 'Ornithologus,' and never once, so far as we have observed, gives him his own name; probably because, while he gives him all due praise, he often corrects his mistakes, and might dislike to appear personal.

Several specimens from his cabinet are still to be seen at the Institute of Bologna; but his numerous MSS. were removed to Paris by Napoleon, and we do not know whether they have been restored.

ALDUS. [See Manutius.]

ALE. The etymology of this word is rather uncertain; the most probable conjecture is, that it is Anglo-Saxon. For specific information respecting the mode of manufacturing ale, and its distinction from beer and porter, we must refer to Brewing, confining this article to a general history of ale as an article of consumption by man. The use of an intoxicating beverage composed of barley or other grain steeped in water and afterwards fermented, may be traced in several parts of the ancient world. Pliny the Naturalist states, that in his time it was in general use amongst all the several nations who inhabited the western part of Europe, and, according to him, it was not confined to those northern countries whose climate did not permit the successful cultivation of the grape. He mentions that the inhabitants of Egypt and Spain used a kind of ale; and says that, though it was differently named in different countries, it was universally the same liquor. See Plin. *Nat. Hist.* lib. xiv. c. 22. Herodotus, who wrote 500 years before Pliny, tells us that the Egyptians used a liquor made of barley (ii. 77.) Dion Cassius alludes to a similar beverage amongst the people inhabiting the shores of the Adriatic, lib. 49, *De Pannoniis*. Tacitus states, that the ancient Germans 'for their drink drew a liquor from barley or other grain, and fermented it so as to make it resemble wine.'—Tacit. *De Mor. Germ.* c. 23. Ale was also the favourite liquor of the Anglo-Saxons and Danes; it is constantly mentioned as one of the constituents of their feasts; and before the introduction of Christianity amongst the northern nations, it was an article of belief amongst them that drinking copious draughts of ale formed one of the chief felicities of their heroes in the Hall of Odin. It is expressly named as one of the liquors provided for a royal banquet in the reign of Edward the Confessor. If the accounts given by Isidorus and Orosius of the method of making ale amongst the ancient Britons and other Celtic nations be correct, it is evident that it did not materially differ from our modern brewing. They state, 'that the grain is steeped in water and made to germinate; it is then dried and ground; after which it is infused in a certain quantity of water, which is afterwards fermented.' (Henry's *History of England*, vol. ii. p. 364.)

In early periods of the history of England, ale and bread appear to have been considered as equally *victuals* or absolute necessaries of life. This appears from the various assizes or ordinances of bread and ale (*assisæ panis et cervisiæ*) which were passed from time to time for the purpose of regulating the price and quality of these articles. In the 51st year of the reign of Henry III. (1266) a statute was passed, the preamble of which alludes to earlier statutes on the same subject, by which a graduated scale was established for the price of ale throughout England. It declared that 'when a quarter of wheat was sold for three shillings, or three shillings and four-pence, and a quarter of barley for twenty pence or twenty-four pence, and a quarter of oats for fifteen pence, brewers in cities could afford to sell two gallons of ale for a penny, and out of cities three gallons for a penny; and when in a town (in burgo) three gallons are sold for a penny, out of a town they may and ought to sell four.' In process of time this uniform scale of price became extremely inconvenient and oppressive; and by the statute 23 Henry VIII. c. 4, it was enacted that ale-brewers should charge for their ale such prices as might appear convenient and sufficient in the discretion of the justices of the peace within whose jurisdiction such ale-brewers should dwell. The price of ale was regulated by provisions like those above stated, and the quality was ascertained by officers of great antiquity, called '*gustatores cervisiæ*,'—ale-tasters, or ale-conners. These officers were regularly chosen every year in the court-leet of each manor, and were sworn 'to examine and assay the beer and ale, and to take care that they were good and wholesome, and sold at proper prices according to the assize; and also to present all defaults of brewers to the next court-leet.' Similar officers were also appointed in boroughs and towns corporate; and in many places, in compliance with charters or ancient custom, ale-tasters are, at the present day, annually chosen and sworn, though the duties of the office are fallen into disuse. These ancient regulations appear to have been dictated by a regard to public health; but in modern times, since ale and beer have become exciseable commodities, the numerous restrictions and provisions which have been introduced are directed principally to the security of the revenue and the convenient collection of duties; though they undoubtedly secure the consumer, to a certain extent, from any adulteration of the article by the admixture of improper ingredients.

ALEHOUSES. The adoption of efficient measures for the regulation of houses appropriated to the sale of intoxicating liquors among the lower orders of the people has been found, especially in populous countries, to be absolutely necessary to the well-being of society. Upon practical subjects, the experience of the past is always the best guide to an opinion for the future; and it may, therefore, be useful to trace, in a summary manner, the history of the laws which have been employed in this country for effecting the due regulation of alehouses. By the common law of England, it was as lawful for a person to open a house for the sale of beer and ale as to keep a shop for the purpose of convepiently selling any other commodity by which he might choose to gain his livelihood; subject only to a criminal prosecution for a nuisance if his house was kept in a disorderly manner, by permitting tippling or excessive drinking, or encouraging bad company to resort thither, to the danger and disturbance of the neighbourhood. As civilization and population increased, this restriction was found to be insufficient; and so early as the eleventh year of the reign of Henry VII. (1494) an act of parliament passed by which two justices of the peace were empowered 'to reject the common selling of ale.' This slight notice of the subject in the statute 2 Henry VII., c. 2, seems to have been entirely disregarded in practice; and by a statute passed in 1552, (5 and 6 Edward VI., c. 25,) reciting, that 'intolerable hurts and troubles to the commonwealth daily grew and increased through such abuses and disorders as were had and used in common alehouses and other houses called tippling-houses,' power was given to magistrates to forbid the selling of beer and ale at such alehouses; and it was enacted that 'none should be suffered to keep alehouses unless they were publicly admitted and allowed at the sessions, or by two justices of the peace; and the justices were directed to take security, by recognizances, from all keepers of alehouses, against the using of unlawful games, and for the maintenance of good order therein; which recognizances were to be certified to the quarter sessions, and there recorded.' Authority is then given to the justices at quarter sessions to inquire whether any acts have been done by alehouse-keepers which may subject them to a forfeiture of their recognizances. It is also provided that 'if any person, not allowed by the justices, should keep a common alehouse, he might be committed to gaol for three days, and, before his deliverance, must enter into a recognizance not to repeat his offence; a certificate of the recognizance and the offence is to be given to the next sessions, where the offender is to be fined 20*s*.' This statute formed the commencement of the licensing system, and was the first act of the legislature which placed alehouses expressly under the control and direction of the local magistrates; and alehouses continued to be regulated by its provisions, without any further interference of the legislature, for upwards of fifty years.

In 1604 a statute was passed (2 Jac. I., c. 9) expressly, as its preamble states, for the purpose of restraining the 'inordinate haunting and tippling in inns, alehouses, and other victualling houses.' This act of parliament recites, that 'the ancient, true, and principal use of such houses was for the lodging of wayfaring people, and for the supply of the wants of such as were not able, by greater quantities, to make their provision of victuals, and not for entertainment and harbouring of lewd and idle people, to spend their money and their time in lewd and drunken manner;' and then enacts 'that any alehouse-keeper suffering the inhabitants of any city, town, or village, in which his alehouse is situated, (excepting persons invited by any traveller as his companion during his abode there; excepting also labourers and handicraftsmen, on working-days, for one hour at dinner time to take their diet, and occasional workmen in cities, by the day, or *by the great*, lodging at such alehouses during the time of their working,) to continue drinking or tippling therein, shall forfeit 10*s*. to the poor of the parish for each offence.' From the exceptions introduced in this statute, and also from the preamble, it is quite clear that, in the time of James I., alehouses were used for a purpose which is now almost wholly discontinued; and that it was then common for country labourers both to eat their meals and to lodge in them. This practice might have arisen from the injudicious prohibition of cottages in the reign of Elizabeth, and the statutes of Inmates, which limited the number of inmates in a house to one family; or it may have been the natural step in the progress of civilization, from the absolute dependence of the servant on his master, both for subsistence and lodging, to the improved condition of the free labourer, who provides himself with necessaries.

The operation of the last-mentioned statute was limited to the end of the next session of parliament, in the course of which a statute (4 Jac. I., c. 4) was passed, imposing a penalty upon persons selling beer or ale to unlicensed alehouse keepers; and by another statute (4 Jac. I., c. 5) of the same parliament, it was enacted that 'every person convicted, upon the view of a magistrate, of remaining drinking or tippling in an alehouse, should pay a penalty of 3*s*. 4*d*. for each offence, and in default of payment be placed in the stocks for four hours.' The latter statute further directs, that 'all offences relating to alehouses shall be diligently presented and inquired of before justices of assize, and justices of the peace, and corporate magistrates; and that all constables, *ale-conners*, [see ALE,] and other officers in their official oaths, shall be charged to present such offences within their respective jurisdictions.' The next legislative notice of alehouses is in the 7th Jac. I., c. 10, which, after reciting that 'notwithstanding former laws, the vice of excessive drinking and drunkenness did more and more abound, enacts, as an additional punishment upon alehouse-keepers offending against former statutes, that, for the space of three years, they should be utterly disabled from keeping an alehouse. The 21st Jac. I., c. 7, declares, that the above-mentioned statutes, having been found by experience to be good and necessary laws, shall, with some additions to the penalties, and other trifling alterations, be put in due execution, and continue for ever. A short statute was passed soon after the accession of Charles I., (1 Car. I., c. 4,) which supplied an accidental omission in the statutes of James; and a second (3 Car. I., c. 3) facilitates the recovery of the 20*s*. penalty imposed by the statute of Edward VI., and provides an additional punishment, by imprisonment, for a second and third offence. At this point all legislative interference for the regulation and restriction of alehouses was suspended for more than a century.

It is remarkable that the circumstances which led to the passing of the above-mentioned statutes in the early part of the reign of James I., and the precise nature of the evils and inconveniences alluded to in such strong language in the preambles, are not described by any contemporaneous writers. It appears, however, from the Journals, that they gave rise to much discussion in both houses of parliament, and were not eventually passed without considerable opposition.

What the extent of the evils arising from alehouses might have been, if these restrictive laws had not been passed, is, of course, mere matter of conjecture; but they never appear to have produced the full advantage which it was expected would be derived from them. During the reign of Charles I. the complaints against alehouses were loud and frequent. In the year 1635 we find the Lord Keeper Coventry, in his charge to the judges in the Star Chamber previously to the circuits, inveighing in strong and angry terms against them. (See Howell's *State Trials*, vol. iii. p. 835.) He says, 'I account alehouses and tippling-houses the greatest pests in the kingdom. I give it you in charge to take a course that none be permitted unless they be licensed; and, for the licensed alehouses, let them be but a few, and in fit places; if they be in private corners and ill places, they become the dens of thieves—they are the public stages of drunkenness and disorder; in market towns, or in great places or roads, where travellers come, they are necessary.' He goes on to recommend it to the judges to 'let care be taken in the choice of alehouse-keepers, that it be not appointed to be the livelihood of a great family; one or two is enough to draw drink and serve the people in an alehouse; but if six, eight, ten, or twelve, must be maintained by alehouse keeping, it cannot choose but be an exceeding disorder, and the family, by this means, is unfit for any other good work or employment. In many places they swarm by default of the justices of the peace, that set up too many; but if the justices will not obey your charge herein, certify their default and names, and, I assure you, they shall be discharged. I once did discharge two justices for setting up one alehouse, and shall be glad to do the like again upon the same occasion.' During the Commonwealth, the complaints against alehouses still continued, and were of precisely the same nature as those which are recited in the statutes of James I. At the London sessions, in August, 1654, the court made an order for the regulation of licenses, in which it is stated, that the 'number of alehouses in the city were great and unnecessary, whereby lewd and idle people were harboured, felonies were plotted and contrived, and disorders and disturbances of the public peace promoted.' Amongst several rules directed by the court on this occasion for the removal of the evil, it was ordered that 'no new licenses shall be granted for two years.' During the reign of Charles II. the subject of alehouses was not brought, in any shape, under the consideration of the legislature; and no notice is taken by writers of that period of any peculiar inconveniences sustained from them, though, in 1682, it was ordered by the court, at the London sessions, that no license should in future be granted to alehouse-keepers frequenting conventicles. The next act of parliament on the subject passed in the year 1729, when the statute 2 Geo. II., c. 28, § 11, after reciting that 'inconveniences had arisen in consequence of licenses being granted to alehouse-keepers by justices living at a distance, and therefore not truly informed of the occasion or want of alehouses in the neighbourhood, or the characters of those who apply for licenses, enacts that 'no license shall in future be granted but at a general meeting of the magistrates acting in the division in which the applicant dwells.' It should be remarked, that at this period a most pernicious element in the compound of mischief produced by public houses had recently sprung into existence, in the shape of spirituous liquors; and in the statute which we have just mentioned, a clause is contained, placing the keepers of liquor or brandy-shops under the same regulations as to licenses as alehouse-keepers. The eagerness with which spirits were consumed at this period by the lower orders of the people in England, and especially in London and other large towns, appears to have resembled rather the brutal intemperance of a tribe of savages than the habits of a civilized nation. Various evasions of the provisions of the licensing acts were readily suggested to meet this inordinate demand; and in 1733 it became necessary to enforce, by penalty, the discontinuance of the practice of 'hawking spirits about the streets in wheelbarrows, and of exposing them for sale on bulks, sheds, or stalls.' (See 6 Geo. II., c. 11.) From this time alehouses became the shops for spirits, as well as for ale and beer; in consequence of which, their due regulation became a subject of much greater difficulty than formerly; and this difficulty was heavily increased by the growing importance of a large consumption of these articles to the revenue. Besides this, all regulations for the prevention of evils in the management of alehouses were now embarrassed by the arrangements which had become necessary for the facility and certainty of collecting the excise duties.

In 1753 a statute was passed (26 Geo. II., c. 31) by the provisions of which, with some trifling modifications by later statutes, the licensing of alehouses continued to be regulated for the remainder of the last century. This statute, after reciting that 'the laws concerning alehouses, and the licensing thereof, were insufficient for correcting and suppressing the abuses and disorders frequently committed therein, contains, amongst others, the following enactments:—1. That upon granting a license to any person to keep an alehouse, such person should enter into a recognizance in the sum of 10*l.*, with sufficient sureties, for the maintenance of good order therein. 2. That no license should be granted to any person not licensed the preceding year, unless he produced a certificate of good character from the clergyman and the majority of the parish officers, or from three or four respectable and substantial inhabitants, of the place in which such alehouse is to be. 3. That no license should be granted but at a meeting of magistrates, to be held on the 1st of September in every year, or within twenty days afterwards, and should be made for one year only. 4. Authority is given to any magistrate to require an alehouse-keeper, charged upon the information of any person with a breach of his recognizance, to appear at the next quarter sessions, where the fact may be tried by a jury, and in case it is found that the condition of the recognizance has been broken, the recognizance is to be estreated into the Exchequer, and the party is utterly disabled from selling ale or other liquors for three years. By a statute passed in 1808 (48 Geo. III., c. 143) a difference was introduced into the mode of licensing, not with a view to the internal regulation of alehouses, but for purposes connected with the collection of the revenue. The license, which was formerly obtained from the magistrates, was, by that act, to be granted by the commissioners, collectors, or supervisors of excise, under certain specific directions, and upon the production by the applicant of a previous license or allowance, granted by the magistrates, according to the provisions of the former statutes respecting licensing. The next act of parliament upon this subject was passed in 1822, 3 Geo. IV., c. 77,) but as that statute continued in operation for only a few years, it is unnecessary to specify its provisions further than to notice, that the preamble states the insufficiency of the laws previously in force respecting alehouses, and that one of its provisions is considerably to increase the amount of the recognizances required both from the alehouse-keeper and his sureties. In 1828 a general act to regulate the granting of alehouse licenses was passed, (9 Geo. IV., c. 61,) which repeals all former statutes on this subject, and enacts a variety of provisions, of which the following are the most important:—1. Licenses are to be granted annually, at a special session of magistrates, appointed and summoned in a manner particularly directed, and to be called the General Annual Licensing Meeting, to be holden in Middlesex and Surrey, within the first ten days of March, and in every other place between the 20th of August and the 14th of September. 2. Every person intending to apply for a license must affix a notice of his intention, with the name, abode, and calling of the applicant, on the door of the house, and on the door of the church or chapel of the place in which it is situated, on three several Sundays, and must serve a copy of it upon one of the overseers, and one of the peace officers. 3. If a riot or tumult happens, or is expected to happen, two justices may direct any licensed alehouse-keeper to close his house; and if this order be disobeyed, the keeper of the alehouse is to be deemed not to have maintained good order therein. 4. The license is subjected to an express stipulation that the keeper of the house shall not adulterate his liquors; that he shall not use false measures; that he shall not permit drunkenness, gaming, or disorderly conduct in his house; that he shall not suffer persons of notoriously bad character to assemble therein; and that (except for the reception of travellers) he shall not open his house, during divine service, on Sundays and holydays. 5. Heavy and increasing penalties for repeated offences against the tenor of the license are imposed; and magistrates at sessions are empowered to punish an alehouse-keeper, convicted by a jury of a third offence against the tenor of his license, by a fine of 100*l.*, or to adjudge his license to be forfeited.

The last act of parliament which relates to the regulation of alehouses is the late 'act to permit the general sale of beer and cider by retail in England.' (1 Will. IV., c. 64.) The following are the most material provisions of this statute:—1. That any householder, desirous of selling malt liquor and cider, by retail, in any house, may obtain an excise license for that purpose, to be granted by the commissioners of excise in London, and by collectors and supervisors of excise in the country, upon payment of two guineas. 2. That a list of such licenses shall be kept at the Excise Office, which is at all times to be open to the inspection of the magistrates. 3. That the applicant for a license must enter into a bond with a surety for the payment of any penalties imposed for offences against the act. 4. That any person licensed under the act, who shall deal in wine or spirits, shall be liable to a penalty of 20*s.* 5. That in cases of riot, persons so licensed shall close their houses upon the direction of a magistrate. 6. That such persons suffering drunkenness or disorderly conduct in their houses shall be subject to penalties which are to be increased on a repetition of the offences, and the magistrates before whom they are convicted may disqualify them from selling beer for two years. 7. That such houses are not to be open before four in the morning nor after ten in the evening, nor during divine service on Sundays and holydays. The reader will observe that the effect of this statute is to withdraw the authority of granting licenses to houses opened for the sale of ale, beer, and cider, from the local magistrates, in whose hands it had been exclusively vested for nearly 300 years, and to supersede their direct and immediate superintendence and control of such houses. The consequence of the facility of obtaining licenses upon a small pecuniary payment, and without the troublesome and expensive process directed by former statutes, has been a rapid and enormous multiplication of alehouses throughout the country, together with very general complaints, especially in the southern and western districts, and amongst the rural population of a considerable increase of idleness and crime, and of increased and increasing demoralization among the labouring classes of the people. A discussion of the justice of these complaints would be foreign to the purpose of this article, and lead too far into the field of controversy; besides which, the facts are at present not sufficiently ascertained to justify the formation of a positive opinion as to the necessity of a change, or the mode of effecting it. It cannot, however, be too often or too strongly impressed upon the minds of all, that it is a fatal error to consider this question too strictly with a view to finance and revenue; these objects, momentous as they undoubtedly are at this period, ought not to supersede those which are of much more weighty importance, as permanently affecting the moral and intellectual character, as well as the health, comfort, and independence of the lower orders of the community. Even as a matter of finance, the encouragement of the use of intoxicating liquors has been considered, by very competent judges, as an object of doubtful policy. 'For government to offer encouragement to alehouses,' says Sir Frederic Morton Eden, in his valuable History of the Poor, 'any further than they are wanted for the many useful purposes which they serve among the labouring classes, is to act the part of a *felo de se*. Nor ought the public ever to be lulled into an acquiescence by the flattering bait of immediate gain, which ere long they would be obliged to pay back to paupers, in relief, with a heavy interest.'

ALEMAN (MATEO). This celebrated Spanish writer was born at Seville about the middle of the sixteenth century. He held an important office in the financial department, under Philip II., which he filled with honour for a long period. Disgusted at last with the broils of the court, he requested his dismissal; and having obtained it, he retired to devote himself entirely to study. In 1604 he published the *Life of St. Antonio de Padua* with an *Encomiasticon in eundem*, in Latin verses, not without merit. We are ignorant of the motive or object of his voyage to Mexico, and only know that in 1609 he published there an *Ortografia Castellana*. But the work which entitles him to the notice of posterity is his *Guzman de Alfarache*, which he published at Madrid in 1599. In this amusing and interesting work Aleman shows he was both a philosopher and a man of the world. It is a bitter satire on the corrupted manners of Spain at that period. The enterprising genius of Charles V. had inspired the Spanish youth with an ambition for military glory, and drawn them off from the cultivation of the useful arts and sciences. His successors were incapable of preserving the immense empire raised by him, and the huge edifice began to fall already under his son. The nation was then swarming with a multitude of men, who, thinking it degrading to earn an honest livelihood, did not scruple to live by cheating and swindling. This was the origin of the multitude of those novels called *Picarescas*, which, from the beginning of the sixteenth to the latter end of the seventeenth centuries, appeared in Spain, intended to describe the life and manners of rogues, vagabonds, and beggars, bringing also the other classes of society upon the stage, either as their victims, abettors, or protectors. Such is the character of Aleman's work. It is written in a pure and correct style, though, from the nature of the subject, it is very often vulgar and even indelicate. The abruptness and rapidity with which the author passes from one subject to another, together with the use of low slang words, render it obscure in many passages. His practice of moralizing or rather preaching is very often carried too far; but we must not forget the age and country in which the author lived. His book was soon translated into almost all the European languages. A French translation appeared in 1600 by Chapui. James Mabbe of Magdalene College, Oxford, translated *Guzman de Alfarache* into English, the first edition of which was published 1622 or 23, the 2d in 1630, and the 3d in 1634. The work of Le Sage, which bears the title of *Guzman de Alfarache*, resembles in no respect the novel of Aleman. In this work as in his other productions, Le Sage copied indeed the figures, but he made out of them a picture adapted to the taste of the French public. We are not acquainted with the precise time of Aleman's death, but it is supposed that it occurred under the reign of Philip III. Nicolao Antonio, *Bibliotheca Hispana Nova*.

ALEMANNI, or ALLEMANNI. It is difficult to give a clear and satisfactory account of this people, although many notices concerning them are to be found in the works both of Greek and Roman authors. These notices, however, generally detail only the circumstances of particular invasions and of mutual injuries, committed on the Roman frontier; but a comprehensive view of the history, and an accurate information respecting the origin and internal government of the Alemanni, are nowhere to be obtained. Their very name, Alemanni, *Allemanni*, *Alamanni*, or *Allamanni*, (the Greek writers call them Αλαμβαννοι,) has been the subject of much fruitless speculation; and after all that critics, etymologists, antiquaries, and historians have said about it, that derivation of this name which was the most obvious, and which perhaps found less favour because it was so, still seems more probable than any other. It surely is more natural to look for the origin of the word *Alemanni* in some Teutonic dialect, ancient or modern, than anywhere else; for it cannot be doubted that this people were Germans.

Ancient authors agree in this, that the Alemanni were a mixed race, and this word a generic name for many tribes. Agathias, in b. i. c. 6. of his *History*, has the following remarkable passage:—'If we are to follow Asinius Quadratus, an Italian, who has written an accurate account of the *Germans*, the Allemanni were a *gathered mob* and *mixed race*, (ξύγκλυδες ἄνθρωποι καὶ μιγάδες,) and this *is expressed by their very name*.' Thus we may, without great reluctance, admit, that the Roman word *Allemanni* was formed from the Alemannic *Allemannen*, since we find that, in German, ALLE still signifies *all*, and MANN (*plur.* männer), *a man*, and that *Allemannen* meant in their language *all men*, or *all sorts of men*,—a vast union of many tribes. Icelandic analogy supports this etymology. In the ancient Norse (*i. e.* Icelandic), the Germans are called PIODVERJAR, i. e. *the men of the nation*, from *Piód*, a nation, and *ver*, *verji*, a man, a defender, protector. The Germans, then, in the eyes of their northern neighbours, were the nation of nations—the great nation—*the nation* κατ' ἐξοχὴν—and thus Romans and Scandinavians used a term, in different languages indeed, yet conveying the same idea, as a name for this people. The French, too, as they have borrowed from the Normans the name of *Normand*, which was significant in the language of the latter though not in French, so they have also borrowed from the Alemanni the appellation *Allemand*, which they have extended to the whole German nation,—also significant in the German, but not in French.

It is likely that the sound of the word Alemanni recommended it to the Romans; considering that it was barbarous, still it was sonorous, and the surname of Alemannicus, which Caracalla is said to have adopted, was easily formed from it, and probably pleased the matrons of Rome. At all events it is more natural thus to derive the name of *Alemanni* from native Germanic roots, than, as several learned etymologists and critics have done, from the *Welch* word *Ellmyn*, being an irregular plural of the sing. *Alltud*, which signifies a foreigner. We say *Welch word* advisedly, not Celtic word, as Rickless, for example, does; for although the Welch is one of the Celtic languages, it is not the pure, or the parent Celtic, but one of the more mixed of the languages of that family; and even if *Ellmyn* were pure and ancient Celtic, little would be gained: the Celtic nations had, at the time when the Allemanni are mentioned by the Romans, been long settled in the westernmost parts of Europe; and it would be difficult, at that period, to prove their presence in any part of Germany.

Moreover, it would be a singular nation, who styled themselves *the Foreigners*, as the Alemanni must have done if the derivation of their name from Ellmyn be true; for it is most natural to suppose, that the Romans learned their name from the Alemanni themselves: and lastly, it follows that these people must have adopted the national designation of *Foreigners* from a language which was foreign to them. It would not mend matters much to suppose, that the Romans learned the name of Allemanni from the Gauls, for that supposition again involves many other improbable suppositions. Pfister's derivation in the *Allgemeine Encyclopædie*, art. Alemanni, is equally fanciful and uncritical, which we think proper, although foreign to the general plan of this work, to notice, it being a not unessential part of truth to confute error, when supported by respectable, and therefore more misleading, authority. On the other hand, the derivation of Alemanni in the most natural way from *Alle männer*, is recommended by the very common practice with many nations, to adorn themselves with boastful names, or with such as harmonize with their distinctive habits or lofty pretensions.

The boundaries of the territory of the Alemanni are even more uncertain than their name; for they seem to have varied much at different periods. Their principal abode, the nucleus from which their dominions spread, was the very heart of Germany, the space between the sources of the Rhine and the Danube; from this vital centre, their sway seems to have extended very far along the banks of both these rivers, towards N.E. and N.W. occupying the entire space between them. In the earliest period of their history, their limits are supposed to have been the Rhine, the Danube, and the Maine; in subsequent ages their territory extended towards the Alps and the Jura mountains. The first notice respecting them in history occurs in the year 214, in the reign of Caracalla. This emperor sojourned some time among them and lived with them on good terms, as they greatly admired his hardiness, frugality, military habits, and personal bravery, as well as his plainness and affability of manner, for he affected entirely to forget the emperor, and assumed the part of their companion. But this play, like every other performance, had its end. Under pretext of raising a regiment of auxiliaries, he called a meeting of those among them who were of military age, and having surrounded them by his soldiers, he gave a signal for a general massacre; such as fled were hunted down by the cavalry. This vile treachery kindled an inextinguishable hatred to the Romans in the breast of the Alemanni; and through many succeeding centuries they continued the most unrelenting enemies of the empire. They also had their revenge on Caracalla. In a battle which they fought with him, their fury is said to have been such, that they drew out with their teeth the arrows by which the Osroeni, who were allies of the Romans, wounded them, lest time should be lost by making use of their hands, which they thought better employed in cutting the Romans down without intermission. They suffered, however, Caracalla to buy of them the *name of victory* for a great sum of money, which he took care to pay in pure gold, at a time when he only used base coin at home. Those of the wives of the Alemanni whom the Romans took captive, put themselves, and many of them their children also, to death, in order to save them from slavery.

After Caracalla's departure, they became much more powerful on the Rhine, for after this period we find them making frequent incursions into Gaul. Alexander Severus at length led an army against them, but being murdered by his own soldiers, he left the victory to his successor Maximinus, who overran and devastated their country from the Rhine to the Danube. During the disturbances in the Roman empire in 237 and the following years, caused by the despotism and bad conduct of Maximus, the Alemanni recommenced their invasions in Gaul with impunity. In the years 257-60, Valerian's general, Posthumus, again drove them out of that country and erected fortresses in their territory. These they indeed repeatedly demolished, but the Romans always repaired them, and held them in possession till the reign of the Emperor Probus (282). After his death the Alemanni could no longer be resisted. Dioclesian in 285, and Maximian in 287, seem only to have attempted to defend the Roman possessions to the west of the Rhine; and although the latter slaughtered vast numbers of them, he gained no further advantage than that the Rhine remained the common boundary. Constantinus Chlorus, in 298-301, again ventured to cross the Rhine, and even marched as far as to the Danube; still the Romans gained no permanent possession of the countries to the east of the Rhine. In a bloody battle at Langres, Constantine the Great slew vast numbers of them, and after this disaster they remained quiet till the year 337; but during the reign of the sons of Constantin they again invaded Gaul, and made their settlements on both banks of the Rhine co-extensive, *i.e.* from the Maine to the other side of Strasburg. Julian, in 356-361, not only drove them out of Gaul, but even made several expeditions into their German domains. In 357 he beat seven of their chieftains in a bloody battle at Strasburg, at which time Chonodomar was their commander-in-chief. The third time, in 359, he seems to have attacked them almost without a cause. The words of Ammianus Marcellinus are as follows: 'He reflected that some of their gaues (pagi) were hostile, and that they would commit outrages unless they were put down like the rest.' For this expedition Julian made great preparations, by sending Hariobandus, a distinguished officer, as a spy, before him, by strengthening his alliance with those Alemannic kings with whom he was at peace, by fortifying the frontier towns nearest the enemy, collecting provisions, and building granaries: yet, when he arrived on the banks of the Rhine near Maynz, he found them well prepared. They defended their frontiers with great spirit, and during a considerable time the Roman emperor found it impossible to cross the river, as they watched his movements from the opposite bank; and wherever he attempted to throw a bridge, they were present on the spot and ready to give him a reception, which rendered the attempt unadvisable. The emperor at last had recourse to stratagem, and made a number of soldiers in small boats cross the river during the night, yet they effected nothing of consequence. Finally, however, assisted by the treachery of an Alemannic chief, Julian crossed, and in this expedition he penetrated even to their eastern boundary. Eight Alemannic chiefs, or dukes, Hortensius, Suomarius, Macrianus, Hariobaudus, Urius, Urficinus, Vestralphus, and Vadomarius, concluded a peace with Julian at Maynz. During the latter part of his reign they did not venture to attack the Romans; but Valentinian I. had almost incessantly to contend with them in his own domain. Gratian, in 377, fought with them a bloody battle at Argusturia (now Horburg). In the latter part of the fourth and the beginning of the fifth centuries, they occupied the southern and western banks of the Rhine, opposite the mouths of the Neckar and Main, almost without evacuating their former abodes. In the middle of the fifth century, they spread over Helvetia, as far as to the Jura and the Lake of Geneva. In whatsoever region they settled, they preserved their national language and manners. After the bloody victory gained by the Frankish king Clodwig, at Tolbiacum (now Zülpich), in 496, they lost their eastern and western Frankish possessions. Many of them, disdaining to dwell in a subdued country, sought refuge with Theodric the Great, who assigned to them abodes in Rhætia. In 536, Vitiges ceded them to the Franks; and after this they were united to the Suevi, and with them consolidated into a dukedom, called the *Duchy of Alemannia.* Subsequent to this period, their history becomes more and more confused, and is also absorbed in the general history of Germany; yet from that circumstance, and from the extension which the French have given to their name, we may judge that they were a leading, a preponderating tribe among the Germanic nations.

As branches of the Alemanni, there have been mentioned the Cenni (Κέννοι), the Leutienses, the Juthungi, the Vithungi, and the Buzinobantes, on the right bank of the Main. The first of these Dion Cassius calls a Celtic nation (Κελτικὸν ἔθνος); but it is difficult to conceive that this statement should be free from error, or, if they were Celts, to admit the theory of modern authors, who make them a branch of the Alemanni.

The Alemanni were a very warlike people, and the Romans particularly admired their cavalry, probably because, like the Gothic and Teutonic nations in general, they were equally fit for equestrian and infantry service. The country was divided into *gauen* (pron. *Gow-en*), by the Romans called *pagi;* which had their name either from the tribes who inhabited them, or from the chiefs or dukes, called kings by the Romans, who ruled over them. Each of these had its peculiar constitution, and was independent: in war only they all acted as one people, with united interests, and had one general. The Alemanni had a peculiar body of laws given to them by the kings Theodric, Childebert, and Clothar, and improved by Dagobert.

For the Alemannic language, see *Germanic Languages,* and the art. TEUTONIC. Notices respecting the Alemanni are to be found in Herodian, Dion Cassius, Ammianus Marcellinus, Agathias, and Aurelius Victor.

ALEMBERT (JEAN LE ROND D'). The birth of this eminent man is stated by some to have taken place on the 16th, by others on the 17th, of November, 1717. This matter is of the less consequence, as his career ought rather to be dated from his abandonment by his parents and exposure in a public market by the church of St. Jean le Rond, near the cathedral of Notre Dame, at Paris, from which he derived his christian name. How he obtained his surname is not mentioned: probably it was that of his foster-mother. He was found by a commissary of police, and instead of being conveyed to the hospital of *Enfans Trouvés,* was intrusted to the wife of a poor glazier, on account of the care which his apparently dying state required. It has been supposed that the discovery, as well as the exposure, was arranged beforehand, as in a few days the father made himself known, and settled an allowance of twelve hundred francs a year, or about fifty pounds sterling, for his support. Other accounts state that the abandonment was the act of the mother, and that the father, upon hearing it, came forward for the protection of his son. This father was M. Destouches, commissary of artillery; the mother was Madame, or more properly, Mademoiselle de Tencin, a lady celebrated for her talents and adventures, and authoress of several works, in one of which, *Les Malheurs de l'Amour,* she is supposed to have given a sketch of her own life. She was sister of Peter Guerin de Tencin, Cardinal Archbishop of Lyons, and took the veil in the convent of Montfleuri, near Grenoble, which place she afterwards quitted, and settled at Paris, where she became more celebrated for wit than virtue. It is said that when D'Alembert began to exhibit proofs of extraordinary talent, she sent for him, and acquainted him with the relationship which existed between them; and that his reply was, 'You are only my step-mother—the glazier's wife is my mother.'

D'Alembert commenced his studies at the *Collége des Quatre Nations*, at the age of twelve years. The professors were of the Jansenist party, and were not long in discovering the talents of their pupil. In the first year of his course of philosophy, he wrote a commentary on the Epistle to the Romans, from which, as Condorcet remarks, they imagined they had found a new Pascal; and, to make the resemblance more complete, turned his attention to mathematics. The attempted parallel probably never existed except in the ingenious head of the author of the *Eloge;* for D'Alembert himself informs us, that his professors did their best to dissuade him both from mathematics and poetry, alleging that the former, in particular, *dried up the heart*, and recommending, as to the latter, that he should confine himself to the poem of St. Prosper upon Grace. They permitted him, nevertheless, to study the rudiments of mathematics, and from that time he persisted in the pursuit. When he left college, he returned to his foster-mother, with whom he lived altogether forty years, and continued his studies. Not that she gave him much encouragement, for when he told her of any work he had written, or discovery which he had made, she generally replied, '*Vous ne serez jamais qu'un philosophe; et qu'est ce qu'un philosophe? c'est un fou qui se tourmente pendant sa vie, pour qu'on parle de lui lorsqu'il n'y sera plus;*' which we may English thus, 'You will never be anything but a philosopher—and what is that but an ass who plagues himself all his life, that he may be talked about after he is dead.'

With nothing but his income of 1200 francs, and the resource of the public libraries for obtaining those books which he could not buy, he gave up all hopes of wealth or civil honours, that he might devote himself entirely to his favourite studies. Here he was dispirited by finding that he had been anticipated in most of what he imagined to have been his own discoveries. In the mean while his friends urged him to enter a profession, to which he at last agreed, and chose the law. After being admitted an advocate, he abandoned this profession and took to physic, as more congenial to his own pursuits. Determined to persevere, he sent all his mathematical books to a friend, resolved that the latter should keep them till he was made doctor; but he soon found that he could not send his mathematical genius with them. One book after another was begged back, to refresh his memory upon something which he found he could not keep out of his head. At last, finding his taste too strong for any prudential consideration, he gave up the contest, and resolved to devote himself entirely to that which he liked best. The happiness of his life, when he had made this resolution, is thus described by himself. He says that he awoke every morning, thinking with pleasure on the studies of the preceding evening, and on the prospect of continuing them during the day. When his thoughts were called off for a moment, they turned to the satisfaction he should have at the play in the evening; and between the acts of the piece he meditated on the pleasures of the next morning's study.

Some memoirs which he wrote in the years 1739 and 1740, as well as some corrections which he made in the *Analyse démontrée* of Reynau, a work then much esteemed in France, procured him admission to the Academy of Sciences, in 1741, at the age of twenty-four. From this time may be dated the career of honour which ranks him among the greatest benefactors to science of the last century. We will now interrupt the order of his life to specify his principal works. In 1743 appeared his *Treatise of Dynamics*, founded upon the general principle which bears his name. (See PRINCIPLE, D'ALEMBERT'S.) The deductions from this new and fertile source of analytical discovery appeared in rapid succession. In 1744 he published his *Treatise on the Equilibrium and Motion of Fluids*. In 1746 his *Reflections on the General Causes of Winds* obtained the prize of the Academy of Berlin. This treatise will always be remarkable, as the first which contained the general equations of the motion of fluids, as well as the first announcement and use of the calculus of partial differences. In 1747 he gave the first *analytical* solution of the problem of vibrating chords, and the motion of a column of air; in 1749 he did the same for the precession of the equinoxes and the nutation of the earth's axis, the latter of which had been just discovered by Bradley. In 1752 he published his *Essay on the Resistance of Fluids*, a treatise originally written in competition for a prize proposed by the Academy of Berlin, but the decision of which was postponed, and finally awarded to a production which has not since gained any reputation for its author. A misunderstanding between Euler and D'Alembert is asserted by some French writers as the ground of this rejection, which, resting on the well-known character of Euler, we must be permitted to doubt. In the same year he also edited Rameau's *Elements of Music*, though his opinions did not entirely coincide with that celebrated system. In 1747 he presented to the Academy of Sciences his *Essay on the Problem of Three Bodies*, and in 1754 and 1756 he published *Researches on Various Points connected with the System of the Universe*. We must complete the list of his mathematical works by mentioning his *Opuscules*, collected and published towards the end of his life, in eight volumes. Though D'Alembert wrote no large system of pure analysis, the various methods and hints which are so richly scattered in his physico-mathematical works have always been considered as rendering them a mine of instruction for mathematicians.

We now turn to his philosophical productions. The French *Encyclopædia*, as is well known, was commenced by Diderot and himself, as editors; and it is needless to speak of his celebrated Introductory Discourse, a work which, as Condorcet expresses it, there are only two or three men in a century capable of writing. D'Alembert contributed several literary articles; but on the stoppage of the work by the government, after the completion of the second volume, he retired from the editorship, nor would he resume his functions when permission to proceed was at length obtained. From that time he confined himself entirely to the mathematical part of the work, and his expositions of the metaphysical difficulties of abstract science are among the clearest and best on record. While engaged on this undertaking, he wrote his *Mélanges de Philosophie*, &c., *Memoirs of Christina of Sweden*, *Essay on the Servility of Men of Letters to the Great*, *Elements of Philosophy*, and a treatise on *The Destruction of the Jesuits*. He also published translations of several parts of Tacitus, which are admitted by scholars to possess no small degree of merit. In 1772, when elected perpetual secretary of the Academy, he wrote the *Eloges* of the members who had died from 1700 up to that date. His correspondence, and some additional pieces, were published after his death. The whole of his works have been collected in one edition by M. Bastien, in eighteen volumes, octavo, Paris, 1805.

In 1752 Frederic of Prussia, who had conceived the highest esteem for his writings, endeavoured to attract him to Berlin. D'Alembert refused the offer, but in 1754 he accepted a pension of 1200 francs. In 1756, through the friendship of M. d'Argenson, then minister, he obtained the same from Louis XV. In 1755, by the recommendation of Benedict XIV., he was admitted into the Institute of Bologna. In 1762 Catharine of Russia requested him to undertake the education of her son, with an income of 100,000 francs. On his declining the offer, she wrote again to press him, and says in her letter, 'I know that your refusal arises from your desire to cultivate your studies and your friendships in quiet. But this is of no consequence: bring all your friends with you, and I promise you that both you and they shall have every accommodation in my power.' D'Alembert was too much attached to his situation and his income of 150*l.* a year to accept even this princely offer. The letter of Catharine it was unanimously agreed to enter on the records of the Academy of Sciences. In 1759 Frederic again pressed his coming to Berlin, in a letter in which he says, 'I wait in silence the moment when the ingratitude of your own country will oblige you to fly to a land where you are already naturalized in the minds of all who think.' In 1763, when D'Alembert visited Frederic, the latter again repeated his offer, which was again declined; the king assuring him that it was the only false calculation he had ever made in his life.

We now come to relate the history of a connexion which ended by embittering the last years of the life of D'Alembert, and finally, it is supposed, had no small share in sending him to his grave. At the house of a common friend he was in the habit of meeting Mlle. de l'Espinasse, a young lady whose talents caused her society to be sought by the *élite* of the literary world of Paris. Between her and D'Alembert a mutual attachment grew up, which though, as appeared afterwards, not very strong on her part, became the moving passion of his future life. When, in 1765, he was attacked by a violent disorder, she insisted on being his attendant, and after his recovery they lived in the same house. It is said that friendship was their only bond of union; and this may be believed, since, in the then state of opinion, the assertion, if untrue, would have been unnecessary. The friendship, or love, of the lady, however, found other objects; and though D'Alembert still retained all his former affection for her, she treated him with contempt and unkindness. Her death left him inconsolable; and his reflections upon her tomb, published in his posthumous work, present the singular spectacle of a lover mourning for a mistress whose regard for him, as he was obliged to admit to himself, had entirely ceased before her death. After that event, he fell into a profound melancholy, nor did he ever recover his former vivacity. His death took place October 29, 1783. Not having received extreme unction, it was with great difficulty that a priest could be found to inter him, and then only on condition that the funeral should be private.

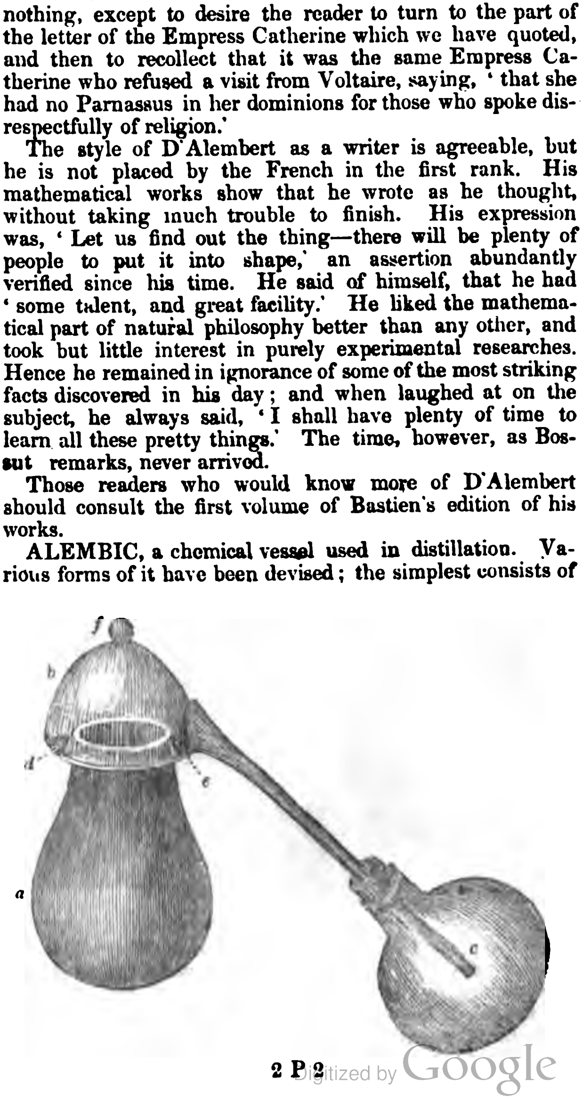
The character of D'Alembert was one of great simplicity, carried even to bluntness of speech, and of unusual benevolence, mixed with a keen sense of the ridiculous, which exerted itself openly and without scruple upon those who attempted the common species of flattery. He was the friend of Frederic of Prussia, because that monarch exacted no servility; and to him only, and two *disgraced* ministers, of all the great ones of the earth, did D'Alembert ever dedicate a work. He was totally free from envy. Lagrange and Laplace owed some of their first steps in life to him; though the former had settled a mathematical controversy in favour of Euler and against him. In his dispute with Clairaut on the method of finding the orbit of a comet, and with Rousseau on the article *Calvin* in the *Encyclopédie*, he gave his friends no reason to blush for his want of temper. It was his maxim, that a man should be *very* careful in his writings, careful *enough* in his actions, and *moderately* careful in his words; his observance of the last part of the maxim sometimes made him enemies. The Duc de Choiseul, when minister, refused the united solicitations in his favour of the Academy of Sciences for a pension vacant by the death of Clairaut, for more than six months, because he had said, in a letter to Voltaire which was opened at the post-office, 'Your protector, or rather your *protégé*, M. de Choiseul.' He cared nothing for those in power, at a time when the latter exacted and obtained deference in very small matters. Madame de Pompadour, who hated all the friends of Frederic, refused the request of Marmontel that she would employ her influence with the king in favour of D'Alembert on one occasion, alleging that the latter had put himself at the head of the Italian party in music. It was his maxim that no man ought to spend money in superfluities while others were in want; and a friend, who knew him well, declared to the editor of his works, that when his income amounted to 8200 francs, he gave away the half. His attentions to his foster-mother, to the end of her life, were those of a son. In his account of his own character, a singular mixture of vanity and candour, written in the third person, he speaks as follows: 'Devoted to study and privacy till the age of twenty-five, he entered late into the world, and was never much pleased with it. He could never bend himself to learn its usages and language, and, perhaps, even indulged a sort of petty vanity in despising them. He is never rude, because he is neither brutal nor severe; but he is sometimes blunt, through inattention or ignorance. Compliments embarrass him, because he never can find a suitable answer immediately; when he says flattering things, it is always because he thinks them. The basis of his character is frankness and truth, often rather blunt, but never disgusting. He is impatient and angry, even to violence, when any thing goes wrong, but it all evaporates in words. He is soon satisfied and easily governed, provided he does not see what you are at: for his love of independence amounts to fanaticism, so that he often denies himself things which would be agreeable to him, because he is afraid they would put him under some restraint; which makes some of his friends call him, justly enough, *the slave of his liberty*.' This account agrees very well with that of his friends.

D'Alembert has been held up to reprobation in this country on account of his religious opinions. But on this point we must observe, that there is a wide line of distinction between him and some of his colleagues in the *Encyclopædia*, such as Diderot and Voltaire. When we blame the two latter, it is, not for the opinions they held, (for which they are not answerable to any man,) but for their offensive manner of expressing them, and the odious intolerance of all opinions except their own which runs through their writings. Men of the best and of the worst lives appeared to be equally offensive to them, if they professed Christianity. The published writings of D'Alembert contain no expressions offensive to religion: they have never been forbidden on that account, as La Harpe observes, in any country of Europe. Had it not been for his private correspondence with Voltaire and others, which was published after his death, the world would not have known, except by implication, what the opinions of D'Alembert were. On this point we will cite two respectable Catholic authorities. The Bishop of Limoges said, during the life of D'Alembert, 'I do not know him personally; but I have always heard that his manners are simple, and his conduct without a stain. As to his works, I read them over and over again, and I find nothing there except plenty of talent, great information, and a good system of morals. If his opinions are not as sound as his writings, he is to be pitied, but no one has a right to interrogate his conscience.' La Harpe says of him, 'I do not think that he ever printed a sentence which marks either hatred or contempt of religion; but we may cite a great many passages where, apparently drawn into enthusiasm by the heroes of Christianity, he speaks of them with dignity, and, *what in him is even more strange*, with sentiment.'—'I knew D'Alembert well enough to be able to say, that he was sceptical in every thing except mathematics. He would no more have said positively that there was *no* religion than that there *was* a God: he only thought the probabilities were in favour of theism, and against revelation. On this subject he tolerated all opinions, and this disposition made him think the intolerant arrogance of the atheists odious and unbearable.'—'He has praised Massillon, Fénélon, Bossuet, Fléchier, and Fleury, not only as writers, but as priests. He was just enough to be struck with the constant and admirable connexion which existed between their faith and their practice, between their priestly character and their virtues.' To these testimonies we need add nothing, except to desire the reader to turn to the part of the letter of the Empress Catherine which we have quoted, and then to recollect that it was the same Empress Catherine who refused a visit from Voltaire, saying, 'that she had no Parnassus in her dominions for those who spoke disrespectfully of religion.'

The style of D'Alembert as a writer is agreeable, but he is not placed by the French in the first rank. His mathematical works show that he wrote as he thought, without taking much trouble to finish. His expression was, 'Let us find out the thing—there will be plenty of people to put it into shape,' an assertion abundantly verified since his time. He said of himself, that he had 'some talent, and great facility.' He liked the mathematical part of natural philosophy better than any other, and took but little interest in purely experimental researches. Hence he remained in ignorance of some of the most striking facts discovered in his day; and when laughed at on the subject, he always said, 'I shall have plenty of time to learn all these pretty things.' The time, however, as Bossut remarks, never arrived.

Those readers who would know more of D'Alembert should consult the first volume of Bastien's edition of his works.

ALEMBIC, a chemical vessel used in distillation. Various forms of it have been devised; the simplest consists of



a *body*, *cucurbit* or *matrass*, *a*, which serves as a boiler; a *head* or *capital*, *b*, with a pipe and a receiver *c*.

Sometimes all these parts are made of glass, and the head and receiver are usually so: when the body is of this material, it is fitted to the head by grinding; but the apparatus, in this case, is extremely expensive, and very liable to accident. When the body is made of metal, the glass head is secured to it by almond or linseed meal lute.

The fluid to be distilled having been put into the body *a*, the head *b* being fitted to it, and the receiver adapted to its pipe, heat is applied to the body either by a lamp or a sand-bath; the vapour which rises is condensed in the head, and, falling into its depressed channel *e*, runs through the pipe into the receiver *c*, loosely fitted to it with a cork. If the receiver be kept partly immersed in cold water, the condensation will be more readily and economically effected. Sometimes the head is perforated at *f*, and furnished with a stopper; by removing this, a supply of the fluid to be distilled may be poured into the body, without disturbing the luting by which the body and head are kept in close contact. An alembic of this kind is not very useful for the general purposes of distillation: it can scarcely be applied to the preparation of acids; and for distilling spirit or water a retort or a still is much to be preferred. An alembic of this form, the body of which is made of silver, and the head and receiver of glass, is sometimes employed for distilling the spirit from the alcoholic solutions of potash and soda, in the process of purifying these alkalis.

The most ancient alembics were made of metal, and generally of tinned copper; the annexed figures represent that proposed by Baumé in his Elements of Pharmacy, with very slight alteration. It is composed of several parts: *a*, fig. 1, represents the *cucurbit*, *body*, or *boiler*, which is made of tinned copper; *b* is a short pipe by which the boiler is replenished with the fluid to be distilled, during the operation, and without disturbing or unluting the apparatus. When in operation, the pipe *b* is stopped with a cork.

Fig. 2 is a section of the *head* or *capital*, which fits into *a*, and is secured by lute; it is divided into two parts which do not communicate with each other; *c* contains cold water, which, by cooling the vapour that rises from the boiler *a* into *d*, causes it to condense into a fluid, which runs down into a small gutter, and is by it conveyed through the pipe *e* into a receiver; *f* is a *cock* by which the water is let out from *c* when it becomes hot by condensing the vapour.

Fig. 1.

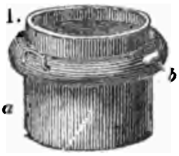
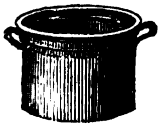


Fig. 4.



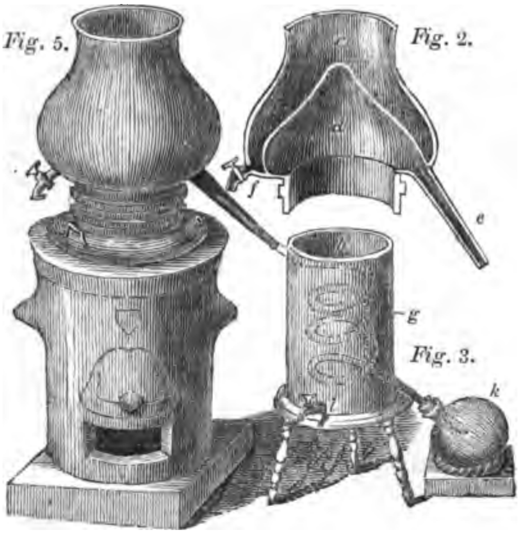


Fig. 5.

Fig. 2.

Fig. 3.

Fig. 3 represents a *worm* or *serpentine*, *g*, into which is conveyed the vapour that may escape condensation in *d*; it is surrounded by cold water in the vessel *h*, which, as it becomes hot, is let out at the *cock i*, and a fresh supply of cold water is poured in; the condensed vapour is received at the end of the worm in the receiver *k*.

Fig. 4 represents a *water-bath*, also made of tinned copper; it fits into the body *a*, and is heated by the medium of the boiling-water contained in it, instead of the fire directly applied. When the water-bath is used, the head, fig. 2, is fitted into it in the manner already described with respect to the body *a*, fig. 1.

Fig. 5 shows the whole apparatus placed in the furnace, with the worm attached to the pipe of the head.

The alembic, in the form now described, is but little used: the addition of the worm surrounded with cold water has rendered it unnecessary to employ any refrigeratory round the head; and the apparatus thus simplified is the common still, which will be described under the article DISTILLATION.

ALENÇON, the capital of the department of the Orne, in France, stands in an extensive plain, on the north-west bank of the Sarthe, which here forms the boundary between the departments of the Orne and the Sarthe. The town itself is not very large; but its five suburbs, one of which stands on the opposite bank of the Sarthe, add to its population and importance. The streets are generally broad, and ornamented with some handsome buildings, especially the prefect's residence, the corn-market, and the town-house, the towers of which last are the remains of the castle of the Dukes of Alençon. These nobles appear conspicuous in the history of France; one of them fell at the battle of Agincourt, [See AGINCOURT,] while attacking the English king.

The population of Alençon (including, we presume, the suburbs) is given by Malte Brun and Balbi at 14,000; the trade of the place is very considerable. Its chief manufactures are of lace and muslin, the latter of which gives employment to more than two thousand persons, who are engaged in making or embroidering it. Some cottons and linens are also manufactured, as well as leather, glass, and iron. The agricultural products of the neighbourhood, including cattle, horses of good quality, goose down and quills, and cider, add to its commerce. The lace manufacture, which has acquired considerable celebrity, was established by letters patent during the administration of Colbert, in 1665. The proprietor had a monopoly for ten years, and a grant of 36,000 livres, or about 1500*l.*

There are at Alençon a library of above 6000 volumes, an agricultural society, a museum of natural history, and a college; the last-mentioned is surmounted by a lantern, which is used as an observatory. There is also a theatre; and horse-races take place annually, on the 25th of August.

Many religious houses and hospitals, and a Jesuits' college, existed in the town before the revolution. In former ages it was fortified, though the outworks and the greater part of the wall are now destroyed, and little remains of its once formidable defences but four gates, by which you enter the town. It was the birth-place of the historian Mezeray. Alençon is in 48° 26′ N. lat., 5′ E. long. of Greenwich. Distance from Paris 116 miles W. by S.

The neighbourhood of the town produces iron, and stone suited for building or for mill-stones. In the quarry of Hertre, a very few miles distant, were found the false diamonds, called the diamonds of Alençon, said to equal the real stone in brilliancy though not in hardness. The mine is said to be now nearly exhausted.

The arrondissement of Alençon contains 416 square miles, and above 70,000 inhabitants.

ALENTEJO, or **ALEMTEJO**, the largest province of the kingdom of Portugal, so called from its position (*alem Tejo*, beyond the Tagus). It is separated on the east from Spanish Estremadura and Andalusia. The boundary on this side is determined, to begin from the north, first by the river Sever, running into the Tagus, soon after by the Gevora and the Caya, tributaries of the Guadiana, the line crossing from the one to the other stream so as to avoid the proximity of Badajoz. It then follows the Guadiana, leaving Olivenza on the east, which since 1801 has belonged to the Spanish crown. North of Mourão it bends from the river to the S.E. so as to meet first the Ardila, and then the Chanza, the latter of which again conducts it to the Guadiana. From this point the boundary runs west to the ocean, so as to separate Alentejo on the south from the Algarve by the ridges of Caldeirão and Monchique. On the west it is bounded by the *comarca* of Setubal, belonging to Estremadura, and below that by the ocean. The Tagus partly forms its boundary on the north, but in the centre of the line the Portuguese province of Estremadura again extends south of the river. In this part the two provinces are divided by small streams called the *Soro*, *Erra*, and *Zatas*, the two former of which run into the third, the Zatas itself falling directly into the Tagus. The province covers a surface of 883 square leagues, or 7947 geographical square miles, and its population is given by Antillon and Miñano at 380,480, that is 48 to the square mile, while the province of Entre Douro e Minho has a population of 346 to the same surface. Some accounts state the population at only 266,009 in the year 1820. The most fertile parts are around Evora, Portalegre, Elvas, Villaviciosa, Beja, and the plains of Ourique. The highest ridge of mountains is the already-mentioned Sierra de Monchique on the south, which rises at one point to the height of 4078 feet. From the northern side of this mountain the waters are collected into the river Sado, which reaches the sea at Setubal. In the spring the malaria arising from this river is very injurious to the health of the inhabitants. The Sierra de Portalegre rises to 2130 feet; that of Osa, north of Evora, slightly exceeds this height. Nearly the whole country is covered with mountains, but their course is so varied that description would be at once difficult and useless. The harbours of Sines and Villa Nova de Milfontes are of little value. The population is not very industrious, yet corn is produced to such an amount as to contribute largely to the support of Lisbon; but the supply of wine and oil is less abundant. The former is altogether consumed within the province, and a considerable quantity of oil is often imported from the bordering regions of Spain. There are many quarries of marble, white, green, and red. The political divisions of the province are these: it contains the eight *comarcas* or districts of Evora, Elvas, Portalegre, Ourique, Villaviciosa, Beja, Crato, and Aviz. Evora, the chief city of the whole province, is the seat of an archbishopric; and three bishops take their titles from Elvas, Portalegre, and Beja. Elvas is also a place of great military strength, and with the adjoining fortress, La Lippe, protects the frontier on the side of Badajoz.

ALEPPO. [See Haleb.]

ALESSANDRIA, one of the five divisions of the principality of Piedmont, which is again subdivided into the provinces of Alessandria, Asti, Casale, Acqui, Voghera, and Tortona. The whole division is said to contain a population of above 510,000.

The province of Alessandria is intersected by hills of small elevation, the spurs or offsets of the Apennine chain, which divides Piedmont from the Riviera of Genoa: it is not well watered, though it is bounded on the north by the Po, which receives below Alessandria the Tanaro. The Tanaro receives the Belbo a little above Alessandria, and the Bormida (increased by the Orba) a little below it. The chief products of this province are, maize, wine, silk, madder, and the best flax in Piedmont. It contains very little wood. The population is estimated at above 90,000.

ALESSANDRIA, a town and fortress in Piedmont, the capital of the province of the same name, near the conflux of the two rivers Tanaro and Bormida. It was built by the Lombard league in 1168, as a barrier against Frederic Barbarossa and the Guibelines of Asti. It was declared a free city like the others of the league, and was named Alessandria in honour of Pope Alexander III., the protector of the Lombard league and the strenuous opponent of the emperor. In 1174, Frederic, having returned to Italy, besieged the new city, which his soldiers, seeing the houses covered with straw or thatch, called by derision Alessandria *della paglia*, or 'of straw,' an appellation whieh it has since retained. Frederic, however, after four months was obliged to raise the siege. After the extinction of the Lombard republics, Alessandria came under the power of the Marquises of Montferrat, and finally of the Dukes of Savoy. Its citadel is one of the strongest places in North Italy, and has been repeatedly besieged, and taken and retaken, by the French and Austrians. The whole town was surrounded by an extensive line of fortifications by order of Bonaparte, who wanted to make it his chief stronghold in Piedmont, but, by the treaty of Vienna, the fortifications have been razed, and the citadel alone remains. The town is well built, has a fine square planted with trees, a public library, and some good palaces and churches. The population is above 30,000, who carry on a considerable trade; a well-attended fair is held twice a year, in April and October. There are some manufactures of linen, silks, cotton stockings, cotton handkerchiefs, and woollen cloth. Alessandria is one of the most considerable and lively towns of Piedmont, situated in a wide and fertile plain 70 miles E. by S. of Turin, and 60 N. by W. of Genoa. The field and village of Marengo are within sight of Alessandria on the opposite or right bank of the Bormida, on the road to Tortona; 44° 55′ N. lat. 8° 36′ E. long.

ALEUTIAN ISLANDS, called also Aleutan, Aleutic, or Aleutsky Islands, these several names being derived from the Russian word, *aleut*, which signifies a *bold rock*.

This group of islands is situated in the North Pacific Ocean, between Cape Alaska in North America, and the peninsula of Kamtschatka in Asia; describing a circular arc which extends from 163° of west to 166° of east longitude, and thus comprehends 31° of longitude. The islands which form the two extremities of the chain, viz. Oonemak, which is separated by a narrow channel from Cape Alaska, and Behring's island, which approaches the nearest to the coast of Asia, are both in the 55th parallel of north latitude, while the others extend in a curve towards the south, the centre one of the chain being situated in the 53d parallel.

The first attempt at geographical discovery in this region was planned, a short time before his death, by Peter the Great of Russia, with the view of ascertaining the distance between the Asiatic and American continents. The plan was prosecuted, in the following reign, by a Dane, named Behring, according to the instructions which were drawn up by Peter with his own hand. Two voyages prosecuted in 1728 and the following year, were not attended with success; but a third expedition, undertaken in 1741, was productive of a better result. Behring discovered the coast of America in 58° 28′ N. lat., and on his return to Kamtschatka visited Behring's island, then uninhabited, where he soon after died. This island, which is 104 miles long, with a mean breadth of 15 miles, is, as before stated, in 55° N. lat. and 167° E. long., 190 miles N.E. of the harbour of St. Peter and St. Paul in Kamtschatka.

Behring's island having thus become known to the inhabitants of Kamtschatka, they were led thither in search of sea-otters and other fur-bearing animals; and some of their vessels being driven to the eastward by the storms prevalent in those latitudes, the other islands of the group were successively discovered. Geographers at first divided this Archipelago into three groups, calling those nearest to Asia the Aleutian, those near to the centre the Andrenovian, and those which are nearest to America the Fox Islands. At present all are comprehended under the name of Aleutian Islands. The derivation of this name has already been given; the Andrenovian group were so named in honour of either the vessel—the St. Andrean—in which the discoverers sailed, or of her owner, Andrean Tolstyck. The Fox Islands received their name in consequence of the great number of those animals found upon them.

A survey of the entire chain was made by two Russian officers in 1768, by order of the Empress Catharine, but our knowledge of the islands and of the adjoining coasts of the two continents is principally derived from the narrative of the last voyage of Captain Cook, who, in 1778, determined with accuracy the positions of the islands, and of the more remarkable points of the two coasts.

As early as 1785, establishments, protected by fortifications, were formed by Russian adventurers in many of the islands. These were all the result of private enterprise. The success by which they were attended led to the formation of the Russian American Company, whose operations were carried on during several years in a somewhat irregular manner; but in 1799 the association was invested with considerable privileges by the Russian government, and it still continues to prosecute the trade in furs with much activity.

The traders who first visited these islands are charged with having acted with the most wanton cruelty towards the natives, whose revengeful feelings were at length so far excited, that they seized upon every opportunity for retaliating upon their oppressors, and succeeded on several occasions in destroying the Russian vessels and murdering their crews. Notwithstanding these disasters, other adventurers were still tempted to go in quest of the valuable skins which the islands supplied in such great abundance.

Our celebrated countryman, Cook, when he visited the islands, found the inhabitants disposed to carry on a peaceable traffic with his sailors, and, at the present day, the Aleutians are observed to be generally a kind-hearted and inoffensive race, but when provoked to anger, they prove themselves malignant, implacable, and indifferent to personal danger.

The number of islands which compose the entire chain is very considerable; above forty have received names. The most important of those situated to the eastward—the Fox Islands—are, Oonemak, Oonalashka, and Oomnack. Those composing the Andrenovian division are smaller than the others, and are seldom visited. The principal of them are, Amlak, Atchka, Tshetchina, Ayag, Kanaga, and Takavangha. The two last mentioned have volcanoes, and Tshetchina possesses a high hill which is apparently an extinct volcano. The division nearest to the Asiatic coast contains, among other islands of less importance, Semitchi, Attoo, Agattoo, Copper Island, and Behring's or Commodore Island.

The prospect on approaching any of these places is described by Kotzebue to be frightful and desolate. Black masses of lava appear to rise perpendicularly from the sea to a great elevation, the whole of each island presenting the appearance of pointed mountains lying close to each other, and some of them having their summits above the clouds.

The islands are all of them destitute of trees, and the inhabitants would suffer much inconvenience in consequence, but for the great abundance of drift wood from the American coast which is continually thrown upon their shores. An unsuccessful attempt was once made to plant a species of pine at Oona-lashka.

The coasts of the Aleutian Islands are all so rocky and so encompassed by breakers, that the navigation among them is dangerous. The whole group bears evident marks of a volcanic origin, and on several of the islands are volcanoes in a state of activity at the present time. The soil is in general of an ungrateful nature, but in some few spots where it is of better quality, gardens have been formed in which several esculent vegetables arrive at tolerable perfection. Cabbages, carrots, turnips, radishes, beet-root, and even cucumbers are constantly raised under such circumstances without difficulty. Potatoes have been recently introduced, and appear likely to be of great benefit to the inhabitants.

The islands are amply provided with springs of water, which, in some instances, flow from the bases of the mountains directly into the sea, and in other cases form considerable lakes, the superfluous waters of which are drained off by natural canals.

The land animals which are general on the islands are, bears, wolves, beavers, ermines, and river-otters. The sea-otter, whose skin is held in much estimation by the Chinese with whom the Russians trade, has had its numbers much diminished. Red, grey, brown, and black foxes are seen in great variety on the Fox islands. Seals and whales are abundant on the coasts, and sea-lions are occasionally met with. The kinds of fish most usually caught are, salmon and halibut; the latter of these are sometimes of an immense size.

The valleys of some of the islands furnish an abundance of herbage, which would support a considerable number of cattle throughout the year.

Almost the only occupations of the inhabitants are fishing and hunting, and the preparation of implements necessary for the prosecution of these pursuits. In fishing they make use of a species of canoe, which they call a baidar, and which consists of a skeleton of wood, over which a covering of seal skins is extended. Thus constructed, these canoes are so extremely light that they may be carried about by one person without difficulty. They are long and narrow in form, and are most usually made to hold only one person; sometimes they are calculated to carry two, and very rarely three people. Each canoe has a kind of deck formed of skins, in which, according to the number it is intended to carry, one or more round holes are left just fitted to the size of the body. The islanders are very expert in the management of these vessels by means of double paddles seven or eight feet in length. They sometimes venture in them to a considerable distance from the land, even in very stormy weather.

Domestic occupations, such as making clothes, and even the covering of canoes is performed by the women, who likewise make mats, baskets, and other useful articles of straw.

The native inhabitants are mostly short, but stout made and well proportioned. But little difference is observable in the clothing of men and women, which consists of a frock made of seal skin, fastened round the neck and descending below the knees. The same material is employed for making boots. Both the men and women bore their under lips, and by way of ornament, insert pieces of bone in the holes. They likewise ornament their frocks with glass beads, feathers, beaks of sea parrots, or white goat's hair brought from Siberia. They all wear a kind of wooden cap which is dyed, generally green, and adorned with figures carved out of sea-cow teeth, or with beads. The women usually wear rings on their fingers, and bracelets of glass beads above the wrists and ancle joints.

The food of the islanders consists almost entirely of fish and the flesh of sea animals. They provide in summer a store of fish which they dry and lay up in small huts for winter use. A very favourite species of food with them is whale blubber, and this substance, when it becomes too rancid for even an Aleutian stomach, they use for lighting and warming their dwellings. Their habitations are holes dug in the earth and covered with sticks, over which grass and earth are thrown. The entrance is from the roof, whence also light is admitted through a window covered with dried fish skins, and the dwelling is divided into separate apartments by means of seal skins and straw mats, so that each one forms the abode of several families.

The islanders are inclined to be superstitious, and are great believers in charms. Some have been baptized, and make a profession of the Christian religion according to the faith of the Greek church. Polygamy is common, if indeed marriage may be said to exist among a people where the men are accustomed to take as many wives as their means enable them to maintain, and may send them back to their friends to form new connexions when those means are diminished. It sometimes happens that one woman will live at the same time with two husbands.

It is hardly possible to form any estimate of the population of the islands. There is reason to believe that it has very seriously diminished since the settlement among them of the Russian traders. Half a century ago Oonalashka was assumed to contain 1300 inhabitants, while recent accounts estimate the population at only 300 souls. (Cook's *Third Voyage*, Coxe's *Account of Russian Discoveries*, Kotzebue's *Voyages round the World*.)

ALEXANDER. [See PARIS.]

[Head of Alexander the Great, enlarged, from a coin in the Bodleian Library, Oxford. The head is repeated beneath, with the reverse, showing the size of the coin.]

ALEXANDER III., commonly called the Great, son of Philip II. king of Macedon, was born B.C. 356. His mother was Olympias, the daughter of Neoptolemus king of Epirus, through whom Alexander claimed a descent from the great Phthiotic hero Achilles. (Pausan. I., 11.)

The history of Alexander forms an epoch in the history of the world. Whatever difficulties we may have in making an exact estimate of his personal character, we can hardly assign too much importance to the great events of his life, and their permanent influence on the condition of the human race. The overthrow of the great Asiatic monarchy which had so often threatened the political existence of Greece, the victorious progress of the Macedonian arms from the plain of

Thebes to the banks of the Danube, and from the Hellespont, the boundary of rival continents, to the Nile, the Jaxartes, and the Indus—these have formed in all ages the theme of historical declamation, and are still the subject of vulgar admiration. But the diffusion of the language and the arts of Greece, the extension of commerce by opening to Europeans the road to India, the great additions made to natural science and geography by the expedition of Alexander,—these are the real subjects for enlightened and critical research. Of the numerous writers who treated of the campaigns of Alexander not a single contemporary remains; and our information is entirely derived from compilers who lived several centuries after the age of Alexander, and founded their narratives on such contemporary records as then existed. With the exception of Arrian, not one of them was equal to the subject; and even he was often too deficient in knowledge of Asiatic geography to enable him to make a proper use of his materials. The accounts of the different writers, though agreeing in all the great events, offer no small discrepancies when we come to details, and, with the exception of Arrian's *History*, are marked by a general absence of sound criticism. We shall notice these authorities briefly at the end of this article.

If we knew nothing more of Alexander than that Aristotle was his master, the memory of the philosopher would preserve that of the pupil. But it is a rare coincidence to find the greatest of conquerors instructed by the first of philosophers—the master of all knowledge teaching the future master of the world. Some of the great projects of Alexander might pass for the mere caprice of a man possessed of unlimited power, if we did not know that Aristotle had given him lessons in political science, and written for his use a treatise on the art of government. That the pupil amidst all his violence and excesses possessed a vigorous and clear understanding, with enlarged views of the advantages of commerce, and of the nature of civil government, is amply confirmed by some of the most prominent events of his life. Unfortunately Aristotle was not his only master; the flattery of Lysimachus, and the obsequiousness of his attendants, conspired to cherish those ungovernable passions which seem to have descended to him from both his parents.

The military education of Alexander commenced from his boyhood: he was trained to be expert in all manly exercises, and particularly in the management of a horse. His first essay in arms was made at the battle of Chæronea, (B. C. 338,) when his father crushed the united forces of Thebes and Athens with their allies, and established the Macedonian supremacy in Greece.

Philip was murdered (B. C. 336) during the celebration of his daughter's marriage, when he was just on the eve of setting out on his Asiatic expedition, at the head of the combined force of Greece. His sudden death inspired the states which had been humbled with some hope of throwing off the yoke of the Macedonian kings. Alexander, in his twentieth year, succeeded to the monarchy and to the great designs of his father. Though threatened with danger on all sides, from the movements of the barbarians on the north, and the restless Greeks in the south, his courage and address saved him. The Thessalians readily chose him as the head of their confederacy; and the Amphictyons confirmed him in the honours which had been granted to Philip. His next step was to march an army into Bœotia, to check the beginning of insurrectionary movements, by showing himself at the gates of Thebes. His vigour secured for him greater honours than Philip had ever received, and the states of Greece, Lacedæmon excepted, transferred to him, at Corinth, with abject flattery and mean submission, the office of commander-in-chief against Persia, which they had already conferred on his father.

In giving a brief sketch of the chief events of Alexander's short life, we may observe that without a constant reference to maps it is impossible to form any idea of the rapidity of his movements, the natural obstacles which he had to encounter, or the immense extent of country which he overran in a few years. All military history without geographical detail is only a heap of confusion, and that of Alexander still waits for more complete illustration from the researches of modern times.

In order to leave no troublesome enemies behind him, he resolved to reduce the barbarians of the north to obedience. From his residence in Macedonia he marched (in the spring of B. C. 335) in ten days to the passes of Mount Hæmus, (the Balkan,) crossed them in spite of the opposition of the natives; and descended into the great plain of the Danube. Here he defeated the Triballi; and after crossing the Danube at a point which it is now impossible to determine, he struck terror into the Getæ, who lived on the northern bank, by the rapidity and decision of his movements. On his return, he led his troops against the Illyrians and Taulantii, whom it was necessary to reduce to submission before he could safely quit his kingdom. A false report of his death, during this expedition, gave the Greeks once more hopes of throwing off the hated yoke of Macedon; and the Thebans set the example, by murdering two officers of the Macedonian garrison, which had occupied the Cadmeia or Acropolis of the city ever since the battle of Chæronea. But while they were indulging in the anticipation of recovering their independence, their ever-active enemy made his appearance before their city. It appears as if Alexander would have been satisfied with a reasonable submission, but party violence in Thebes prevented all concession, and the proposals of the Macedonian king were rejected with insult. After a short resistance Alexander's troops entered the city, when one of those horrid scenes of carnage ensued which form a necessary part of a conqueror's progress. It was then that the Phocians, with the Platæans and other Bœotians in the army of Alexander, inflamed by the remembrance of what they had once suffered from this unprincipled city, slew all before them, 'even those who made no resistance; they murdered the suppliants in the temples; they spared neither woman nor child.' (Arrian, I. 8.) The number killed is stated at 6000, which may possibly be exaggerated: the survivors were sold for slaves, except the ministers of religion, and the few who were the friends of the conqueror or who had opposed the revolution: the temples and the house of Pindar, it is said, were spared; but all the rest of the city, except the Cadmeia, was levelled to the ground, and Thebes for the present was blotted out of Greece. (B.C. 335.) Alexander did not march farther south, though the Athenians had been active in organizing the late resistance. One such example was sufficient for a warning.

In the spring of B.C. 334, Alexander set out on his Asiatic expedition with a force of about 35,000 men, and a very small supply of money. The largest component part of his army was Macedonian, with about 7000 allied Greeks, some mercenary troops, and several bodies of Thracians, 1500 Agrianian light infantry, and some other bodies of troops. His cavalry, on which his success in a great measure depended, was mainly composed of Macedonians and Thessalians.

Having arrived at Sestos in twenty days, and crossed the narrow channel of the Hellespont, the descendant of Achilles and his friend Hephæstion did honour to the mounds that were said to contain the remains of the mighty hero and his beloved friend Patroclus. Youthful enthusiasm may have been one motive to the display made before the army on this occasion, but it was no less a part of Alexander's policy to induce his followers to look upon him as the representative of the greatest warrior of the heroic age.

At the period of Alexander's landing in Asia, the unwieldy and disjointed monarchy of the Persians presented an appearance in every respect analogous to the Turkish empire at present. The Persians themselves, the ruling caste, were comparatively few in number. One monarch with absolute power claimed the sovereignty of almost countless nations, and of an immense extent of country, the parts of which were in many cases separated by natural boundaries which were difficult to pass. The provinces that lay remote from the seat of government could only be maintained by the presence of an armed force under a military governor nominated by the king. The partition of the empire and the distribution of power were therefore essential to the very existence of the Persian monarchy; but this system was also the remote cause of its weakness and dissolution. Each powerful governor was kept in submission by no other motive but fear of punishment; and when he felt himself able to defy his master, the bond of union was for the time broken. Hence some provincial governments passed quietly from father to son, the monarch tacitly consenting to an arrangement which he could not prevent. Darius, the king of Persia, who was contemporary with Alexander, seems to have been ill qualified to retrieve the falling fortunes of the monarchy: he was deficient in courage and military skill, and had no hope of opposing the invader but by turning against him the arms of the Greeks themselves.

From the time of Cambyses, the son of the first Cyrus, to the age of Alexander, we find renegade Greeks constantly in the pay of the Persian monarch, ready to serve their new paymaster against those who were united to them by kindred and language. The civil commotions which so often disturbed the peace of Grecian communities were also continually driving refugees to seek from the king of Persia the rank and property which they had lost at home. At this time the hopes of Darius rested on Memnon, a Greek of Rhodes, whose military skill might have made him, with better opportunities, a formidable opponent to the Macedonian king. The first combat between the invaders and the Persians was on the banks of the Granicus, (now perhaps the Oostvola,) a river which falls into the Sea of Marmara. The Persians possessed an elevated position on the east bank of the river, which their generals determined to defend, contrary to the advice of Memnon, who being, as it appears, not in the command, could only recommend for the present the safer expedient of a retreat. But the dispositions of the Persians were totally unsuited to oppose the violent attack of Alexander's cavalry, which crossed the river and maintained itself on the opposite bank until the light infantry that followed had time to come up, when the compact front of the Macedonians bristling with their formidable spears broke the less disciplined lines of the Persian cavalry, and secured a complete victory. To the daring personal courage of Alexander, who himself killed two Persians of the highest rank, and to the long spears of the Macedonians, the victory may be mainly attributed. The Greek infantry in the Persian army was cut to pieces, with the exception of 2000, who were sent into Macedonia in chains, and condemned to slavery. Alexander showed, after the battle, that he knew how to win affection by flattering self-love, as well as to lead men to conquest. He visited his own disabled soldiers, listened to the tale of their exploits and their wounds, and gave to the parents and children of those who had fallen privileges of distinction and immunity from civil burdens. Twenty-five horsemen belonging to the Companion cavalry,—a kind of military order, perhaps instituted by Alexander,—had fallen in the first assault: Lysippus, the famous sculptor, was ordered to make their figures in bronze, which were placed in the town of Dium in Macedonia, and afterwards adorned one of the public buildings of Rome.

This success was of the utmost importance to Alexander, by preparing the submission of most of the Greek towns on the Ægean, in which he adopted the policy of establishing democratic forms of government, with the double purpose of showing that he had come as the liberator of the Greek states, and perhaps, too, with a view of preventing their combining against himself by the constant occupation which they would have in quarrelling with one another.

To crowd into the compass of a short article the military operations of Alexander's campaigns would be a useless attempt: even Arrian's narrative is often too meagre and unsatisfactory to enable us to form a clear conception of the events. Nothing but a careful examination of a map, and some idea of the nature of the country, can give a reader any notion of the vigour of the Macedonian general. One of the most memorable events between the battles of the Granicus and Issus was the capture of Halicarnassus in Caria, which Memnon only left when it was no longer possible to hold out. This memorable siege is minutely described by Arrian, whose personal experience (see ARRIAN) enabled him to detail the military events of Alexander's life better than the compiler Diodorus or the rhetorician Curtius.

The progress of Alexander southward was marked by an event in which the durable features of nature bear evidence to the truth of history. In proceeding from Phaselis to Perga he sent part of his troops by a newly-made but difficult route in the interior; he himself proceeded along the shore of Lycia, where the mountains rise from the sea step by step like a ladder, leaving between the base of the ladder (or *climax*, as the Greeks called it) and the sea, a beach which offered a shorter and much more convenient road. The projecting cliffs, however, over which there appears to have been at that time no way, would render it necessary for the men in some places to wade through the water, though not without danger; but a favourable opportunity was offered for accomplishing this, by the depression of the sea in this part, consequent on the blowing of a north wind. (See Beaufort's *Karamania*, p. 116. Arrian, I., 26.) Among the numerous writers of Alexander's history there were not wanting those who embellished it with stories of miraculous interpositions, and unmeaning flourishes of rhetoric, in which they showed at once their own ignorance of the character of the country traversed by Alexander, and reckoned on a corresponding ignorance and credulity in their readers.

After gaining the strong post of Celænæ, near the source of the Mæander, the Macedonian general marched to Gordium in Phrygia, (B. C. 333) where he had another opportunity of turning to profit the belief of a superstitious age. The empire of Asia was promised to him who should untie the complicated knot which fastened to the pole of a chariot the yoke and collars of the horses. Alexander relieved himself from the difficulty, either by cutting the cord, or some equally expeditious process. The promptitude of his resolution, and the presence of a victorious army, could not fail to secure him the credit of having fulfilled the intentions of the Deity.

The army was now increased by fresh reinforcements from home, and the return of the new married soldiers who had been sent to winter in Macedonia. In approaching the passes which lead from the central plateaus of Asia Minor into the plains of Cilicia, Alexander must have been in the track of the Greeks who accompanied the younger Cyrus in his expedition against his brother, not quite a century before; and the march from the mountain pass to Tarsus (the modern Tersoos) on the Cydnus, probably followed the same route. A remarkably narrow defile, about twenty miles north of Tarsus, which is cut in the rock, has been conjectured to be the pass described by Xenophon and Arrian. At Tarsus the career of Alexander was nearly terminated by a fever, either caused by fatigue, or by throwing himself when heated into the cool stream of the Cydnus. A similar act of imprudence at Tersoos is said to have been fatal to the Emperor Frederick Barbarossa.

A little before this time Memnon died, and with him the best hopes of Darius. This skilful commander, at the time of his death, was in the Ægean with a powerful fleet, to which Alexander had nothing to oppose: he was master of Chios, the chief part of Lesbos, and ready to fall on Eubœa and Macedon, with the prospect of being supported by the Lacedæmonians. His sudden death relieved Alexander from an opponent whose operations in Greece might have compelled him to give up the dazzling prospect of Asiatic conquest.

From Tarsus Alexander marched, partly by the route of the younger Cyrus, along the Gulf of Issus to the little town of Myriandrus in Syria. Darius had for some time occupied an extensive plain in Syria, well adapted for the evolutions of his large body of cavalry, and for the disposition of his immense army. Contrary to the advice of Amyntas, a Greek deserter, he abandoned this position for one in which defeat was almost certain. An offset from the range of Taurus runs down to the Gulf of Issus, (the modern Gulf of Skanderoon,) and terminates in the high land of Cape Khynzyr. The mountains press close on the shores of the Gulf of Issus, leaving in some places a plain barely large enough for the battle-ground of an army: in one particular spot the passage is so narrow as to be capable of an easy defence. By this unguarded pass Alexander had advanced into Syria, while by another pass farther north in the mountain range, Darius moved from Syria to the plain of Issus with the river Pinarus in his front. He was now in the rear of Alexander; but he had engaged himself in a position where victory might be confidently expected by the Macedonians. Alexander marched back through the Syrian pass, and found the Persian king prepared for battle in the plain of Issus. The left wing of the Macedonian army was protected by the sea, and the dispositions on the right were such as to prevent the superior force of the Persians from effectually out-flanking the Greeks on that side. The Persian king, though possessing a far superior force, waited the attack on the opposite bank, as if conscious of his inferiority, and anticipating a defeat. Alexander himself, who was on the right wing, crossed the stream, attacked the Persians with impetuosity, and soon put their left wing to the rout. The 30,000 Greek mercenaries in the Persian army offered a stout resistance to the main body of the Macedonians; and the Persian cavalry on the right, who were opposed to the Thessalians, fought bravely as long as their king remained on the field of battle.

The Persian king himself gave the signal for flight when he saw his left wing entirely routed; and the cavalry, soon following the example of their leader, turned their backs with the rest of the army. The slaughter, though perhaps exaggerated, must have been prodigious, from the nature of the ground; and Ptolemy, the future king of Egypt, who was in the battle, relates that in one narrow pass the pursuers crossed the road on the upheaped bodies of the slain. Darius succeeded in escaping over the Euphrates by the usual ford at Thapsacus, (35° 20′ N. lat.) but his mother, wife, and his infant son, who had attended him to the field of battle, fell into the hands of the conqueror, and experienced from him the most humane and respectful treatment. This victory (about the close of B.C. 333) may be considered as having decided the fate of the Persian monarchy: it opened to Alexander a passage towards Egypt and Babylon, and checked the designs of Agis and Pharnabazus in Western Asia and the Ægean. One obstacle only lay in the way, which proved more formidable than the armies of Darius. A single day was sufficient to disperse a numerous army, but the labours of many months were necessary for the capture of Tyre. This great commercial city was situated on an island (33° 12′ N. lat.) separated from the mainland by a channel about half a mile wide; which, on the side of the continent, was shallow and muddy, but had about eighteen feet water close to the island. The island itself was defended by lofty walls, and well supplied with all the ammunition of war. For many centuries this wealthy city had been the great entrepôt between the eastern and the western world; and through it the inhabitants of Europe had long received those Asiatic products which we find mentioned in the oldest Greek writers. Her commerce and her ships had penetrated to all known seas; and her adventurous traders, through many intermediate hands, received the products of countries which the Tyrians themselves never visited. Her merchants were princes, and her warehouses were stored with all that contributes to national wealth and domestic comfort. We find in the twenty-seventh chapter of Ezekiel a most glowing picture of the prosperity of this great emporium, expressed with all the sublimity and strength of the ancient Hebrew poetry. (See Volney's explanation of this chapter.—*Syria*, chap. xxix.)

The cities of Phœnicia submitted to Alexander on his approach, and the ancient Sidon yielded without a blow; but Tyre, proud of her naval superiority, refused to grant all that was demanded, and prepared for a vigorous resistance. Alexander, in order to assault the place, was compelled to unite the mainland and the city by a causeway, which was not effected without great labour and difficulty. It is said that Nebuchadnezzar had taken the city by the same means; but, if the story is true, his causeway must have been of such a nature as to be easily removed. It is more probable that the island was not occupied till after the old city, which was on the mainland, had been taken by Nebuchadnezzar. Alexander's work still remains, and the island of Tyre is now part of the mainland. After a laborious blockade of seven months, the place was taken by storm, and the impatience of the besieging army was gratified by the slaughter of 8000 Tyrians; 30,000 more were sold into slavery; and, if we trust the authority of Diodorus and Curtius, the conqueror was guilty of the inhuman act of crucifying 2000 men on the sea-shore. The last bulwark of the Persian monarchy was now gone, and the dominion of the sea, as well as of the land, was in the hands of the Macedonians. Under the Persian monarchy Tyre enjoyed favour and privileges, on condition of furnishing the main part of the navy in all the wars with the Greeks; a condition to which the Tyrians probably were not averse, as it gave them additional means for crushing the Greeks, whom they hated as their rivals in the commerce of the Mediterranean. The siege of Gaza, one of the strong towns of Palestine, occupied Alexander for two months; but the obstinate defence of the inhabitants did not preserve the city from being taken, nor the women and children from being sold into slavery.

After the sieges of Tyre and Gaza, according to the authority of Josephus, Alexander marched to the holy city of Jerusalem, intending to punish the inhabitants for their refusal to supply him with troops and money. The High-priest Jaddus went forth to meet the conqueror, attended by the priests and people, and accompanied by all the imposing insignia of the Jewish religion. Alexander was so struck with this spectacle, that he pardoned the people, adored the name of the Most High, and sacrificed in the temple, according to the directions prescribed to him by Jaddus. The book of the Prophet Daniel was shown to him, and the passage pointed out in which it was foretold that the King of Grecia should overcome the King of Persia. With this, as the historian says, he was well satisfied, interpreting himself to be the person foretold by the prophet. The story appears only like another version of the visit to the Temple of Ammon, in Libya; and will not, in our opinion, bear the test of examination. Arrian says nothing about it. (See S. Croix, *Examen Critique*, p. 547, &c.)

Nothing now remained to check the march of Alexander into Egypt, which yielded without striking a blow. In seven days the army marched from Gaza, through the desert to Pelusium, the frontier town of Egypt on the east. The Persian governor found resistance hopeless, and the country passed at once under the dominion of the Greeks, an event to which circumstances had been long gradually tending. From the time of Amasis (B.C. 560) the Greeks had received permission to settle in Egypt; and, at the time of Alexander's invasion, there can be no doubt that the country contained a very large proportion of that nation. Under Persian government Egypt had always been an unruly and troublesome province, and the contest for the possession of it, between the Greek and Persian, and the Persian and Egyptian, had more than once been doubtful. The Egyptians hated the Persians for their religious intolerance, and the desecration of their temples, while the more accommodating Greek readily associated his own with the religious usages of the Egyptians, and was willing to assign to both a common origin. From Pelusium Alexander visited the sacred city of Heliopolis, renowned for its temples and obelisks, and Memphis, then the great capital of Egypt; south of this point we have no reason for supposing that he ever went. He next sailed down the Canopic, or western branch of the Nile, and entered the lake of Marea, where he founded the city of Alexandria, which still preserves his name. (See ALEXANDRIA.) From motives of policy, vanity, or curiosity, or perhaps under the influence of all three, Alexander determined to visit the far-famed temple of Ammon, an object of religious veneration to the Egyptians, and also probably, as it now is, the centre of a considerable trade. The site of this curious spot is now ascertained to be Siwah, (29° 12′ N. lat. 44° 54′ E. lon.,) where the ruins of a temple, and the hot springs, confirm other evidence as to its locality. (See AMMONIUM.) Alexander marched along the coast by the same route that Mr. Brown followed in 1792. This road is preferred to the more direct route on account of the better forage for cattle which it affords; and, on the whole, it presents no very formidable difficulties. After a march of seventy-five hours along the coast from Alexandria westward, Mr. Brown proceeded into the interior in a south-west direction. Alexander's march along the coast terminated at Parætonium, a point somewhat beyond that reached by Brown. The English traveller's account of the route from the coast to Siwah agrees with that of Alexander, as given by Arrian. It was through a country 'perfectly barren, consisting wholly of rocks and sand.' Arrian's description of Alexander's interview with the priests, and his notice of the oracular responses, are limited to a general remark, which shows that he did not think the story worth telling. Other authorities inform us that Alexander was honoured with the title of the Son of Jupiter, and a promise of the empire of the world. There is a remarkable discrepancy in the accounts of Ptolemy and Aristobulus, as to the route by which he returned. Ptolemy says that he took the short cut through the desert to Memphis, while Aristobulus asserts that he returned by the way that he came.

Alexander having received some reinforcements from Greece, and established the government of Egypt on a wise and liberal footing, set out to attack the Persian king, who had again collected a considerable army. In the spring of B.C. 331, he marched to Tyre, where he made some stay; from thence to the ford of Thapsacus on the Euphrates, and across Mesopotamia to the Tigris. Such a march makes but a small figure in the brief narrative of Arrian, and is but an inconsiderable part of the military operations of Alexander: it amounts, however, to above 800 miles. The king crossed the Tigris, and, advancing through Aturia, found Darius encamped on the banks of the Bumadus, near a small place called Gaugamela, or the *Camel's House.* The immense disproportion between the Persian and Grecian armies was no disadvantage to the less numerous, but better disciplined force of Alexander, though the victory was not obtained without a struggle. As on former occasions, many divisions of the Persian army behaved with courage, and the Asiatic cavalry made a strong resistance; but the early flight of the timid king left the Macedonians a certain victory. Darius fled to Ecbatana (Hamadan) in Media; and Alexander, who no longer had any reason to fear such an opponent, marched unmolested to take possession of Babylon, and the empire of Asia. This battle is more commonly known by the name of the battle of Arbela, (now Erbil,) up to which city Alexander pursued Darius. Arbela is between forty and fifty miles east of Gaugamela.

The battle of Arbela may be considered as an epoch in the life of Alexander. Though Darius was still alive, he could no longer be considered as king; his power was crushed; the fairest part of his empire had submitted; and the progress of the conqueror was henceforward attended with almost immediate submission. But the conduct and temper of Alexander began to undergo a change. Intoxicated with success, he gradually assumed the state and manners of an Asiatic sovereign; and, unrestrained by habits of self-control, he gave way to the most guilty excesses, which, if we trust the evidence of history, it is equally futile to palliate or deny.

The ancient city of Babylon, which had so long resisted the first Cyrus, and the first Darius, yielded, without a blow, at the approach of Alexander. The Macedonian adopted a more prudent and generous policy than the Persian monarchs, whose fanaticism and intolerance to foreign religions are hardly exceeded by that of the followers of Mohammed. Xerxes had ruined the temples of Babylon, and even had dared to profane the shrine of the Great Bel, and to murder the high priest. Alexander gave orders to restore the temple of the deity, and showed himself a worthy proselyte, by sacrificing to Bel, according to the rites prescribed by his ministers the Chaldeans.

A march of twenty days brought the Macedonians from Babylon to the banks of the Choaspes, (the Kerah,) on the east side of which stood the city of Susa, (Sus,) then the chief residence of the Persian kings, and the depository of their treasures; now only remarkable for its extensive ruins, which spread for several miles along the banks of the Kerah.

From Susa the active monarch advanced to the Pasitigris, (the Karoon,) and thence by the route which Timour afterwards followed, along the valley of Ram Hormuz, to the mountain pass (Kala-i-Sifid, the *white castle*,) which led into Persia Proper, (Fars,) the original seat of the Persians. His object was to surprise Persepolis, in which he succeeded; and, according to some accounts, he burnt the palace of the Persian kings in a fit of drunken madness, and at the instigation of Thais, an Athenian prostitute, who accompanied the army. It is difficult to believe all the circumstances as they are related; and it is almost certain that the real destruction of Persepolis belongs to the Mohammedan epoch. Under the name of Istakhar it is often mentioned by oriental writers; and the immense remains of Tchil-Minar, (the forty columns,) perhaps once the palace of the Persian kings, have been described and copied by various modern travellers. Persepolis was a kind of sacred city to the Persians; the former capital of their early empire, and the burying-place of their monarchs after the seat of government was removed to Susa and Ecbatana.

From Persepolis Alexander marched to Ecbatana, (B.C. 330,) but not by a direct route. On his approaching the city Darius fled past the ancient Rhagæ, and through the passes of the Elburz mountains, (Caspiæ pylæ,) to seek a refuge in his Bactrian provinces. In fact, he was now a prisoner in the hands of the Bactrian satrap Bessus, who accompanied him in his flight, and assumed the command. At Ecbatana the Thessalian cavalry and many of the allied troops having terminated their period of service, were honourably dismissed with full pay and presents. Some who preferred a life of adventure were enrolled as volunteers. The Thessalians sold their horses to the king, and with the rest of the Greeks received a safe convoy to the shores of the Mediterranean.

The march of Alexander from Rhagæ, (the modern Rey, whose extensive ruins lie near Tehran,) to his entrance into India, is the most obscure part of his history. The geography of those regions is still very imperfectly known to us, and the brief narrative of Arrian, our sole trustworthy authority, only enables us to form a general idea of the movements of the army. Alexander penetrated into regions where no European army has yet followed him, and few travellers have ventured to explore. The surprising rapidity of his movements and his capacity to endure toil, are not surpassed by what is recorded of Genghis Khan and Tamerlane, though we may readily admit that Arrian in this part of his work may have exaggerated, and fallen into error from unavoidable ignorance of the country. It is the same with distance as with time; both of them are unfavourable to clear perception. As the history of a remote age is comprised in a few words, so the immense spaces of Asiatic geography dwindle into insignificance, and leave no impression on the reader. But nothing is wanting, except a clear conception of the distances traversed by Alexander, and the obstacles encountered, to convince us that of all the conquerors who ever troubled the peace of mankind, he was the most unwearied and daring.

From Rhagæ the Macedonian commander passed through one of the defiles in the Elburz mountains, commonly known by the name of the *Caspian Pass*, and in one night accomplished, while pursuing Darius, a distance of 400 stadia through the arid wastes of Parthia, with foot-soldiers mounted on horses. Just as Alexander was coming up with the fugitives, Bessus took to more hasty flight, while two of his Persian attendants assassinated their unfortunate monarch, and made their escape with 600 horsemen. Alexander sent the body to Persepolis to be interred in the tombs of the Persian kings.

The army now advanced into the ancient Hyrcania, comprising a part of the modern Mazanderan, a country hemmed in on one side by lofty wooded mountains, and on the other stretching down in a sloping plain to the great inland waters of the Caspian. The king's object was to gain over the remnant of the Greeks, who had served in the army of Darius, for his progress eastward might be dangerous, and the occupation of the conquered provinces insecure, if he left in his rear a body of armed Greeks. After some negotiations, they came and surrendered at his camp, and Alexander had the good policy to pardon all, and to take a great many of them into his pay on the same terms as they had served the Persian king. Some Lacedæmonian ambassadors to king Darius, who surrendered at the same time, were put in chains. In Zadracarta, the capital of Parthia, (a city whose site is totally unknown,) Alexander stayed fifteen days: his next progress was towards the frontier of Areia, along the northern verge of the great salt desert, and to Susia, (Toos?) a city of Areia. According to a policy often successfully imitated, he left the government of Areia in the hands of the Persian satrap Satibarzanes, and prepared to lead his soldiers into a still more remote land. The traitor Bessus had fled into Bactria, (Bokhara,) one of the remotest possessions of the Persian monarchy, where he had rallied round him a few Persians, and a considerable body of the natives of the province. He had assumed the royal name of Artaxerxes, and placed the tiara[*] erect on his head, the symbol of Persian sovereignty. A new claimant thus arose to the empire of Asia. Alexander set out towards Bactria, but was speedily recalled by the news of Satibarzanes having revolted almost as soon as his master had turned his back. With a body of cavalry, and mounted spearmen, and his ever-faithful Agrianians, the unwearied king returned before he was expected: in two days he marched 600 stadia, and entered Artacoana, (Herat?) the capital of the province, to which he gave a new ruler. His course, which seems to have been changed by this unexpected revolt, was now bent to the country of the Drangæ, or Sarangæ, and to their capital. The limit of this march, in this direction, it is impossible to determine; but we must look for the country of the Drangæ on the banks of the great Helmund, which flows into the lake of Zerrah.

Here one of those events in Alexander's life must be briefly noticed, which cast the darkest shade on his character. Philotas, the son of Alexander's faithful general Parmenion, was accused of conspiring against the king, and of having long harboured treacherous designs. The charge *may* be true; at least Philotas was tried by his Macedonian peers who pronounced him guilty, and carried the sentence into execution by transfixing him with their spears. The father was absent in Media at the head of an army. A letter from Alexander, conveyed by one of the companions to three other commanders in Media, contained the sentence of Parmenion. It was thus that a Persian king used to issue his decrees of death against a governor, whom he had reason to fear; and the same sanguinary policy, the offspring of fear, was the only remedy that a Turkish sultan would have applied in a similar case. No proof of Parmenion's guilt is brought forward, and the absence of all real charge against *him*, tends rather to show that the tyrant had basely murdered the son, and feared the just resentment of the father.

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[*] This upright head-dress is humorously compared by the comic poet Aristophanes to a cock's comb (Birds. 487.) The reader may form an idea of what is meant by looking at a newly published print of the combat of Alexander and Darius from the ruins of Pompeii.

The army now advanced, probably along the valley of the Helmund, to the Ariaspi, a people to whom the first Cyrus had given the name of Orosangæ or benefactors, (Euergetæ,) for their aid in his Scythian expedition. Their civilized manners secured to them the favour of the second great conqueror of Asia. The Arachoti, sometimes called the White Indians, a people who live west of the Indus, and south of the great mountains, were subdued by Alexander: these operations, as well as the complete conquest of the Areii, were accomplished in the winter time, 'in the midst of much snow, want of provisions, and hard suffering on the part of the soldiers.' Nothing but the general's own capacity of endurance could have maintained the discipline of his army. Were the history of this campaign more minutely known, we might, perhaps, find a parallel to the unconquered endurance of the Macedonian king, in Charles XII., amidst the marshes of the Ukraine, and a contrast in the hasty retreat and abandonment of his army, by the greatest conqueror of modern times. Alexander in his progress to the mountains built a city, which he called by his own name Alexandria, supposed by some to be the modern Candahar; this, however, we may dispute. His course now lay over the Caucasus, as his historian terms the western part of the Hindoo Coosh, (Cau-Casus — Ko-Koosh,) the mountain range that here separates the waters that flow southwards or into the ocean from those that contribute to the lakes of central Asia. The greater part of the mountains were lofty and bare of wood, but the residence of a great number of people who here found food for their cattle. Bessus laid waste the country on the north side of the mountains, in order to impede the progress of his pursuer; 'but,' to use the simple and energetic words of the Greek historian, 'Alexander moved forwards not a bit the less: with difficulty, indeed, through deep snow, and without provisions; but still he moved on.'

On the nearer approach of Alexander (B.C. 329), the Persian satrap crossed the Oxus, burnt his boats, and retreated to Nautaca, a town of Sogdiana, the modern Mawarennahr. Alexander advancing took in succession Aornos and Bactra: the latter is conjectured to be near the modern site of Balk, which lies on the line of road that the conqueror probably followed. The Oxus is described by Arrian as the largest river crossed by Alexander except the rivers of India, and as flowing into the Caspian Sea, [see AMU;] its breadth was about six stadia, which proves that Alexander crossed it about the melting of the snow on the mountains in May or June; the current was deep and rapid, and its banks offered no materials for constructing boats or rafts. In five days, however, Alexander passed all his army over by means of floats made of the tent skins of the soldiers stuffed with dried reeds and grass (Arrian iii. 29. Compare Xenophon, *Anab.* i. 5.) Before crossing this mighty stream and entering on a new world, he sent home his disabled Macedonians, and such of the Thessalian volunteers as were no longer fit for service. The traitor Bessus fell into the hands of Alexander soon after he had crossed the river; after being kept a prisoner for some time, his nose and ears were cut off by order of Alexander, and he was sent to Ecbatana to be put to death. Arrian, like an honest chronicler, condemns this barbarous punishment; the conqueror, intoxicated with success, debased himself by ordering those cruel mutilations, of which ancient and modern Persian history present such frightful examples. Alexander had now assumed the insignia and the state of an Asiatic despot, and it would be difficult to distinguish his future conduct from that of any other conqueror who has been the scourge of Asia.

From the Oxus the army marched to Maracanda, (Samarcand,) the royal city of Sogdiana, and at a later period the seat of the wise and vigorous government of Tamerlane. The impetuous Macedonian still advanced eastward till he reached the banks of the Jaxartes, (the Sir,) which he proposed to make his frontier against the Scythians, or the nomadic tribes, occupying the country now possessed by the Kirghiz. After taking several cities to which the inhabitants had fled for refuge, he at last assaulted Cyropolis on the Jaxartes, a town which claimed for its founder the great Cyrus. This place is conjectured to be Khoojund, but it must be remarked that the measurement of distances and the fixing of positions in this part of Asia are yet entirely conjectural. When the actual geography of these regions has received that illustration which we are daily expecting, we may then venture to illustrate the descriptions of antiquity. After taking Cyropolis, Alexander crossed the river, defeated the cavalry of the Scythians, and pursued them under the burning heat of a Bucharian summer. The army was exhausted by thirst, and the commander himself was compelled to recross the river in consequence of illness, caused by drinking the unwholesome water, the only kind that is found in these arid steppes. A city founded on the banks of the Jaxartes, which bore the name of Alexandria, was designed to commemorate the limit of his conquests, and to serve as a frontier against the nomadic tribes. It would be unprofitable to detail minutely the operations of the army in a country of which most readers know as little as of the interior of New Holland. Alexander recrossed the Oxus, and spent the next winter (of 329 and 328 B.C.) at Bactra or Zariaspa. Here Arrian relates the story of Cleitus's death. It was during a festival in honor of Castor and Pollux, and the drunken revellings which followed, that Alexander murdered his friend Cleitus. Arrian remarks that Alexander, among other Asiatic customs, had adopted the Persian fashion of hard drinking, while the miserable flatterers, by whom he was surrounded, encouraged his vanity by exalting him above the demi-gods and heroes of Greece. Cleitus, who was drunk himself, had the boldness and imprudence to deny Alexander's claim to such extravagant honours, and the furious king, whom his attendants were unable to restrain, pierced his friend through with a javelin on the spot. Unavailing honours to the dead, and bitter remorse on the part of the murderer, were the natural termination of this tragical story.

In the spring of 328 Alexander recrossed the Oxus at a place marked by a fountain of water and a fountain of oil, (naphtha?) which, if discovered, might throw some light on the course of the army. He paid a second visit to Samarcand in order to tranquillize the country, and spent the severe season of the next winter in quarters at Nautaca; the cold of this region rendering winter operations impracticable. In the following spring (B.C. 327) he assaulted a strong natural fortress in which Oxyartes the Bactrian had deposited his wife and daughters. The place was almost inaccessible, and well furnished with provisions; and in addition to this, a recent fall of snow had rendered the scaling of the rocks more difficult. By means of the iron pins used for securing their tents, and strong ropes of linen, some adventurous soldiers ascended the steepest face of the fortress by night, and by the suddenness of the surprise frightened the garrison into a surrender. Alexander thus not only got possession of the strongest post in Sogdiana, but he found there a wife in Roxana, the daughter of Oxyartes, whom his followers pronounced to be the handsomest woman they had seen in Asia, after the wife of Darius. We have but few and doubtful traces of Alexander being much devoted to the fair sex. His conduct to the wife of Darius may have proceeded from indifference, though it is more charitable, and, perhaps, more true, to assign it to a generous feeling for a female whose husband's feebleness and misfortunes were more likely to excite pity than the wish to insult his fallen fortunes. Roxana was the daughter of a Bactrian prince, but to which of the tribes now found in Bucharia this wife of a Greek king belonged, it is impossible to say. The Tadjiks, who are considered the aborigines of Bucharia, are a handsome race, with European features, fine eyes, dark hair, beautiful teeth, and a good complexion: among their women there are some whom the conqueror of Asia might gladly make his wife, and his soldiers might approve the choice. After capturing another almost impregnable fort, Alexander moved southward about the end of spring, crossed the Caucasus, (Hindoo Coosh,) and in ten days arrived at Alexandria. It is impossible that ten days' march could have brought him from Balk to Candahar; nor, if we reckon the ten days from the crossing of the mountains, can we even then admit that he marched to this city; it is most probable, then, that the time is incorrectly given, for there are stronger reasons for supposing that Candahar was the Alexandria than any other known place. The memory of Alexander is still preserved among the ignorant inhabitants of Bucharia, where a molla reads in the public place to a numerous audience assembled around him, the exploits and adventures of Iskander the Great.

The winter residence in Bactra had been marked by new executions. A conspiracy was formed among the royal pages to murder the king, but, being discovered in time, Hermolaus and his young associates suffered the punishment of death by stoning, after having first been put to the torture. Callisthenes, a pupil of Aristotle, was implicated in the charge; he was first tortured and then hanged. There seems no doubt about the existence of a conspiracy, and as little doubt that it was provoked by the intemperate conduct of Alexander. (See Arrian, iv., 13, 14.)

The progress of the army from Alexandria to the passage of the Indus is difficult to trace, though we can have no doubt that it followed, in part at least, the line of an existing commercial road, and would be pretty near the same route that would be followed now. In his march Alexander crossed the Choes or Choaspes, (the river of Caubul?) and the Gyræus, both of them then considerable streams; he took the important town of Massaga, (Massagour,) and once more assailed one of those mountain fortresses, by name Aornos, which seems, from the peculiar difficulties which it offered, to have had additional charms for the adventurous spirit of Alexander. The place was captured in spite of a vigorous resistance; and the army advanced, by a road which they were obliged to construct for themselves, to the bridge of boats over the Indus which Ptolemy and Hephæstion had been sent forward to make.

Neither Aristobulus nor Ptolemy have informed us, says Arrian, how the bridge across the Indus was constructed: he conjectures, however, that it was made by boats, fastened together with planks laid across them, and the whole kept steady by baskets full of stones let down from the prow. Such a bridge of boats there is now at Attock on the Indus, a little north of which is probably the place where Alexander crossed. The river here is above 1000 feet wide, and very deep. It is only from November to April that such a bridge can be thrown over the river, for this is the period when it is not flooded. Alexander, who had spent the winter between the Caubul and the Indus, must have entered India early in the year B.C. 326. His route was the same as that of Timour and Nadir Shah, the object of whose plunder was the city of Delhi.

The region which the Macedonian conqueror now entered is watered by numerous large streams, whence it receives the Persian name of PENJ-AB, or the *five rivers*. The waters of the Penj-âb unite in one stream, and fall into the Indus on the left bank in 28° 55′ N. lat. Taxila was the first Indian town he came to, and here the army enjoyed a little repose after its toils. Taxilas, the king, had saved himself by previous submission; and it seems not unlikely that the dissensions among the Indian rulers of this country materially facilitated the operations of the Macedonian army. Alexander's progress was towards the Hydaspes, (now the Behut, or Bedusta, also called by the natives the Jylum,) a large river swollen by the solstitial rains. His boats that had been constructed on the Indus had been taken in pieces, and brought across the country to the bank of the river; but a more formidable enemy than the swollen Hydaspes presented itself on the opposite bank. Porus, an Indian king, one of the great rulers of the Penj-âb, was stationed there with a formidable army, and a train of elephants that rendered all attempts at landing too dangerous to be hazarded. By a manœuvre, Alexander, with part of his troops, and his formidable companion cavalry crossed the river in another place before he was discovered. The troops of Porus were upon this drawn up in order of battle in the plain, with a line of elephants in front; the rest of the dispositions of the Indian prince were such as showed him a master of the art of war as practised at that day in India. Unlike the timid monarch of Persia, Porus made a gallant defence; but the Macedonian cavalry, and the compact mass of the infantry bristling with their spears directed by the courage and skill of Alexander, were a force that no Indian army could resist. The whole loss of the enemy was, according to Arrian, about 23,000, while the number that fell on the side of the conqueror is stated so disproportionately small, as to lead us to doubt the accuracy of Arrian's authorities. Two sons of Porus fell in the battle; and the gallant father at last yielded to Alexander, who treated him with the respect due to his rank and courage, and restored to him his kingdom with extended limits. In this battle a number of elephants fell into the hands of the Greeks; and from this time we may date the use of that animal in European warfare.

We are told that Alexander founded two cities, or probably military posts, one on each bank of the Hydaspes. One city was called Nicæa, to commemorate his victory: the other Bucephala, in honour of Alexander's horse Bucephalus, which, after carrying his rider safe through so many battles, died in the last encounter, worn out by old age and fatigue.

From the Hydaspes the army advanced to the great Acesines or *Chin-ab*, which Ptolemy describes as fifteen stadia, or considerably above a mile in breadth. This estimate, which may be true of some parts in the rainy season, when Alexander crossed it, far exceeds the ordinary limits of the river. It was crossed in boats, and on skins; the latter mode, which is still common on the Chin-ab, was found the safer conveyance. The country between the Chin-ab and the Hydraotes, (Ravee, or Iraoty,) to which Alexander was now advancing, is said to be a sheet of hard clay without a blade of grass, except on the banks of the rivers. Over this tract he marched and crossed the Hydraotes to attack a new enemy. A second Porus, who was king of the country between the Acesines and Hydraotes, had fled as the enemy approached, and hence received the name of Coward. The recurrence of the name Porus, added to other reasons, proves that this was not a proper name of an individual, but of a family or tribe. The dominions of the runaway Porus were given to the true man. But all the Indians east of the Hydraotes were not cowards: the Cathæi, a warlike tribe, were determined to oppose the invader. Three days' march brought the Greeks to Sangala, where the Cathæi were stationed on an eminence with a triple line of waggons around it. Such mounds or eminences, surrounded by a brick wall higher on the outside than the inside, are found in the Penj-âb. The city was captured with the usual slaughter, and the power of the brave Cathæi was for the time broken. A pastoral tribe, a robust and manly race, bearing the name of Kattia or Jun, still exists in the countries between the Chin-ab and the Ravee, and is conjectured by a late explorer of those regions (Burnes) to be the Cathæi of Arrian. The name and the locality are certainly in favour of this hypothesis. The king was still eager to press forward beyond the Hyphasis, a river which under the name of Garra joins the Chin-ab (29° 30′ N. lat.,) and is formed of the united streams of the Sutledge and the Beeah. The latter name is a contraction of Bypasa, which retains some traces of the Greek name Hyphasis. Report magnified the wealth of the countries east of the Hyphasis, and the adventurous conqueror probably thought to make the Ganges the boundary of this progress. But his Greek troops exhausted with fatigue, disappointed in finding a country poor, and full of vigorous enemies, and seeing themselves now only a handful of strangers in a foreign land, could not be induced either by threats or persuasions to cross this river. The Hyphasis was, therefore, the boundary of Alexander's conquests and of that victorious progress, to which no other history offers a parallel. The Macedonians, a race hitherto looked on with contempt by many of the southern Greeks, furnished the officers for this bold undertaking; the Republics, whose names and exploits form the subject of all previous Grecian history, had no representative in the glories of the Indian conquest. It appears further when we consider the small number of Macedonians, Thessalians, and soldiers from southern Greece who formed the original army, or were afterwards added to it, that Alexander's army must have been constantly recruited from the nations among whom he came, and must have presented at this period a strange and motley aspect of Asiatic and European troops officered by Macedonians.

Our limits compel us to pass briefly over the remaining events of Alexander's life. The army retraced its steps to the Hydaspes, where a fleet was constructed of the timber which this river still abundantly supplies from the upper parts of its course. On descending the river to its confluence with the Acesines, the fleet experienced, at the junction of these streams, the dangerous rapids which are said only to exist in July and August. The long ships of war suffered severely, but the 'round boats,' as Arrian calls them, which probably resembled the native boats still used on the river, passed the dangerous spot in safety. A late traveller (Burnes) finds but a faint resemblance between the description of Arrian and the realities at the junction of these two great rivers. (vi. 4.)

The Malli, a powerful Indian tribe, who seem to have chiefly occupied the lower course of the Hydraotes (Ravee), were next attacked. We are inclined to look in the modern

Multan, or Malli-than, which stands on a mass of ruins, on the left bank of the Chin-ab, for the capital of the Malli which was taken by Alexander; but it is impossible to reconcile the description of Arrian, which is certainly very vague, with the position of Multan. We can hardly doubt, however, that Multan is on the site of one of the conquered cities. In this campaign, Alexander, like some of the modern heroes of the Penj-âb, swam across the Ravee, at the head of his cavalry, to attack the enemy, who were drawn up on the opposite bank.

The Oxydracæ, who were also obliged to surrender, may possibly have their name preserved in the name of Ouch, a town with a considerable population on the left bank of the Chin-ab, five miles below the junction of the Garra, which takes place in 29° 30′ N. lat.

The troops moved downwards (B.C. 325) to the confluence of the Indus and the Chin-ab at Mittun (28° 55′ N. lat.), where Alexander gave orders to found a city at the confluence of the two mighty streams, and to build dock-yards. Here he left Philip as satrap, with all the Thracians that belonged to the army, and a sufficient number of soldiers of the line to ensure the military occupation of the country. With his fleet increased, Alexander sailed down the Indus, placing Craterus and the elephants on the east bank, with orders to advance. He visited, in his voyage downwards, the royal city of the Sogdi, doubtless a corrupted name, and established there a dock-yard. Musicanus, an Indian prince, who lived lower down the stream, surrendered, and his city received a foreign garrison. Oxycanus, another prince, resisted, but in vain: his two chief cities were taken, and himself made a prisoner. The next acquisition was Sindomana, the capital of Sambus, which is probably the modern Sehwan (26° 22′ N. lat.), where there is a large mound sixty feet in height, surrounded by a wall of burnt brick, and which now encloses only a heap of ruins. Musicanus, in the mean time, revolted,—induced by the Brachmans, that is, the ruling caste. His second career was, however, short: he was caught and hanged, together with the leaders of the movement.

The narrative of Arrian is here obscure and corrupt (compare vi. 15, 9, and 17, 6): it appears, however, that part of the army was sent from the banks of the Indus by land, towards the country of the Arachoti and Drangæ (through Candahar), by a route now well known to exist; from Candahar they were ordered to proceed to Carmania. The fact of this line of road being known to Alexander, is a confirmation of his having been on the site of Candahar before he entered India, and it also adds to the probability of this being the Alexandria above alluded to. Shikarpoor on the Indus must be about the point of departure.

At Pattala (Tatta?), the apex of the great delta of the Indus, and about sixty-five miles from the sea, Alexander established a naval station, and laid the foundation of a city, which he no doubt anticipated would prove the centre of an extended commerce; and such it might be in the hands of a politic and powerful governor. The enterprising monarch himself explored the two great arms that embrace the delta of the Indus. In the western, called the Buggaur, he experienced the dangers of this rapid and destructive stream, swollen to increased fury by a strong wind from the sea; while the rapid ebb and flow of the tides, which at full moon rise about nine feet, left his boats suddenly on dry land, and as suddenly returned to surprise them. At last he reached the mouth of the stream, and beheld the great Indian Ocean: he floated onwards till he was fairly in the open sea, with the view of ascertaining, as he said, if he could spy any land. His historian conjectures that he wished to be able to say that he had navigated the Indian Ocean. He next explored the eastern branch, which he found more practicable, and opening into a wide æstuary. It may be doubted whether he sailed down the Sata, or present eastern arm of the Delta. It is possible that he navigated the Koree, which has the widest embouchure of all, though now no longer an outlet of the Indus. Alexander appears to have had views somewhat beyond those of an ordinary commander: he evidently possessed a spirit of geographical discovery.—'With a few horsemen,' says Arrian, 'he followed the outline of the Delta along the margin of the ocean, to see what kind of a country it was, and he ordered wells to be dug for the benefit of those who might navigate this coast. He also established a naval station on the wide æstuary, and left a garrison to keep the country in order.

Nearchus, the commander of Alexander's fleet, received orders to set out on his voyage along the coast towards the Persian gulf, as soon as the change of the monsoons would allow him. The narrative of this voyage, the earliest of which any account is extant, will be given under the head of NEARCHUS. Alexander himself set out from Pattala with his army somewhat earlier, about September, B.C. 325. The route from the Delta of the Indus to Bunder Abbas (Gombroon) on the shore of the Persian Gulf is practicable for elephants, and also for an army when attended by a fleet with supplies. This line differs very little from that which Alexander would follow in his sixty days' march from the western limits of the Oritæ to Pura (Fureg?) Scarcity of water drove the army on one occasion to seek it by digging on the sandy beach of the ocean, the coast of which they followed for seven days. But the sufferings of the soldiers in this arid desert, if we follow the accounts of Arrian and Strabo, were almost beyond description, owing, perhaps, as much to the want of supplies for so large a number of men, as to the barrenness of the country itself. We have no doubt that the difficulties of this desert were exaggerated by the Alexdrine historians. The sufferings of an ill-provided army in a country unable to furnish sufficient supplies, added to the exhaustions of so many campaigns, would doubtless all tend to make the inhospitable wastes of Gedrosia (Mekran) look more formidable than they really were. From Pura the army advanced without any difficulty to the capital of Karmania (the modern Kirman.) Here Alexander was joined by Craterus with the elephants, and the detachment already spoken of as sent through Candahar. The route of this commander was doubtless along the valley of the Helmund, from which the road to Kirman offers no serious difficulties. Nearchus also joined the king here, having conducted the fleet in safety to Harmozia, a place on the main land opposite the barren island of Hormuz, a name once celebrated in modern oriental warfare and commerce.

From Kirman, Hephæstion led the mass of the army, with the beasts of burden, and the elephants down to the coast, as the road along the Persian Gulf was more practicable in the winter season that was approaching. The king himself advanced with his lightest troops and the companion cavalry to Pasargadæ, (probably Murghaub,) the burial place of the great Cyrus. [See CYRUS. PASARGADÆ.] He found the tomb rifled by some robbers, who cared not for the honour of the great national hero who for more than 200 years had slept undisturbed. The golden coffin that contained the embalmed body of the monarch was the object of the plunderers, but after taking off the lid and throwing the corpse from its resting-place, they were unable to carry off the booty on account of its weight. Alexander ordered the mutilated body to be restored to the tomb, and Aristobulus tells us he himself received the king's commands to repair the damage that had been done, and secure the remains of the great Persian warrior from any similar insult.

From Pasargadæ, Alexander came to Persepolis, the city which he is said to have burnt at his former visit. If we may trust Arrian, the sight of the mischief he had done gave him no satisfaction. Here he named Peucestas, a Macedonian, satrap or governor of the province of Persis, in the place of the Persian governor who was hanged for his mal-administration. Peucestas forthwith followed a course of policy which Alexander well knew how to appreciate. He adopted the dress and usages of the country, and made himself a perfect master of the Persian language: the Persians, as we are informed by the historian, were naturally pleased with him. His example, to a certain extent, may serve as a pattern to modern nations who occupy a foreign land.

At Susa, on the banks of the Ulai, or Choaspes, (B.C. 324,) the army at last rested from their labours, and the interval of leisure was employed in enjoying the festivities of marriage. Alexander himself took another wife, Barsine, the eldest daughter of Darius; if we may trust Aristobulus, he married also at the same time Parysatis, the daughter of Ochus, thus sharing the honours of his Bactrian wife Roxana with two of Persian stock. Eighty of his chief officers, at the same time, received each an Asiatic wife from their royal master, who seems to have assigned the women to their respective husbands just as he would have parcelled out so many governments. Hephæstion married a daughter of Darius, it being Alexander's wish that his and his friend's children should be related by blood. The wives of Craterus, Perdiccas, Ptolemy, the future king of Egypt, Eumenes, Nearchus, and Seleucus, are specially mentioned by the historian.

'The marriages,' he adds, 'were celebrated after the Persian fashion: seats were placed for the bridegrooms, and after the wine, the brides were introduced, and each sat down by her husband. The men took the females by the hand and kissed them, the king setting the example. Alexander gave a dowry with each. Every other Macedonian who chose to take an Asiatic wife was registered, and received a present on his marriage; the number who followed the king's example was above 10,000. The feastings and revelry that attended the marriage celebration were diversified by every kind of amusement that music, theatrical representations, and all the talents of the most skilful *artistes* of the Greek nation could supply; but in the midst of this scene of perhaps riotous festivity, we must not overlook the wise policy of Alexander, by which he endeavoured to blend the conquerors and the conquered into one nation by the strong ties of inter-marriage. It was obviously, also, a further design of Alexander, as we see from his historian, to train the natives of Asia to European arms and manœuvres, and by incorporating them with his troops, and forming also new bodies, to render himself independent of the control of his Macedonians.

Discovery and works of utility also still engaged his attention. He sailed down the Karoon (Arrian vii. 7, says the Eulæus) into the gulf, examined part of the Delta of these rivers, and ascending the Shat el Arab, went up the Tigris as far as Opis. In this voyage he removed several of those large masses of masonry, commonly called *bunds*, which were built across the river for the purpose of making a head of water and favouring irrigation; but they proved at the same time an impediment to the navigation, which it was the conqueror's policy to improve and extend. Various remains of such constructions exist at the present day in the rivers of Susiana.

Having quelled a rising mutiny among his Macedonians, and dismissed the worn-out veterans with more than their full pay, he went, about the close of the year B.C. 324, to Ecbatana, the northern capital of the empire, where Hephæstion his favourite died. The grief of Alexander, which was no doubt sincere, displayed itself in all the outward circumstances of sorrow, but from the mass of contradictory accounts, Arrian (vii. 14) found no little trouble in extracting a probable and a rational narrative. On his route towards Babylon from Ecbatana, (Hamadan,) Alexander diverted his grief by subduing the Cossæi, a mountain tribe of robbers, whom he entirely rooted out, as he thought; but they soon showed themselves again. It seems as if the temperament of Alexander required a feverish excitement, and that rest and inactivity would have proved more fatal to his existence than the most incessant toil. Neither the severity of winter, nor the difficulties of the country proved any obstacle 'to Alexander and Ptolemy, the son of Lagus, who commanded part of the army.' On his approach to the ancient city of Babylon, he was met by embassies from nearly every part of the known world, who had come to pay their respects to the new lord of Asia—from Carthage, from southern Italy, from Europe north of the Black Sea: Celts and Iberians too, it is said, paid their homage in this motley assemblage.

The priests of the temple of Belus endeavoured to persuade the king that he could not safely enter the city: the great Belus himself had given this warning. Their motives, as Arrian tells us, and as we might readily suspect, were not so disinterested as they appeared. The great temple was in ruins, and the priests had made little progress in rebuilding it according to the orders given during Alexander's first visit (Arrian iii. 16): they enjoyed, however, its ample revenues, which, like prudent economists, they had no wish to expend on a useless building. The king despised the warning of Belus and his priests, and entered the city.

In Babylon Alexander proposed to fix the seat of his empire, and to live in a style of splendor unknown even to the monarchs of the East. His projects were grand and characteristic. He sent Heraclides to build vessels on the Caspian, and to explore these unknown waters, which Herodotus a century before had declared to be an inland sea, but other opinions connected with the Euxine, or the Great Ocean. He excavated a basin at Babylon to hold the vessels that should navigate the Persian gulf and the Euphrates, while he spared no pains to induce skilful seamen to repair to his new capital. The circumnavigation of the Arabian peninsula, and the subjection of its predatory hordes, were also part of his plan, but no commander of those who were sent out ventured farther than Cape Maketa (Cape Mussendom) at the entrance of the gulf. The improvement of the agriculture of the fertile Babylonian plains was another object of his policy; as a preliminary to which the numerous canals for irrigation required repair, and the great drain from the river during the season of the floods, the Pallacopas (see EUPHRATES, PALLACOPAS), was rendered more efficient. These fertile regions still retain the traces of the ancient Babylonian culture in their canals, embankments, and other contrivances for irrigation; but they wait for the presence of a wise and powerful government to secure to the labourer the produce of his industry, and to rouse him by example to attain the happiness which nature is ready to bestow.

In the midst of these undertakings, and the preparation for his Arabian expedition, Alexander died. The immediate cause of his death was a fever, probably contracted while superintending the work in the marshes round Babylon, and aggravated by a recent debauch. The daily bulletins during his illness may be seen in Arrian (vii. 25): he seems to have had no physician. This is nearly all that can with certainty be said about the circumstances of his death. He died at the early age of thirty-two years and eight months, after a reign of twelve years and eight months; during nearly the whole of which time, his sword was actively employed in diminishing the numbers of the human race. Arrian (vii. 28) has pronounced his perhaps too partial panegyric, the truth of which, however, no one should dispute till he has carefully weighed the whole evidence. 'Whoever,' says the historian in conclusion, 'vilifies Alexander, should not allege merely those events of his life which merit blame, but should collect *all* the facts of his life and then consider, first, who he is himself, and what has been his own fortune; and then, who Alexander was, and how great was *his* fortune: he should consider that Alexander was the undoubted monarch of two continents, and spread his name over the whole earth; and especially should the vilifier of Alexander bear this in mind, if he is himself a person of little importance, engaged in matters also of little importance, and not managing even these well. I think there was no nation, nor city, nor individual of that day, who had not heard of Alexander's name. It is my opinion, then, that such a man, who was like no other mortal, would never have been born without a special providence.'

Alexander is said to have had a handsome person. He died without leaving any undisputed successor, or any distinct declaration of his will. His wife Roxana was with child at the time of his death.

His body was embalmed probably after the manner in use among the Persians, and finally deposited at Alexandria in Egypt, though all the circumstances attending its transport are exceedingly contradictory and uncertain. A sarcophagus in the British Museum, brought from the church of St. Athanasius at Alexandria, (No. 6 in the catalogue,) has been named without any reason the Sarcophagus of Alexander.

In this imperfect sketch many events are omitted which it is impossible to crowd into a limited space, and many parts of the narrative thus become obscure and perhaps incorrect. The following authorities may be consulted for more minute particulars, and by those who take pleasure in reconciling contradictions: Arrian's *Anabasis*. Strabo. Quintus Curtius. Plutarch's *Life of Alexander*. Diodorus, Book 17. Justin. These are the chief, but not the only antient authorities. The reader may also consult *Examen Critique des Anciens Historiens d'Alexandre le Grand*. Mitford's *Greece*. Williams' *Life of Alexander*. Burnes' *Memoir on the Indus*. *Journal of the Lond. Geog. Soc.* 1833. Lassen's *Pentapotamia Indica*.

To comprehend the political events that followed the death of Alexander, the reader may turn to the articles ANTIGONUS, ANTIPATER, DEMETRIUS, EUMENES, LYSIMACHUS, PERDICCAS, PTOLEMY, SELEUCUS; and also for other parts of his life, but briefly treated here, to ALEXANDRIA, AMMONIUM, ARISTOTLE, BABYLON, ECBATANA, EUPHRATES, INDUS, SUSA, PASAGARDÆ, PERSEPOLIS NEARCHUS, PARMENION.

ALEXANDER I., son of Amyntas I., said to be the tenth king of Macedon, was alive at the time of the great Persian invasion of Greece, B.C. 480. His history, as far as it is known, and his share in the troubles of the Persian wars, are contained in the last five books of Herodotus.

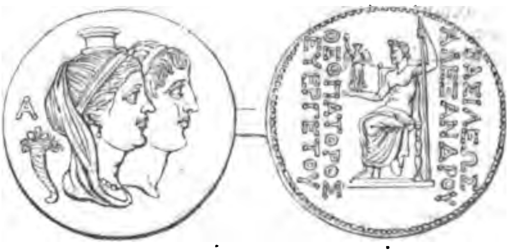
ALEXANDER II., the sixteenth king of Macedonia, was the son of Amyntas II., and ascended the throne about B.C. 370.

[Alexander Balas.]

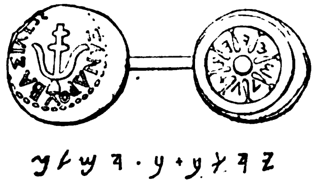
ALEXANDER I., surnamed **BALAS**, or Βαλλης, reigned as king of Syria from 150 to 145 B.C. According to some authorities, Alexander took his surname from his mother Bala, or Balle. The following is the account given of the origin of this adventurer. His predecessor, Demetrius I., occasioned by his bad government a rebellion, which was supported by the kings of Egypt, Cappadocia, and Pergamus. The governor of Babylon, Heraclides, being exiled to Rhodes by Demetrius, induced a certain Alexander Balas, of low birth, to feign himself a son of Antiochus Epiphanes, and to claim as such the right of succeeding him. The Roman senate acknowledged this pretender on his appearing at Rome, in order to revenge themselves on Demetrius I. Polybius, who was at that time at Rome, states that the whole city was surprised at the edict, by which the senate recommended the cause of the adventurer Balas to the support of the confederate nations. This edict had, however, the effect, that Ariarathes, king of Cappadocia, Ptolemy and Attalus II., king of Pergamus, sent troops to Alexander Balas to assist him after his return from Rome against Demetrius. Many discontented Syrians joined this army. This civil war in Syria relieved the Maccabees, who were almost subdued before this diversion took place. Demetrius I., as well as Alexander Balas, endeavoured to obtain the support of Jonathan, the Maccabee, who headed at that time the Jewish patriots. Jonathan embraced the party of Alexander Balas, who conferred upon him the high priesthood, styled him friend of the king, and presented him with a purple robe and a diadem. Alexander Balas having been defeated in the first battle, 152 B.C., received reinforcements and gained a decisive victory in the year 150. Demetrius I., who was wounded by an arrow, perished in a swamp. Alexander Balas then mounted the throne of Syria, and married at Ptolemais, Cleopatra, a daughter of Ptolemæus Philometor. On this occasion Jonathan, the Maccabee, was treated with great distinction by Alexander and Ptolemæus, was again presented with a purple robe, and appointed commander, or Meridarch of Judæa. When Balas considered his government sufficiently established, he left the cares of administration to his favourite Ammonius, in order to enjoy without restraint a luxurious life. Ammonius put to death those members of the royal family of the Seleucidæ whom he could get into his power, but there still lived in the island of Cnidus two sons of the last king, the elder of whom, Demetrius II., landed in Cilicia, whilst the governor of Cœlesyria, Apollonius, rebelled against Balas in the year 148 B.C. Apollonius was beaten by Jonathan, but Balas himself was obliged to march against Demetrius II. Ptolemy, who had apparently come to assist his son-in-law, suddenly embraced the cause of Demetrius, after accusing Balas of an intention to murder him. Balas, being defeated by Ptolemy, escaped into Arabia, where he was murdered by an Arabian chieftain contrary to the laws of hospitality, in the town of Abas, which was afterwards called *Motho*, (*his death.*) Demetrius II., surnamed Niketor, then ascended the throne of Syria.

The Emir who cut off the head of Balas and sent it to Ptolemy, is called by Josephus *Zabel*, and in Maccab. xi. 16, 17, *Zabdiel*. Diodorus Siculus (in Excerpt. Photii, cod. 244) calls him *Diocles*. Perhaps he had adopted a Greek name, like other Orientals of his time, and like the Jews of our days, who often adopt English names after their arrival in England, changing *Hirsch* into *Harris*, *Aaronsohn* into *Harrison*, *Levi* into *Lyons*, &c.

Justin (xxxv. 12) states, that Balas was the original name by which Alexander was known during the period of his private life. He is called by Strabo *Balas Alexandros;* where the word *Balas* appears to be used by him as synonymous with king. In the British Museum there are *forty-seven* silver and copper coins of Alexander Balas. On some coins he is called Θεοπατωρ (because his pretended father, *Antiochus*, had called himself Θεος, God) Ευεργετης, (see 1 Maccab. x. 1,) and Νικηφορος. These two last surnames he likewise adopted from his pretended father. On some coins the head of Alexander Balas is associated with that of Cleopatra, who occupies the foreground with a modius on her head,—an indication of his subordination to this proud woman. Handel wrote an Oratorio entitled Alexander Balas. (Fröhlich, *Annales Syriæ, Nummis Illustr.* tab. viii., ix. p. 61; Eckhel, Doctr., *Numm. Vet.* tab. iii. p. 227; Athenæus, v. c. 10; Polyb. *de Legat.* c. 140; Appian, *Syr.* c. 31; Diod. Sic. *Fragm.* xxxii.; Joseph. *Archæol.* xiii. 2; 1 Macc. x. 11; Gesenius in *Ersch und Gruber; Seleucidarum Imperium sive Hist. regum Syriæ ad fidem numismatum accommodata per Foy-Vaillant.*)



[Alexander Balas.]



[Alexander Jannæus.]

ALEXANDER JANNÆUS, third son of Johannes Hyrcanus, succeeded his brother Aristobulus as king of the Jews and as high-priest, from B.C. 106 or 104 to 79. Following the example of his brother, he turned the disturbances in Syria to his own profit. He attacked Ptolemais, (the present Acre,) which, like other cities, had made itself independent. The inhabitants called Ptolemæus Lathyrus, of Cyprus, to their assistance, by whom Alexander Jannæus was beaten on the banks of the Jordan, and Palestine horribly ravaged, until, by the aid of Cleopatra, the mother of Lathyrus, Alexander was enabled to repel his enemy. Alexander then conquered Gaza, burned the city, and massacred the inhabitants who had joined the party of Lathyrus; but not without losing many of his own soldiers. Jannæus embraced the party of the Sadducees; and, of course, was hated by the Pharisees and by the people. On the Feast of Tabernacles, after being pelted by the people with lemons, and loudly insulted by their opprobrious language, he caused 6000 men to be cut down, and in future protected himself by a body-guard of Libyans and Pisidians. Having lost his army in an unfortunate expedition against the Arabians, the Pharisees made an insurrection, and carried on for six years a civil war against the king, in which 50,000 Jews are said to have perished. The rebels, supported by the Arabians, the Moabites, and by Demetrius Eukæros, compelled Alexander to escape into the mountains. But a part of the auxiliaries coming over to the king's party, he was now enabled to crush the rebels, and to gratify his vengeance by crucifying, on one day, 800 of the most distinguished captives: their wives and children were massacred before their eyes; whilst the king dined with his wives in sight of the executed rebels. On account of this cruelty he was surnamed the *Thracian*.

Having intimidated his enemies, and restored public peace, he engaged in several successful wars, by which he enlarged his dominions. Being desirous to reconcile his subjects, he asked them what he should do in order to make them quite content? '*Die*,' they replied. He did die at the siege of Regaba, or Ragaba, in the territory of Gerasene beyond the Jordan, in consequence of his gluttony, in the twenty-seventh year of his reign. He had two sons; but left the government to his widow. Before his death, he advised his wife Alexandra to conciliate the Pharisees, by whom he was buried in a pompous style. His reign, like the rest of the later history of the Jews, is full of cruelty and acts of perfidy, although, in comparison with others, he has obtained the praise of moderation. (Joseph. *Archæolog.*, xiii. c.12-15.) There is a small copper coin of Jannæus in the British Museum, but the Samaritan inscription between the rays of the stars, mentioned by others, is not discernible. (Compare Bayeri, *Vindiciæ*, *Num. Hebr.*, plate, fig. 5.) There is a coin extant of Alexander Jannæus, having on one side an anchor, and the legend *Αλεξανδρου Βασιλεως*, and on the other a star, between the rays of which stands in the Hebrew coin characters, יהונתן (Jonathan), and on others, מלך יהונתן (King Jonathan). Barthelemy and Eckhel, *Doctr. Numm.* iii. p. 479, have rendered the authenticity of this coin very probable. Gesenius thinks that Jonathan was the Hebrew name by which he was known among the Jews; whilst Alexander was the Greek name which he had adopted, like other monarchs during this period, when the Jews were so fond of imitating everything Greek.

[Alexander Zebinas.]

ALEXANDER II.—*Zebinas*, or *Zebinæus*—a pretender to the Syrian crown, reigned over a part of the kingdom of Syria, from the year 128 to 122 B.C. The inhabitants of Apamea, Antiocheia, and some other cities, disgusted with the tyranny of Demetrius II., requested Ptolemæus Physcon to appoint another king. Ptolemy sent them a young Egyptian, the son of a broker Protarchos of Alexandria, whom he represented as having been adopted by Antiochus Sidetes. The pretender took the name Alexander; but the people called him, in derision, זְבִינָא *Zebina*, that is, *the bought one*. Demetrius being defeated near Damascus, fled to Tyre, where he was murdered. Zebinas, thinking his kingdom firmly established, refused the annual tribute to Ptolemæus Physcon, who now encouraged Antiochus VIII., the son of Demetrius II. Zebinas was in his turn defeated by the Egyptian army, and retreated to Antioch; where, being unable to pay his troops, he permitted them to pillage the temple of Victory, and took for himself the golden statue of Jupiter. Expelled by the people of Antioch from their city, and deserted by his troops, he endeavoured to escape on board a small vessel into Greece, but was taken by a pirate, and delivered into the hands of Ptolemy, who put him to death. Twenty-two coins of Zebinas are to be seen in Fröhlich, *Annales Syriæ*, tab. xii. (Compare p. 84, Eckhel, *Doctr. Numm. Vet.* iii. p. 237; Justin, xxxix. 1, 2; Joseph., xiii. 9, 10; Athenæus, v. 17; Gesenius, in *Ersch und Gruber*; Foy-Vaillant, *Syriæ Hist. ad fidem numismatum accommodata*.) The British Museum contains twenty-six silver and copper coins of Alexander Zebinas.

ALEXANDER, a son of King Aristobulus II., and grandson of Jannæus, was taken captive in Judæa by Pompey, who intended to exhibit him with his father and brother in his triumph at Rome. Alexander escaped on the journey, and returned to Judea, where he raised an army of 10,000 foot and 1500 horse to attack Hyrcanus, who had been appointed by Pompey to govern Judea. Alexander took several castles in the mountains; but Hyrcanus imploring the assistance of the Romans, Marcus Antonius, who was sent by Gabinius, governor of Syria, defeated Alexander near Jerusalem, B.C. 57, and besieged him in Alexandrion, a small town with a fine castle about six miles south of Tyre, where he capitulated. After his father Aristobulus had escaped from Rome to Judæa, and had been again defeated and put into prison, Alexander once more took up arms, conquered Judæa, put many Romans to death, and besieged the rest in Garizin. But his army of 30,000 men was finally defeated by Gabinius, in a battle near Mount Tabor, in which 10,000 Jews perished. Alexander at last fell into the hands of Metellus Scipio, and was beheaded at Antioch, in the year 49 B.C. (Joseph., *Arch.* xiv. 5, 6, 7; *Bell. Jud.*, i. 8, 9.) A few variations of this account occur in יוסיפון בן גוריון. (*Ed. To. Frid. Breithaupt.* lib. iv. cap. xxiv., xxv. p. 337 to 349.)

ALEXANDER SEVERUS. [See SEVERUS.]

ALEXANDER POLYHISTOR. [See POLYHISTOR.]

ALEXANDER I., one of the earliest bishops of Rome, succeeded Evaristus about the beginning of the second century of our æra, but the precise epoch is not well ascertained.

ALEXANDER II., a Milanese, succeeded Nicholas II. in 1061. This was at the beginning of the long dispute between the See of Rome, and the Emperors of Germany, concerning the investitures, of which cardinal Hildebrand, afterwards Gregory VII., was the chief instigator. The imperial party assembled another conclave at Basle, where they elected Cadalous, Bishop of Parma, who took the name of Honorius II. After a struggle between the two competitors, Cadalous was taken prisoner and confined in the castle of Saint Angelo at Rome, and Alexander was generally acknowledged as lawful pope. He died in 1073, and was succeeded by Gregory VII.

ALEXANDER III., Cardinal Rolando of Siena, succeeded Adrian IV. in 1159. His long pontificate of 21 years was agitated by wars against the Emperor Frederic I., and by a schism in the church, during which three successive antipopes were raised in opposition to Alexander. The latter took part with the Lombard Cities in their struggle against Frederick. [See FREDERIC BARBAROSSA.] At last peace was made, and the pope and the emperor became reconciled at an interview they had at Venice in 1177, and Alexander was universally acknowledged as legitimate pope. He held a great council in the Lateran palace in 1180, when, among other regulations, a decretal was passed, that two-thirds of the cardinals should be requisite to make an election valid. He died at Rome in 1181, and was succeeded by Lucius II. The famous Thomas à Becket was Archbishop of Canterbury during Alexander's pontificate. The latter took part with the English prelate in his contest with King Henry II., and canonized him after he had been murdered.

ALEXANDER IV., of Anagni, succeeded Innocent IV. in 1254. He inherited the ambition, but not the talents of his predecessor. He manifested the same inveterate hostility against the house of Suabia, and its representative Manfred, King of the two Sicilies, but did not succeed in his attempt at overthrowing the latter, which became the work of his two immediate successors. Alexander died in 1261, and was succeeded by Urban IV.

ALEXANDER V., a native of Candia, and monk of the Franciscan order, was elected in 1409, and died the following year. He was succeeded by John XXIII.

[Alexander VI.]

ALEXANDER VI. Roderic Borgia of Valencia in Spain, a man of great personal wealth and of some ability, but of loose conduct. He had been made a cardinal by his uncle Calixtus III., and was elected pope in 1492, after the death of Innocent VIII. At the time of his election, he had four children by his mistress Vanozia; and (during his reign) he made no scruple at employing every means in his power to confer on them honour and riches. The most notorious of his sons was Cesar, first cardinal, and afterwards made Duke of Valentinois in Dauphiny by King Louis XII.

from which he was styled the Duke Valentine, a name which he rendered infamous by his atrocities. The politics of the pope were capricious and faithless in the extreme. At first he was hostile to the house of Aragon then reigning at Naples, and showed himself favourable to the French who were at that time attempting to invade Italy, but afterwards his younger son, Gioffredo, having married a daughter of Alfonso II. of Naples, Alexander allied himself with the latter, for the purpose of arresting the progress of the invaders. As, however, Charles VIII., at the head of his army, advanced upon Rome, the pope received him with honour, and promised him his support for the conquest of Naples, and even gave him his son, Cardinal Cesar, as a hostage. But the Cardinal found means to escape; and Alexander joined the league formed in the North by the Venetians and Sforza against the French, which led to the expulsion of the latter. He afterwards allied himself to Lewis XII. of France, successor of Charles VIII., who wanted the Pope's sanction for divorcing his first wife: he was also a party to the double treachery by which Ferdinand of Spain first betrayed the cause of his relative, Frederic of Naples, partitioning that kingdom between Lewis XII. and himself; and then, breaking his engagement with the French, he seized upon the whole of the conquest by means of his general, Gonsalvo. Alexander's internal policy was, if possible, still more perfidious. He was bent upon the destruction of the great Roman families of Colonna, Orsini, and Savelli; and either by treachery or open violence he in great measure succeeded in putting to death most of them, and seizing on their extensive possessions. He sent his son, the Duke Valentine, into the Romagna, where, by means of similar practices, the latter made himself master of that country, entrapping and strangling the independent lords and petty despots of the various towns. Alexander gave his only daughter Lucretia Borgia in marriage, first, to Giovanni Sforza, Lord of Pesaro, whom she afterwards divorced; then to a prince of the house of Aragon, who was murdered by her brother Cesar; after which she lived some time in the pontifical palace, sharing in the intrigues and licentiousness of that court. She was married a third time, in 1501, to Alfonso d'Este, son of Hercules Duke of Ferrara, to whom she brought as a dowry 100,000 golden pistoles, besides jewels. Alexander's eldest son, John Duke of Gandia, was murdered one night while returning from a debauch, by unknown assassins, and thrown into the Tiber. (See Roscoe's *Leo X.*, vol. i.) At last Alexander himself died on the 18th of August, 1503, being seventy-four years of age. It was said, and several historians have repeated the assertion, that he died of poison which was intended for his guest, the Cardinal of Corneto. This crime, however, is not clearly proved; and the Pope having been ailing for some time with a tertian fever, this circumstance, added to his advanced age and irregular habits, is sufficient to account for his death. He was succeeded nominally by Pius III., who died twenty-six days after his election, and then by the famous Julius II. The pontificate of Alexander VI. is certainly the blackest page in the history of modern Rome. The general demoralization of that period, of which abundant details are found in John Burchard's *Diarium*, as well as in Panvinius, Muratori, Fabre's continuation of Fleury's *Ecclesiastical History*, and other writers, Catholic as well as Protestant, appears in our times almost incredible.

ALEXANDER VII., Fabio Chigi of Siena, succeeded Innocent X. in 1655. He embellished Rome, protected learning, but was accused of favouring too much his relatives and connexions. He was embroiled in a dispute with the imperious Louis XIV. of France, in consequence of some insult which had been offered by the populace to the Duke of Crequi, French ambassador at Rome. He died in May, 1667, and was succeeded by Clement IX.

ALEXANDER VIII., Cardinal Ottoboni of Venice, succeeded Innocent XI. in 1689. He assisted his native country in its wars against the Turks. He died in February, 1691, at the age of eighty-two, and was succeeded by Innocent XII.

ALEXANDER I., king of Scotland, was a younger son of Malcolm III. (Canmore), and succeeded his eldest brother Edgar, who died without issue on the 8th of January, 1107. In those times, in Scotland, as well as in other countries, the succession to the throne was frequently regulated, at least to a certain extent, by the will of the reigning king; and Edgar, at his death, left part of his dominions to his younger brother David. Lord Hailes thinks that David's share was only the Scottish portion of Cumberland; but it appears rather to have included the whole territory that was considered subject to the Scottish crown to the south of the Forth, except the Lothians. Alexander was at first inclined to resist this apportionment; but he eventually acquiesced in it. The instructions of his mother, Margaret, the sister of Edgar Atheling, and the advantages which he enjoyed from the society of the English exiles, who crowded, after the Conquest, to his father's court, had given to Alexander a degree of literary cultivation which none of his predecessors had possessed. His natural talents seem also to have been of a superior order; while he possessed, in an eminent degree, the energy of character suited to the government of the rude and turbulent country which Scotland then was. His reign, almost from its commencement, was agitated by successive insurrections; every one of which, however, he promptly put down. One of the most serious was that excited in the district of Moray, in 1120, by Angus, the grandson of Lulach, son of the wife of Macbeth, and the occupant of the throne for a few months after the death of that usurper. Angus claimed the crown in virtue of this descent; but the attempt was met by Alexander with his usual decision, and speedily quelled. From the energy which he displayed on this occasion, he derived the epithet, or surname, by which he is known in Scottish history. The old chronicler, Wynton, says,

> 'Fra that day forth his lieges all
> Used him Alexander the Fierce to call.'

Alexander showed equal spirit in resisting all foreign encroachments upon the independence of his kingdom. The annals of Scotland during his reign are chiefly occupied with the disputes occasioned by the pretensions of the Archbishops of Canterbury and York to episcopal jurisdiction over that country. A very full abstract of the course of this controversy has been given by Lord Hailes; but it is sufficient here to state, that the determination of the Scottish king at length compelled the English prelates to give up the contest. St. Andrew's, and several of the other ecclesiastical foundations of Scotland, were largely indebted to the bounty of Alexander. The only church of which he was the founder, however, was, we believe, that which he built in 1123 on the isle of Inchcolm, in the Frith of Forth, in the neighbourhood of which he had nearly perished in a tempest. He died at Stirling, without leaving any legitimate issue, on the 27th of April, 1124, and was succeeded by his brother David I. Alexander had married Sibilla, the natural daughter of Henry I. of England. She died suddenly, at Lochtay, on the 12th of June, 1122.

ALEXANDER II., king of Scotland, was born at Haddington, on the 24th of August (St. Bartholomew's day), 1198, and succeeded his father, William the Lion, on the 4th of December, 1214, being crowned at Scone on the following day. His mother was Ermengarde, daughter of Richard Viscount of Beaumont, and granddaughter of a natural daughter of Henry I. of England. He began his reign by entering into a league with the English barons who were confederated against King John,—engaging to aid them in their insurrection, on condition of being put in possession of the northern counties of England. This led to several devastating incursions into each other's dominions by the two kings. The death of John, in October, 1216, put an end to their hostilities; and the following year Alexander concluded a treaty of peace with the new sovereign of England, Henry III., one of the conditions being that Alexander should espouse Henry's eldest sister, the Princess Joan. This marriage accordingly took place on the 25th of June, 1221. In the course of the following thirteen or fourteen years, Scotland was disturbed by insurrections which broke out successively in Argyle, in Caithness, in Murray, and in Galloway; all of which, however, Alexander succeeded in repressing. Meanwhile the connexion which he had formed with the royal family of England preserved peace between the two countries, and even led to considerable intercourse between the Scottish king and his brother-in-law, whom he repeatedly visited at London. The death of Queen Joan, however, without issue, on the 4th of March, 1238, and the marriage of Alexander, on the 15th of May in the following year, with Mary, daughter of a French nobleman, Ingelram de Couci, broke this bond of amity; and after some years of mutual dissatisfaction and complaint, the two kings prepared to decide their differences by arms in 1244. By the intervention, however, of some of the English nobility, bloodshed was prevented, after Alexander had approached the border with an army, it is said, of 100,000 men; and a peace was concluded at Newcastle in August of that year. In 1247, another insurrection broke out in Galloway, which Alexander soon succeeded in putting down. In the summer of 1249, he had set out at the head of an army to repress a rebellion raised by Angus, Lord of Argyle, when he was taken ill at a small island, variously spelled Erray, Kerreray, Kerarry, or Kirarry, off the coast of Argyle, and died there on the 8th of July. By his second marriage, he left an only son, his successor, Alexander III., born at Roxburgh on the 4th of September, 1241. Alexander II. bears a high character in the pages of the ancient historians and chroniclers of Scotland; and he appears to have been a prince endowed with many great qualities. Besides the warlike ability with which he preserved both the independence and the internal order of his kingdom, he is particularly celebrated for his regard to justice, and the wisdom and impartiality with which he took care that the law should be administered among all classes of his subjects. This is a virtue in a king, or governor, that never fails to attract the popular attachment and respect; and, accordingly, we are told by a contemporary English writer, Matthew Paris, that Alexander was deservedly beloved, not only by his own subjects, but by the people of England likewise. He is usually characterised as altogether one of the ablest and best of the Scottish kings.

ALEXANDER III., King of Scotland, was the son and successor of Alexander II. Although only eight years old at his father's death, he was crowned at Scone, by David de Berneham, Bishop of St. Andrew's, on the 13th of July, 1249, having previous to that ceremony been knighted by the same ecclesiastic. He had, already, when only a year old, been betrothed to Margaret, the eldest daughter of the English king, Henry III.; and notwithstanding the youth of both parties, the celebration of the marriage took place at York, on the 25th of December, 1251. The connection thus formed, together with the minority of his son-in-law, gave Henry a plausible pretext for interfering, as he was very anxious to do, in the affairs of Scotland; and the distracted state of that kingdom, occasioned by the factions among the nobility, facilitated his views. In August, 1255, he approached the borders at the head of an army; and, the Castle of Edinburgh, in which the king and queen resided, having been previously taken by surprise out of the hands of the Comyns, in whom the regency of the kingdom was then vested, that party, comprising the most patriotic portion of the nobility and clergy, was dismissed from power, and the administration committed to their opponents. This arrangement, although made ostensibly in concert with the young king, may be considered as having been dictated by Henry, and as having had for its principal object the establishment of the supremacy of England. It was the commencement of the design so perseveringly pursued by Henry and his successor, to reduce the Scottish kings to the condition of vassals. The eminent talents, however, which Alexander began to display as soon as he came of age, and took the administration of affairs into his own hands, together with the determination he showed to maintain his own rights and the independence of his dominions, effectually thwarted the further prosecution of these views so long as he lived. Meanwhile he kept on good terms with his father-in-law. In 1260, he visited London with his queen; and in February, 1261, the latter was delivered at Windsor of a daughter, who was named Margaret.

Alexander had not long assumed the government, when he was called upon to meet a foreign power, which aimed at the conquest of the kingdom. On the 1st of October, 1264, Haco, king of Norway, after having ravaged the western islands in the course of the summer, approached the coast of Ayrshire at the head of a numerous fleet. Every preparation had been made by the Scottish king to meet this formidable armament; but he found after all his best aid in the elements. When only a small portion of the Norwegian troops had landed, a tempest of unusual fury suddenly arose, and drove nearly all the ships on shore or otherwise destroyed them. The attack of the Scottish soldiers and peasantry completed the destruction of the invading force; and Haco with difficulty made his escape, only to die of a broken heart a few months afterwards. Next year Magnus, Haco's successor, agreed to relinquish to the king of Scotland the Hebrides and the Isle of Man for the sum of 4000 marks, and a small yearly quit-rent. In 1282, the peace between the two kingdoms was further consolidated by the marriage of Alexander's daughter, Margaret, to the Norwegian king Eric, then a youth of fourteen. Margaret died in 1283, but left a daughter of the same name, commonly designated the Maiden of Norway, who eventually became the successor of her grandfather on the Scottish throne.

The successful resistance which, seconded by his clergy, he offered to an attempt of the pope to levy certain new imposts in his dominions, is almost the only other act of Alexander's reign which history has commemorated. Under his sway, Scotland appears to have enjoyed a tranquillity to which she had long been a stranger, and which she did not regain for many years after his decease. The death of his daughter Margaret, however, was the first of a succession of calamities. Soon after her nuptials, Alexander, the Prince of Scotland, the king's only son, who was born in 1263, had been united in marriage to Margaret, daughter of Guy, Earl of Flanders; but he also died without issue on the 28th of January, 1284. On the 15th of April, 1285, the king, having sometime before lost his first wife, took for a second, Joletta, daughter of the Count de Dreux, in the hope of leaving a male heir. But on the 16th of March, 1286, as he was riding in a dark night between Burntisland and Kinghorn, on the banks of the Frith of Forth in Fifeshire, he was thrown with his horse over a precipice, and killed on the spot. The place, which is called the King's Wood End, is still pointed out. The death of Alexander, followed as it was in a few years by that of the Maiden of Norway, was one of the most unfortunate events that ever befel Scotland, which it left to contend at once with the internal distractions arising from a disputed succession, and with all the art and force employed by a powerful neighbour to effect its subjugation. But Alexander was not less lamented by his subjects on account of his own wisdom and virtues. The country had never before enjoyed such prosperity, and Scotland may be said, during this reign, to have passed from semi-barbarism to civilization. It was under Alexander that its intercourse with England first became considerable, and that it began to acquire an acquaintance with the arts and manners of what we may call European life. This king also improved and completed the system for the dispensation of justice which had been introduced by his father; he divided the country into four districts for that purpose, and made an annual progress through it in person for hearing appeals from the decisions of the ordinary judges. He was long affectionately remembered in Scotland; and the old chronicler Wynton has preserved the following verses about him, which are extremely interesting, as being the most ancient specimen of the Scottish dialect now extant:—

> 'Quhen Alexandyr oure King was dede,
> Dat Scotland led in luwe (love) and le (law),
> Away wes sons of ale and brede,
> Of wyne and wax, of gamyn (gamboling) and gle.
> Oure gold was changed into lede.
> Christ, born into virgynytè,
> Succour Scotland, and remede,
> Dat stad (placed) is in perplexytè.'

ALEXANDER, WILLIAM, a statesman and poet of Scotland, who flourished in the reign of James VI. [See Stirling, Earl of.]

ALEXANDER JAROSLAWITZ NEVSKOJ enjoyed a high renown among his countrymen for bravery, prudence, and religious zeal: he has been celebrated in many a Russian ballad, and is still venerated by the present generation. He was the second son of the Grand Duke Jaroslaw II. Wsceladowitz, and was born at Wladimir in 1219. At the period when his father ruled over Novogorod, (in 1237,) the Tartars, with a tremendous army, under the command of the Khan of Kaptshak, a grandson of Tshingis Khan, invaded Russia, desolated the country in the most cruel manner, overran it even to the Upper Volga, and exacted the most degrading submission from the Russian princes. Jaroslaw, although not immediately attacked by the Tartars in his own Principality of Novogorod, found it advisable to repair to the great Tartar horde, stationed at that time in the region of the modern city of Kasan, to pay homage to Batu-Khan. From this Khan he received the grand duchy of Wladimir, to be held as a fief, made Perjaslawl his residence, and, as his elder son Feodor had died in 1232, he entrusted Alexander the younger with the government of Novogorod. Returning a second time to the great horde, and there remonstrating against certain unreasonable Tartarian commands, he met with ill treatment, and died on his homeward journey, in the month of September, 1245.

Alexander succeeded his father in the fief of Wladimir, the possession of which was confirmed to him by Batu-Khan. Alexander, while his father was still alive, had distinguished himself by two great victories, of one over the Swedes, and another over the united order of the Livonian and Teutonic Knights of the Sword. A crusade against the Russians had been instigated by Pope Gregory IX., who, by a bull of 1229, enjoined the bishops of Lübeck, Linkjöping, and Livlond, to prohibit all intercourse and commerce with the schismatic Russians, as long as they should resist the conversion of the apostate Finlanders. This, however, only was a negative measure; but the bull of the 14th May, 1237, by which the Livonian and Esthonian Knights of the Sword were united to the Teutonic order, evidently by way of strengthening them for a Russian crusade, tended in a more direct and positive manner towards the destruction of the Greek Church in the north-east of Europe. The Roman Court also opened negotiations with Eric the Eleventh, King of Sweden, who, at the pope's instigation, gladly sent an army against the Finlanders, which landed near the mouth of the Neva, on the spot where St. Petersburg has since been built. Alexander marched against this army, and, on the 15th of July, 1240, totally defeated it, at the confluence of the Ishora and the Neva. By this victory he obtained the honourable surname of Nevskoj, or Alexander of the Neva. While he was thus engaged, the Knights of the Sword, commanded by their chief, Hermann von Balk, had taken Pleskow. Early in the year 1241 Alexander marched against them from Novogorod, and drove them out of Pleskow; but, having allowed his army to disperse in the autumn, he next winter saw the enemy again in the field. The Knights of the Sword had advanced within thirty versts of the city of Novogorod. With great speed Alexander again collected his army, pursued the retreating enemy, and, on the 5th of April 1242, fought them on the ice of the lake of Peipus, where he gained a decisive victory: 400 Teutonic Knights were slain, and fifty were taken prisoners; those of the prisoners who were Germans were pardoned, but the Esthonians Alexander ordered to be hanged, considering them as Russian rebels. Alexander returned in triumph to Pleskow, having liberated that city and its commerce, which at that time was considerable, from the yoke of foreigners.

Arms proving unavailing, the Roman Court had recourse to diplomacy as a surer means for converting Alexander. Several attempts of this kind had been made in vain with his predecessors, by the popes Innocent III., Honorius III., and Gregory IX. Innocent IV. made a new trial, and in the year 1251 sent two cardinals, who, in Russian Chronicles, are called Gald and Gemont, as ambassadors to Alexander Nevskoj; they brought a letter from this pope, dated January 23, 1248, probably so long antedated, in order to show how long his holiness had been big with the scheme of the embassy, but Alexander remained inflexible, and the cardinals returned without effecting anything for the church of Rome.

Though Alexander was successful against the Pope, he continued a vassal of the Tartars as long as he lived; it does not, however, appear that Russia was during his reign actually invaded or plundered by them.

He repaired to the great horde three times, and died on his return from the last of these journeys at Kassimcow in 1263; from that place his body was removed to Wladimir, and there interred. It is a tradition that shortly before his death he took holy orders: but it probably has no good foundation. Alexander's wife was a daughter of Wrateslaw, Prince of Polotsk, by whom he had four sons: Vassilj, Dmitrij, Andrej, and Danilo. It is uncertain whether the valiant Jueje (George) who ruled over Novogorod till 1270, was also his son. The foundation of St. Petersburg in 1703, on the very spot where the national hero had gained such an important victory, naturally recalled the memory of Alexander Nevskoj in a lively manner. The Tzar Peter on this occasion instituted St. Alexander-Nevskoj's Order of Knighthood, but did not himself give that decoration to any man; this was first done after his death by his consort Catharine. There is also in St. Peterburg a St. Alexander-Nevskoj Monastery, which is well endowed, to which now is attached a seminary for the education of young divines called St. Alexander-Nevskoj's Academy.

ALEXANDER, Emperor of Russia, called by his countrymen Alexander Paulowitsch, that is, Alexander the son of Paul, was born on the 23rd December, 1777. He was the son of the Emperor Paul and of Maria, daughter of Prince Eugene, of Würtemberg. From his infancy he was distinguished for a gentle and affectionate disposition, and a superior capacity. His education was directed not by his parents, but by his grandmother the reigning Empress, Catharine II., who lived until he had attained his nineteenth year. Under her superintendence, he was carefully instructed by La Harpe and other able tutors in the different branches of a liberal education, and in the accomplishments of a gentleman.

ALEXANDRE I. EMPEREUR DE TOUTES LES RUSSIES.

Catharine was succeeded, in 1796, by her son Paul, whose mad reign was put an end to by his assassination on the 24th of March, 1801. No doubt can be entertained that Alexander, as well as his younger brother Constantine, was privy to the preparations which were made for the dethronement of his father, which had, indeed, become almost a measure of necessity; but all the facts tend to make it highly improbable that he contemplated the fatal issue of the attempt. The immediate sequel of this tragedy was a slight domestic dispute, occasioned by a claim being advanced by the widow of the murdered emperor to the vacant throne, who had not been admitted into the conspiracy; after a short altercation she was prevailed upon to relinquish her pretensions, and the grand duke Alexander was forthwith proclaimed emperor and autocrat of all the Russias. This collision does not seem to have left any unpleasant traces on the mind either of Alexander or his mother, to whom during his life he always continued to show respect and attachment. The Empress Maria survived her son about three years.

The history of the reign of Alexander is the history of Europe for the first quarter of the present century. We can here only attempt a slight outline of the course of events during that busy time, with a reference to the movements of the Russian emperor. When Alexander came to the throne, he found himself engaged in a war with England, which had broken out in the course of the preceding year. He immediately indicated the pacific character of his policy by taking steps to bring about a termination of this state of things, which was already seriously distressing the commerce of Russia; and a convention was accordingly concluded between the two powers, and signed at St. Petersburg on the 17th of June, 1801. The general peace followed on the 1st of October, and lasted till the declaration of war by England against France on the 18th of May, 1803. Meanwhile Georgia, hitherto under the protection of Persia and Turkey, had been occupied, on the invitation of the people themselves, by the troops of Russia, and incorporated with that empire. Alexander also, during this interval, showed his disposition to extend the influence of Russia in another direction, by entering into a negociation with France respecting the compensation to be granted to certain of the minor powers of Germany, with which country he was connected both through his mother, and through his father, who was born head of the house of Holstein-Gottorp. It was in the course of these negociations that he had his first interview with the King of Prussia, which is understood to have laid the foundation of an intimate friendship between the two sovereigns, and to have established a concurrence of views which powerfully influenced the future policy of each. In a dispute with Sweden, with regard to the frontier of Finland, although hostilities were averted by the concession of the Swedish king, the extensive military preparations which were immediately made by Russia, showed how little that power was disposed to allow the invasion of any of her rights.

Alexander did not immediately join England in the war against France; but even in the early part of 1804, symptoms began to appear of an approaching breach between Russia and the latter country. On the 11th of April, 1805, a treaty of alliance with England was concluded at St. Petersburg, to which Austria became a party on the 9th of August, and Sweden on the 3rd of October following. This league, commonly called the third coalition, speedily led to actual hostilities. The campaign was eminently disastrous to the allied powers. A succession of battles, fought between the 6th and the 18th of October, almost annihilated the Austrian army, before any of the Russian troops arrived. Alexander made his appearance at Berlin on the 25th, and there, in a few days after, concluded a secret convention with the King of Prussia, by which that prince, who had hitherto professed neutrality, bound himself to join the coalition. Before leaving the Russian capital, Alexander, in company with the king and queen, visited at midnight the tomb of the great Frederick, and, after having kissed the coffin, is said to have solemnly joined hands with his brother sovereign, and pledged himself that nothing should ever break their friendship. He then hastened by way of Leipzig and Weimar to Dresden, from whence he proceeded to Olmutz, and there, on the 18th November, joined the Emperor of Austria. On the 2nd of the following month, the Austrian and Russian troops, commanded by the two emperors in person, were beaten in the memorable and decisive battle of Austerlitz. The immediate consequences of this great defeat were, the conclusion of a convention between France and Austria, and Alexander's departure to Russia with the remains of his army.

Although Alexander did not accede either to the convention between France and Austria, or to the treaty of Presburg, by which it was followed, he thought proper after a short time, to profess a disposition to make peace with France, and negociations were commenced at Paris for that object. But after a treaty had been signed on the 20th of July, 1806, he refused to ratify it, on the pretence that his minister had departed from his instructions. The true motive of his refusal no doubt was, that by this time arrangements were completed with Prussia and England for a fourth coalition; and it is even far from improbable, that the negociations which led to the signature of the treaty had from the first no other object beyond gaining time for preparations. On the 8th of October hostilities recommenced, and the victory of Jena, gained by Bonaparte a few days after, laid the Prussian monarchy at his feet. When this great battle was fought, Alexander and his Russians had scarcely reached the frontiers of Germany; on receiving the news they immediately retreated across the Vistula. Hither they were pursued by Bonaparte, and having been joined by the remnant of the Prussian army, were beaten on the 8th of February, 1807, in the destructive battle of Eylau. Finally, on the 14th of June, the united armies were again defeated in the great battle of Friedland, and compelled to retreat behind the Niemen. This crowning disaster terminated the campaign. An armistice was arranged on the 21st; and five days after Alexander and Napoleon met in a tent erected on a raft in the middle of the Niemen, and at that interview not only arranged their differences, but, if we may trust the subsequent professions of both, were converted from enemies into warmly attached friends. A treaty of peace was signed between the two, at Tilsit, on the 7th of July; by a secret article of which Alexander engaged to join France against England. He accordingly declared war against his late ally, on the 26th of October following. The treaty of Tilsit indeed converted the Russian emperor into the enemy of almost all his former friends, and the friend of all his former enemies. Turkey, though supported by France, had for some time been hard pressed by the united military and naval operations of England and Russia; but upon Alexander's coalition with the French emperor, a truce was concluded between Turkey and Russia at Slobosia, August 24, and the Turkish empire was saved from the ruin which threatened it. A war with Persia, commenced in 1802, continued to be carried on with varying success.

On the 24th of February, 1808, Alexander, in obedience to the plan arranged with Napoleon, declared war against Sweden, and followed up this declaration by despatching an army to Swedish Finland, which, after a great deal of fighting, succeeded in obtaining complete possession of that country. On the 27th of September, the Russian and French emperors met again at Erfurt; many of the German princes, with representatives of the King of Prussia and the Emperor of Austria, also attended the Congress, which continued to sit till the 15th of October. On this occasion a proposal for peace was made to England in the united names of Napoleon and Alexander; but the negociations were broken off after a few weeks.

The friendly relations of Alexander with France continued for nearly five years; but, notwithstanding fair appearances, various causes were in the meanwhile at work which could not fail at last to bring about a rupture. The Russian autocrat having failed in the plan of policy with which he had begun his reign, and which seems to have contemplated the avoidance of war, but at the same time the exercise of a powerful foreign influence, appears to have resolved to try another game, and to see what he could gain by entering into confederacy with the great conqueror of nations. But the peace of Tilsit, and the new relations into which Russia was thrown, however much they may have been to the mind of the sovereign, entailed such privation and commercial suffering on the people of that country, by severing the connexion with England, as made it at length impossible to persist in this course of policy. In the meanwhile, however, the treaty of Vienna, signed on the 14th of October, 1809, which, following the battles of Esling and Wagram, dissolved the fifth coalition against France, increased the Russian dominion by the annexation of eastern Gallicia, ceded by Austria. The war with Turkey, also, which had been recommenced, continued to be prosecuted with success. But by the end of the year 1811, the disputes with the court of Paris, which ostensibly arose out of the seizure by Bonaparte of the dominions of the duke of Oldenburg, had assumed such a height as left it no longer doubtful that war would follow. A treaty of alliance having been previously signed with Sweden, on the 19th of March, 1812, Alexander declared war against France: and on the 24th of April he left St. Petersburg to join his army on the western frontier of Lithuania. The great events which followed may be supposed to be fresh in the memory of all but the youngest of our readers. On the 28th of May peace was concluded at Bucharest on advantageous terms with Turkey, which relinquished everything to the left of the Pruth. The immense army of France, led by Napoleon, entered the Russian territory on the 25th of June. As they advanced, the inhabitants fled as one man, and left the invaders to march through a silent desert. In this manner the French reached Wilna. On the 14th of July, Alexander had repaired to Moscow, from whence he proceeded to Finland, where he had an interview with Bernadotte, then crown prince of Sweden. Here he learned the entry of the French into Smolensk. He immediately declared that he never would sign a treaty of peace with Napoleon while he was on Russian ground. 'Should St. Petersburg be taken,' he added, 'I will retire into Siberia. I will then resume our ancient customs, and, like our long-bearded ancestors, will return anew to conquer the empire.' 'This resolution,' exclaimed Bernadotte, 'will liberate Europe.'

On the 7th of September took place the first serious encounter between the two armies, the battle of Borodino, in which 25,000 men perished on each side. On the 14th the French entered Moscow. In a few hours the city was a smoking ruin. We cannot pursue the story of Napoleon's homeward march, and the destruction of his magnificent army. Not fewer than 300,000 Frenchmen perished in this campaign. The remnant, which was above 150,000, repassed the Niemen on the 16th of December.

In the early part of the following year, Prussia and Austria successively became parties to the alliance against France. Alexander, who had joined his army while in pursuit of Bonaparte at Wilna, continued to accompany the allied troops throughout the campaign of this summer. On the 26th and 27th of August he was present at the battle of Dresden; and on the 18th of October at the still more sanguinary conflict of Leipzig. On the 24th of February, 1814, he met the King of Prussia at Chaumont, where the two sovereigns signed a treaty binding themselves to prosecute the war against France to a successful conclusion, even at the cost of all the resources of their dominions. On the 30th of March, 150,000 of the troops of the allies were before the walls of Paris; and on the following day at noon, Alexander and William Frederick entered that capital.

We shall not enter into the detail of the transactions which followed this event. Alexander, owing in a great measure to his engaging affability, as well as to the liberal sentiments which he made a practice of professing, was a great favourite with the Parisians. The conquerors having determined upon the deposition of Bonaparte, and the restoration of the Bourbons, Alexander spent the remainder of the time he stayed in inspecting the different objects of interest in the city and its vicinity, as if he had visited it in the course of a tour. He left the French capital about the 1st of June, and proceeding to Boulogne, was there, along with the King of Prussia, taken on board an English man-of-war, commanded by his present Majesty, then Duke of Clarence, and conveyed to Calais, from which port the royal yachts brought over the two sovereigns to this country. They landed at Dover on the evening of the 7th, and next day came to London. They remained in this country for about three weeks, during which time they visited Oxford and Portsmouth, and wherever they went, as well as in the metropolis, were received with honours and festivities of unexampled magnificence, amidst the tumultuous rejoicings of the people. From England, Alexander proceeded to Holland, and thence, after a short stay, to Carlsruhe, where he was joined by the empress. On the 25th of July he arrived at his own capital of St. Petersburg, where his appearance was greeted by illuminations and other testimonies of popular joy.

The Congress of European sovereigns at Vienna opened on the 3d of November, 1814. In the political arrangements made by this assembly, Alexander obtained at least his fair share of advantages, having been recognized as King of Poland, which country was at the same time indissolubly united with Russia. Before the members of the Congress separated, however, news arrived of Bonaparte's escape from Elba. They remained together till after the battle of Waterloo; when Alexander, with the Emperor of Austria and the King of Prussia, proceeded to Paris, where they arrived in the beginning of July, 1815. On the 26th of the following September, the three sovereigns signed an agreement, professedly for the preservation of universal peace on the principles of Christianity, to which, with some presumption, if not impiety, they gave the name of the Holy Alliance. On leaving Paris, Alexander proceeded to Brussels, to arrange the marriage of his sister, the Grand Duchess Anne, with the Prince of Orange; and from thence, by the way of Dijon and Zürich, to Berlin, where he concluded another family alliance, by the marriage of his brother Nicholas, now emperor, with the Princess Charlotte, daughter of the King of Prussia. On the 12th of November he arrived at Warsaw, and after publishing the heads of a constitution for Poland, he left this city on the 3d of December, and on the 13th reached St. Petersburg.

No great events mark the next years of the reign of Alexander. On the 27th of March, 1818, he opened in person the first Polish diet at Warsaw, on the close of which he set out on a journey through the southern provinces of his empire, visiting Odessa, the Crimea, and Moscow. The congress of Aix-la-Chapelle, at which he was present with the Emperor of Austria and the King of Prussia, met in September, and on the 15th of the following month promulgated a declaration, threatening, in reference to the then state of Spain, the suppression of all insurrectionary movements wherever they might take place. The congresses held in 1820 and 1821 at Troppau and Laybach, on the affairs of Naples and Piedmont, and that of Verona in 1822, were also mainly directed by the Russian autocrat. Meanwhile the insurrection of the Greeks in 1820, although publicly condemned by Alexander, was attributed by Turkey to the secret encouragement of Russia, and seemed to threaten a renewal of hostilities between the two countries; but for the present Alexander determined to persevere in his pacific policy. In 1823, several tribes of the Kalmucks, who had formerly acknowledged the sovereignty of China, exchanged it for that of Russia.

In the beginning of the winter of 1825, Alexander left St. Petersburg on a journey to the southern provinces, and on the 25th of September arrived at Taganrog on the sea of Azof. From this town he some time after set out on a tour to the Crimea, and returned to Taganrog about the middle of November. Up to nearly the close of this latter excursion, he had enjoyed the highest health and spirits. But he was then suddenly attacked by the common intermittent fever of the country, and when he arrived at Taganrog he was very ill. Trusting, however, to the strength of his constitution, he long refused to submit to the remedies which his physicians prescribed. When he at length consented to allow leeches to be applied, it was too late. During the few last days that he continued to breathe, he was insensible; and on the morning of the first of December he expired.

It was for some time rumoured in foreign countries that Alexander had been carried off by poison; but it is now well ascertained that there is no ground whatever for this suspicion. It appears, however, that his last days were embittered by the information of an extensive conspiracy of many of the nobility and officers of the army to subvert the government, and even to take away his life; and it is not improbable that this news, which is said to have been brought to him by a courier during the middle of the night of the 8th, which he spent at Alupta, may have contributed to hasten the fever by which he was two or three days after attacked. For full details upon this subject, and a translation of the Report of the Commission appointed to inquire into the affair by the Emperor Nicholas, we refer the reader to vol. ii. pp. 333—435 of Webster's *Travels in the Crimea, Turkey, and Egypt*; London, 1830.

The death of Alexander took place exactly a century after that of Peter the Great, under whom the civilization of Russia may be said to have commenced. The state of the empire did not change so completely during Alexander's reign, as it did during that of Peter; but still the advancement of almost every branch of the national prosperity in the course of the quarter of a century during which Alexander filled the throne was probably, with that one exception, greater than had ever been exhibited in any other country. The reader will find in the 13th chapter of a *Sketch of the Life of Alexander*, by H. E. Lloyd, Esq., (8vo., London, 1826,) an ably drawn up account of the emperor's internal administration of his dominions, and of the various improvements which were introduced under his auspices. At the head of these are to be reckoned his exertions for the diffusion of education among his people. He founded or reorganized seven universities, and established 204 gymnasia, and above 2000 schools of an inferior order. (See *Journal of Education*, No. V.) The literature of Russia was also greatly indebted to his liberal encouragement, although he continued the censorship of the press in a modified form. He greatly promoted among his subjects a knowledge of and taste for science and the fine arts by his munificent purchases of paintings, and anatomical and other collections. The agriculture, the manufactures, and the commerce of Russia were all immensely extended during his reign. Finally, to Alexander the people of Russia were indebted for many political reforms of great value. Certain checks were applied to the arbitrary authority of the monarch, by rights granted to, or recognized in, the senate; the provincial governors were subjected to more effective control; the laws were improved by a mitigation of the severity of the old punishments, and in various other respects; personal slavery was entirely abolished; and even of the serfs attached to the soil, great numbers were emancipated, and arrangements made for the eventual elevation of all of them to a state of freedom. Under Alexander also, both the extent and the population of the Russian dominions were greatly augmented; the military strength of the nation was developed and organised; and the country, from holding but a subordinate rank, took its place as one of the leading powers of Europe.

Alexander was married on the 9th of October, 1793, to the Princess Louisa Maria Augusta of Baden, who, on becoming a member of the imperial family, assumed the name of Elizabeth Alexiewna. By her, however, he had no issue. On his death, his next brother, the Grand Duke Constantine, was proclaimed king at Warsaw; but he immediately surrendered the throne to his younger brother, the present Emperor Nicholas, according to an agreement made with Alexander during his lifetime.

ALEXANDERS. [See SMYRNIUM.

ALEXANDRETTA. [See SCANDEROON.]

ALEX'ANDRIA, MODERN, called *Iskanderieh* by the Arabs, the only port of Egypt, stands on an artificial neck of land which joins the continent to the ancient island, now the peninsula, of Pharos; 31° 13′ N. lat. 29° 53′ E. long. We shall first describe its present appearance, and then give a short sketch of its origin, its ancient condition, and its existing monuments.

The district around Alexandria consists of a long narrow strip of land, bounded on one side by the Mediterranean, and on the other by the Lake Mareotis. At the time of the French invasion in 1801, this lake was dry; but the British troops, during the siege of Alexandria, by cutting a passage through the narrow neck of land that separates it from Lake Aboukir or Madieh, let in the sea, and restored the bed of the Mareotis to the dominion of the water. The immediate territory of Alexandria, thus limited by the sea and the lake, extends from the tower of the Arabs, which is west of the town, to Cape Aboukir east of it: the width of this tract near the city may be seen from the accompanying plan. The whole of this district is a continuous chain of calcareous rock and sand, without good water, and almost without vegetation.

There are two ports. The old port is at the extremity of an extensive roadstead, the entrance to which lies across a chain of rocks stretching from Cape Marabout on the main land to the Cape of Fig Trees, which is the western extremity of the island of Pharos. There are three passes into the road, the deepest of which will admit frigates, and probably vessels of the line. The port itself, which is at the eastern extremity of the roadstead, is sheltered from the violent winds that blow between N.W. and N.E. by the high coast of the island of Pharos. The anchorage is good, and the port might be made one of the most convenient in the world. The new port has also a line of rocks stretching across the entrance, and it is further exposed to the violent north and north-east winds which sometimes render it impracticable to anchor there. It is also very shallow in many parts, owing both to natural rocks and to sand and rubbish which have been thrown into it. The currents of the sea also sometimes bring sand; and the constant decomposition of the calcareous rock, which in some part lines it, contributes still further to choke it up. It is stated in the public prints that the present Pasha is going to lay out a large sum in improving the ports of Alexandria. The passage into the new port is about 650 feet east of the Diamond Rock, and the fort of the Pharos. This fort is also a light-house, and is connected with the island Pharos by an artificial dyke, made in part of ancient granite columns laid transversely. The island of Pharos itself consists of a saline arid soil and dazzling white calcareous rock: it is bordered with reefs, especially on the west side. The Arabs calls it *Roudah el Tyn*, or Garden of Fig Trees, because this fruit is successfully cultivated on this otherwise barren spot. The island shows many traces of ancient building, such as we know existed under the Greek dynasty and the Roman empire.

The modern town occupies the neck of land between the two ports, which was originally intended merely to form a communication with the Pharos: but in consequence of the continual increase which it receives, it has gradually become the chief inhabited part. Such quays and jettees as there are on the two ports, are, in a great measure, formed of the materials of old Alexandria. The mosques, the public warehouses, and even the private dwellings contain fragments of granite, marble, and other stones, which clearly indicate that they once belonged to ancient edifices. The streets are narrow, and unpaved, full of dust in dry weather and of mud when it rains: the houses, both internally and externally, present no great attractions, and the general appearance is, to a European, dreary and monotonous. The town contains a great number of mosques, and some public buildings, such as the custom-house, new palace, marine arsenal, and the fortifications. The mosque called that of the Thousand and One Pillars is the chief ecclesiastical building. Alexandria is still a place of considerable trade, being the chief port by which the products of Egypt are exchanged for those of the various countries of Europe. Most of the European nations have a consul resident at Alexandria. The population, at the time of the French evacuation in 1801, was only about 7000: at present it is said to amount to above 25,000. In the bazaars may be seen a motley population, composed of Turks, Egyptians, Arabs, Greeks, Jews, and the various natives of Europe that trade with Alexandria. In 1827, 605 ships entered the port, and 622 cleared out; in 1828 there were 891 arrivals, and 865 departures. The particular arrivals of the latter year will give a better idea of the trade of Alexandria:—

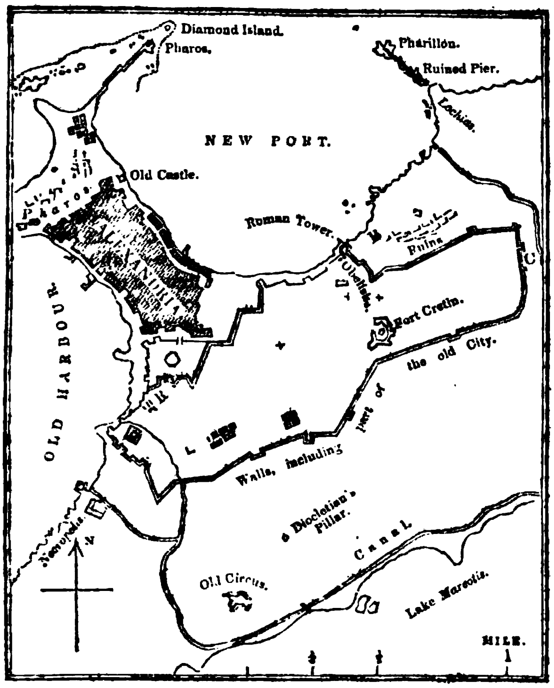
	Arrivals.	Departures.
Austrian,	293	284
Danish,	1	3
English,	136	135
French,	139	152
Ionian Islands,	102	93
Netherlands,	3	1
Prussian,	2	2
Papal,	6	8
Russian,	23	26
Sardinian,	110	91
Sicilian,	14	10
Spanish,	15	17
Swedish,	13	13
Tuscan,	34	30

The rise of the sea at Alexandria is not regular; the greatest elevation is due to the winds that blow between the points of west and north-east, and even this does not amount to more than from nineteen to twenty-five inches. The climate of Alexandria is in general pretty good, though the occasional visitations of the plague in modern times have given rise to a contrary opinion; but the ravages of epidemics are perhaps to be attributed more to the character and habits of the people than to the climate. The winter, during which there is a great deal of rain, is the most unhealthy season: the French army lost 1650 men during the months of December, 1798, and January and February, 1799.

Alexandria communicates with the Rosetta branch of the Nile at Foua by means of a canal, called the Mahmoudy, constructed under the present governor Mohammed Ali. This canal was restored and completed in 1820 by the labour of 150,000 Fellahs, of whom it is said that 20,000 died of fatigue. The whole length of the canal is about forty miles, but it is already much injured by deposits of mud, and can only be navigated when the waters of the Nile are high.

As the town has no fresh water, the inhabitants are obliged to have recourse to the cisterns which are annually filled partly by the winter rains, and partly by water brought from the canal. [See Abercromby.]

ALEXANDRIA, Ancient, owes its origin to Alexander the Great, who, during his visit to Egypt, (B.C. 332,) gave orders to erect this city between the sea and the Mareotic Lake. The architect was Dinocrates, a Macedonian. A large part, but not the whole of it, was contained within the present walls, which are chiefly the work of the Arabs. One main long street, thirty stadia in length, ran through the city from the eastern extremity to the Necropolis at the western, and this was intersected by another main street, ten stadia in length, running nearly north, in a direction from the Mareotic Lake. The object of this arrangement was to give the city the benefit of ventilation from the north winds. The main land and the island of Pharos were connected by a dyke, called the Heptastadium, in which, at each end, there was a passage for vessels from one port to the other. Over these passages there were also bridges; and we are told that water was conveyed along the dyke to the island of Pharos, though we do not understand how this was managed, unless the bridges must have been very high. On the rocks now occupied by the present Pharos, a magnificent light-house was constructed by Sostratus of Cnidus, in the reign of Ptolemy Philadelphus (B.C. 283): its height is stated, though probably with much exaggeration, to have been 400 feet. The point opposite to the Pharos was called Lochias; and as the Lochias itself was prolonged towards the Pharos along some rocks, on which the Pharillon now stands, this prolongation received the name of Acro-Lochias, or the Point of Lochias. In advancing from Lochias towards the obelisks, we traverse the ground where stood the palaces of the Ptolemies, the theatre, and various temples. The port bounded by the two promontories, by the north-east part of the city, and the Heptastadium, was called the Great Port. The other port was called Eunostus (safe return): it contained also a small port called Kibotos, or 'the Chest,' because the entrance could be completely closed; no traces of it, as far as we can learn, can be made out. A canal which united the lake with port Eunostus terminated in or near port Kibotos, and was nearly the S.W. limit of the city. Still farther S.W. was the Necropolis, (city of the dead,) or great cemetery of Alexandria. This city in its full extent was divided into several quarters, but we cannot assign either the names or the exact limits of each. The court end, otherwise called Bruchion (B) comprised the part between the Lochias, the site of the Obelisks, and the eastern or Rosetta gate (C). It contained also the Museum. The Rhacotis (R) bordered on port Eunostus, and contained the great temple of Serapis, which, after the



From the survey of Capt. W. H. Smyth.

establishment of Christianity, was for a long time a grievous offence to the Christians. Theophilus, the patriarch of Alexandria, obtained permission from the emperor Theodosius (A.D. 390) to destroy this edifice; and no one could accuse him of executing the commission imperfectly. A place called *Soma*, (the body,) in the quarter of the palaces, contained the tomb of Alexander the Great. Besides the canal which united the port Eunostus with the lake, there was also a canal from the lake to the town of Canopus, situated near the mouth of the western branch of the Nile. By means of this canal the city was supplied with river water, which was kept in cisterns. These were so numerous that a Roman writer tells us, (*De Bello Alexandrino*, cap. v.) ' nearly all Alexandria was undermined, and furnished with subterranean aqueducts to convey the Nile water to private houses, where after a short time it became purified.' Innumerable traces of such constructions are found on the site of old Alexandria.

The city was embellished by the Ptolemies with the spoils of the ancient towns of Egypt, and for several centuries continued to receive accessions and improvements. At one time it was the rival of Rome in size, and the first commercial city of the earth. It became, what Tyre had been before, the point of exchange for the eastern and western world, but with a commerce more widely extended after the conquests of the Macedonians had laid open the eastern world to Greek enterprise. Diodorus, who visited Alexandria just before the downfall of the empire of the Ptolemies, says, that the registers showed a population of more than 300,000 free citizens.

The enclosure which is surrounded by a double wall flanked with lofty towers, contains the remains of old Alexandria,—an almost shapeless mass of rubbish in which we see fragments of broken columns and capitals, pieces of wall, cisterns half choked up with earth, bits of pottery, glass, and all the signs of complete desolation. There are five gateways or entrances into this enclosure. Of the two granite obelisks, commonly called Cleopatra's Needles, one is still standing; the other is lying near it on the ground. The dimensions of the two are pretty nearly the same. The whole height of the erect obelisk, including the pedestal and the three steps, all of which are covered with earth, is about seventy-nine feet. When the French examined the base of this obelisk, the accumulation of earth around it was about sixteen feet deep. It has suffered considerably, like all the remains, and even the natural rocks, of Alexandria, from the action of the atmosphere: the west side is in the best state of preservation, and the south the worst of all. These two obelisks formed the entrance to the temple or palace of Cæsar, as it is called, though there is no doubt that they were moved from some of the ancient cities of Egypt by the Ptolemies. Near the two obelisks is part of a tower called ' the Tower of the Romans,' and probably it may be correctly named.

About the centre of the enclosure stands the mosque of St. Athanasius, on the site of a Christian church erected by this patriarch during the fourth century. In this mosque the French discovered the beautiful SARCOPHAGUS of Egyptian breccia, which is now in the British Museum. It was ungenerously required of the French at the capitulation of Alexandria, (1801,) together with other monuments of antiquity, which they had collected with great pains. Near the mosque are the shafts of three colossal pillars of red granite, which are the only remains of a large number that once existed in this part of the city; but it is not possible now to determine to what kind of an edifice they belonged.

The cisterns for keeping the Nile water are still in great part preserved. They consist of vaulted chambers supported by columns, which form arcades of two or three stories. (See *Plans*, &c., *Egypte*, *Antiq.*, vol. v., pl. 37.) The interior walls are covered with a thick red plaster that is not permeable to water. The level of these cisterns varies, but some of them are from fifteen to eighteen feet below the level of the sea. At the time of the French occupation of Alexandria, there were about 308 of these cisterns known to exist, though many more are doubtless buried beneath the rubbish: the number in use at that time was 207.

The only remarkable monument between the wall and the lake is the column commonly called Pompey's Pillar. It stands on a mound of earth about forty feet high, which contains remains of former constructions. The shaft, which consists of a single piece of red granite, is about sixty-seven feet long, and weighs at least 276 tons: the whole height, with the capital, which is in bad taste, and the base and pedestal, which are no better, is about ninety-four feet. According to a Greek inscription on the plinth of the base, on the west side, it appears to have been erected (though perhaps not for the first time) in honour of the Emperor Diocletian by a prefect of Egypt whose name cannot be further deciphered than that it begins with PO. The foundation of this pillar has evidently often been examined, probably with the hope of finding treasures; and it is, perhaps, owing to this disturbance that it is inclined about seven inches to the S.W. Amidst the broken materials around its base we discover the centre stone on which it rests: this is a piece of yellowish breccia, with Egyptian hieroglyphics on it, placed the wrong end upwards.

Having crossed the canal, in going S.W. from the pillar, we come to some catacombs cut in a small elevation of a sandy calcareous stone; and farther south, in the calcareous rock that faces the sea, we find almost countless excavations, in the sides of which niches are cut: these once formed part of the Necropolis, or burial-place of old Alexandria. The most spacious of these, which, like the rest, communicates with the sea by a narrow passage, is about 3830 yards S.W. of the column, and is near the place called by the inappropriate name of Cleopatra's Baths. In the interior we find a great number of chambers and passages cut in the rock in such a style of decoration as proves their Greek origin. Such a monument could only be intended for a king. (See Plates, *Egypte*, v. 42, for the plan; and Mayer's *Views in Egypt.*)

The history of this city is as remarkable as its monuments once were. We can here only indicate its great epochs. From B.C. 323 to B.C. 30, when it fell into the hands of the Romans, it was the residence of the Greek kings of Egypt, the resort of commerce, and of many foreign nations, especially Jews; and also the centre of the scientific knowledge of that day. In the campaigns of Julius Cæsar at Alexandria, B.C. 48, the place sustained much damage.

From B.C. 30 to the Arab conquest under Omar, A.D. 640, Alexandria was still a flourishing city under the Roman emperors, and afterwards under the eastern empire. Alexandria early adopted the Christian religion, and became one of the strongholds of the true faith. It was also the theatre on which the Christians showed their most determined hostility to all the works of Pagan art.

In 969, the Fatemite caliphs seized on Egypt and built New Cairo, from which time Alexandria declined still more, and sunk to the rank of a secondary Egyptian city; the discovery of the route round the Cape of Good Hope in 1497, tended still further to diminish the commercial importance of Alexandria.

For more information on the history and antiquities of Alexandria, see Diodorus, *lib.* xvii. Strabo, *lib.* xvii. D'Anville, *Egypte. Description de l'Egypte*, and the plates, vol. v. (Pococke. Niebuhr.)

ALEXANDRIA, a town and port of entry in the United States of North America, in the district of Columbia, on the west or Virginia side of the Potomac, and about 105 miles from the mouth of the river; 38° 49′ N. lat. Ships of the line can ascend the river as far as Alexandria, which is the most distant point from the ocean to which vessels of the largest size can be navigated in the United States. The whole voyage from the ocean through the entrance of Chesapeake bay to Alexandria is about 200 miles. Alexandria lies about five miles direct distance S.S.W. of the Capitol at Washington: the communication across the Potomac is kept up by a wooden bridge a mile in length.

The town slopes down to the river with the streets at right angles to one another, and is on the whole pretty well built. It has a court-house, gaol, alms-house, a theatre, market-house, and places of worship. Good wharfs extend along the river about half the length of the city, and allow the largest vessels to come up to them. The chief trade of the place is in flour, a great part of which is brought from the Shenandoah valley of Virginia, and the back part of Pennsylvania. The population of Alexandria in 1800 was 4196; in 1810, 7227; in 1820, 8218, of whom 2603 were blacks. The canal from the Ohio to Washington, when completed, will probably much increase the trade of this town. (Darby's *Geog. of the United States.—Encyclop. Americana*, &c.)

Returns of shipping at the port of Alexandria:—

	From Sep. 1, 1828, to August 31, 1829.	From Sep. 1, 1829, to August 31, 1830.	From Sep. 1, 1830, to August 31, 1831.
	Tons.	Tons.	Tons.
American vessels entered,	7825	8238	4167
„ departed,	1,401	12,727	14,986
Foreign vessels entered,			872
„ departed,	261		878
Registered tonnage belonging to the port employed in coasting trade, . .	5908	4403	4462
Steam vessels, . . .	246	330	378
Enrolled and licensed tonnage, ...	10,137	3972	3937

ALEXANDRIAN LIBRARY, a celebrated collection of books, formed and maintained by the first Ptolemy, king of Egypt, and his successors; and probably the largest which was ever brought together before the invention of printing. It is said to have been founded by Ptolemy Soter, after he had associated his son, Ptolemy Philadelphus, with him on the throne (and therefore between B.C. 285 and 283), in consequence of the suggestions of Demetrius Phalereus, who had seen and profited by public libraries at Athens. Demetrius was appointed superintendent of the new establishment, and busied himself diligently in collecting the literature of all nations, Jewish, Chaldee, Persian, Ethiopian, Egyptian, &c., as well as Greek and Latin. Some authors assert that, before his death, he had brought together 200,000 volumes; but Eusebius says, with more probability, that at the death of Ptolemy Philadelphus, which occurred later, there were but 100,000 volumes in the library. It was situated in the quarter of Alexandria called *Bruchion*. Philadelphus purchased the library of Aristotle. (Athenæus, b. 1.) Ptolemy Euergetes, who succeeded Philadelphus, and was a warm patron of learning, also took a great pleasure in increasing the library. In the reign of Ptolemy Epiphanes, Eumenes, king of Pergamus, established a rival library. The Egyptian monarch, in a fit of jealousy, forbade the exportation of paper (*papyrus*) from his dominions; and the invention of parchment, or, perhaps, the improvement of this material (*charta Pergamena*), was the consequence. (Pliny.) Ptolemy Physcon (or Euergetes II.) was also a great book collector; and is said to have commenced a second library, probably that which was placed in the Serapeion, or temple of Serapis, in a different quarter of the city. It is said that during his reign all books brought into Egypt were seized, and sent to the Museum, as it was called, where they were transcribed, and the copies delivered to the owners, while the originals were detained in the library,—a royal road to the formation of a valuable collection. Almost all the Ptolemies were patrons of learning; and at last the Alexandrian Library is said to have amounted to 700,000 volumes. It is to be recollected that the rolls (*volumina*) spoken of contained far less than a printed volume: as, for instance, the *Metamorphoses* of Ovid, in fifteen books, would make fifteen volumes, and one Didymus is said by Athenæus to have written 3500 volumes. This consideration will bring the number assigned at least within the bounds of credibility.

In the siege of Alexandria by Julius Cæsar, the library in Bruchion was burnt by a fire which spread from the shipping to the town, and 400,000 volumes perished. (Seneca; Orosius, lib. 6.) The library of the Serapeion is said to have been also burnt in this siege; but this has been disputed. If burnt, at least it was very soon re-established; and there is reason to presume that the diligence of the learned men, who frequented and were attached to these establishments, would preserve some part of their contents to aid in the formation of the new library, to which Marc Antony presented, through Cleopatra, the whole collection of Pergamus, amounting to 200,000 volumes. Gibbon (chap. xxviii.) asserts that the old library was totally consumed, and that this gift was the foundation of the new one, which continued to increase in size and reputation for four centuries, until, at the destruction of the Serapeion by Theophilus, Patriarch of Alexandria, it was dispersed, A.D. 390. That this was the case we learn from Orosius, who visited the place twenty years afterwards, and saw the empty cases (lib. 6.) Still the library was re-established; and Alexandria continued to flourish as one of the chief seats of literature, till it was conquered by the Arabs, A.D. 640. The library was then burnt, according to the story generally believed, in consequence of the fanatic decision of the Caliph Omar,—'If these writings of the Greeks agree with the Book of God, they are useless and need not be preserved: if they disagree, they are pernicious and ought to be destroyed.' Accordingly, it is said, they were employed to heat the 4000 baths of the city; and such was their number, that six months were barely sufficient for the consumption of this precious fuel. (Gibbon, chap. li.) Gibbon has employed his ingenuity to discredit this account, which in itself appears by no means improbable. The library was, at all events, dispersed, if not destroyed: it ceased to exist as a public institution.

Connected with the library of Bruchion was a college, or retreat for learned men, called the Museum, where they were maintained at the public expense, in unbroken leisure, and with every facility for the pursuit of knowledge. This establishment was subsequently transferred to the Serapeion, and continued to flourish till the destruction of the temple by Theophilus. The sciences of mathematics, astronomy, and geography, were especially cultivated: witness the names of Euclid, Apollonius, Eratosthenes, and, in later times, of Ptolemy the geographer. Criticism, philology, and antiquities, were also much studied. Alexandria continued, until its capture by the Saracens, one of the most noted seats of learning in the world. (*Acad. des Inscriptions*, tom. ix. p. 397; Gibbon, chap. li., and the original authorities quoted in these works.)

ALEXANDRIAN CODEX, a celebrated manuscript of the Old and New Testament, in Greek, now preserved in the British Museum. It was sent by Cyrillus Lucaris, patriarch, first of Alexandria, then of Constantinople, to Charles I.; was placed in the royal library in 1628; and continued there until that collection was removed to the British Museum, in 1753. The history of the MS., before its transfer to Charles I., is involved in much uncertainty. For some time the received account was, that it was written in Egypt by a woman named Thecla, in the latter half of the fourth century, and was brought from Alexandria by Cyrillus. This minute specification of name and date rests entirely on two documents affixed to the book itself; one a short note in Arabic, merely stating that, according to tradition, the book was written by the martyr Thecla. The other is a Latin autograph of Cyrillus, of which this is a literal translation. 'This book of the Old and New Testament, as we have it from tradition, was written by the hand of Thecla, a noble Egyptian woman, about 1300 years ago, a little after the council of Nicæa. The name of Thecla was written at the end of the book: but on the extinction of Christianity in Egypt by the Mohammedans, the books of the Christians were reduced to the same condition. The name, therefore, of Thecla has disappeared and is torn out, but memory and recent tradition preserves it.—Cyrillus, Patriarcha Constanti.' The high character of Cyrillus places him above the suspicion of intentional fraud: but his statement is vague and unsatisfactory. Why the Mohammedans should spare the book, but tear out the transcriber's name; what is the value of the tradition which asserts the name of Thecla to have been written at the end of the book; how is that Thecla to be identified with the Thecla who lived after the Nicene council, when the existence of three Christian Theclas, two of them martyrs, is noted in the Fathers, and there may have been three thousand—these are questions on which the passage above quoted throws no light, nor can they be answered from external evidence. On the other hand, a passage in the letters of John Rudolph Wetstein, uncle to the celebrated critic of that name, has been brought forward to convict Cyrillus of inaccuracy, if not fraud: in which the writer asserts on the authority of Matthæus Muttis, his instructor in Greek, who had been ordained deacon by Cyrillus, that the patriarch brought the manuscript from one of the monasteries on Mount Athos, well known as a great repository and manufactory of Greek MSS. Now Cyrillus passed some time at Mount Athos before he went to Alexandria, so that he may have brought it originally from Mount Athos, and yet have taken it from Alexandria to Constantinople; and, further, he does not say that he brought it from Alexandria, though his note, above quoted, indicates that it was written, or at least had been deposited in Egypt. This is rendered probable by internal evidence. Moreover, it appears to have been dedicated at some time to the use of the Alexandrian patriarch, if we may trust the following interpretation of an Arabic note at the foot of the first page of Genesis. It is to be observed, however, that the passage is confessedly very hard to be understood, and that a different version was given by Mr. Baber in his notes, from that which he subsequently adopted in the prolegomena of his edition, which runs thus:

> 'This book is dedicated to the patriarchal chamber in the fortified city of Alexandria. Whoso shall take it thence, be he excommunicated, torn forcibly from the church, and communion of men. 'Athanasius the humble.'

Two patriarchs of this name presided over the church of Alexandria after the Saracen invasion, one at the end of the thirteenth, the other in the fifteenth century,—either of whom may have written this. It seems, therefore, that there is no ground for charging Cyrillus with fraud.

The real age and value of this MS. has been much controverted. By some commentators it is said to be the oldest, and most valuable copy of the New Testament in existence: others deny its very remote antiquity, and equally depreciate its merit. Mill and Woide admit the date assigned by Cyrillus. Oudin would bring it down even to the tenth century. Michaelis thinks its date cannot be ascertained within a period of about 200 years, and that it cannot be older than the sixth, nor later than the eighth century. Its authority is as much controverted as its age. Mill believes it to be the most perfect copy existing of the Apostolic text. Wetstein and Michaelis alike speak slightingly of its readings. Griesbach asserts that it follows three different editions: the Byzantine in the Gospels; the Western in the Acts and Catholic Epistles; and the Alexandrine in the Epistles of St. Paul. These points have been minutely discussed by Dr. Woide, formerly librarian of the British Museum, who published a fac-simile of the New Testament, in his preface. As might be expected, he is a staunch advocate of the excellence of his MS. A second edition of the preface (Notitia Codicis Alexandrini) was published by Spohn, who controverted many of Woide's opinions, showed that the MS. was by no means free from blunders of transcription, and reduced both its age and authority to a much lower standard. It has received great attention from biblical critics, and has been collated, among other persons, by Mill, Wetstein, and by Woide, who has given a very copious and complete collection of its variations from the received text as edited by Mill. This is to be found in a cheaper form in Spohn's edition of the *Notitia*, Lips. 1788.

The MS. is contained in four volumes, of the shape and size of large quarto, of which the New Testament fills the last. It is written on vellum, in double columns, in uncial or capital letters, without spaces between the words, accents, or marks of aspiration. The letters are round and well formed. Some words are abbreviated, but they are not very numerous. There is a variety in the colour of the ink, and formation of the letters, which indicates that it was not all written by the same hand. The MS. is on the whole in good condition; but sometimes the ink has eaten through the parchment so as to leave holes, in which, however, the shape of the letters can generally be traced; sometimes the ink itself has scaled off. It has suffered more seriously from the loss of the upper corner of the inner margin, which has been shaven off, why, or by what accident, it is not easy to guess. Sometimes only the margin has suffered, and the text is untouched: sometimes the beginning or end of eight, ten, or more lines is destroyed. The New Testament has been more injured from this cause than the Old. St. Matthew is wanting up to chap. xxv. 6, where it begins with the word ΕΞΕΡΧΕΣΘΕ: there are also chasms in St. John, from vi. 50, to viii. 52, and in 2 Cor., from iv. 10. to xii. 7.

The New Testament has been more fully described, and more carefully collected than the Old; from which, however, Grabe published his splendid edition of the Old Testament, Oxf. 1717—20. They are uniform in appearance and execution, but the Old Testament seems to be in rather better condition. Here and there a leaf has been partially destroyed; but there are, we believe, no considerable chasms. It contains, besides all the canonical, and most of the apocryphal books found in our editions, the third and fourth books of the Maccabees, the Epistle of Athanasius to Marcellinus, prefixed to the Psalms, and fourteen hymns, the eleventh in honour of the Virgin. Ecclesiasticus, the Song of the Three Children, Susannah, and Bel and the Dragon, do not appear to have formed part of the collection. The New Testament contains the genuine Epistle of Clement to the Corinthians, and part of the other which has been attributed to him. This is the only known manuscript in which the genuine Epistle exists. A fac-simile of the Old Testament has been published by the Rev. H. Baber, of the British Museum.

For more minute information, we may refer to Woide's *Notitia*, especially as edited by Spohn: to Michaelis's Introduction to the New Testament; and the Prolegomena of Mill, Wetstein, Grabe, and Baber.

ALEXANDRINE VERSE, a species of verse so called from having been first employed, according to some authorities, in a French translation, by Alexander de Paris and Lambert Lieon, of a Latin poem called the Alexandriad, according to others in an original work in the former language, on the life of Alexander the Great, composed by these poets in association with Jean le Nivelois and others. After its first introduction, it appears to have fallen for a long time into disuse among the French poets, until it was revived by Jean Antoine de Bœuf (one of the seven called the Pleiades), in the reign of Francis I. The first, however, who attuned the national ear of France to this verse, was the celebrated Ronsard, since whose time it has become the regular heroic verse of the French language; or that in which all their epic, tragic, and other greater poetical works are composed. It consists of twelve syllables, subject to the rule that it shall always be broken into two regular hemistichs, or, in other words, that its sixth syllable shall always terminate a word. The English Alexandrine verse consists in like manner of twelve syllables; but among us it has been rarely used throughout a whole poem. The longest and most remarkable poetical work in our language, written wholly in Alexandrine verse, is Drayton's *Polyolbion*. In general, it is employed only occasionally in poems written in our usual heroic verse of ten syllables, and never except in the concluding line of the couplet or triplet. In Dryden, by whom it has been used in this manner most frequently, and with the finest effect, it most commonly winds up a triplet—such as that in which Pope has at once described and exemplified the manner of his great predecessor:

> 'Waller was smooth; but Dryden taught to join
> The varying verse, the full resounding line,
> The long majestic march, and energy divine.'

The Alexandrine verse in English also forms the closing line of what is called the Spenserian stanza. Regularly, it ought always, as in French, to be divisible into two hemistichs; but, in the freer spirit of our poetry, this rule is occasionally violated.

ALEXEI MICHAILOWITZ, born at Moskwa in the year 1630, was a son of the Tzar Michäilo Feodorowitz Romanow, the first of the house of Romanow that held the sceptre of Russia, and of his second consort Evdokia Lukianowna Streshnew. At the death of his father, July 12, 1645, he succeeded to the crown, and as he was still very young, he was mainly guided by the advice of his councillors; Morosow, his tutor and brother-in-law; Miloslawskoj; and Plessow, a judge in one of the high courts at Moskwa. The excessive avarice and despotism of these men caused an insurrection in Moskwa, in 1648, in which Plessow and several of their creatures were murdered. The Tzar's intercession with difficulty saved Morosow from the people's fury.

Two impostors disturbed the tranquillity of Alexei's reign. Both of them chose Poland as their first scene of action. One of them, called Dmitri, pretended to be a son of Otrepiew, (who, by way of distinction, was called the *false Dmitri*,) and of Marina; he was treated like a prince by Wladislaw, king of Poland, but had to leave that country when the king died. He then went to Sweden, and from thence to Holstein, where he was arrested, delivered up to Russia, and put to death in Moskwa. The other impostor's real name was Timoka Ankudinow. On account of some crimes he left his country, and sought refuge in Poland, where he declared himself to be a son of the late Tzar, Wassili Shuiskoi; but receiving no countenance, he went to Constantinople, where, in order to make himself popular with the Turks, he submitted to the ceremony necessary to become a Mohammedan. Finding even this fruitless, he wandered about in Italy, and having become a Catholic in Rome, he roved through Austria, Hungary, and Transylvania. He next obtained from the Prince Ragotzy a letter of recommendation to the Queen Christina of Sweden, who received him well, and even granted him a considerable pecuniary allowance. Alexei, resenting this, insisted on his being delivered up; but the impostor escaped from Stockholm, and likewise from Revel, although in the latter place he had been put in prison. In Germany, he adopted the Lutheran religion: but at last, at the instance of Russia, he was arrested in Holstein, and in the year 1653 brought to Moskwa, where he was put to death, after suffering severe torture.

These impostors would hardly deserve notice, were it not for a war which broke out between Russia and Poland in 1654, the real cause of which was the countenance given to these adventurers in Poland. The immediate cause of the war was the protection granted by Russia to certain Cossacks subject to the Poles.

In this war the Polish commander-in-chief, John Radzivil, was completely defeated at Sklovo; the Russians took Smolensko in 1654, and almost the whole of Lithuania was conquered and devastated by them. The Poles, being at this time severely pressed by the Swedes, found it advisable, after two years' war, to agree to an armistice, which was concluded at Nienietz, in November, 1656, Austria being on this occasion the mediator. The Poles agreed to cede the provinces of Smolensko, Tshernigow, and Seweria to the Russians, for a sum of money.

Alexei's second war, which was against Charles Gustav of Sweden, commenced before the armistice with Poland was concluded. After the armistice, Alexei, agreeably to a promise given to the Poles on that occasion, carried on the war with great vigour. The cause of complaint on the part of the Russians was, that Gustav had hindered the operations of their army in Lithuania. The Russians entered Karelia, Ingermania, and Livonia with 120,000 men, and the Knies, Dolgorukoi, took Dörpt, and frightened away the professors of the university. But the Russians were compelled to raise the siege of Riga, after six weeks, (from the 20th of August to the 5th of October, 1656,) with the loss of 14,000 men; owing to the vigorous resistance of the renowned Swedish general, Magnus de la Gardie. In the year following, on the 9th of July, the Russian army, under the command of Matthias Wassiliewitz Ishermetiew, was completely routed by the Swedish general Fritz von Löven at Wolk, and the Russian commander died of his wounds a few days after the battle. A new army of 30,000 men entered Livonia, but, without effecting any thing, was compelled by the plague to march off. This induced Alexei in his turn to agree to an armistice with Sweden, which was signed on the 23rd of April, 1658, and three years after, on the 21st of June, 1661, converted into a treaty of peace at Kardis, by which their former possessions were mutually secured to each party. A peace had also been concluded between Poland and Sweden, in 1660, at Oliva; but before its conclusion, the war between Russia and Poland had been renewed: this war, too, was occasioned by the Cossacks on the Dnieper, who had revolted from Russia, and sought protection from the Poles. Although the Russians were defeated in several battles, the issue of this war was quite as advantageous to them as that of the former contest with Poland; for in the thirteen years' armistice concluded at Andruszow in 1667, Russia gained, in addition to former conquests, that part of the Ukraine on the other side of the Dnieper of which she had already got possession.

Immediately after the conclusion of the Polish war, a formidable insurrection broke out among the Don Cossacks. Stenko Razün, a Cossack, resented the death of his brother, who had been executed by order of a Russian general, and seduced his countrymen to revolt: they burnt and devastated the country from the lower Wolga to Jaik, took Astrachan, in 1670, (where Stenko ordered the Woiewod Prosorowskoy to be thrown over the walls,) and several other cities.

Hopes were held out to Stenko which prevailed on him to present himself at Moskwa, where he was executed as a traitor and rebel: after this, tranquillity was easily restored among the Cossacks. Alexei's last war was against the Turks. Led by their hetman **Dorosensky**, the Saparogian Cossacks had revolted against the Poles, and made a treaty of alliance with Mohammed IV., receiving from him the province of Ukraine in fief. From this cause naturally arose a war between the Poles and the Turks; and Russia was not slow in interfering. Her ambassador Miloslowskoy was ordered to expostulate in behalf of the Poles, and moreover to demand that Azow, which originally belonged to Russia, and in 1642 had been taken from the Cossacks by the Turks, should again be ceded to Russia. But Mohammed's success did not dispose him to listen to the demands of Russia: he took the Polish frontier fortress Kaminieck, conquered the whole of Podolia in less than two months, and alarmed the Russians by the rapidity and success of his operations. The King of Poland, Michael, drew no advantage from the victory over the Tartars gained by Sobiesky at Kaluszo on the 18th of October, 1672, but made a hasty peace which was disgraceful to his country. This peace would have encouraged Mohammed to resist the claims of Russia even if well founded, and of course it emboldened him to resist her claim to Azow; nay, he went farther, he even expected Alexei to cede to him Russian Ukraine. But the King of Poland's peace was rejected by the Polish diet, and Alexei was glad to assist even a constitutional power in renewing hostilities against the formidable Turks. At first he carried on the war with great vigour, but finding the Poles not so ready, as he had expected, to agree to certain ambitious schemes, according to which the crown of Poland was to be settled on his descendants, his zeal abated, and he died, before a peace with the Turks was concluded, on the 10th of February, 1676, in his 46th year.

The most impartial and best-informed writers agree in representing Alexei Michâilowitz as a man endowed with more than ordinary talents and a clear understanding: his private character exhibits many amiable traits. Alexei set at large the Danish count, Waldemar Christian Gyldenlöve, who, since the year 1644, had been kept under arrest as a prisoner of state by the Tzar Mich. Feodorowitz. The count being betrothed to one of the daughters of this emperor, Irina Michâilowna, and having arrived in Moskwa to celebrate the marriage, he was, contrary to original stipulations, required to change his religion. Upon this he disguised himself and attempted to escape from Moskwa, but was discovered, and kept confined till the Tzar Michael's death.

Alexei Michâilowitz did much for the improvement of Russia; agriculture and manufactures were constant objects of his solicitude: he invited many foreigners to Russia, especially mechanics, artists, and military men, whom he treated liberally. He ordered many works, particularly on applied mathematics, military science, tactics, fortification, geography, &c., to be translated into Russian, and when he found that the plates could not be re-engraved in Moskwa, he bought a number of original copies in order to take the plates out of them and insert them in the translations: he enlarged the city of Moskwa and built two of its suburbs. Before his time Russia had hardly any coinage of her own: a small head of a Tzar was usually stamped on foreign coins, which made them Russian and gave them currency; he was the first who coined silver rubles and quarter rubles. He commenced ship building and the construction of harbours in the Euxine and the Caspian, and raised the trade of Astrachan to a flourishing condition. Alexei likewise completely reformed the Russian laws. A committee of five was ordered to make abstracts of existing Ukases, of the decisions of the Boyar Courts, of such Greek laws as might be applicable in Russia, to compare these with the Sudébnik, (a more ancient code compiled under Iwan Wasiliewitz in 1542:) and lastly to add new enactments for cases till then undecided: this is the origin of Alexeis Sobórnoie Uloshénie (Universal Code) which was read before the emperor in October, 1649, and in the same year printed and promulgated. One of the most liberal enactments of this code prohibits '*free* peasants to sell themselves, or to enter into a contract by which they would become *glebæ adscripti.*' The same code contains a curious law relative to snuff and tobacco. 'No man, whether a native Russian or a foreigner, shall dare to have any kind of tobacco about him, or smoke it, or traffic in it: if convicted of transgression, the first time, he is condemned to certain severe corporal punishments and knowting besides; a second time, he shall again suffer knowting, and his nostrils shall be cut open, or his nose cut off, and he shall be sent away to a distant part of the empire.' This law is now by no means strictly enforced, yet the Russians still have a great aversion to smoking tobacco.

Alexei moreover commenced and partly effected an extensive ecclesiastical reform, chiefly in matters concerning the liturgy. [See Raskólniki and Starowerzi.] This emperor was twice married: his first wife was Maria Iljinishna Miloslawskoy, by whom he had five sons, (two of whom, Feodor Alexeiewitz and Iwàn Alexeiewitz, were his successors on the throne of Russia,) and seven daughters. His second wife was Natalia Kirillowna Naríshkin, by whom he had one son, Peter Alexeiewitz, (Peter the Great,) and one daughter, Natalia Alexeiewna.

ALEXEI PETROWITZ, the eldest son of Peter the Great of Russia, and of Eudoxia the first wife of that monarch. He was born at Moscow, in 1695. From his boyhood Alexis showed a headstrong disposition, and an inclination for low pleasures, which, as he grew up, assumed the character of a decided aversion and opposition to that reformation of the ancient manners of the country which it was the object of Peter's life to effect. It was in 1716, however, while the Tzar was absent on his second tour through Europe, that the prince may be said to have first thrown off his allegiance, by secretly quitting Russia, and taking flight to Vienna, from whence he some time after retired to Naples. Peter, having returned from abroad, foresaw the confusion and mischief which this conduct in the heir apparent might eventually occasion, and went to work with his usual energy to counteract and defeat a plan which threatened the destruction of whatever he had done for the improvement of Russia. It was some time before he succeeded in discovering his son's retreat; but having at length learned where he was, he gave instructions to some noblemen, who proceeded to Naples, and induced the prince to return to Russia, and to solicit his father's forgiveness. The determined character of Peter's extraordinary mind now displayed itself with fearful sternness. As soon as he had secured the person of his son, he proceeded to treat him as a criminal. Being deprived of his sword, he was brought before an assembly of the clergy and nobility, and there compelled to execute a formal resignation of his pretensions to the crown. At the same time, effectually to crush the sedition of which he was the head, his principal partizans were all arrested, and some of them put to death. His mother was shut up in a monastery. But all this was not deemed enough. The prince himself was finally brought to trial, and condemned to suffer death. This was in the year 1718. The day after he was informed of his sentence, Alexis was found dead in prison, and it was given out that he had been carried off by some natural illness; but suspicions have been naturally enough entertained that a private execution accomplished the end, without incurring the risks or inconveniences, of a public one. The prince, whose unhappy career was thus terminated, left a son, a child of three years old, who in 1727, on the death of Catharine I., became emperor under the title of Peter II. He only reigned for three years. After the death of Alexis, Peter declared his second son his heir, but he also died soon after, to the great grief of his father. These events opened the succession to the empress, who, on the death of her illustrious husband in 1725, assumed the title of Catharine I.

ALEXIS COMNE'NUS I., Emperor of Constantinople, ascended the throne in 1081. The Comneni were a family of Italian origin transplanted into Asia Minor. Isaac Comnenus I., whose father Manuel had served the empire with distinction, was elected emperor in 1057, by the troops, in opposition to Michael VI. Isaac having abdicated two years after, and his brother John having declined to succeed him, the imperial purple was assumed by Constantine Ducas, a friend of the Comneni. After several reigns interrupted by revolts, Alexis, the third son of John Comnenus, was raised by the soldiers to the throne, from which his predecessor, Nicephorus Botaniates, himself a usurper, was hurled down, and forced to retire into a monastery.

Alexis assumed the reins of the empire at a critical moment: the Turks had spread from Persia to the Hellespont, the frontiers of the Danube were threatened by swarms of barbarians; the Normans, who were masters of Apulia and Sicily, attacked the provinces on the Adriatic; and, to crown the whole, the first crusade came with its countless multitudes, threatening to sweep away the eastern empire, and Constantinople itself, in their passage. 'Yet, in the midst of these tempests, Alexis steered the imperial vessel with dexterity and courage. At the head of his armies he was bold in action, skilful in stratagem, patient of fatigue, ready to improve his advantages, and rising from his defeat with inexhaustible vigour. The discipline of the camp was revived, and a new generation of men and soldiers was created by the example and the precepts of their leader. In a long reign of thirty-seven years he subdued and pardoned the envy of his equals: the laws of public and private order were restored, the arts of wealth and science were cultivated, the limits of the empire were enlarged in Europe and Asia, and the Comnenian sceptre was transmitted to his children of the third and fourth generation.'—Gibbon's *Decline and Fall of the Roman Empire*, ch. xlviii.

The most important event of Alexis' reign is the passage of the crusaders through his dominions. His conduct on that occasion has given rise to the most conflicting statements by various historians. Alexis had solicited some assistance from the western princes against the invading Turks, but he was alarmed at the approach of hundreds of thousands of undisciplined and riotous fanatics led by Peter the Hermit, who ravaged the Christian countries on their way with as little scruple as if they had been Mohammedan. This promiscuous multitude, however, was safely passed by Alexis's care across the Bosporus into Asia, where they were drawn by the Turks into the plains of Nicea, and there destroyed, in 1096. The regular part of the expedition came after in several divisions, under the command of Godfrey of Bouillon, of several French princes, and of Bohemond and Tancred, son and nephew to Robert Guiscard, the Norman conqueror of Sicily. After a long and painful march, the crusaders encamped under the walls of Constantinople. Alexis supplied them with provisions, but carefully guarded the city against any surprise on their part. Frequent affrays, however, took place between the Franks and the Greeks, who looked upon their unwelcome guests with as much fear and aversion as they did on the Turks. The leaders of the crusaders were admitted to the imperial presence, where they paid homage to Alexis, who found means to tame and to conciliate the rude chiefs by gifts, and by promises of assistance in their expedition to the Holy Land, while he induced them one after the other to pass quietly over to Asia. This being accomplished, Alexis assisted them in the capture of Nicea from the Turks, which conquest, however, he kept for himself. In the same manner he profited by the progress of the crusaders, following as it were in their wake, and reconquering from the Turks all the coasts of Asia Minor and the neighbouring islands, and driving the Turkish sultans into the interior to the foot of Mount Taurus. While intent upon this, Alexis neglected or forgot to lend any further succour to the crusaders, who were fighting on their own account in Syria and Palestine. The Latin historians therefore accuse him of bad faith, whilst his daughter, Anna Comnena, who wrote her father's life, extols his wise policy, dwelling with haughty indignation on the insolence and rapacity of the western barbarians. The Byzantine Greeks were a refined, but effeminate and corrupt race; cunning, suspicion, and dissimulation were their principal weapons of defence against the headlong violence of the feudal semi-barbarous Franks. Alexis died in 1118, and was succeeded by his son John Comnenus, a good and wise prince His other son Isaac was the father of another John, who apostatized to the Turks and married their sultan's daughter, and through whom, apparently, Mahomet II., centuries after, boasted of his Comnenian descent; and of the famous Andronicus, who, after a most adventurous career, usurped the throne in 1183, causing his relative, the youthful heir, Alexis Comnenus II., to be strangled, together with his mother Maria, the Emperor Manuel's widow Andronicus was himself overthrown and put to a cruel death three years after, and in him ended the imperial line of the Comneni on the throne of Constantinople. Andronicus' posterity reigned afterwards over the province of Trebizond, with the pompous title of emperors (See the various *Histories of the Crusades*, and the collection of the *Byzantine Historians;* and particularly the *History of* Anna Comnena.)

ALFIERI (VITTORIO), was born at Asti in Piedmont, in January, 1749, of a noble and wealthy family. He lost his father when a child, and his mother having married again, young Vittorio and his sister Julia were placed under the guardianship of their uncle, Pellegrino Alfieri. Another uncle, Count Benedetto Alfieri, was the well-known architect who built the king's theatre at Turin, and other public and private structures. Vittorio at nine years of age was sent as a boarder to the *academy*, or college of the nobles at Turin. He gives in the memoirs of his own life a very unfavourable description of the method of education which then prevailed in that and other institutions of the same kind. He went through the courses of Latin grammar, humanities, and rhetoric, all in Latin, learning by heart passages of the classics without knowing any thing of ancient history or geography. Italian grammar did not form part of his studies, and he was left to understand Italian books as well as he could. He was, moreover, a sickly boy, of shy manners, self-willed, and impatient of control. At the age of thirteen he was admitted to study philosophy in the University of Turin, and of this course he also gives a very amusing description. The lectures were in Latin, with which Alfieri, notwithstanding his three or four years' schooling, was not very familiar. The morning lectures were on geometry, and such was his progress, that he never could understand Euclid's fourth proposition. The afternoon lecture was devoted to logic and metaphysics, 'when the students. wrapped up in their mantles, used to fall regularly asleep, while the professor, half-dozing himself, went through a Latin explanation of his subject in a languid, monotonous tone of voice, which was now and then interrupted by some one of his audience snoring louder than the rest.' Thus passed the first year of philosophy; in the following, he studied physics to very little better purpose; he next passed on to civil and canon law, but his health would not allow him to continue his course, and he contented himself with the degree of Master of Arts, after going through a sort of examination by the help of his good memory, the assistance of a tutor, and the easy indolence of the examiners. He had, at the same time, private teachers of geography, which he liked very well; of music, in which he made little or no progress; of fencing and of dancing, which latter he absolutely detested, as well as the French master who taught him. He attributes to the appearance of this man his first unfavourable impressions of the French in general, which he says were strengthened by seeing the Duchess of Parma and her maids, on their passage through Turin, all besmeared with rouge, which was not then used by Italian ladies. Of one exercise he was passionately fond, and this was riding, which served materially to improve his health. He still continued to live in the academy, but under much less restraint: at the age of fourteen, by the laws of Piedmont, he was master of his own income, and only subject to his guardian in so far as he could not alienate his property. He then entered the army, as all young noblemen were bound to do, with the rank of ensign in a provincial regiment, which in time of peace only assembled for a few days twice in the year.

At the age of seventeen he obtained the king's leave to travel under the escort of an English Catholic tutor. He went first through Italy, and having got rid of the tutor, next proceeded to France, where he was introduced at the levee of Louis XV., at Versailles. He was struck with 'the Jupiter-like superciliousness of that monarch, who stared at the persons introduced to him without condescending to say a word to them.' Alfieri's pride (and he had a considerable share of it) was evidently hurt. From France he came to England, with which country he was pleased from the first. He admired 'the general appearance of comfort, the life and activity of the people, the neatness and convenience of the houses, tiny as they appeared to him coming from Italy, the roads, the inns, the horses, the women—every thing.' Contrary to the common supposition, he found a greater facility of introduction into company to a foreign gentleman well recommended in London than at Paris. After spending in England the winter of 1768, he crossed over to Holland, which country he liked best next to England. He attributed the advantages of both to their institutions, and the long habit of rational freedom. In Holland Alfieri began his love adventures, which he followed with all the madness of a southern temperament. His life was, for several years after, restless and dissipated; he ran from Holland to Italy, thence to Vienna, to Berlin, to Denmark, Sweden, Russia, and thence through Germany and Holland, back again to England in 1771, when he had an intrigue, not very creditable to him, with a married lady, and fought a duel with her husband. He afterwards went to Spain and Portugal, and thus completed his tour of Europe. He has written an account of his travels in his *Satire*.

In 1773 he returned to Turin, where he took a house, and apparently settled. There, in the midst of another love intrigue, and after having recovered from a severe illness, he began to write some scenes of a drama on the subject of Cleopatra. This was his first essay in Italian versification. He next wrote, in French prose, two tragedies, Filippo and Polinice. At last, dissatisfied with these essays, he resolved on removing to Tuscany to study the pure Italian language. In 1777 he went first to Siena and then to Florence, where he applied himself seriously to dramatic composition. He there also made the acquaintance of a lady who fixed his heart for ever. This was the wife of Charles Edward Stuart, called the Young Pretender, (see Albany, Countess of,) at whose house most foreigners visited. The lady afterwards separated from her husband, and retired into a convent at Rome. Alfieri continued attached to her, and followed her to several places; at last, after her husband's death in 1788, it appears that they were privately married, although the marriage was never made public, and by some is doubted.

In 1782 Alfieri had completed fourteen tragedies, ten of which were printed at Siena. Though he paid little attention to the strictures of the purists, he answered a long letter of Calsabigi, in which the latter had criticised his work with some show of reason. After this we find Alfieri starting again for England in the autumn of 1783, for the sole object, as he informs us, of buying horses. After spending a winter in London, he set off, on his return to Tuscany, with a retinue of fourteen horses. He describes in a humorous style the trouble he had in leading his cattle across the Channel, through France and over the Alps, not then so practicable as now, into Italy. In 1785, the Countess of Albany having gone to live in France, Alfieri also repaired thither, and resided first at a villa near Colmar, and afterwards in Paris, where he superintended the edition of his tragedies, by Didot. Soon after he published his other miscellaneous works at Kehl. Alfieri and the Countess were living quietly at Paris, when the French revolution drove them away. He was present at the tragedy of the 10th of August, 1792, after which he hastened to get passports for himself and the lady; but on coming out of the city they were stopped at the barrier by a squad of *sans culottes*, who, seeing two travelling carriages and servants, wanted to stop them, saying they were aristocrats running away, and to lead them to the Hôtel de Ville. Had this taken place, the probability is, that both Alfieri and the countess would have perished in the massacres of the subsequent September. Alfieri, however, by showing a bold countenance vociferating as loud as the French themselves, swearing h was a foreigner, an Italian, and appealing to the seven passports which he held in his hands, after half an hour's altercation came clearly through the barrier. Two days after their departure the municipal officers repaired to the house of the Countess, seized her furniture, Alfieri's horses, books, MSS., &c.; and their property in the funds was sequestered, under the plea that they were emigrants.

Alfieri and his companion hastened through Belgium and Germany back to Florence, from which city he never stirred after. Here he wrote his *Misogallo*, a collection of satirical sonnets, letters, and epigrams, in which he has embodied all his early prejudices and his more recent feelings of dislike to the French people. It is a work of undiscriminating passion. At forty-six years of age he began studying Greek, and by his own unassisted application he was enabled in two years to understand and translate the Greek writers. In 1799 the French troops entered Florence, but remained there only a few months, which Alfieri spent at a country seat, to avoid the unpleasant scenes of military violence. He afterwards lived quietly at Florence, seeing nobody except the Countess and his old friend the Abbate Caluso, till 1803, when an attack of the gout, to which he was subject, added to his constant application and an extremely sparing diet, terminated his life on the 8th of October, at the age of fifty-five. He expired without much pain, his constitution being evidently worn out. The Countess of Albany was by his side in his last moments. He was buried in the church of Santa Croce, the Florence Pantheon, where many years before the sight of Michael Angelo's mausoleum had inspired him with a desire for literary fame. The Countess of Albany had a fine monument raised to him by the celebrated Canova.

Alfieri gave to Italy the first tragedies deserving the name. The unities are strictly preserved, the characters are few, the action one, no by-play or subordinate incidents; and yet, notwithstanding all this meagreness, there is so much power in the sentiments, so much nervousness in the language, such a condensation of single passion, that the performance of one of Alfieri's tragedies keeps the audience as spell-bound. Such, at least, is the effect they produce upon an Italian audience.

The "Saul" is the finest of Alfieri's plays; the author has imparted an oriental and biblical colouring to the language and the situations of his personages, which, together with the fine lyric passages expressive of the changes in Saul's mental alienation, give a peculiar, an epic interest, to this play. The "Filippo" is considered as the next in merit. Most of the others are on Greek and Roman subjects. Two are taken from the history of Florence,—*La Congiura dei Pazzi*, and *Don Garzia*, the son of Cosmo I., Grand Duke of Tuscany. A. W. Schlegel, of Bonn, in his 'Course of Dramatic Literature,' has given copious strictures on Alfieri's plays, which have been replied to by Gherardini, in his notes to the Italian translation of the professor's work, in which the reader may find all the arguments for and against the Italian tragedian. Alfieri's classic drama is very different from that of the French stage; it is chiefly distinguished by its extreme simplicity, the absence of all superfluous declamation and tedious narrative, and the exciting abruptness of his blank verse. This arrangement of words, which has been called harsh, was by him purposely studied, to supply the deficiencies of the measure.

Of Alfieri's minor works several have been already mentioned in the course of this article. He wrote six comedies, four of them on political subjects, being satires on the various systems of government, 'the One,' 'the Few,' the 'Too Many,' and the fourth is 'the Antidote, a mixture of the Three Poisons.' Among his prose works the *Tirannide* is a vehement invective against tyranny, taken in the old and extreme sense of Machiavelli's *Principe*. But such a government as Machiavelli saw before his eyes in several Italian states when he wrote, existed no longer in any part of Christian Europe in the days of Alfieri; hence the sketch of the former has all the thrilling vividness of a portrait from life, whilst that of Alfieri is taken from books and his own excited imagination. His translation of Sallust is very much esteemed. Alfieri's abhorrence of the excesses of the French during the first revolution, and of their subsequent servility under military despotism, has caused some to imagine that he had renounced all his liberal ideas before his death. But this is a superficial view of things. A man may admire liberty, and yet be indignant against those who prostitute its name by crimes. Alfieri's idea of liberty was inseparably connected with that of order and security for persons and property, and he saw the latter violated every day both in France and in Italy. His violent temper led him sometimes into paradox and seeming contradictions. But he was, upon the whole, an independent, candid, honest-hearted writer; and his example and his precepts gave a temper to the Italian mind which has not been lost. He formed a moral school, not numerous indeed, but including some of the brightest names in Italian literature of the present age. His name is ever mentioned by the Italians with respect. He kept aloof from those attacks and sneers against religion and decency, in which weaker minds indulged in his time; on these points he gave no scandal to his Christian brethren. In his private character he was a warm and constant friend, and a man of honourable sentiments and conduct. Alfieri's works have gone through many editions, both separately and together in one collection. Two editions of the latter were published,—one at Pisa, in 1808, in 22 vols. quarto; and another at Padua, 1809-10, in 22 vols. octavo. His tragedies, his autobiography, and some of his minor compositions, have been published in the Milan collection of the Italian classics, under the title of *Opere Scelte*, in four volumes octavo, 1818; and this is the most correct edition of that part of his works. (See *Vita di Vittorio Alfieri da Asti, scritta da esso.*)

ALFONSIA. [See Elæis.]

ALFONSO V. of Aragon, and I. of Sicily, succeeded, in 1416, his father, Ferdinand I., who had annexed the crown of Sicily to that of Aragon. To these two Alfonso added that of Naples. Queen Joanna II. having adopted him for her heir and successor, Alfonso repaired to Naples, but was driven away by the party of the Angevins, headed by the famous Sforza Attendolo, and the queen was compelled, in 1423, to name as her successor, Louis III. of Anjou. At the death of Joanna, in 1435, Alfonso renewed his claims, but was opposed by René of Anjou, who after Louis's death had been called to the throne by the last will of the queen. The court of Rome declared for René. Alfonso's fleet was attacked near the island of Ponza by the Genoese who had taken René's part, and was totally defeated, Alfonso himself being taken prisoner. The Genoese sent him to Philip Maria Visconti, Duke of Milan, who was then also lord of Genoa. Alfonso found favour with his keeper, who was pleased with his acuteness of mind and his superior address, and who, being also jealous of the French dominion at Naples, not only restored him to liberty, but made an alliance with him. Alfonso repaired to Gaeta, which his fleet had taken by surprise, and thence he went into the Abruzzi and Puglia, where he found partisans among the nobility. The war between him and René was carried on in those remote provinces for several years, till at last the treachery of the younger Caldora, a condottieri chief, ruined the affairs of René, and Alfonso advanced against Naples in 1442. His soldiers entered the city through an old aqueduct, and René escaped by sea to Provence, where he reigned till his death, the last king of the house of Anjou. Alfonso now fixed his residence at Naples, and for the first time since the Sicilian vespers, Sicily and Naples were united under the same monarch. Alfonso applied himself to re-establish order and justice throughout the kingdom, which had long been a prey to misgovernment and confusion under the weak and corrupt reign of Joanna II. In order to strengthen himself with the nobles, whose power was very great, he extended their feudal privileges, and he also increased largely the number of the feudatories of the crown. In return he obtained of them in parliament assembled grants of money, or *gifts*, as they were called, and fresh taxes to supply his expenditure. One of these taxes, which was a ducat upon each hearth, was resisted by the concubines of the clergy, at that time extremely numerous in the kingdom, who alleged that they shared in the immunities of the clerical order; until Alfonso, by a circular dated 3rd of February, 1446, charged the bishops with the collection of the tax and the arrears for three years past. This curious document is still to be seen in the archives of Naples. The wide plains of Puglia having been devastated during the preceding wars, and become a desert, Alfonso made of them an immense pasture-ground for the flocks of the neighbouring provinces, and placed the administration under a particular court: the revenues resulting from it fell to the profit of the fisc or crown, and such it has remained, to the present day, under the name of *tavoliere di Puglia*.

Alfonso was engaged in frequent disputes with the popes, which were terminated by the treaty of Terracina in 1443, when he joined the Papal troops against Francesco Sforza, the son of his old antagonist, and dispossessed him of the *marches*. Sforza having afterwards become, first, general, and then duke of Milan, Alfonso joined the Venetians against him and his allies, the Florentines. It has been a subject of reproach against Alfonso, as well as the other Italian leaders of that time, that, instead of relieving Constantinople from the attacks of the Ottomans, they wasted their energies in the petty quarrels of private ambition. Alfonso made a scanty compensation for this neglect, by affording an asylum and assistance to the fugitive Greeks who brought their learning into Italy. The most favourable feature of Alfonso's reign is his patronage of letters. Beccadelli, called Panormita, and Pontanus established the famous academy which took the name of the latter. Panormita wrote a work *De Dictis et Factis Alphonsi*; and Fazio, who was secretary to the king, wrote also commentaries *De Rebus gestis ab Alfonso I.* The learned Valla was for a time at the court of Alfonso. The study of jurisprudence was particularly encouraged by the same monarch. Paris de Puteo and Gian Antonio Carafa, two celebrated jurisconsults, were both his councillors. He collected a splendid library at a great expense, and caused translations to be made from the Greek of the works of Aristotle, Xenophon, &c.

Alfonso was fond of the arts, and to him Naples owed several embellishments: he first caused the streets to be paved with large flags; he restored the aqueducts which supply the fountains with water, and drained the neighbouring marshes which infected the atmosphere. He enlarged the mole and the arsenal, and raised the fine triumphal arch which forms the entrance of the Castelnuovo, which was then the king's palace.

Under Alfonso both Naples and Sicily, so long distracted by internal feuds, civil wars, and foreign invasions, enjoyed a period of tranquillity, and his grateful subjects styled him the Magnanimous, whilst the men of letters whom he protected called him the Wise.

Alfonso had no legitimate children, having early separated from his wife, owing to her intemperate, though not ill-founded jealousy. By his various mistresses he had but one son, Ferdinand, to whom he was fondly attached. In order to secure him at least one of his several kingdoms, he assembled a parliament in 1442, and by making large concessions to the barons, induced them to declare Ferdinand, Duke of Calabria and heir to the crown. Next day Alfonso invested his son at the altar with the ducal crown, and the barons did him homage. The pope had already granted Ferdinand a bull of legitimacy. Alfonso's brother, John, remained heir to the crowns of Aragon, Valencia, Sardinia, and Sicily. This John was afterwards succeeded by Ferdinand called the Catholic, who reconquered the kingdom of Naples, which continued to be a dependency of Spain for several centuries.

In 1457 Alfonso sent a fleet against Genoa, to favour the party of the Adorni faction, which had been exiled; the city was hard pressed by the besiegers, when the news of Alfonso's death released it from danger. The king had attended a great hunting party in Puglia, where he overfatigued himself, and was carried back ill to Naples. After giving his parting advice to his son Ferdinand, recommending him to moderate the taxes, to keep peace with the pope, and to favour his Neapolitan subjects in preference to the Aragonese and Catalonians, he expired on the 17th June, 1458.

ALFONSO II., of Naples, son of Ferdinand I., and grandson of Alfonso I., was the chief cause of the famous revolt of the barons under his father's reign, and of the cruelties that followed. On the death of Ferdinand in 1494, he succeeded to the throne; but the approach of the French, under Charles VIII., frightened him, and he ran away before he had completed one year of his reign. He retired to a convent at Messina, where he practised great austerities, to atone, as he thought, for the crimes he had committed. He died soon after. Ferdinand II., his son, succeeded him, and, with the assistance of the Spaniards, drove away the French; but dying prematurely in 1496, was succeeded by his uncle Frederic, Alfonso II.'s brother. (Guicciardini, *Storia d'Italia;* Porzio, *la Congiura dei Baroni.*)

ALFONSOS, of Spain and Portugal. [See ALONSO.]

ALFORD. [See LINCOLNSHIRE.]

ALFORT, a hamlet in France, in the department of the Seine, about five miles south-east of Paris. It is noted for its royal veterinary school, established in 1766, which contains a special library, and a collection of comparative anatomy and pathology. There are accommodations for the sick horses, a botanic garden, chemical laboratory, &c., It is separated from Charenton by the Marne. (*Diction. Géograph.*)

ALFRAGANIUS, properly AL-FARGANI, or with his complete name, Ahmed ben Kothair Al-Fargani, was a celebrated astronomer, who flourished under the reign of the Abbaside caliph Mamun, in the earlier part of the ninth century of the Christian æra. He was called Al-Fargani from his native place, Fargana, a town and province in Transoxiana. We possess an elementary treatise on Astronomy by him, chiefly founded on the system of Ptolemy, which was printed, with a Latin translation and notes, by Golius, in 1669.

ALFRED THE GREAT. This illustrious and excellent king was born in the year 849, at the royal manor of *Vanathing*, (Wantage,) in Berkshire. Anglo-Saxon writers, and among these the king himself, commonly write his name Ælfred, and this orthography is frequently followed on ancient coins: in some instances, however, as in the one copied below from a coin in the British Museum, the name is written Aelfred: in other writers, and indeed on some coins too, we find ЄLFRED. Gibson, in his edition of the *Saxon Chronicle*, reads Ælfred throughout. Norse (*i. e.* Icelandic) writers invariably write this king's name Alfredr, the final *r* being a short syllable forming the nominative termination which is pronounced *ur*.

Alfred's lineage was ancient and illustrious: on the father's side, Anglo-Saxon authors count twenty-two generations from him up to Woden, (*i. e.* Odin.) Alfred's father was Ethelwolfe, and his grandfather Egbert, both kings of the West Saxons; his mother was Osburgh, a daughter of Oslac, who, although only a butler to king Ethelwolfe, was still descended from renowned Gothic progenitors, and was by his son-in-law raised to an earl's rank. Ethelwolfe had four sons lawfully begotten—Ethelbald, Ethelbert, Ethered, and Alfred; and one illegitimate son, Athelstane. Alfred being the youngest of Ethelwolfe's legitimate issue could entertain but small hopes of succeeding to the crown; and it appears, therefore, the more surprising that when in the fifth year of his age (A.D. 853) he was sent to Rome, he received royal inaugural honours from Pope Leo IV. There seems, however, no reason to doubt this fact: the explicit words of the Saxon Chronicle are: 'þa wæs þonne Leo Papa on Rome, and he hine to cyninge gehalgode,' (at that time Leo was pope in Rome, and he consecrated him king.) The assertion of Asser, Alfred's friend and councillor, is equally clear, and it is supported by many other authorities. Alfred's journey to Rome certainly gave a considerable impulse to his inquiring mind.

Asser laments the neglect of Alfred's early education, and states that he 'remained *illiterate* till his twelfth year or longer.' We apprehend that the best educated princes in Europe of the ninth century remained illiterate considerably beyond that age. Examining the whole passage more attentively, (p. 16, Wise's edition,) we find that Asser probably used the term 'illiteratus' in a very restricted sense, *i. e.* for one unacquainted with *Latin*. He states, that his noble mind thirsted for knowledge from the very cradle; that he took delight in listening to Saxon poems, and got them by heart; and that when his mother offered to her sons a book of Saxon poems as a prize to him who first should learn them, Alfred instantly went to his tutor, read the book, and repeated its contents to his mother. Asser, as a Welshman, seems to have accounted *Saxon* learning for nothing; as a priest, he doubtless affected to hold up Latin as the only orthodox vehicle of knowledge. But, turning our attention to Alfred's subsequent life and occupations, we must feel inclined to give him credit for earlier acquaintance with Latin than his biographer has done. The works of this prince show that at some time or other he must have acquired a knowledge of Latin which, for a prince, in Alfred's age, was almost miraculous. In his youth and manhood we find him so occupied that we must admit that unless this knowledge was acquired early, it would be unaccountable how he could acquire it at all: and the style of his works in his native language shows that his acquaintance with classical models was familiar, and extended to more than mere words and phrases—he had imbibed the spirit of the authors of Greece and Rome.

But in his unremitting pursuit of knowledge Alfred did not neglect those accomplishments which the age admired, and which its habits and mode of life rendered indispensable: he was expert in hunting and shooting, and early accustomed himself to endure fatigue and occasional abstinence from food; and even in his youth he distinguished himself in successful conflicts with the numerous bands of foreigners who at this period so frequently invaded the English coast.

The enemies with whom Alfred had to contend were DANES. By this term ought to be understood all the Scandinavian nations, viz. Danes, Swedes, and Norwegians indiscriminately, who, because they at that period spoke a common language, the *Norse*, (then called *Danish*, or Dönsk Tunga, in foreign countries,) went by the appellation which, strictly speaking, was peculiar to the most powerful of the Scandinavian tribes. Many reasons, indeed, make it probable that the invaders on the English coasts in Alfred's time were chiefly Norwegians, and not *Danes*, in the strictest sense of that word. Danish invasions commenced nearly a century later, and ended in final conquest. English chroniclers, Matthew of Westminster and others, who mention Rolf the Walker's invasion, call him and his followers *Danes;* and yet it is well known that he was a Norwegian nobleman: and although we cannot identify the names of other chieftains with those known in Norwegian any more than with those known in Danish history, it still is more probable that they chiefly belonged to the former nation.

The Scandinavian nations of this period cultivated war as a favourite science. Their other acquirements and talents, even the literary (and these were not inconsiderable) were made subservient to it, and were valued in proportion to the degree in which they contributed to its advancement. The constant themes of the poets were the warlike exploits of eminent chiefs; and history recapitulated in prose the subjects of the songs of many a bard. In the ninth century the Norwegians seem to have surpassed all other European nations in bravery and warlike spirit. So great was the fame they had acquired, that subsequently they were hired in considerable numbers by the Byzantine emperors to fight against their Asiatic and African enemies. It is essential in Alfred's history rightly to appreciate the character of the enemy with whom he had to contend; for it has been grossly misrepresented by the monastic writers, and consequently Alfred's merit lowered much below its true standard. We can only do justice to Alfred by bearing in mind that he had to defend his dominions against the incessant attacks of the most accomplished warriors of the age, in which he displayed such skill, perseverance, bravery, and prudence, as must secure to him a high place among military commanders.

Frequent as foreign invasions had been during the reign of Ethelwolfe, as well as during the two subsequent reigns of Ethelbald and Ethelbert, they became particularly formidable at the commencement of the reign of Ethered, (866,) when Alfred was eighteen years of age. At this early period Alfred seems to have been his brother's most valuable general. In this year the foreign army invaded East Anglia, but after obtaining horses from the inhabitants, they made peace with them, and committed no further depredations. The year following they sailed up the Humber to York, and took that city after a bloody battle with the Northumbrians, in which the two rival kings, Osbryht and Ella, who had united their forces against the invaders, were slain. In 868 the invaders marched on to Nottingham in Mercia, when the Mercians besought Ethered and Alfred to come to their assistance; the brothers instantly marched with the West Saxon army, but after a skirmish with the foreigners the Mercians chose to treat with them. During the two following years the exploits of the invaders were confined to Northumbria and East-Anglia; they killed Edmund, the king of the latter, in a bloody battle; in the former they plundered a wealthy monastery called *Medeshamstede*, (now Peterborough,) and slew the abbot and all the monks.

In 871 the foreigners invaded the kingdom of the West Saxons, and in this one year, besides many minor battles which Alfred fought at the head of small bands, there took place altogether *nine* great battles between the invaders and the West Saxons. At Inglefield the latter were victorious, at Reading the former; at Æscesdune (Aston or Ashendon) the West Saxons gained a great victory against the kings Bagsæc and Healfdene, of whom they slew the former, along with five earls. This victory must be mainly considered as Alfred's. He bravely attacked the enemy, while Ethered, on his side, deferred the engagement for the sake of hearing mass. A fortnight after this battle the West Saxons were in their turn defeated at Basing, and two months later also at Mereton, where the bishop Heamund was slain. Ethered died shortly after Easter in this year, and Alfred succeeded to the crown, being twenty-three years of age. A month after his accession, though his forces were greatly reduced, he was with a very small army compelled to a general engagement at Wilton with the whole army of the invaders: in the earlier part of the day he routed the enemy, who, however, being much superior in numbers, at last kept the field. After this victory, no further encroachment on Alfred's territory seems to have followed immediately. It may be supposed that the bloody victory of Wilton had so much weakened the invaders, that they for a time abstained from offensive warfare against the most valiant as well as most powerful of the Saxon princes: but still they remained in England, and during the three following years consolidated and recruited their power by more successful wars against other English rulers. In this interval they overran and occupied Mercia and Northumberland. After so many bloody battles Alfred's army was greatly reduced, and he was well aware that he could not now take the field with advantage. Still he was determined to leave nothing untried which might harass the enemy. The pressure of circumstances—the very inability to bring an effective army into the field—first suggested the idea, which ultimately proved so salutary, of fitting out a fleet.

For this true account of the origin of the English fleet it would be fruitless to look in any *History of England;* but an attentive reader of the *Saxon Chronicle* will nevertheless find it confirmed by the facts there stated. Extraordinary distress first suggested the idea of the 'wooden walls;' and it is remarkable, that Alfred, being placed in such embarrassing circumstances, became the first founder of that naval power which in subsequent ages was to be an object of the world's dread and admiration. Alfred perceived that he had great advantages in fitting out a small flotilla to act in known seas, and on a dangerous coast, (for most of the invaders landed between the Humber and the Thames,) against invaders ill-acquainted with its peculiar perils. This plan was much more practicable than to fit out an army capable of taking the field against a brave and numerous enemy. So important was this discovery to Alfred, that subsequently, when he was compelled to abscond for a short time, the perpetuation of his reign and the preservation of the West-Saxon monarchy were, in all probability, mainly owing to the existence of this small navy; for by its means alone he so far preserved possession of his kingdom, that it could be said that the invaders still had a fighting enemy within Alfred's domains.

Small as Alfred's fleet was in the beginning, in the first naval engagement his men attacked seven of the enemy's ships; of these they took one and the rest made their escape. Finding that regular battles were not the most advantageous warfare against a leader such as Alfred, the invaders changed their plan; they entered his fortresses by night, and there determined to risk an attack. In 876 they stole into Wareham, but Alfred found means to drive them out, and even obtained hostages as a guarantee that they would immediately leave his kingdom: yet a part of their army soon after entered Exeter in a similar manner. Alfred pursued them to that city, and again bound them by solemn oaths and hostages to evacuate his dominions.

In the year 878, shortly after Epiphany, the invaders entered Chippenham and took possession of it. About this time they must have received considerable reinforcements, although contemporary writers do not mention such a fact; but that Alfred *now* no longer had an effective army, appears manifest, from the expedients and fruitless negotiations to which he was driven. This greatly encouraged his enemies. They now spread over the whole kingdom of the

West Saxons; and for a very short time accomplished a despotic military occupation. Many of the inhabitants fled their country, and sought more peaceable abodes beyond sea. Alfred, with a small troop, was obliged to conceal himself in woods and mountain fastnesses. Neotus, and, after him, Asser, says that he for a time sought refuge with one of his cowherds; who, it seems, so faithfully kept his master's secret, that he did not even tell his wife that the king was their guest. One day, while sitting near the fire pointing arrows and making a bow, she had set him to turn some cakes which she left on the fire: owing to Alfred's neglect the cakes were burned, for which she chid him, saying, that he was 'good at eating cakes, but bad at turning.' Alfred passed the time from Christmas to Easter in a state of concealment and destitution; even in these circumstances he was not entirely inactive, but secretly maintained a kind of correspondence with the most devoted and faithful of his adherents. A foreign chief who during this winter had with twenty-three ships invaded Devonshire, was slain with 840 men, and his standard, called the 'Raven,' was taken. It is extremely difficult to determine how far Alfred was concerned in, or connected with this exploit, but it certainly was performed by his party.

About Easter, Alfred with a few of his friends took possession of a small island situated in the midst of a marsh formed by the stagnating waters of the Tone and Parret in Somersetshire. This island the Saxons, probably from the circumstance here mentioned, called Æthelinga-igge; its modern name is Athelney. This inaccessible place he made still stronger by fortification; and from thence, assisted by his neighbours in Somersetshire, he made frequent excursions against the foreigners, and at Whitsuntide again took the field at the head of a considerable army. At a place to the east of Selwood, called Ecgbyrtes-stane (perhaps Brixton), he was cordially received by the people of Somersetshire, Wiltshire, and Hampshire, and from thence he immediately marched by night to Æthandune (Eddington): here he fought a great battle with the whole foreign army, routed them and pursued them to a strong hold, which he besieged during a fortnight. The invaders capitulated; and Alfred once more accepted four hostages and their solemn oath that they would leave his territory and receive baptism. This last article in the treaty Alfred insisted upon, not so much from zeal for conversion as from fear, which repeated experience had shown to be well grounded, that the difference of religion would make such oaths as he prescribed of no effect. Accordingly the king, Godrun, and thirty chiefs of his army, were baptized at *Alre*, (Auler,) a place near Athelney; Alfred stood godfather on this occasion, and gave to Godrun the name of Athelstane. Godrun remained twelve days with the king, and when, in order to undergo the ceremony of removing the baptismal chrism (*i. e.* unction) at Wedmore, he left him, he was honoured with magnificent presents. On this, as well as on many other occasions, we may admire in Alfred the rare union of fortitude and moderation, of unshaken firmness and ready forgiveness; which in this instance proved salutary, for Godrun ever after continued his faithful friend and vassal.

During the four following years (879—882) a new swarm of invaders overran several parts of Mercia and East Anglia; but after the victory of Eddington we find Alfred's power, both by land and sea, gradually increasing. In 882 he fought a naval battle, and took four ships from the enemy. In another battle, in 885, he took sixteen ships. He also obtained several victories by land, one, for example, very decisive, at Rochester. Thus, owing to his activity, bravery, perseverance, and success, in 886 he became, by common consent, sovereign of all England; excepting those parts of the north and east of which the foreigners still retained possession. Their tenure had now, however, become exceedingly precarious. Yet there is no record of any solemn formality gone through, or universal homage done to Alfred on this occasion, and probably such did not take place; his title was stronger and better than what could have been thus conferred, for he enjoyed the unbounded confidence of those who acknowledged him as a ruler: they needed his protection more than he needed their submission. A few years interval of peace now followed, which Alfred employed in the most laudable manner: he rebuilt and repeopled many cities which had been utterly ruined during the war: London, in particular, he thoroughly repaired, and appointed the *Ealdorman* (Duke) Ethered to be its governor. The many admirable civil institutions, laws, and improvements of which Alfred was the author must be assigned to this period, 886—893.

Alfred was not only the first statesman and legislator, but he was also the first scholar in his dominions; this twofold character he supported with astonishing ability. We must admit that it is by no means Asser's intention to magnify Alfred's scholarship, but even from his memoirs we may, in spite of their author, gather the fact, that Alfred vastly exceeded even the most learned of his prelates in scholarlike accomplishments. Asser's simplicity and credulity are somewhat ridiculously manifested in the account he gives of, what he conceived to be, Alfred's first attempt at reading and translating, which the bishop evidently held to be miraculous.

A more formidable invasion than any of those which he had repelled, yet awaited Alfred. The *Saxon Chronicle* commences the recital of events of the year 893 with an unusually solemn and ominous preamble, and calls the invading army 'SE MICELA HERE' (the great army). This army embarked, bringing their horses with them, at Boulogne, and landed in Kent with 250 sail, in the mouth of a river now dry, anciently called Limine, (near New Romney,) at the eastward of the Weald. They towed their ships four miles up the river, towards the wood, and there occupied a fortress, situated in a marsh, which was ill defended by a few villagers; from thence they marched on to Appledore. In a short time Hæsten (Norse, Hásteinn) arrived in the mouth of the Thames with eighty ships, and, taking Milton, erected there a fortification. He seems to have been commander-in-chief of the army conveyed in both these fleets. These invaders commenced offensive operations in the following year, and were now joined by the East Anglians and Northumbrians, who broke their allegiance to Alfred. Various causes are assigned for this defection, such as the absence of a governor (for Godrun died in 890); the predatory propensities of the inhabitants, a great number of whom were probably foreigners, who had settled there after their late conquest; and the allurement of Hæsten's fame, who enjoyed the reputation of an eminent leader. The first of these causes is the most probable; and we may add, that a natural bias in favour of those who spoke the same language, and whose laws, manners, and religion were similar to their own, was likely to recommend an alliance with Hæsten to the East Anglians and Northumbrians. But although this double attack from an internal and external foe, at the same time, was most formidable, Alfred was well prepared; and, on this occasion, his high military talents were conspicuously displayed. He neither sought nor avoided a general engagement; but was particularly circumspect in the choice of his position, and pitched his camp in a place where the advantages afforded by wood and water were all in his favour. He kept the enemy in such awe that they chose not to hazard a general engagement more than twice; once, on their first landing, and before Alfred had taken the field with his whole army; and the second time when they left their camp. During the whole time of their stay, they confined themselves to skirmishes, and predatory excursions in small bands; but were generally beaten, either by detachments of the king's army, or by the inhabitants of the towns. Still they had obtained a considerable quantity of booty, and, leaving their camp, attempted to transport it over the Thames, into East Anglia, where their ships were stationed; but the king's army defeated them, and rescued the booty. The invaders, however, remained in a strong position; and the foreigners who had settled in Northumberland and East Anglia gathered a fleet of 100 ships, with which they laid siege to Exeter, and another of forty ships, with which they invaded Devonshire. The king, accordingly, with the main body of his army, marched to Exeter, leaving only a detachment of chosen troops to prosecute the war in Essex. Victory followed his arms in both places: the detachment which he had left in Essex pursued the enemy to Bemfleet, to which place they retreated, it having been fortified by Hæsten. Hæsten being absent, but the place full of warriors, the king's troops besieged it, demolished the fortifications, took every thing of value which they found, captured Hæsten's wife and his two sons, disabled some of the enemy's ships, burnt others, and brought several away either to London or to Rochester. Hæsten's wife and sons, when conducted to Alfred, were instantly released. In victory, Alfred's memory always suggested motives for mercy—never for revenge; and this time he recollected that he had been a godfather to one of

Hæsten's sons, and the Duke Ethered to the other. He dismissed them, not only unhurt, but (respecting their rank in a manner agreeable to the spirit of the times) even honoured with presents. As soon as Alfred with his troops reached Exeter, the enemy retreated to their ships; but, while he was occupied in Devonshire, two main divisions of the invaders united at South Showbury, in Essex, and there erected a fortification. From thence they marched along the Thames and so on to the Severn, and then following the course of that river up to Buttington, were joined by many Northumbrians and East Anglians on their march. Here they were besieged by three of Alfred's chiefs, the Dukes Ethered, Ethelm, and Ethelnoth: the siege continued many weeks; the enemy were brought to the greatest distress by famine, and at last had nearly eaten up all their horses. At length they made a sally on the besiegers, who occupied the eastern bank of the river, but were defeated by the English, who however lost in this battle several officers and men of rank. A part of the enemy saved themselves by flight. Once more they gathered a considerable army out of Northumberland and East Anglia, and assembled at Wirhall, (West Chester,) where they were again besieged; and only left the place when all the supply of provisions around it was consumed or destroyed. They then marched into North Wales, and plundered the country; and from thence over Northumberland and East Anglia, to Mersey. Here they made no long stay, for, in the beginning of winter, they entered the Thames with their ships, which they towed up along that river and the Lea. On the latter stream, about twenty miles from London, they erected a fortification. In the mean time, those whom Alfred had driven away from Exeter had returned to Sussex, and plundered the country about Chichester; the inhabitants of that town attacked them, slaughtered many hundreds, and took some of their ships. The citizens of London marched out against those on the Lea, attempting to dislodge them and demolish their fortification, but were this time defeated (896). During the autumn Alfred had his camp pitched in the neighbourhood of London, in order to protect the reapers while engaged in the harvest.

By the erection of fortresses, coupled with his great vigilance and activity, he compelled his enemies to retreat upon the Severn. In the years 895-897, a severe pestilence raged in England, both among men and cattle; this calamity greatly checked Alfred's military operations.

In 897, the invaders overran Northumberland and East Anglia; and in the same year Alfred had to contend with an enemy of a new description. Some Northumbrian pirates (Spelman says their captain's name was *Sigefert*) fitted out vessels for stealing and robbing along the south coast of England. Alfred ordered vessels to be built exceeding these in length, height, and swiftness; some of them carried sixty oars, and some more: they differed in make from other ships at that time used in the North Sea, and were particularly fit for the service for which they were destined. Near the Isle of Wight a naval engagement took place between the king's ships and the pirates, in which a great number of the latter were killed, and others, who with difficulty had escaped, were afterwards taken and hanged at Winchester. English historians seem not to be aware of any distinction between these pirates and the foreigners who devastated the country during Alfred's reign: yet Alfred's proceeding, as well as the words 'mid *stælhergum*' used in the Saxon Chronicle, show that the age considered the difference between these and the former as very great. When captive warriors were brought to Alfred, he treated them with every mark of respect and dismissed them loaded with presents; but pirates he condemned to ignominious death.

During the two last years of his reign Alfred seems to have enjoyed some tranquillity. He died on the 27th of October, 901, being fifty-two years of age, and having reigned twenty-nine years and six months.

Thus far goes the chronicle of Alfred's reign, or the bare recital of public events in which he acted, for the most part as a leader, and where he always, in respect to talent, knowledge, policy, and character, maintains a lofty supremacy over his contemporaries. Yet we may say that only the less important part of Alfred's history has been handed down to us. The age in which he lived paid almost an exclusive attention to military exploits; the arts of peace were disregarded and held in small esteem, unless, indeed, they were brought to bear upon religious establishments. Thus we find more information respecting monasteries founded, or erected, or repaired by Alfred, such as one at Athelney, another at Shaftesbury, and a third at Winchester, than the towns and castles, which, at his command, and under his direction, were rebuilt and repaired. Yet it is certain that London came into his possession in a ruinous state, and that, in rebuilding a great part of it, he introduced the use of stone and brick; wood being the only material used before his time. He also rebuilt Winchester and many other cities. The most glorious achievement of Alfred's reign, however, was the establishment of a navy. The idea of shipbuilding once conceived, it appears that it was prosecuted with astonishing vigour: he was also encouraged to further exertion by the success which attended his flag on almost every occasion. He was not content to multiply the number of such ships as formerly had been in use; but he introduced also material improvements into naval architecture: 'His ships were not,' says the Saxon Chronicle, 'like the Danish or Frisian ships,' that is to say, they were not like those ships which till that time had been thought the best of those used in the German Ocean; and from the results we may justly infer that Alfred's ships were better. It seems that even in Alfred's time his fleet had so rapidly increased, that it considerably exceeded the number of one hundred sail: it was divided into small squadrons, and stationed in different places off the coast.

Alfred accomplished a task of extraordinary difficulty in the consolidation of his dominions. When he succeeded to the sovereignty of the West Saxons, Mercia, East Anglia, and Northumberland still existed as independent kingdoms. The rulers of these, although in an equal degree exposed to the ravages and depredations of a common enemy, had not the prudence or policy to see the advantage of a uniform co-operative plan of defence, and accordingly they were crushed and conquered in detail. The West Saxons alone were ready, when called upon, to defend England: their views were not merely confined to their coasts and boundaries; thus the *Hegemonia* (Leadership) naturally and spontaneously fell into their hands: they became the English Athenians, and Alfred their Themistocles. It was Alfred's object to regenerate the whole Anglo-Saxon nation, and to create a new national spirit; and this, we find, he effected not ostentatiously, but by unwearied political activity: he was in reality the King, the Liberator, the Reformer of all England. He was, however, quite content to be called KING OF THE WEST SAXONS; and probably deemed it childish to provoke disputes by the assumption of an empty title, while at the same time he incessantly laboured, by the most laudable means, to render his title the strongest and best that ever was earned by any sovereign.

Alfred compiled a code of laws for his subjects; but whether any part of these has been preserved, or how much of them is embodied in subsequent codes, cannot now be determined. For the twofold purpose of more effectually administering justice, and at the same time better controlling and keeping in check a turbulent population, now partly consisting of newly settled foreigners, Alfred instituted a census, and divided England into counties: the counties he again subdivided into hundreds, and the hundreds into tithings. Ten neighbouring householders were formed into one corporation, called tithing or freebourgh, who were made answerable for each other's conduct, and over whom a tithingman or headbourgh was appointed to preside. If a person neglected to have himself registered in a tithing he was punished as an outlaw: change of residence required to be notified to the tithingman. The tithings had jurisdiction and adjusted minor differences among themselves; weightier causes were referred to the court leets of the hundred, which were held monthly, and where the vice courts or hundreds judged along with twelve freeholders as assessors or jurors. From this court, again, an appeal lay to the county court, which was held after Michaelmas and Easter, and consisted of the freeholders of the county. Here the bishop presided together with the aldermen. The last appeal lay to the king in council. In what state Alfred found the judicial department, when he began to reform it, may be judged from the fact, that in one year he ordered *forty-four* judges to be executed. 'Le Roy Alfred fist pendre xliv justices en un an tout come homicides, par leur faux judgments.' Asser mentions that he frequently reprimanded the judges for wrong judgments.

In estimating the merits of Alfred as an author and a scholar, we are less astonished at the vast extent of his knowledge, and even at his literary activity, than at the good taste evinced, both in the choice which he made of books for translating, and in the execution of his translations. His diction is classically easy and simple, yet not unadorned. Spelman has furnished the following list of his original works:—

1. An Abridgment of the Laws of the Trojans, the Greeks, the Britons, the Saxons, and the Danes; 2. Laws of the West Saxons; 3. Institutes; 4. A Book against unjust Judges; 5. Sayings of the Wise; 6. A Book on the Fortunes of Kings; 7. Parables and Jokes; 8. Acts of Magistrates; 9. Collection of Chronicles; 10. Manuale of Meditations. And the following of translations:—1. Paulus Orosius's History against the Pagans, six books;[*] 2. St. Gregory's Pastorale; 3. St. Gregory's Dialogues; 4. Bede's History, five books; 5. Boetius on the Consolation of Philosophy; 6. The *Merchen-Lage* (Laws of the Mercians); 7. Asser's Sentences; 8. The Psalms of David. Alfred was an elegant poet, but his compositions in verse are not mentioned here.

Alfred made greater efforts for the advancement of knowledge among his subjects than any prince of the ninth century—even more than Charlemagne. Here, indeed, it would be difficult to find a rival to him among princes of any age or country. His own description of the state in which he found the kingdom, in respect of literary culture, is interesting; and his feeling of his own merits in effecting a change for the better, modestly expressed as it is, is equally so. We read in his circular letter which is prefixed to his translation of 'St. Gregory's Pastorale,' as follows:—'It (knowledge) had fallen in such total decay among the English, that there were very few on the other side of the Humber who understood the common prayers, so as to be able to tell their meaning in English, or who could have translated into that language a Latin passage; and I ween there were not many on this side of Humber who could do so. Indeed there were so few such, that I do not even recollect one to the south of the Thames, at the time I succeeded to the crown. God Almighty be thanked, there are now some holding bishoprics who are capable of teaching.' He invited many eminent scholars from other countries, and corresponded with Bishop *Fulco* of Rheims, whose agency he made use of for engaging scholars in his service. In this way were invited Grimbaldus, Werefrid, Asser, and John the Monk; John Scotus, when exiled from France, being suspected of heresy, found a ready asylum with Alfred. But this king was not an exclusive patron of mere theoretical knowledge; he also encouraged the useful arts, and always gave a favourable reception to mechanics of superior skill.

The common notion that Alfred founded the University of Oxford, is, indeed, unsupported by contemporary testimony: it appears more probable that a monastic school existed there before this time. It is, however, certain that he did much for its improvement; provided the school with better teachers than it had before; and when differences arose among them, went thither in person for the purpose of re-establishing order and harmony. It is a prominent trait in Alfred's character, that his mind was ever open to instruction on any subject: he entertained voyagers and travellers, in order to gather information respecting coasts and countries in his age unknown: this may be exemplified by Other's and Wulfstane's Tour.[†]

Having so many and multifarious occupations, it behoved Alfred to husband his time; being eminently religious, he divided it into three equal parts, allotting one to prayer and pious exercises, the second to business, and the third to sleep and refreshment. He found that sun-dials, which he no doubt had seen in Italy and France, were less useful in England, where the sun is more frequently obscured. He had, therefore, to choose a more certain expedient; and accordingly he had wax-candles made with marks for the hours, and placed in lanterns that they might burn steadily and equally; these he burned night and day, and by the marks in his candles could always tell what o'clock it was.

In outward appearance Alfred was remarkably handsome and graceful, tall, stout, well made, and active, fond of hunting and other bodily exercises, and skilful in mechanical arts; yet he did not enjoy good health. From his early youth he suffered an excruciating inward pain: about his twentieth year a change took place in his malady; but still he suffered severe pain during the remainder of his life. In his twentieth year Alfred had married Alswith, a daughter of Athelred, Earl of Gainesborough, surnamed the Great, and of Adburgh, who was descended from the kings of Mercia. Alswith survived her husband four years. They had two sons:—1. Edward, surnamed the Elder, who succeeded his father, and 2. Ethelward; and three daughters:—1. Athelfled, who married Athelred, a Mercian Earl. This lady inherited much of her father's extraordinary endowments; 2. Athelgeova, who became Abbess of Shaftesbury; and 3. Alfrith, who married Baldwin, Earl of Flanders.

Sources for Alfred's Biography.—The Saxon Chronicle; Asseris Menevensis *Annales Rerum Gestarum Ælfredi;* Matthæi Westmonasteriensis *Flores Historiarum;* Florentii Wigorniensis *Chronicon ex Chronicis;* Gulielmi Malmesburiensis *De Gestis Regum Anglorum, Libri* V.: Ingulphi *Historia Anglorum;* two MS. Lives of St. Neot in the Cotton Library, the one in Saxon, Vespasian, D. 14, the other in Latin, Julius, E. 7.; Spelmanni *Vita Ælfredi,* Oxon, 1678, fol., Sharon Turner's *History of the Anglo-Saxons.*

ALFRETON, a town in Derbyshire, 14 miles N.N.E. of Derby, and 140 N.N.W. of London. The whole parish contained a population in 1831 of 5691. The inhabitants are engaged in the manufacture of stockings and brown earthenware; or in the neighbouring collieries. At Riddings, within a short distance of Alfreton, are some considerable iron-works, the property of Mr. James Okes, which, in the excellence of their arrangements, and the skill with which they are conducted, are inferior to none in the country. The houses of Alfreton are irregularly built, and some of them very old; the church, a rude, ancient structure, has an embattled tower with pinnacles. At Swanwick, a hamlet in the parish, is a free-school for educating twelve boys and eight girls of Swanwick and Greenhill Lane, endowed in 1740, by a Mrs. Turner.

There is a weekly market on Friday, chiefly for grain; and two fairs, one in July; the latter, a statute fair, in November. The living is a vicarage in the gift of the Morewood family.

ALGÆ is the name given by botanists to the tribe of plants which comprehends the sea-weeds, lavers, and fresh-water submersed species of similar habits. In structure they vary through a vast variety of intermediate gradations from the state of simple microscopic vesicles, to branched woody individuals many fathoms in length. Some of them are only visible to the naked eye when they are collected in heaps; of this nature is the green and red slime that we find in damp walks, at the bottom of shaded walls, and in similar situations; others grow together in the beds of the ocean, and when they rise to the surface form floating banks of such extent as to impede the course of ships; of this kind are the Chorda filum, or *sea cat-gut,* of Orkney, meadows of which have been seen in Scalpa bay, and the *gulf-weed* of navigators, which, according to Humboldt, being carried by the Gulf stream, forms two banks in the great basin of the Northern Atlantic ocean, one of which stretches over 11° of latitude, and the other over 4°.

The genera may be conveniently divided into three sections, *jointless, jointed,* and *disjointed;* of each of which we shall give a few illustrations.

1. *Jointless Algæ.*—These constitute the great mass of the order; they comprehend all the broad membrane-like sea and fresh-water species, as well as the large and tough tangles and dulses so common on our coasts. Their structure is extremely simple, consisting of roundish cellules, either adhering firmly to each other, or connected by a mass of transparent gelatine. When the plants fructify, they either form little cases, in which reproductive grains are enclosed; or some part of their cells changes its appearance, acquires a deeper colour, and finally drops in pieces; or the whole mass of each individual seems, when ripe, to separate into particles capable of reproduction.

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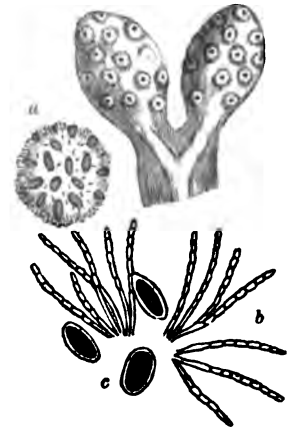
[*] This translation is, like some others of Alfred's, very free: whole chapters are omitted, but not such as contain valuable information; others are merely abridged; and in the first chapter of the first book, Alfred has inserted the Narrative of Other's and Wulfstane's Voyages. Orosins's seven books Alfred has condensed into six. Mr. Daines Barrington edited Alfred's Anglo-Saxon version of Orosius, with an English translation of Alfred's text. London, 1773. 8vo.

[†] But it is going too far to assert or insinuate, as some German authors have done after Spelman, that Alfred sent out an expedition to discover a north-east passage to India: such an opinion receives no countenance, either from Alfred's own works or from those of contemporary authors. Alfred, indeed, sent alms to India; at least, that has been asserted; but if he did so, he sent them as was then usual, over land.

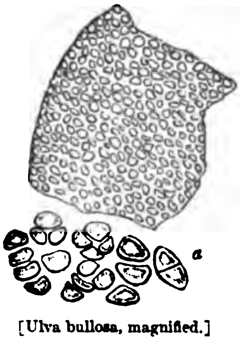
It is in this division of the order that all the useful species, and those of large dimensions, are to be found. All the kinds that are consumed in the important manufacture of *kelp* [See KELP]; the eatable sorts, which, in the state of birds'-nests, are collected in the islands of the Indian Archipelago and sold at a high price to the Chinese; those which we consume as laver; the species that afford vegetable glue; all those from which the important medicine called *Iodine* is obtained; and finally the principal part of what our farmers use for manure, belong to the great tribe of *jointless Algæ;* of which 55 genera and about 160 species are known as natives of the coasts or ditches of Great Britain.

Of all the species, that which is the most common is the *Fucus vesiculosus*, a plant of which great quantities are cast upon our coast, and which is known by its strap-shaped, olive-green, forked divisions, having little yellowish oval uneven pods at their points, and by the crackling noise it makes when trodden upon; a circumstance which is owing to its stems having a considerable number of air bladders, by means of which it floats. The structure of the pods is highly curious. Externally they consist of a hard rind, covered with tumours, each of which has a little hole in its centre. Internally they contain a soft mucous substance, in which lie, next the rind and immediately below its tumours, a number of round balls (*a*). These little balls are composed of jointed threads (*b*), which hold together a great many little oval grains (*c*) enveloped in a sort of jelly. These grains are the means the species has of propagating itself, and when ripe they are discharged through the holes in the tumours above described.



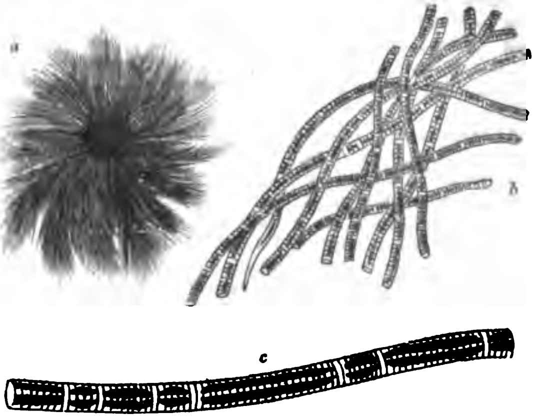
[Fucus vesiculosus.]

Another extremely common kind, *Ulva bullosa*, is found floating in ditches and in stagnant pools, where it rises to the surface in green, blistered, slimy patches, which, to the naked eye, are merely a thin membrane of the most uniform texture. But if microscopically examined, this is an object of no common beauty; it seems as if composed of little green balls (*a*), about as big as the particles in the human blood, having no sort of adhesion with each other, but holding together by a transparent thin jelly. It is by these little green balls, or by the matter they contain, that the ulva is propagated. The common *Laver* of the shops is very nearly the same thing, but is a marine species.



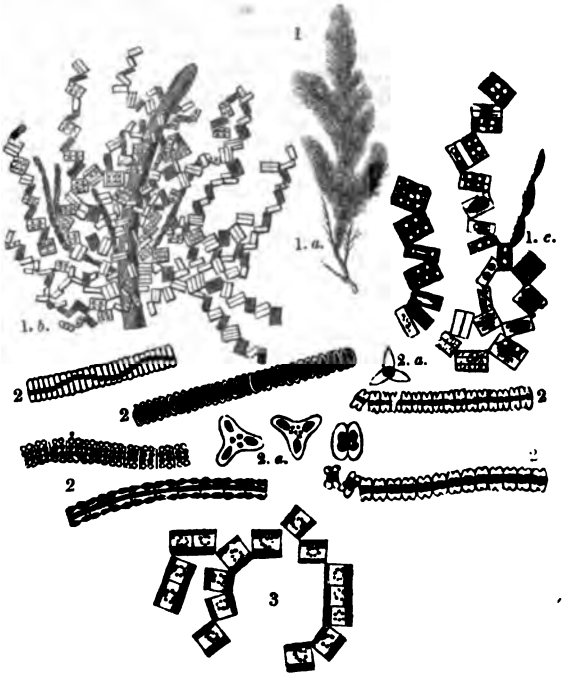
[Ulva bullosa, magnified.]

2. *Jointed Algæ.*—To this section belong the greater number of freshwater species, and many of marine station. The jointed Algæ are commonly called *Confervæ*, and are instantly recognised by their having thread-like tubes, the joints of which differ in length and in the manner in which their contents are arranged. An endless variety of these little plants may be found in ditches and running streams; and their structure is not less interesting than simple. As far as we know, they multiply by means of little granules contained in their tubes; and they grow by the addition of one tube to the end of another. They never have the tubes collected into bundles, but are always thus simply constructed. The most remarkable among them are the *Zygnema* and *Oscillatoria*, both of which approach the animal kingdom, but in unequal degrees. The species of the latter genus form dark green or purple slimy patches, in damp places, or in water, and are exceedingly remarkable for a power they possess of moving spontaneously; when in an active state their tubes are seen to unite and twist about just as if they were vegetable worms, but they grow like plants, and their manner of increase is altogether vegetable; yet they possess several of the chemical characters of animal matter, and when burnt yield a carbon of the most fetid odour, exactly resembling that of decaying animal substances.



[Oscillatoria distorta. *a*, natural size; *b*, *c*, magnified.]

3. *Disjointed Algæ.*—At this point we have reached the organic limits of the animal and vegetable kingdom. Disjointed Algæ are characterized, by their original or final spontaneous separation, into distinct fragments, which have a common origin but an individual life. They may be compared to animals living in society, and only dispersing when the necessity of multiplying their race obliges them to do so.



1. Diatoma vulgaris; *a*, natural size; *b*, *c*, magnified.
2. Diatoma Swartzii, magnified; *a*, end view.
3. Fragillaria unipunctata, magnified.

It is upon the stems of other plants, immersed in water, or floating in pools and ditches, that these curious productions are met with; in their habits they are so paradoxical, that naturalists are far from agreed as to whether they are not really minute animals, but their mode of growth seems to compel one to answer such a question in the negative. At the same time it must be confessed that the stories which are told of them by observers deserving of credit, are such as to shake our confidence in spontaneous motion from place to place being a positive test of animal or vegetable nature.

Among confervæ, in ditches, are often found little microscopic fragments of organized bodies, some resembling ribands, and separating into numberless narrow transverse portions; others dividing partially at their articulations but adhering at their angles, like chains of square transparent cases. These are disjointed algæ. When combined they are motionless, with all the appearance of confervæ, and their joints are filled with the green reproductive matter of such plants; but when they disarticulate, their separate portions have a distinct sliding or starting motion. The foregoing wood-cuts represent some of these curious productions.

ALGAROTTI (FRANCESCO), was born at Venice in 1712. His father was a wealthy merchant. He studied at Rome and Bologna, in which latter place he had for instructors Eustachio Manfredi and Francesco Zanotti, who afterwards continued his friends and correspondents. Algarotti made great progress in the study of languages, the mathematics, astronomy, and anatomy. Being at Paris at the age of twenty-one, he there wrote his *Neutonianismo per le Dame*, or explanation of the system of Newton, adapted to the taste and understanding of female students. This is still considered as his best work. He next proceeded to London, whence he accompanied Lord Baltimore to Petersburgh. He gave an account of this journey in his *Letters on Russia*, a country then comparatively little known. From Russia he went to Germany, where he became acquainted with Frederic, then Crown Prince of Prussia, who was living in philosophical retirement at Rheinsberg. The prince was so much pleased with his society, that four days after his accession to the throne, he wrote to Algarotti, who was then in England, inviting him in the most pressing manner to come to Berlin. Algarotti accepted the invitation, and remained afterwards in the Prussian capital or at Potsdam the greater part of his life, not as a servile courtier, but as the friend and confidant of Frederic. The king gave him the title of count, made him his chamberlain, and employed him occasionally in diplomatic affairs. He was also commissioned by the Elector of Saxony to collect objects of art throughout Italy for the gallery of Dresden. For five and twenty years from Algarotti's first acquaintance with Frederic to the moment of his death, their mutual friendship and confidence were never interrupted. Towards the latter part of his life, Algarotti, finding the climate of Prussia too cold for his declining health, returned to Italy, where he lived first in his own house at Venice, afterwards at Bologna, among his literary friends, and lastly at Pisa, where the mildness of the air induced him to remain, as he was evidently sinking under consumption of the lungs. There he corrected the edition of his works then publishing at Leghorn; the study of the fine arts and music filled up the remainder of his time. In this calm retirement he waited for death, which came on the 3d of May, 1764, in his fifty-second year. Frederic, to whom Algarotti in his will had bequeathed a fine painting, ordered a monument to be raised to him in the Campo Santo, or great cemetery of Pisa, where it is to be seen. It is asserted by Ugoni, in his biography of Algarotti, that Frederic forgot to pay Count Bonomo the expense of this mausoleum. Algarotti was an honorary member of many universities and academies of Italy, Germany, and England. He was the friend and correspondent of most of the literary men and women of his time, among others, of Voltaire, Maupertuis, Metastasio, Bettinelli, Lord Chesterfield, Lady Wortley Montague, Madame du Bocage, &c. Besides the two works above mentioned he wrote *Letters on Painting*, in which he has described several frescoes which are now lost; he also wrote a number of essays on various subjects. His works have been swelled by the insertion of his extensive correspondence into seventeen volumes, octavo, Venice 1791. Algarotti's style seldom rises above mediocrity; his chief merit is that of having rendered science and literature fashionable among the upper classes of his time and country. He was a man of much information and considerable taste, but of a cold imagination, and not profound in any particular branch of learning.

ALGARVE, the most southern of the six provinces forming the kingdom of Portugal. The Sierra of Monchique and Caldeiraõ separate it from Alentejo on the north, and the river Guadiana from Andalusia on the east. On the other two sides it is washed by the ocean. Its extent, from the Guadiana to Cape St. Vincent on the west, is eighty-seven geographical miles in a straight line. The breadth varies from thirty to sixteen. The census of 1798 gave the number of *fuegos* or houses at 25,523, from which, if we allow, with Antillon, five persons to each *fuego*, we have for that period a population of 127,615. The surface is calculated by the same writer to be 232 square leagues. These data give a proportion of 551 persons to the square league, or sixty-one to the square mile. But this population is not spread at all uniformly over the country. The mountains occupy more than two-thirds of the surface, and are but thinly inhabited, while the rich, but narrow slip along the coast, has a comparatively crowded population. Protected by its boundary of mountains from the cold winds of the north, Algarve produces the fig, almond, lemon, orange, olive, vine, and algarroba (*ceratonia edulis*), in the highest perfection; and there is little doubt that the climate would be found well suited to some of the tropical productions. On the other hand, the extent of sea coast, amounting to more than 120 miles, has given a maritime character to the inhabitants, who benefit largely by the periodical visits of the pilchard from the northern seas, and the tunny from the Mediterranean, the sea marshes near Castromarin on the Guadiana furnishing the requisite salt. These fisheries supply the navy of Portugal with her most valuable sailors. The province is divided into four *comarcas*, which take their names from the chief towns, Tavira, Faro, Lagos, and Silves, the three first of which lie upon the coast. At the mouth of the Guadiana, a little below Castromarin, there is a handsome town, St. Antonio de Arenilha, or Villa Real, which was built in 1774, by the orders of the Marquis de Pombal, at the expense of the richer inhabitants of the province. It was avowedly intended for the accommodation and encouragement of the fishermen, and a vast sum was spent upon it, but the position was so ill-suited for the purpose, that the despotic authority of the court could not induce the fishermen to abandon for it their former quarters upon the coast near Montegordo. Another object may have been to command the mouth of the Guadiana against the Spaniards. The whole province is under the ecclesiastical superintendence of a single bishop, who takes his title from it. The name Al-garve is derived from the Arabic language, and signifies *the west*. (Miñano, &c.)

ALGEBRA. This word is derived by contraction from the Arabic phrase *Al jebr e al mokābalah*, the nearest English translation of which is *restoration and reduction*. So short a definition is of course useless; we shall endeavour to give the first and most simple view of this science, our limits not permitting us to go, even in the smallest degree, into its operations.

In establishing the rules of arithmetic, it is always necessary to use general reasoning: that is, reasoning the nature of which would not be altered if other numbers had been chosen, different from those which were really employed in the question. For example: If 2 acres let for 13*l.* how much will 17 acres let for? It is shown immediately that the number of pounds required is that obtained by multiplying 13 and 17 together, and dividing the product by 2: and it appears moreover that by the same reasoning a similar rule might be established when the numbers are different from those given above, provided the form of the question remains the same. That is, if any number of acres we please to name, cost a certain number of pounds, the price of any other number of acres may be found by multiplying that other number by the number of pounds the first acres cost, and dividing by the number of the first-mentioned acres. Thus we have established a general rule, and the steps by which we translate this into an algebraical expression are as follows. We invent short signs to signify that multiplication and division are to take place: we express the former by putting × between the numbers which are to be multiplied together, the latter by writing the divisor under the dividend, and drawing a line between them. The foregoing rule then stands as follows:

$$\left.\begin{array}{c}\text{Price in pounds of}\\ \text{second No. of acres}\end{array}\right\}\text{ is }\frac{\text{Second No. of acres}\times\left\{\begin{array}{c}\text{Price in pounds of}\\ \text{first No. of acres}\end{array}\right\}}{\text{First No. of acres}}$$

So far we have abbreviated by using two *symbols of operation;* to which we may add that we write + between two numbers which are to be added together, and − between two numbers of which the second is to be taken away from the first. Now suppose that, to catch the eye, we put a letter whenever a number is named in the question, in order that by looking for that letter we may quickly find out in what part of the result the aforesaid number is used. For example: If a certain number of acres (a) cost a certain number of pounds (b), how many pounds will another number of acres cost (c)? The answer is, as above,

$$\frac{\text{Second No. of acres }(c)\times\left\{\begin{array}{c}\text{Price in pounds of}\\ \text{first No. of acres}\end{array}\right\}(b)}{\text{First No. of acres }(a)}$$

The last step is, to let the letters themselves stand for the several numbers: which will save the necessity of writing words in the result. Our final algebraical way of writing the question will then be—If a acres cost b pounds, how much will c acres cost? The answer is

$$\frac{c \times b}{a} \text{ pounds, usually written } \frac{cb}{a} \text{ pounds.}$$

To take another instance, which we first write algebraically: If a pounds of sugar, at m pence a pound, be mixed with b pounds of sugar, worth n pence a pound, the worth of a pound of the mixture is

$$\frac{ma + nb}{a + b} \text{ pence,}$$

which in the usual language cannot be stated more shortly than as follows:—To find the worth of a pound of mixed sugar, knowing how much of each sort was in the mixture, and how much each was worth per pound, multiply the number of pounds of each sort by the number of pence which a pound of it costs, add the products together, and divide by the whole number of pounds in the mixture.

This will be sufficient to give the reader an idea of the notation of algebra, and the very great abbreviation which it introduces into the details of processes. For further explanations, see ADDITION, &c., POSITIVE, NEGATIVE, EQUALITY, EXPONENT, INDEX, POWER, ROOT, and the article NOTATION.

We have said nothing of the reasoning of algebra, because it differs in no respect from that of arithmetic, or any other science, at least in the elementary part. It proceeds upon such fundamental and self-evident principles as the following:—that two equal numbers remain equal when the same number has been added to or subtracted from them, or when they have been both multiplied or both divided by the same number—that no number is altered by the addition of any number followed by the subtraction of the same, or by being multiplied by any number, if the product be afterwards divided by the same number; and so on. To take a very simple case, suppose we ask, What number is that, which multiplied by 3 and the product increased by 6, gives 30? Without knowing the number, we can see that if three times the number, together with 6, gives 30, three times the number must be 24, or the number required must be the third part of 24, or 8. The algebraical method of expressing this is as follows, where = means that the numbers between which it is placed are the same.

Let x stand for the number; then by the question

$$\begin{aligned} 3x + 6 &= 30 \\ \text{Therefore } 3x &= 30 - 6 = 24 \\ \text{or} \quad x &= \frac{24}{3} = 8 \end{aligned}$$

We give the preceding, not as a specimen of the advantages of algebra, but of its language only, for we have purposely chosen such a question as needs no assistance, in order to make the method of expression more evident. [See AXIOM, EQUATION, PROBLEM.]

The operations of algebra are to be considered in a very different light from those of arithmetic. In the latter science, absolute numbers are given, and an absolute number is sought: in the former, it is rather the nature of the question which is given, and it is required to find, not so much the answer to any particular case, as a general method of solving any case whatever. The symbols used are not numbers, but *general* representations of them, that is letters, each of which may stand for any number we please, provided that it keeps the same meaning throughout the question. Hence in what are called addition, multiplication, &c., of algebraical quantities, we do not ask, 'What *number* does this multiplication give,' but 'what *set of operations* are equivalent to, and, if we please, may supply the place of, this multiplication?' For example, suppose it occurs in a question that one number is to be added to, as well as subtracted from, another, and that the two results are to be multiplied together. Let a and b stand for the two numbers, of which let a be the greater. So long as we use *general* symbols, that is, so long as we do not assign some particular numbers, which a and b are to signify, we cannot perform the above operations, but can only indicate them by the marks above mentioned; for example, $a + b$ stands for the sum of a and b, $a - b$ for the difference, and

$$(a + b) \times (a - b)$$

for the product of this sum and difference. So far we need nothing more to tell us what to do, as soon as a and b shall have their values assigned to them: for instance, if a be 7, and b be 3, $a + b$ is 10, $a - b$ is 4, and the above product is 10 × 4, or 40. But, in the meanwhile, we see in the above a sort of double operation: there is inside each pair of brackets something to be done, while the results of the brackets themselves are connected by a further process. It is asked then, what simple processes will supply the place of the preceding, so that whatever numbers a and b may stand for, the product of this sum and difference may be obtained from them? The answer to this is obtained by the process of algebraic *multiplication*, and proves to be $a\,a - b\,b$, or b multiplied by itself, and the result subtracted from a multiplied by itself. In the preceding example, this is $7 \times 7 - 3 \times 3$, or $49 - 9$, or 40, as before. For details of various operations, see the general heads already quoted, and BINOMIAL THEOREM, DEVELOPEMENT, SERIES.

The earliest treatise on algebra of which we can fix the date within two centuries is that of Diophantus, an Alexandrian Greek, who lived certainly before the middle of the fourth century after Christ, and perhaps so early as the middle of the second. It is very unlike a modern treatise on algebra, being entirely destitute of general symbols, and consisting altogether of a species of problems which have since received the name of *Diophantine*, in which it is required to solve certain questions, the answers to which shall be whole numbers only. It is so like the Hindoo algebra in its character, that it is impossible to suppose the two wholly unconnected. But as the Hindoo algebra is of a much higher cast than that of Diophantus, we are obliged to suppose, either that Diophantus obtained from the East a part of their knowledge, or that the Hindoos, setting out with the Greek algebra only, made considerable improvements after the fifth century. As the Hindoo Algebra has been very much extolled by some, and more than proportionally cried down by others, we quote from Delambre, who is distinguished among the latter. 'The Hindoos had algebra of the first and second degrees; they knew how to solve indeterminate problems; and they made these acquisitions themselves; they are also the authors of the system of arithmetic now universally received by us.'—*Histoire de L'Astronomie Ancienne*, vol. i., p. 556. To these we might add many minor points, and also that, in the solution of indeterminate equations of the second degree, they had made as much progress as ever was made in Europe before the middle of the eighteenth century. We must refer those readers who are curious upon this subject to the preface of Mr. Colebrook's translation of the *Bija Ganita*, and to the history of algebra in the second volume of Dr. Hutton's *Mathematical Tracts*.

The Persians and Arabs confessedly derived their knowledge of the subject from the Hindoos. We do not, however, find that they proceeded as far as their masters: for the Arabic treatises, so far as we know, contain only the solution of equations of the first and second degree, and their application to various arithmetical questions, excluding all mention of indeterminate equations.

It was by means of the treatise of Mohammed Ben Musa, who lived in the time of the Caliph Al Mamun, that the science was introduced into Europe. A complete and able translation of this work, by Dr. Rosen, with the original Arabic, was published in 1831, by the Oriental Translation Fund.

Thus much of the science was introduced into Europe, or rather into Italy only, at the beginning of the thirteenth century, by Leonardo Bonacci of Pisa. Algebra lay dormant in Italy, without receiving any material improvement, till the middle of the sixteenth century, when it was introduced into Germany, France, and England, nearly about the same time by Stifelius, Peletarius, and Robert Recorde, respectively. The Hindoos, instead of using the letters of the alphabet, designated various unknown quantities by the names of different colours; the Persians and Arabs employed the word answering to 'thing' in their language for the unknown quantity, and the Italians adopted the word 'cosa' for the same purpose: hence algebra came to be called the *Regola de la Cosa* in Italy, and the *Cossike Art* in England. It is to be observed, however, that in no country, up to the time of Vieta, were letters used to signify anything but quantities sought; those *given* being always certain numbers, and never arbitrary representations of numbers in general. Hence the simple word '*thing*,' or any abbreviation of it, was sufficient for their purpose.

While algebra was being introduced into the various countries of Europe, the Italians began to make the first steps towards its improvement. The solution of an equation of the third degree was discovered by Cardan and Tartaglia; that of the fourth by Ferrari; while various other discoveries were made by Bombelli and Maurolico. We must refer the reader to the several lives of these mathematicians. Vieta, a Frenchman, who died in 1603, made the grand improvement of using letters to stand for known as well as unknown quantities, and with the additional power derived from this improvement, laid the first steps of the general theory of equations. In England, Harriot, who died in 1621, carried on and extended the discoveries of Vieta; and from the time of the two latter we must date the modern form of the science.

Our limits will not allow us even to name the crowd of discoverers who have extended this branch of pure mathematics since the time of Vieta. We must refer to the work of Hutton already cited, to Bonnycastle's translation of Bossut's *Histoire des Mathématiques*, or to the original work itself: to the preface of the mathematical part of the French Encyclopædia; or to the histories of Montucla and Cossali. The first and second are the most likely to fall in the way of the English reader.

The only necessary preliminary to the study of algebra is a good knowledge of the four rules of arithmetic, and of common and decimal fractions. Without so much it is impossible to read any work with profit; and in the want of it we must look for the reason why the science appears repulsively dry to most persons. On this subject, we refer the student to some remarks in page 59 of the treatise on the *Study of Mathematics* published by the Society.

ALGEBRAIC. An expression is said to be *algebraic*, as distinguished from *transcendental*, when its number of terms is finite, and when each term contains only addition, subtraction, multiplication, division, and extraction of roots, the exponents of which are given. Thus all infinite series, as well as expressions containing

$$\log x,\ a^x,\ \sin x,\ \cos x,\ \&c.,$$

though used in algebra, in the widest sense of the word, are improperly said to be not *algebraic*, but *transcendental*. Similarly, a curve is said to be *algebraic* when its equation (see Curve) contains no transcendental quantities.

ALGEBRAIC GEOMETRY. A name given to the application of algebra to the solution of geometrical problems. For the principal points of interest connected with it, see Abscissa, Ordinate, Co-ordinates, Curve, Curvature, Equation, Tangent.

ALGECIRAS, a maritime city of Spain, on the western side of the bay of Gibraltar, which is about seven miles across, but the distance by land from the fortress is seventeen miles. It contains an aqueduct, a dock-yard, and a citadel nearly in ruins. One of the most important articles of commerce is the coal found in the neighbouring mountains. There have been found here several Roman inscriptions and other antiquities. Population 9900. 36° 8′ N. lat., 5° 26′ W. long. Al-Geciras is an Arabic name, and signifies 'the Island.'

ALGECIRAS, or ALJEZIREH, 'the Island,' is the Arabic name of the ancient Mesopotamia.

ALGHERO or ALGERI, a town on the west coast of the island of Sardinia, in 40° 28′ north lat., and 8° 21′ east long., about fifteen miles south of Sassari.

The town was founded about the beginning of the twelfth century, and, in 1353, surrendered to the Aragonese. The citizens very soon revolted and overcame their conquerors, but were reduced to obedience in 1355, when the Sardinian and Genoese inhabitants were expelled by the Spaniards, and their places supplied with Catalans. Alghero was made a bishop's see in 1503, and five years after was fortified. It became a very favourite residence of Charles V. of Spain, who, following a custom then prevalent, gave to it the title of 'most faithful.'

The town stands on the shore, and is built in the form of a parallelogram, on a low rocky point, jutting out from a sandy beach. It is surrounded by stout walls, flanked with bastions and towers. The streets are narrow, but well paved and cleanly. There are two entrances through gates, one at the mole or landing place on the north, and the other at he ravelin in the land front.

Alghero contains twelve churches and convents, besides a spacious cathedral. The bishop is suffragan to the bishop of Sassari. The town also contains several public schools, the students in which are carried through a course of philosophical instruction. There are some fountains of pure water outside the town, but within, the inhabitants obtain their supply of this most necessary article by means of cisterns.

The country round is well cultivated and has a pleasing appearance. It produces abundance of wine of good quality, as well as butter, cheese, vegetables, and fruits. Tobacco has of late years become a profitable object of cultivation. The exports from the town consist of wine, tobacco, wool, skins, rags, anchovies, coral, and bones, which latter article is much in demand by the sugar refiners of Marseilles, who use animal charcoal in large quantities. The coral obtained at this part of the coast is the most highly esteemed of any in the Mediterranean sea for its quality.

The town stands in a spacious bay, formed on the north by the south point of Cape Caccia, and on the south by Cape Marargin. The anchorage within is good. The town contains 6700 inhabitants. [Smyth's *Sketch of the present State of Sardinia*; Malham's *Naval Gazetteer*.]

ALGIERS, the Regency of, one of the Barbary States, is bounded on the east by the Regency of Tunis, by the Empire of Morocco on the west, the great desert of Sahara on the south, and by the Mediterranean sea on the north. Its greatest length from the river Zayne on the Tunis frontier to Twunt on the western frontier, at the foot of the mountains of Trara, 40 miles east of the Mulloiah River, is about 500 miles; its breadth cannot be stated with precision, as the confines between its dependencies south of the great Atlas chain, and the roving inhabitants of the Sahara, are not determinate. We know, however, that the sway of Algiers extends at least as far south as the Wadadjedee River, about 200 miles' distance in a direct line from the capital. Reckoned from other points the breadth is much less. The territories of the regency are divided into four governments, namely, 1. Al Jezira, or Algiers properly so called; 2. Titteri, to the south of it; 3. Constantina, or Costantina, to the east; 4. Mascara or Tlemsen, to the west. The three last provinces are each ruled by a Bey, who was appointed by and dependent upon the Dey or Pacha of Algiers, till the late French occupation of the capital. Many tribes, however, live scattered about the country, who either have always refused to acknowledge the successive rulers of the coast and capital, or whose subjection is merely nominal, and confined to the payment of an annual tribute. It is impossible to ascertain with accuracy the population of the whole country, but, judging by approximation, it cannot be less than 2,000,000.

The chain of the Atlas runs through the whole length of the Regency, and its various ridges, with the intervening valleys, occupy the greater part of its surface. A central ridge, or succession of ridges, marks the boundary between the Tel or country fit for tillage, and the Sahara, and divides the waters that run into the Mediterranean from those that flow southward, and lose themselves in the marshy lakes of the interior, the Shott and the Melgigg. This ridge begins with the mountains south of the town of Tlemsen on the borders of Marocco, then runs in a north-east direction to Mount Wannashrees, the Mons Zalacus of Ptolemy, a huge rugged mountain generally covered with snow, and one of the most noted landmarks of the country south-west of Algiers. It is situated in the eastern part of the province of Mascara, about sixty miles south from Cape Tennes. To the eastward of the Wannashrees, in the province of Titteri, are other high summits called Titteri-Dosh and Jebel Deera; and farther to the N.E., on the borders of Costantina, is Mount Jurjura, perhaps the Mons Ferratus of the ancients, which is as conspicuous in the eastern province as Wannashrees is in the western. The Jurjura is seen from the coast about Bujeiah, and is always covered with snow in winter. The Jurjura seems to belong more properly to the little Atlas chain. From this point the central group of the Atlas, which from the borders of Morocco runs so far nearly parallel to the sea-coast, assumes a south-eastern or inland direction, forming the high ridges called Wanougah and I-aite, which are succeeded farther to the east, but more in a parallel line with the sea-coast, by those of the Welled Selim, Mustewah, Auress, and Tipasa, the last continuing the chain into the territory of Tunis east of the Mejerdah River, between 35° and 36° latitude. Another and a lower ridge, or continuation of ridges, known to geographers by the name of Little or Maritime Atlas, rises nearer the coast from the mouth of the river Shelliff, whose bed divides it from the central chain, and running between its northern bank and the sea, forms the heights called Summata, Teneah, and Magrouah, which divide the plain of Metidja, in the immediate district of Algiers, from the province of Titteri, and thence, after connecting itself with the higher chain of the Jurjura, detaches itself again, continuing direct east through the northern part of the province of Costantina, forming the summits called Sgawe and Artyah, and thence runs into Tunis towards Bizerta. Numerous projections from this chain run into the sea, and form the abrupt promontories called by the Mediterranean sailors Cape Carbone, Cape Jiljili, Cape Bougaron, Cape Iron or Ras Hadeed, Cape Rosso, &c. The height of the little Atlas to the south of the city of Algiers, near the town of Medeyah, is from 1000 to 1500 feet. Besides these two divisions of the chain Atlas, we know that there are other, and some very high, summits a long way south in the Sahara; but whether they form a continuous ridge, or are merely detached groups, branching from the central chain, is not well ascertained, any more than their height or position. The Mounts Zaggos, Sahari, and Zekkar, south of the province of Titteri, and between the parallels of 34° and 35°, and the Mounts of the Lowaate farther to the south-west, in which the Wad-ad-jedee has its source, are in the country called by the Moors Beled-el-jerrid, or Land of the Palm-tree, but which the Arabs know only by the general name of Sahara, and which can hardly be said to be subject to Algiers. This was the country of the Gætuli, which Strabo calls 'a Mountainous Land.'

The principal river of Algiers is the Shelliff, which has its sources within the borders of the Sahara, south of the Wannashrees Mountains; flows N.E. into Titteri, and after receiving the Midroe, which comes from the southernmost Atlas, forms the Titteri Gawle or Lake, and then runs north until it meets the little Atlas ridge not far from Medeyah; its current then turns abruptly westward through the province of Mascara, and after a course of nearly 300 miles enters the sea below Cape Ivy, or Jebel Dis. During the rainy season it overflows a great tract of country, so as to interrupt the communication by land between Algiers and Oran. The other rivers are the Yisser, to the east of Algiers; the Zowah, or river of Bujeiah; the Wad-el-Kebeer, Ampsaga of the ancients, which flows into the sea north of Costantina; and the Seiboos, or river of Bona. South of the Atlas is the Wad-ad-jedee, or 'river of the Kid,' a considerable stream which runs from west to east for nearly 200 miles, and after watering and fertilizing the country called Zaab, and receiving a number of minor streams from the central Atlas, loses itself in the Melgigg, a marsh on the borders of the desert. There is another marsh of great extent on the south-western borders of Costantina called the Shott. 'It is a large plain or valley between two chains of mountains, which, according to the seasons of the year, is either covered with salt or overflowed with water. Several parts of the Shott consist of a light oozy soil, which, after sudden rains, or the overflowing of the adjacent rivers, forms quicksands, to the great danger of the unwary traveller.' (Shaw's *Travels in Barbary*.) Several small streams from the north, and a considerable one from the south, called Mailah or Shayer, which has its source in the Mount Zekkar, and is said to be salt, lose themselves in the Shott.

The climate of the country north of the Atlas is generally healthy and temperate, but when the khamsin or south-wind blows, the thermometer rises sometimes to 100° of Fahrenheit, and even more; this, however, lasts only from two to five days. This wind is dry, and although depressing, is not otherwise unhealthy. It carries along with it a quantity of extremely fine sand, which penetrates into the houses and through every crevice. From April to September the prevailing winds are from the east, and the rest of the year they are mostly from the west. The heavy rains are in November and December, the months of January and February are generally very fine. In April the fields are clothed in their brightest verdure. From July to October the surface of the country is burnt by the rays of the sun; the oleander alone remains green. Near the coast, however, the sea-breeze cools the air during the day, and heavy dews fall at night. The atmosphere is very pure and bright, but is considered unfavourable to persons of weak sight. Ophthalmia is a common disease, as well as cutaneous disorders, and even elephantiasis, owing principally to the want of cleanliness in the country people. No bad fevers or other endemic diseases are prevalent.

The fertility for which this country was renowned in ancient times still continues; in the valleys that are watered by streams, vegetation is extremely luxuriant. The mould is of a very dark colour; in some places it is reddish, and impregnated with nitre or salt, but generally the soil is much less sandy than in Tunis or Morocco. The country is also more hilly, the springs are more frequent, and the dews more abundant, than in the adjoining states. The hills are covered with fruit trees of every kind, and the fruit is generally exquisite. A species of the lotus is found here, the fruit of which is eaten. The palm is indigenous, but the best dates come from the other side of the Atlas. Few timber trees are to be seen except a species of oak, the *quercus ballota*, which bears a very nutritive kind of acorn. The mountains near Bujeiah used to supply the dock of Algiers with timber. There are many species of the cypress and chestnut trees. There are also very extensive plantations of *nessri* or white roses; these flowers are much larger than those of Europe, and yield the essence known by the name of attar of roses. The sugar-cane grows in this country; a species of it called Soleyman rises to a great height, and gives more sugar than any other species known. The *indigofera glauca* thrives also. The grain sown is wheat, barley, Indian corn, millet, doura, and also rice.

The cows of Barbary are small, give but little milk, and generally lose it altogether with the loss of the calf. Algiers and Morocco are the original countries of the Merino sheep. Goats are very numerous, and supply the people with milk. Horses are proverbially excellent; the asses are uncommonly fine and much used for riding; the country people eat the flesh of the young ones. Their mules are excellent. The camel is considered superior to that of Asia, and good cheese is made of its milk. The interior of the country abounds with wild boars, porcupines, antelopes, and all sorts of game. In the fastnesses of the Atlas are panthers and leopards, but no tigers; the lion still maintains the character of its Numidian progenitor for superior strength, fierceness, and also, at least according to Arab report, for its occasional forbearance and generosity. In the desert of Angad on the borders of Morocco are large flocks of ostriches. The country is infested by various venomous reptiles and insects, especially scorpions of large size, whose bite is dangerous. There are also serpents of the boa kind. The locusts pay occasional visits, when they destroy the harvest of whole districts in a few days; the tribes south of the Atlas eat them.

The races that inhabit the territory of Algiers may be reckoned seven in number· Berbers or Kabyles, Arabs, Moors, Turks, Cooloolis, Jews, and negroes from Soudan. One half of the whole population consists of Kabyles, the aborigines of the land: although somewhat mixed with the various nations that have successively conquered the country, they still retain much of their Numidian character and habits. The name of *Berbers* is of uncertain origin, and they themselves are unacquainted with it; they call themselves Mazigh or Amazirgh, which name was known to the old geographers and historians. Ammianus Marcellinus calls the island on which the light-house of Algiers is built, *insula Mazucana*. The oldest Arabian writers call the town of Algiers *Jezira Beni Mazighanan*, the island of the Sons of Mazigh. The Mazigh race is believed to have extended at one time all over North Africa, from the borders of Egypt to the Canary Islands: they spoke one common language, of which the Showiah and the Shillah of the Berbers are dialects, as well as the language of the Guanchos of the Canary Islands, and probably also the language spoken by the Tuaricks of the Great Desert. The Moors call the Berbers 'Kabyles,' from Kabileah, *i. e.*, clan, but they often give this appellation indifferently to the tribes of the interior, whether Berbers or Arabs, although two very distinct people, because both are living in clans. The Kabyles inhabit the whole of the mountainous country, both along the great and the little Atlas chains, while the Arabs occupy the intermediate plains. The clans of the former assume before their names the Arabic prefix *Beni*, as Beni-Mozab, whilst many of the Arab tribes scattered about the country of Algiers use that of Welled, which means the same, such as Welled-Helfa, the children of Helfa. The Kabyles live in villages called *dashkrahs*, consisting chiefly of huts which they call *gurbie*, made of mud and loose stones, covered with branches of the palm-tree, and thatched with turf or straw. The Arabs generally live under tents, in camps, which are called *dowar*. The Kabyles who live on the little Atlas and near the coast understand Arabic, but the tribes farther removed in the interior know no language but their own. More advanced in agriculture than the Arabs or Moors, they understand the method of irrigation; 'we have seen,' says Captain Rozet, 'in the neighbourhood of Belida, orchards and fields as neatly arranged and as carefully cultivated as those of France. The Kabyles work the mines of their mountains, and extract iron, copper, and lead; it is said, even gold and silver: their arms are frequently decorated with silver plates very well wrought, and they make a spurious coin of silvered copper. They make guns, ploughs, and many coarse utensils, which they sell to the Arabs and Moors, know how to temper steel, and make also sabres and knives of a tolerable quality. They manufacture gunpowder for their own use, and much better than that which is made at Algiers, but they never sell any of it. The Kabyles are very eager after European guns; they offered me as much as the value of two hundred francs for mine. Their women weave common woollen and linen stuffs for the use of the family. They do not bake bread, but they crush the grain between two stones, make a paste of the flour with water, and bake it under the ashes, or fry it with oil. The olive is their chief produce, but the oil they make is very sour, probably because they allow the fruit to ferment before they press it. They carry great quantities of it in skins to the Algiers market. They make a kind of soap with oil and soda. The Kabyles grow pears, apples, apricots, peaches, and grapes, in all the chain of the little Atlas. They gather a great quantity of honey and wax, which they bring to Algiers; with poultry, dates from the other side of the Atlas, lion and panther skins, and monkeys. The tribes who live on the borders of the plain, or in the great valleys, have cattle, and flocks of sheep and goats. They have no camels, this animal not being suited to mountainous regions, but they have excellent asses and mules which they never sell. The Kabyles are a middle-sized race, of spare habit of body, but robust and well made, and even elegant in their forms. Their complexion is generally dark, but seldom swarthy. Their heads are more round, and their features shorter, than those of the Arabs; they have not the fine aquiline noses so common among the latter; the expression of their countenance is intelligent, but somewhat sinister and ferocious. The furniture of their huts is very simple; a few sheep-skins or mats spread on the ground or on a wooden platform in a corner, serve them as beds; their *hykes*, which resemble in shape the plaid of the highlanders, and their *boornooses* or cloaks with hoods, which constitute their dress by day, serve them as blankets at night; a few baskets, earthen dishes, pots, and jars, for their milk and honey; they keep their grain and fruit in large vats made of clay baked in the sun, or bury them in holes under ground. In almost every hut of the Beni-Sala we found a Koran, which the inhabitants had left on running away. The women wear the hyke like the men, with a close short-sleeved tunic underneath; they do not veil their faces like those of the Arabs and Moors; they let their hair fall on their shoulders; they wear large ear-rings, paint their arms and legs in various devices, and their nails and the palms of their hands with henné or vegetable red.' The short account of the Berbers of Morocco, and their appearance and language, given by Lieutenant Washington in his 'Geographical Notice' of that empire, inserted in the first volume of the *Journal of the Royal Geographical Society of London*, agrees with most of the above particulars of the Kabyles of Algiers, and serves to strengthen the supposition that they are all of a kindred race. Each tribe of the Kabyles has a sheik or chief, like those of the Arabs; there are also families of rank among them. Each tribe has its Marabut, who is a sort of oracle: these men are considered holy, and are allowed every liberty. They accompany the tribes to war, and exercise great influence over them. The Kabyles, especially those remote from Algiers, have never submitted to either Arabs or Turks; they pay no regular tribute, but the Dey used to send parties of janizaries to seize their cattle, or kidnap several heads of families, for whom he made them pay a heavy ransom. The Kabyles in their mountains are inhospitable, and different in this respect from the Arabs: they are capricious and faithless, like their Numidian ancestors, very cruel to their enemies, and seem to delight in tormenting their unfortunate prisoners, whom even the women have been known to join in torturing. They are Mohammedans, and practise circumcision, but never frequent the mosques of the Moors. Those who live at or come to Algiers have a separate place of meeting for themselves. Their religion seems, however, very superficial, and mixed with superstitious practices.

The Arabs who encamp in the plains are known also by the name of Bedoweens, and indeed the latter appellation is often given indiscriminately to the Kabyles also by the people of the towns on the coast. These Arab tribes are the remains of the various great immigrations of their countrymen from the east, and have kept themselves distinct from the other races around them. They resemble in their appearance and habit their Asiatic ancestors, of whom they boast. They often move their camps in quest of water, or fresh pasture for their flocks. They speak the Koreish or eastern Arabic with more or less purity; are strictly observant of the Koran, are governed by their elders or sheiks, and are all tributary to the bey of their respective province. When dissatisfied with the Turks, they often move their camp in the night, and withdraw with their cattle into another state, or plunge into the Desert. Not many years since, the wide plains of Bona and Costantina were all on a sudden left solitary, the Arabs having withdrawn across the frontier into the state of Tunis. Some of the Arabs are cultivators of the soil, and have villages in the neighbourhood of the towns, but they are very careless in their agriculture, and will, when dissatisfied, abandon their huts and remove to another district. The Arabs are strict in their conjugal duties, and differ in this from the Kabyles, among whom the marriage bond is held very loose. In their predatory habits, their frugal diet, their fondness for music, and story-tellers, the Arabs resemble the rest of their brethren scattered over Asia and Africa. The women are generally spare, swarthy, and ill-favoured.

The name of Moors has been used in Europe in a general sense, meaning the African Arabs; but the present Moors of Barbary are become a people distinct from the original Arabian conquerors, as well as from the actual nomade Arabs, who live in the interior of the country. The Moors constitute the bulk of the population of the towns and the districts immediately around: they are a very mixed race, sprung from the various nations who have successively occupied the country; the Arabian stock, however, which was engrafted on the population existing at the time of the Mussulman conquest, may be supposed to predominate. Their number was much swelled by the Moors who were driven away from Spain. They are not so swarthy as the Bedoweens; the men who are much exposed to the rays of the sun acquire a very dark complexion, but their women and children are as clear as those of Europe, and often very handsome. Fatness is an indispensable condition of female beauty among the Moors, and great pains are taken by mothers and nurses in order that their girls may attain this desideratum. The Moors are further advanced in civilization than the Arabs or the Kabyles; they are used to the comforts of towns, many of them are wealthy, and fond of luxury and pleasure. But their moral character stands very low. They have all the vices of the Arabs without their virtues, and the fierce, brutal passions of the Turks without their bravery. They are lazy, sullen, vindictive, and cruel. Lasciviousness and unnatural lust are common vices among them as among the Turks. Having been for ages accustomed to tremble before the military despotism of the Ottomans, the Moors are pusillanimous, servile, and treacherous. They are not deficient in intelligence; all the boys frequent the schools, where they learn reading, writing, and arithmetic at a trifling cost; elementary instruction having been established at Algiers for ages past on a method somewhat resembling the Lancasterian. The Moors speak the Moghrebin or western dialect of the Arabian language.

The Turks, who for more than three centuries have been the rulers of Algiers, formed a militia which seldom amounted to ten thousand; and though it was at last reduced to five thousand, even this small body kept the whole population in perfect submission. They were nominally, at least, under the orders of the Sultan, as lord high sovereign of the country. The Dey was selected from among their own body. Every other year fresh recruits from the Levant, lawless characters from Constantinople, Salonichi, and Smyrna, with fierce Arnauts from Albania, came to fill up the vacancies. Christian renegades were occasionally admitted among them, but Moors or Arabs never. The main body of the Turks was stationed at Algiers, but detachments were sent as garrisons to the various towns of the provinces. In case of attack from other powers, the Moors, Arabs, and Kabyles served as auxiliaries under the orders of the Turks. The janissaries, as the Turkish militia were called, were well paid, and their pay continued for life, even after they retired from the service. They enjoyed great privileges, and any insult offered to them by the natives was punished with death; indeed they generally took the law into their own hands and inflicted summary punishment. They were not subject to the common tribunals for any offence, but were tried before their own court, and punished privately by their Aga. As the Turks had no women of their nation, they married either Moorish women or Christian slaves; the offspring of these marriages, called Kooloolis, constitute a considerable proportion of the population of Algiers and the other towns. Their number is reckoned by Mr. Gräberg, the Swedish consul, at 17,000 in the city of Algiers alone. Some of the Kooloolis entered the militia, others were employed in various offices under government; many are possessed of property, which their fathers or themselves have acquired, especially by holding shares in the privateers, for this was a profitable speculation of the Turks. They are generally good-looking, and have clear complexions like their Turkish parents. All the above races, being Mohammedans, are polygamists.

The Jews came in great numbers to Algiers on being driven away out of Spain and Portugal, at the same time as the Moors. They are reckoned to be between 40,000 and 50,000, living in the principal towns, chiefly on the coast. They are, as every where else, brokers, agents, jobbers, retailers, hawkers, and some of them are merchants and bankers. Despised and ill-used by the Turks, they were still necessary to them in all money transactions, in all maritime speculations, and in their financial operations. They exercised by this means considerable influence on the members of the government. Many of them grew rich, though in continual dread of losing both their property and their lives.

The negroes are slaves brought from Soudan by the caravans or kidnapped by the Bedoweens of the Desert. Between 4000 and 5000 were brought every year into the territories of Algiers, one half of whom were taken to the capital, where they were exposed in the bazaar, and sold partly to wealthy Moors or Turks, and partly to speculators who exported them by sea to the Levant. The blacks in the service of private individuals at Algiers are generally treated with considerable mildness; they are, in fact household servants.

The territory of Algiers includes the several divisions of ancient Numidia, both of the Massyli and of the Massæsyli, the kingdoms of Massinissa and his rival Syphax, and afterwards of Jugurtha It also includes part of the Mauritanian kingdoms of Bocchus and of Juba. It was conquered successively by the Romans, the Vandals, the Byzantine Greeks, and lastly by the Arabs, who invaded North Africa at the beginning of the eighth century, and established Islamism. Ferdinand the Catholic, after driving the Moors from Spain, sent an expedition to Africa under Cardinal Ximenes and Don Pedro Navarro, which took possession, in 1509, of Oran and Marsa el Kebir, and of Bujeiah in the following year. They also took possession of the island before Algiers, and built a fort there. The Moors of Algiers, who were under a chief called Selim Eutemi, called to their assistance the Turkish corsair, Horush, who had made himself famous by his exploits in the Levant seas. Horush landed at Jiljili in 1516, and soon after attacked the Spaniards in concert with the Moors, and re-conquered part of the country. Having rid himself of Selim Eutemi by violence, he remained master of Algiers, where he ruled tyrannically. He afterwards marched westward and took Tlemsan, but being attacked both by the Spaniards from Oran, and by the Moors who revolted against him on account of his cruelties and extortions, he put himself in march with his Turks to regain Algiers, but being overtaken and surrounded near the river Mailah, not far from Oran, he died fighting, in 1518. Horush, when cruizing in the Levant, was called familiarly by his crews, Baba Horush, or 'Father Horush,' which the European sailors corrupted into Barbarossa. His brother, Khair-ed-din, to whom he had left his ships, succeeded him in the dominion of Algiers, and to secure his authority, put himself, in 1519, under the allegiance of the Sultan of the Ottomans, Selim I., who appointed him Pacha and Regent of Algiers, and sent him a body of janissaries. Khair-ed-din took from the Spaniards the island before Algiers, which he joined by a pier to the main land in 1530, thus forming a safe harbour. He manned a large fleet with which he swept the Mediterranean, striking terror among the Christian sailors. Solyman I. called him to Constantinople, and raised him to the rank of Capudan Pacha or Great Admiral. Hassan, a Sardinian renegade, who succeeded him in the regency of Algiers, continued to scour the sea and make incursions on the coast of Spain. Charles V., in the plenitude of his power, was baffled in his attack upon Algiers in 1541. A terrible storm dispersed his fleet, and the army was obliged to re-embark in the greatest confusion. From that epoch the Algerines thought themselves invincible, and extended their piracies not only all over the Mediterranean, but also into the Atlantic. They seized the vessels of all nations who did not agree to pay them a tribute. Admiral Blake first taught the Algerines to respect the flag of England. Louis XIV. caused Algiers to be bombarded in 1683 by Admiral Duquesne, which led to a peace in the following year between France and Algiers. The Spaniards, under General O'Reilly, landed near Algiers in 1775, but were obliged to re-embark in haste and with loss. The Dutch, after several combats with the Algerines, by paying a sum of money, obtained respect for their flag. So did likewise the Danes and Swedes. The Austrian and Russian flags were protected by the special interference of the Porte, in consequence of treaties with the latter. But the Italian states were the greatest sufferers from the piracies of the Algerines and the other Barbary powers, who not only seized their vessels and cargoes, but made slaves of all on board, who were either sold in the market, or sent, chained, to the public works. The precise epoch of the beginning of this organized, and we may almost call it legalized, system of piracy, for it was recognized by the various treaties which the Christian powers condescended to sign, appears to date from the end of the fifteenth century, when the Spanish Moors, driven out of Granada and Andalusia, settled on different points of the opposite coast of Barbary, and thence retaliated upon their Christian enemies by seizing their vessels. The establishment of the Knights of St. John in the Island of Malta, whose profession was one of constant warfare against Mussulmans, tended to keep alive and to justify the system of indiscriminate reprisal on the part of the latter. But cupidity was the great incentive, as the produce of the prizes and of the slaves was an essential source of revenue to the Algerine government, and of profit to private speculators. It was a common saying, that Algiers without privateers must starve. In 1815 the Algerine power was checked in its lawless exactions by the ships of the United States, which took an Algerine frigate and brig: the dey was also compelled to conclude a treaty with the Americans, renounce all tribute, and pay them 60,000 dollars as compensation for the ships that had been plundered. Lord Exmouth, in execution of the determination taken by the congress of Vienna, put an end to Christian slavery in 1816; but the Algerines still claimed the right, as an independent power, of declaring war against any state they chose, and of seizing its merchant vessels, and releasing the crews or keeping them in prison till peace was agreed on. At last an insult offered by Hussein Pacha, the last dey, to the French consul in April, 1827, induced the French government to send an expedition on a very large scale to take possession of Algiers. This was effected in June, 1830. Algiers capitulated to General Bourmont, the dey abdicated and retired to Europe, while the French took possession of the town, of the fleet, and of the treasury, where they found above two millions sterling in precious metals and stores. They garrisoned Algiers, and established a sort of military government under the general in chief. They have also garrisons at Oran and Bona, but do not possess any ground beyond the walls of those towns. Their dominion south of Algiers does not extend beyond the first ridge of the little Atlas. They have appointed a new bey of Titteri, but the Kabyles and the Arabs are at war with them both in Titteri and Mascara, and the bey of the great province of Costantina has refused to submit. The latter has assumed the title of pacha, and seems to consider himself independent. One great advan tage, however, has resulted from this expedition; the Mediterranean sea has become free from Algerine privateers which have been its scourge for more than three centuries.

The title of dey, which in Turkish means 'Uncle,' was not lately used at Algiers: the sovereign was styled pacha and effendi; the Moors called him Baba, 'Father.' He was elected by the bashis or officers of the militia, assembled in dewaun, or rather by a faction of them, which also frequently shortened his reign by a violent death. Few sovereigns of Algiers for the last two centuries have died of natural death. Any common janissary might aspire to the supreme rank. The sultan formerly used to appoint the pacha of Algiers, who was at the same time commander of the forces, and to send men and money for the service of the garrison, but the Turkish militia obtained in the seventeenth century the right of choosing their own commander, and paying themselves out of the revenue of the regency: still the sultan continued to send a pacha as civil governor until the beginning of the last century, when Baba Ali Dey or chief of the militia seized the then pacha, put him on board a ship, and sent him back to Constantinople. He sent by the same vessel envoys with rich presents to the vizier and other officers of the Porte, representing to them that the expelled pacha had treacherous views, and that in future the chief of the militia might as well fulfil the duties of pacha also, of course with the approbation of his highness. The affair was winked at by the Porte, and from that time the janissaries and the dey of their choice were absolute masters at Algiers.

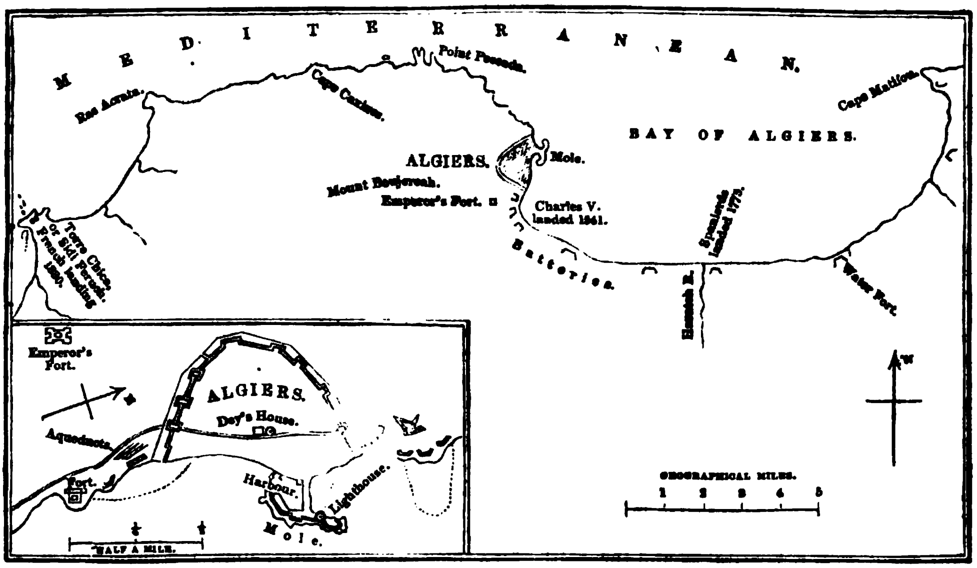
The principal towns of the regency of Algiers are, next to the capital, Costantina, the ancient Cirta, with a population of about 30,000 inhabitants, [see COSTANTINA,] Bona, near the site of Hippona, the see of St. Augustine, with a population of 4000 inhabitants, and a capacious harbour nearly choked with mud. To the eastward of Bona were La Calle and Bastion de France, two old French settlements which were destroyed in 1827. This coast is frequented by the coral-fishing boats from France and Italy. Westward of Bona is Jijel or Jiljili, a harbour and a fort. The Kabyles of this mountainous coast are the most ferocious of the whole country, and merciless plunderers of wrecks. Bujeiah, on the gulf of the same name, once a place of considerable importance, now reduced to 5000 inhabitants, with a good harbour, carried on some trade in oil and wax, the produce of its territory. In the interior of the vast province of Costantina are many remains of cities once famous, such as Seteef, once the capital of the Mauritania Sitifensis; Tiffesh once Thebestis, in a very fertile plain, which extends towards the Mejerdah or Bagradas river; Tipsa, the ancient Tipasa, a frontier town towards Tunis, with an Algerine garrison. In the same neighbourhood is Gellah, also a frontier town, built on a mountain almost inaccessible, a place of asylum for the outlaws of the two states, who countenance one another, and live in a sort of wild freedom. Zainah, in the southern part of the province, Dr. Shaw supposes to be the ancient Zama, he having found no other vestiges answering to this place. The most remarkable antiquities next to those of Cirta are found at Tezzoute, in a valley of the Jibbel Auress, about fifty miles south of Costantina, and which appear to belong to the ancient Lambæsa: the ruins are nearly three leagues in circumference; among the rest are magnificent remains of the city gates, several Roman inscriptions, parts of an amphitheatre and of a triumphal arch, the frontispiece of a beautiful Ionic temple, and an elegant little mausoleum built in the shape of a dome supported by Corinthian pillars, which the Arabs call 'the Cupola of the Bride.' The Jibbel Auress, Mons Aurasius, is an extensive group of mountains with fertile valleys intervening, embracing an area of nearly 100 miles in circumference, and inhabited by a number of clans of Kabyles, whom neither Arabs nor Turks have ever subjugated. Some of these tribes are much fairer than the generality of the Kabyles, and have hair of a yellowish colour, which has led Dr. Shaw and others to suppose them to be a remnant of the Vandals. The whole province of Costantina is highly interesting, and full of ancient remains, but little explored by travellers: it is decidedly the finest, as it is the largest and most important division of the regency. In the province of Titteri is the town of Medeyah, the residence of the bey, in a fertile district in the midst of the little Atlas; it reckoned above 10,000 inhabitants, but suffered severely in the several conflicts in 1830-31 between the French and the Arabs and Kabyles. Belida, situated between Medeyah and Algiers, on the borders of the fine plain called Metidja, with a population of 9000 inhabitants, has been equally unfortunate. Coleah is twelve miles from Algiers near the sea, a thriving village. About fifteen miles westward of Medeyah are the hot springs of Mereega, the *Aquæ calidæ Colonia*. In the western province of Mascara is Shershel once Jol, the residence of Juba, afterwards called Julia Cesarea, a sea-port town most strongly and pleasantly situated; it has repeatedly suffered from earthquakes, but has yet some trade and manufactures of steel and pottery. A large tract in its neighbourhood is strewn with remains of its former magnificence, pillars, mosaic pavements, ruins of a large aqueduct, &c. Mustigannim, a town of between 5000 and 6000 inhabitants, is built on the slope of a hill near the sea, in a very fertile and well-cultivated district: Arzew is the ancient Arsenaria, near which are valuable salt-pits which might be made more productive. Oran, or more properly Warran, is a coast town of from 10,000 to 12,000 inhabitants, and the common residence of the bey of the province. It is a fortified place, and carries on some trade by sea. The Spaniards were masters of it for near three centuries until 1792, as well as of the neighbouring Marsa el kebir, the Portus Magnus of the ancients, a natural harbour, one of the best on the coast of Barbary. Farther to the S.W., near the mouth of the river Tafna, are some remains of the ancient Siga or Sigeum, the metropolis of Syphax and other Mauritanian kings. About fifteen miles from it, in the interior, is the city of Tlemsen, the capital of the province, built on a rising ground below a ridge of rocky mountains which form part of the Atlas, in a fine and fertile country irrigated by a number of streams. The old Tlemsen, once the capital of a kingdom, was much larger than the present town, but was almost wholly destroyed in 1670 by Hassan Dey of Algiers. Tlemsen reckons still about 20,000 inhabitants, and is the third city of the regency, next to Algiers and Costantina. There are manufactures of carpets and blankets, and some trade carried on with the interior. It is not far from the borders of the Sahara, which here approaches very near the coast. Mascara, the ancient Victoria, once also the capital of the western province, now much decayed, is situated about thirty miles inland from the Bay of Arzew. Fifteen miles to the N.E. of Mascara is El Callah, a small town with several villages around it, built among the Atlas mountains, the population of which are busily employed in the manufacture of carpets, bournooses, and other woollens, for which El Callah is the chief mart in the whole regency.

The territory south of the Atlas, which is included within the limits of the regency of Algiers, consists of two great districts: the Zaab, or ancient Gætulia, which lies south of the provinces of Costantina and Titteri, between the Atlas and the Wad Adjedee river, and the Wad Reag, which is south of the latter and stretches to the very edge of the sandy desert. The town or village of Biscara, with a small castle and a Turkish garrison from Costantina, is the principal place in the Zaab. Dates are the chief produce of the country. The Biscareens are a tribe distinct both from the Arabs and the Kabyles, although believed to be of Arab descent; they have fixed habitations, are industrious, honest, and quiet. Many of them come to Algiers, where they are preferred as servants and porters, and where they have an amir or consul to settle their concerns. They have been confounded by Europeans with the other Kabyles. They are very dark; they profess Mohammedanism, and speak a dialect of the Arabic. The Biscareens trade with Soudan by the way of Ghadamis. The country of the Biscareens is watered by several streams from the southern slope of the Atlas which fall into the Wad Adjedee, the principal of which is the Wad Abeadh, that rises in the mountains of Auress in Costantina, and flows southward until it meets the Adjedee not far above the Melgigg.

Wad-Reag is another collection of villages like those of the Zaab, but south of the Adjedee and ranged in a N.E. and S.W. direction. The principal villages are Tuggurt, south of the Melgigg, En-gousah, and farther south-west, Wurglah, a populous place frequented by the caravans from Soudan, and Nadrama, on the edge of the Desert. These are the extreme limits of human fixed habitations. The Beni Mozab live to the westward of Wurglah, between 32° and 33° of latitude; Gardeiah, Beri-gan, and Grarah are their principal villages. They are a tribe of the Kabyles or Mazigh, have the same appearance and complexion, and speak the same dialect as their brethren, but are milder and more peaceful in their disposition; many of them live in Algiers, where they keep the public baths. They govern themselves as a republic, are independent of the regency, and they keep an amir at Algiers who was acknowledged by the dey. They reckon it twenty days' journey from their country to Algiers. Dr. Shaw sees in them a branch of the Melanogætuli of the ancient geographers. They grow a little barley, but their chief nourishment is dates. 'Their country,' says Dr. Shaw, 'is very dry, they have no fountains or rivulets, and in order to obtain water, they dig to the depth sometimes of 100 fathoms, through different layers of sand and gravel till they come to a flaky stone like slate, which is known to be immediately above the *Bahr taht el erd*, or 'the Sea below ground.' The stone is easily broken through, and the flux of water which follows the stroke rises so suddenly and in such abundance, that the person let down for this purpose has sometimes, though raised up with the greatest quickness, been overtaken and suffocated by it.'

Among the numerous works on Algiers the following deserve mention: Shaw's *Travels in Barbary*, a very good topographical description of the country; Laugier de Tassy, *Histoire Générale du Royaume d'Alger;* Rehbinder, *Nachrichten und Bemerkungen über den Algierschen Staat;* Pananti, *Avventure ed Osservazioni sopra la costa di Barbaria*, a work too poetical in its style, but full of curious details and anecdotes; Shaler's *Sketches of Algiers;* Rozet, *Voyage dans la Régence d'Alger*, since the French occupation.

ALGIERS, the city of, in Arabic, *Al Jezira*, i.e., 'the Island,' to which was added the epithet of *Al-gazie*, 'the warlike.' It was first built about 935 by Jussuf Zeri, an Arabian chief, of the Zeirite dynasty, which succeeded that of Aghleb in the sovereignty of the country. It is in the shape of an irregular triangle, of which one side is formed by the sea-coast, and the other two run up the declivity of a steep hill which faces the N. and N.E.; the houses rise gradually one above the other, so that there is scarcely one that has not the prospect of the sea from its terrace. The houses are square, and mostly two stories high; they have a closed court in the middle, on which, and not on the street, the windows of the apartments open. The flat terrace at the top is the resort of the family, especially in the evening, to enjoy the sea breeze. The buildings are all painted white, and the reflection of the sun from them is very painful to the eyes. The circumference of Algiers is little more than two miles; the streets are very narrow, the widest being only twelve feet in breadth. The population of Algiers was reckoned in 1830 at about 70,000, since which it has decreased at least one-fourth by emigration; of these, about 8000 were Jews, 1000 Christians, and the rest Mohammedans. There were thirteen great mosques with minarets, and about seventy small ones, belonging to private individuals. There was also a synagogue, and a chapel and hospital for the Christians; the latter was supported by the Spanish government. The Palace of the Pacha, called also the Jenina, is in the lower part of the town, but the late dey had his residence in the Casabah or citadel, at the highest point of the city. The other remarkable buildings of Algiers are the barracks, the light-house, the dock-yard, the principal bazaars, the mole, and the quays. The hills, which rise in the form of an amphitheatre around the city, are studded with country-houses, gardens, vineyards, and olive groves. Algiers is well supplied with water from a large reservoir, the water of which is conveyed from the country by an aqueduct, and then distributed by conduits all over the city. There are a great number of public baths, of small coffee-houses, and some wretched inns called *Fonducs*. The batteries which defend Algiers on the seaside are very strong, but the fortifications on the land side are weak and exposed. The castle called the Emperor's, which is outside the walls, commands the city, but is itself commanded by the upper part of Mount Boujereah. Below the Emperor's fort, a road leads from the Casabah along the inland skirt of Mount Boujereah to the point of Sidi Ferruch, about fourteen miles west. It was by this road that the French advanced, in June, 1830, to invest the Emperor's fort, which, after a brisk cannonade, was abandoned by the Turks on the 4th of July. The following day Algiers surrendered to General Bourmont, on condition that persons, private property, and the religion of the country should be respected, and that the dey and his Turkish militia should quit Algiers, carrying with them their personal property. The French took possession of the town, the castles, and all public property of every kind; among the spoil were twelve ships of war, 1500 bronze cannon, and 48,000,000 of francs in gold and silver. No mention was made of the provinces, nor of the future government of the country. Algiers lies in 36° 49′ N. lat., 3° 25′ E. long.



[ALGIERS, from a French survey.]

ALGONQUINS, the name of a tribe of North American Indians, or, rather, a kind of generic name, under which are included numerous native tribes, which are related to one another. The principal tribe of the Algonquin nation, at present, is the Chippewas. The Algonquins, even in their present depressed state, are spread over a large tract of country, from the shores of lakes Erie and Ontario to the neighbourhood of the Esquimaux. The term Algonquin is one of the three divisions, which the early French writers made of the native tribes, the Hurons and Sioux being the others. The Algonquin language is now spoken by the Chippewas, Ottowas, Potawatamies, Sacs and Foxes, Shawnese, Kickapoos, Menomonies, Miamies, and Delawares. These languages are said to approach to the Chippewa, which may be called the standard, in the order in which we have placed them.

When America was first discovered, the dialects of the Algonquin language extended from the Penobscot in Maine to the Chesapeake Bay, and from the Atlantic Ocean to Lake Superior. The tribe which is properly designated by the name of Algonquin was found on the banks of the Uttawas river, which enters the St. Lawrence near Montreal, and also on the north shore of lakes Erie and Ontario.

From the specimens given in Adelung's *Mithridates* of the Chippewa and Algonquin tongues, it cannot be doubted that they are the same languages. In the regions that extend from the Uttawas river, north and west, to Lake Winnipeg, the Saskatchevine river, and still farther, Adelung places the Knistenaux, a widely-spread tribe, whose language, if we may judge from the specimens given, is closely allied to the two just mentioned.

By comparing the specimens of the Knistenaux, Algonquin, and Chippewa languages, with a very copious Cree vocabulary, we have no doubt that the latter language is closely akin to all three. So vague, indeed, are the notices of Indian tribes, that it is quite possible that all the four names, which we have used, may, to a certain extent, represent the same nations or parts of the same nations. The Crees are now described as occupying the country between the 50th and 57th parallels of north latitude, and the 80th and 105th of west longitude, and are in fact geographically, as well as by language, part, at least, of the people called by Mackenzie the Knistenaux, and by Charlevois the Cristinaux or Kilistinous. The meaning and origin of the word Algonquins is, we believe, unknown. (See *North American Review*, No. L. Adelung's *Mithridates*.)

ALGOA BAY, known also as Port Elizabeth, and formerly called Zwartkop's Bay, is situated in Cape Colony, South Africa, in 33° 56′ south latitude, and 26° 53′ east longitude. This inlet, which is about twenty miles broad from east to west, is nearly five hundred miles eastward of Cape Town, between it and the newly-settled district of Albany.

The anchorage of Algoa Bay was surveyed in 1820, by Captain Moresby, of his Majesty's ship Menai. It is a good holding ground, and for six months of the year, when the north-west winds prevail, is perfectly secure, but during the remaining months a heavy sea rolls in from the south-east. The tide rises in the bay from six to seven feet. The shore is a level sandy beach; it receives the waters of the Zondag, Zwartkop, and Kowie rivers, and has besides some fine springs of water on the western side. The surrounding country forms part of the district of Uitenhagen.

Port Elizabeth was the place of debarkation for the emigrants who went from this kingdom to Cape Colony, in 1820; as many as 3659 individuals landed here in the summer of that year.

An establishment has been formed on the eastern coast of the bay for curing beef. This process can only be conducted from the beginning of May to the end of August, at which time the season is favourable, and the cattle are in good condition. It is expected that a considerable trade in this kind of provision may be carried on between the settlers and the Mauritius, as well as with vessels touching on their way from India, and eventually also with the West India Islands. It likewise appears probable that a fishery may be successfully prosecuted in the bay, which is much frequented by black whales. (*Report of the Commissioners of Inquiry upon the Trade of the Cape of Good Hope*:—Printed by order of the House of Commons.)

ALGUACIL, an officer in Spain answering to the English bailiff. The name is from the Arabic *el-vazil*, or from the Hebrew verb *gazal*, which means to catch. His duty is to take into custody, and execute criminals in the court of the king at the command of the judges. In case of any quarrel or disturbance he has the power to take any person into custody, and deliver him up to the authorities. The common alguacils are appointed by the judges. The *alguacil mayor* is a superior officer, whose functions are the same as those of the common alguacil. He is appointed by the common council, of which he is a member. The duty of an alguacil is at present confined to the apprehension of criminals; the office of executioner being discharged by the *verdugo*.

[See *Partida*, II., ley, xx. tit. ix., and Covarrubias, *Tesoro de la Lengua Castellana*.]

ALHAMA, Artigis Juliensis, a town of Spain in the kingdom of Granada. Its present name is from the Arabic article *al* and *hammiyat*, 'warm baths.' It is situated upon an eminence detached from the chain of Zafarraya, and about a mile from it are the baths, which consist of two ponds. The smallest of them is called De la Reina. The water is hard, clear, and sulphureous, and has an oily taste. When the sun-light falls upon it, an unctuous substance is perceived on its surface, which has the appearance of oil. In cold weather a sort of mist rises from the water, which deposits in the pipes through which it flows a white substance resembling soap. These baths are inclosed in a building of freestone which has nothing remarkable in its appearance. The Moors derived a great profit from these baths; some authors make it amount to 500,000 ducats.

Owing to its situation, this town is in the winter months covered with snow, and in summer scorched by a burning sun. It contains one parish, two convents of monks, and one of nuns. The population amounts to 6000 inhabitants. It is fifteen miles south-west of Granada. (See Miñano.)

ALHAMA. There are two other towns in Spain, perhaps more, which derive the name of Alhama from having mineral waters.

ALHAMBRA, an antient castle and palace of the Mohammedan kings of Granada. It was built by Mohammed II., about the year 675 of the Hegira, or 1273 of our æra. He gave it the name of *Medinet Alhambra*, or the Red City; according to some writers on account of being made of a kind of red clay, but according to others, from the name of the tribe of Mohammed Alhamar. The Alhambra walls are built of a kind of cement of red clay and large pebbles, which being exposed to the air acquires the hardness of stone.

The exterior of the castle presents nothing very striking. The Arabs heaped up their buildings without order, regardless of their exterior appearance, and sought only internal convenience and comfort. The Alhambra is situated on a hill, which runs out to the east of the town of Granada. It is surrounded by a strong wall, flanked by square towers, and inclosing an area of 2500 feet in length and 650 in breadth. It is said that 40,000 men could be conveniently lodged in it. The walls follow all the windings of the mountain, and are constructed according to the best rules of fortification in the middle ages; before the invention of gunpowder it must have been impregnable. The river Darro flows by the base of the hill, on the east, north, and west. In this limited space the kings of Granada had united everything calculated to afford security in time of war, and comfort and pleasure in time of peace.

The easiest ascent is by the street of the *Gomeles*, so called from a distinguished Moorish family of that name. In coming out of the *Puerta de las Granadas* or 'pomegranate gate,' the road is divided into three, the middle one for carriages, and the other two, which are very steep, for foot travellers. The middle road ascends, between the hills of the Alhambra and *Torres Bermejas*, through a very thick wood of lofty elms, the branches of which are so interlaced that the rays of the sun never penetrate their thick foliage. Innumerable clear rivulets glide through the forest irrigating the ground, which is covered with verdure, or fall from rock to rock forming a number of beautiful cascades. Near the summit of the hill is the fountain of Charles V. on a sort of natural terrace, from which there is a bird's-eye view of all the ascent, which amply repays

[Gate of Justice, from Murphy's Arabian Antiquities of Spain.]

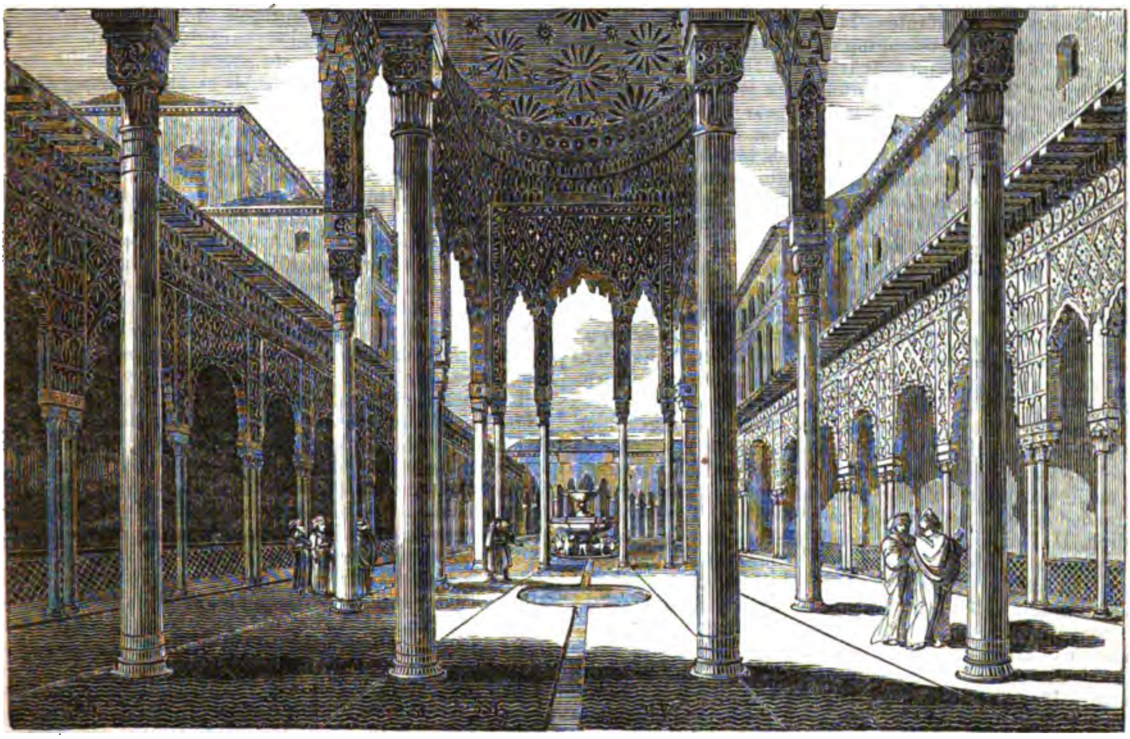
for the fatigue. After passing this fountain the traveller comes in sight of the Alhambra gate, called *Judiciaria* or of Judgment, because justice was administered there after the custom of the East. It is a square tower, the horseshoe arch of which rises to half the height of the tower, and is a perfect model of this kind of arch, so characteristic of Arabian architecture. Upon a stone in this tower is the following inscription in Arabic, which is thus rendered by James Murphy. 'This gate, named Babu-sh-shariāt, may God prosper through it the law of Islam, even as He has established it a monument of glory, was built at the command of our Lord, the commander of the Muslims, the just sultan Abu-l-Hajjàj, son of our Lord, the warlike sanctified (deceased) sultan Abu-l-Walid ebn Nasr, whose pious deeds for religion may the Almighty recompense, and whose valorous performance in the cause of the faith may He graciously accept. And it was completed in the month of the glorious birth of Muhammad, in the year 743 (1348). May Heaven constitute it a protecting bulwark, and reckon it among the lasting actions of the righteous!' We then enter the porch which winds along the barbican, and leads to the *Plaza de los Algibes*, or square of the cisterns. These are two in number, the largest of which is 102 feet long and 56 wide; it is arched over, and inclosed by a wall 6 feet thick. The principal arch is 47 feet wide in the centre, and is 17 feet below the ground: in these cisterns the water deposited its sediment, and was kept cool for the use of the castle.

On the east side of this Plaza is the palace of Charles V., a beautiful specimen of the *cinquecento* style, by the famous architect Alonso Berreguete. On the north is a very simple and unostentatious entrance to the *Mesuar*, or common bathing court, the first of the Moorish palace. On entering it the visiter feels as if magically transported into one of the fairy palaces described in the *Arabian Nights*. The *Mesuar* is an oblong court 150 feet in length and 56 in width. It is paved with white marble, and the walls covered with arabesques of admirable workmanship. The inscription, *Wā lā ghalib illa-lla*, that is, 'God alone is conqueror,' which is often repeated throughout the building, is read on the peristyles at each end of the court. In the midst of this court is a basin sufficiently large to swim in, bordered with parterres of flowers, beds of roses, and rows of orange trees. This court was designed as a common bath for servants and other dependents of the palace, and supplied with water the fountains of the other apartments.

At the lower end of the Mesuar is an archway leading to the *Patio de los Leones*, or lions' court, which may be considered as the type of Arabian architecture. It measures 100 feet by 60, and is paved with white marble. In the centre of it is a large basin of alabaster supported by twelve lions, not in the best taste. Over this basin a smaller one rises, from which a large body of water spouts into the air, and falling from one basin into the other is sent forth through the mouth of the lions. This court is surrounded by a gallery supported by a great number of slender and elegant columns, 9 feet high, and 8¼ inches in diameter. These columns are very irregularly placed, sometimes they are single, and sometimes in groups of two or three. The walls, up to the height of 15 feet from the ground, are covered with blue and yellow mosaic tilings. The peristyles and ceiling are beautifully ornamented with arabesques and fret-work in the most exquisite taste. Around the upper face of the fountain of the lions are some Arabic verses, which describe in a style of oriental hyperbole the wonders and the beauty of the fountain.

On each end of the court projects a sort of portico or gallery, supported likewise with light marble columns.

On the left side of the court of the lions is the *Sala de los Abencerrages*, where the cicerone never fails to show the blood of these brave warriors, which, however, is nothing else but the deposit of the water impregnated with iron on the white stone.



[Court of the Lions, from Murphy's Arabian Antiquities of Spain.]

Opposite to the *Sala de los Abencerrages*, on the other side of the court of the lions, is the *Sala de las dos Hermanas*, or Hall of the Two Sisters; so called from two huge flags of white marble, without a flaw or stain, which are in the pavement. On the upper end of the Mesuar arises the magnificent tower of Comares, so called from a delicate work named *comaragia*. This massive tower rises above the rest of the building, and overhangs a deep ravine, which descends almost perpendicularly to the river Darro. The prospect from this tower is truly magnificent. The delightful valley through which the Darro flows, part of the city of Granada and of its beautiful vega (plain), present an enchanting natural panorama. The *Sala de Comares* was undoubtedly the richest in the Alhambra, and still preserves traces of its past splendour. The walls are richly stuccoed and ornamented with arabesques of such exquisite workmanship, that the most skilful artists would be greatly embarrassed to imitate it. The ceiling is of cedar-wood, inlaid with ivory, silver, and mother of pearl. The three sides of the hall are full of windows, formed in the immense thickness of the wall, which thus allow a free circulation to the air, and admit a faint light which produces a surprising effect. In the same manner all the halls of the Alhambra are lighted and ventilated.

On the east of the *Sala de Comares* is the *Tocador de la Reina*, or Queen's Toilet; in a corner of this apartment there is a stone drilled full of holes, through which ascended the smoke of the costly perfumes burnt beneath. Close by is the charming little garden of Lindaraja with an alabaster fountain, and groves of roses, myrtles, and orange trees.

At a short distance from the Alhambra rises the *Cerro del Sol*, or 'Sun Mountain,' on which the *Generalife* is situated, a villa where the Mohammedan kings spent the summer months. The palace of Generalife is built in the same style as the Alhambra. Its situation is highly picturesque. The views are all varied, and all charming. We see here fountains spouting above the loftiest trees, numerous cascades, terraces placed in amphitheatre, and the immense cypresses and the ancient myrtles which once overshadowed the kings and queens of Granada. Among them is distinguished the cypress of the *Reina Sultana*, under which the queen was surprised with her beloved Abencerrage, as the romance says.

When we examine the halls of the Alhambra, we are no less surprised at the elegance of their construction and the beauty of their ornaments than at the durability of a work of such a delicate nature. It appears, indeed, incredible that, after a lapse of nearly five centuries, its fountains should continue to play; the blue, the carmine, and the gold, should preserve all their brilliancy and freshness; its slender columns and apparently fragile fillagree work should have stood the vicissitudes of time, and the terrible shocks of earthquake to which this place is subject.

The Alhambra has a governor, who generally lives at Granada. It is guarded by a body of *invalidos*, or retired veterans, who serve as guides to the visiters.

See Swinburn's *Travels in Spain*, letter xiii. Colmenar, *Délices de l'Espagne*, vol. iii. James Murphy's *Arabian Antiquities of Spain*.

ALHAMBRA, more properly Alambra, a small town of Spain, in the province of La Mancha, eleven miles north of Villa-Nueva de los Infantes. It contains many inscriptions and other antiquities belonging to the Roman period; and there can be little doubt that it marks the site of the town called by the Romans Laminium. The letters *min*, in the middle of a Roman word, generally appear in the Spanish in the form of *bre* or *bra*. Thus, *hominem*, a man, *femina*, a woman, were changed by the Spaniards to *hombre*, *hembra*, respectively. The present town, Laminium, would thus naturally be altered to *Lambra*, which with the Arabs would almost certainly become Alambra, or Alhambra; the more so as in this form it would have a meaning in the Arabic language, like the Al-hambra of Granada. Alambra is in 38° 59′ N. lat. 2° 59′ W. long. Population 734. Pliny, Ptolemy, and the *Antonine Itinerary* mention Laminium.

ALHAZEN, or **ALLACEN**, properly Al-Hassan, or, with his complete name, Abu Ali al-Hassan ben al-Hassan ben Haitam, a distinguished mathematician, who lived during the earlier part of the eleventh century. He was a native of Basra. Relying upon his skill in mechanics, he had declared, that he would engage himself to construct a machine by means of which the inundations of the Nile could be made productive of the same advantage, whether they exceeded or fell short of the average height. The Fatimide caliph, Hakim biamr-allah heard of this, and sent for Al-Hassan, on whom he bestowed rich presents, hoping that he would fulfil his engagement. But when Al-Hassan had made himself better acquainted with the nature of the river, he perceived that he had undertaken an impossibility, and in order to avoid the consequences of Hakim's anger at his disappointment, he feigned insanity till Hakim died (A.D. 1020). He lived at Cairo, where he supported himself by copying books, and devoted his leisure hours to study and original composition. He died A.D. 1038. A long list of his works may be found in Casiri's *Bibliotheca Arabico-Hispana Escurialensis*, vol. i. p. 415. A treatise on optics, by Al-Hassan, was translated into Latin by Risner, and printed at Basil, under the title of *Opticæ Thesaurus*, in 1572.

ALI BEN ABI TALEB, surnamed by the Arabs *Asad Allah*, and by the Persians *Shir-i-Khoda*, i.e. the Lion of God, was the fourth caliph or successor of the Arabian prophet Mohammed in the government of the new empire founded by him, and occupied the throne during the years 35-40 after the Hegira (A.D. 655-660). He was the cousin-german of Mohammed, and had from his childhood lived under his care and protection. When the latter announced himself as a prophet, Ali, then ten or eleven years old, was, according to tradition, the first man who acknowledged his divine mission. From these circumstances, and also on account of his marriage with Fatima, the daughter of Mohammed, Ali appeared to have strong claims to the commandership over the Faithful, when the prophet died (A.D. 632) without leaving male issue. Three other associates of the prophet, Abu Bekr, Omar, and Othman, were, however, successively appointed caliphs, before Ali came to the throne, (A.D. 655;) and his son Hassan, who succeeded Ali in 660, was in the ensuing year obliged to resign the government to Moawia, the first caliph of the Ommaiade dynasty. The controversy concerning the respective rights of Abu Bekr, Omar, and Othman, on the one side, and of Ali ben Abi Taleb and his lineal descendants on the other, has given rise to the schism of the Sunnites and Shiites in the Mohammedan community. [See Abu Bekr.] The commencement of the troubles arising from this division disturbed the reign of Ali himself. His predecessor Othman had been killed during a revolt at Medina, where a number of malcontents from different parts of the empire were assembled; those from Egypt succeeded in elevating Ali to the caliphat. Two of his competitors, Zobair and Talha, at first acknowledged him, with feigned submission, as sovereign; but when Ali refused to appoint them governors of the important towns of Basra and Kufa, by the inhabitants of which their claims to the caliphat had been chiefly supported, both deserted him, and in common with Ayeshah, the still surviving widow of Mohammed, formed a strong party against Ali. They had already made themselves masters of Basra, when Ali, at the head of an army of 30,000 men, defeated them in a battle near Khoraiba (A.D. 656). Talha and Zobair were killed: Ayeshah, who had been present at the conflict, was taken prisoner and sent to Mecca.

New disturbances soon arose at Damascus, where Moawia, a near relative of Othman, had by a strong party been appointed *Amir* or chief. Ali encountered him near Saffein, (A.D. 657,) in the neighbourhood of which place nearly a whole year was consumed in skirmishes between the two armies, but no decisive battle ensued. At last the two opponents agreed to withdraw, Ali to his residence at Kufa, and Moawia to Damascus; the former appointing Abu Musa al-Ash'ar, and the latter Amru ben al-As, as delegates to arrange the controversy in a peaceable convention at a place called Dumat-al-Jondal, between Syria and Irak. This measure excited much dissatisfaction among the adherents of Ali, many of whom blamed the caliph for having submitted to the discretion of mortals the settlement of a dispute which, in their opinion, ought to have been left entirely to the decision of Providence and to the chance of war. The discontented, who on this account seceded from Ali, assembled at Naharvan under the command of Abdallah ben Waheb: most of them were, however, dispersed after a decisive battle, (A.D. 658,) in which Ali was victorious.

The caution with which the governor of Egypt, Saad ben Kais, had conducted himself during the disputes between Ali and Moawia, rendered him suspected by the caliph. Ali removed him, (A.D. 658,) and appointed as his successor, Mohammed, the son of Abu Bekr, who behaved with such rigour towards the adherents of Moawia, that much discontent was excited in Egypt. Moawia availed himself of this opportunity to send an army under the command of Amru ben al-As into Egypt, who vanquished and killed Mohammed. Soon afterwards Moawia took possession also of Basra, which Ali's governor, Zayyad, made but a feeble effort to defend. Abdallah ben Abbas, however, reconquered that town for the caliph.

The next year (A.D. 659) passed by without any military operations. But in A.D. 660 Moawia sent an army under the command of Bosr ben Artha into Hejaz, who took possession of the two sacred cities, Mecca and Medina, and on his return defeated and killed Abdallah ben Abbas, the governor of Basra.

About this time three of the zealots of Naharvan, Abdorrahman ben Moljam, Borak ben Abdallah, and Amru ben Bekr, with the design of restoring unity and peace in the Mohammedan empire, entered into a conspiracy to murder the governor of Egypt, Amru ben al-As, the caliph Ali, and Moawia. Amru ben al-As and Moawia escaped, but Ali was struck by Abdorrahman ben Moljam with a poisoned sword in his residence at Kufa, and died after three days, (A.D. 660,) at the age of fifty-nine, or, according to others, sixty-five years.

Ali had by Fatima three sons, Hassan, Hossain, and Mohsen: the latter died very young. Hassan succeeded his father for a short time in the government, and with him terminated, according to Arabic historians, the *legitimate* caliphat, *i. e.* the succession of those caliphs who had been appointed by the free choice of the Faithful. [See Ábu Belba.]

ALI HYDER. [See Hyder Ali.]

ALI PACHA, a celebrated Albanian chief, was born about 1750, in the little town of Tepelen, in the pachalik of Berat, on the left bank of the river Voioussa, the ancient Aous, at the foot of the Klissoura mountains. Ali's family was distinguished by the name of Hissas, and had been for ages settled in the country; it belonged to the Albanian tribe or clan of the Toske or Toxide, who boast of being old Mussulmans. One of Ali's ancestors, after being for some time a klephtis, or highway-robber, made himself master of Tepelen, and assumed the title of Bey, holding it as a fief of the pacha of Berat; this acquisition became hereditary in his family. Ali's grandfather distinguished himself in the Ottoman service by his bravery, and was killed at the siege of Corfu against the Venetians, in the beginning of the eighteenth century, while in the act of mounting the rampart and calling to his men to follow him. His sword was preserved as a trophy in the arsenal of Corfu until the French occupation of that island in 1797. His son Vehli Bey, the father of Ali Pacha, was a good, quiet, liberal-minded man, very partial towards the Greeks. The neighbouring beys or feudal Albanian chiefs combined against him, and deprived him of the greater part of his estates. Vehli, unable to resist, died of grief, leaving two sons, one by each of his two wives, and one daughter. The mother of Ali and of his sister Shynitza, a woman of masculine courage, but cruel disposition, having got rid of her rival and of her rival's son by means, as it was said, of poison, secured the succession to her own son Ali, then fourteen years of age. Young Ali accompanied his mother, who put herself at the head of the little band that remained attached to the Hissas family, keeping at bay her enemies, making incursions into their territories, and practising all the stratagems of Albanian clan warfare; for that country, although nominally subject to the Porte, is still in a condition somewhat similar to that of the Highlands of Scotland a century or two since.

Ali at times sought adventures on his own account as a klephtis. With 'sixty paras in his pocket, and his trusty gun,' as he used in after times to boast, he sallied from home, and roamed about mountains and valleys, and thus acquired that minute knowledge of the topography of his own country which proved so useful to him in his subsequent career. But a cruel event soon plunged Ali's family in misery and shame. The inhabitants of Gardiki, a town in the mountains near Argyro Castro, made an attack by night on Tepelen while Ali was absent, and surprised both his mother and sister. The two women were taken to Gardiki, where they were kept strict prisoners for a month, and given up to the brutal lust of the inhabitants in succession. At last, through the agency of some individual more humane than the rest, they were released from their dreadful situation. This event had probably a great influence on Ali's disposition. The cruelty of his enemies soured his disposition, and inspired him with that thirst for sanguinary revenge which became a leading feature of his character. His mother and sister were frequently urging him to remember the insult offered to them, and the former, on her death-bed, enjoined him not to rest until he had exterminated the whole race of the Gardikiotes. This wish was not fulfilled till many years after, when Ali, being at the summit of his power, *remembered* Gardiki. Surrounding the town with numerous troops, he obliged the inhabitants to surrender at discretion, and carefully picking out all those who had participated in the outrage against his mother and sister, together with their families, he had all the men killed, and the females sold as slaves. The tresses of the latter served to stuff the cushions of Shynitza's divan.

Ali, after the mishap above mentioned, raised a band with which he carried on a desultory and predatory warfare against his enemies. He was, however, at first unsuccessful, and being reduced to great difficulties for want of money, often wandered alone in the mountains not knowing where to seek for shelter. On one of these occasions, as he afterwards related to the French General Vaudoncourt, 'he was sitting under the ruins of a convent, bitterly reflecting on his desperate situation, and mechanically sounding the ground with his stick, when he suddenly thought he felt something resounding underneath. He dug the earth and found a small coffer full of gold, buried there probably during former civil wars. With this money he raised 2000 men, and re-entered Tepelen in triumph.' He now made a vigorous effort to recover the whole of his father's possessions. His mother accompanied him in his campaign. The neighbouring Beys of Argyro Castro, Gardiki, Kaminitza, Ziormovo and others, united against him, defeated him, and drove him into the mountains with a small remnant of his men. This was the critical moment of Ali's life. He took a sudden resolution. Being informed that his two most powerful enemies, the Beys of Argyro Castro and Gardiki, had quitted their confederates and returned home, he left his place of concealment in the middle of the night, unknown to his mother, and proceeded alone to the camp of his enemies, and at day-break presented himself to the leaders. 'The fate of Ali is in your hands,' said he to them; 'you may destroy me, but remember that my death now will not be of any benefit to you. The Beys of Argyro Castro and of Gardiki aim at domination over all our country; my fall will only remove an obstacle to their views. The strong hold of Tepelen, still in the hands of my brave men, might, if you were to unite with me, arrest their ambition. You may choose, but be sure that my ruin will only lead to yours.' The Albanians, like the Arabs, have high notions of hospitality, at least while in their own country, and he who voluntarily puts himself under their protection is generally safe. Ali's reasoning made an impression on them, and from being his enemies they became his allies. His mother, who, on discovering his flight, thought him lost, met him soon after at the head of the united tribes. Ali was now a powerful chief, but his band having committed many depredations about the country, attracted the notice of Koort, Pacha of Berat, who marched against him and took him prisoner. His youth, and his comeliness, however, gained him favour with the Pacha, and it was whispered also with the Pacha's daughter. But the Pacha was a proud man; his family—for the Albanians, unlike the Turks, have a great regard for genealogies—was traced back to a long list of viziers, and even, it was pretended, to the great Scanderbeg himself. Ali, compared to him, was but an adventurer, a klephtis. The Pacha therefore dismissed his prisoner with presents, and gave his daughter in marriage to Ibrahim Bey, who afterwards succeeded to the pachalik of Berat. Hence, perhaps, arose the implacable hatred subsequently manifested by Ali against Ibrahim. Ali, continuing his predatory career, fell next into the hands of the Pacha of Jannina, and was near being executed in the very city which afterwards became his capital. But the Pacha thought better of the matter, and as he was himself surrounded by hostile neighbours, he made a friend of Ali, who was in return to serve him against his enemies. Ali served him so well that numerous complaints reached the Porte of the incursions and depredations committed by his band The Porte ordered the Derwend Pacha, who has the inspection of the high roads of Roumily, to exterminate this troop of robbers. The Derwend Pacha of the time happened to be no other than the old Pacha of Berat, Ali's friend. The sequel is easily guessed. An interview took place between the two chiefs, and Ali, withdrawing his Arnaouts from the high roads, took service under the Pacha, who wrote a favourable account of him to Constantinople, and obtained his forgiveness. But an intrigue of Ali with the former object of his attachment, the Pacha's daughter, now married to Ibrahim, obliged him to decamp suddenly in order to save his life. He then entered the service of the Pacha of Negropont, where he accumulated great wealth. Ali's career as klephtis, or chief of high-road robbers, which he had followed for ten years, was thus terminated. Having returned to Tepelen he married the fair Emineh, daughter of Kasselan the rebel Pacha of Delvino, who had established himself as an independent tyrant in the stronghold of Argyro Castro. Kasselan, however, was soon after decapitated by order of the Porte, and his successor married Shynitza, Ali's sister, but was afterwards murdered by his brother Solyman, who married the young widow. By these events the wealth of Kasselan came into Ali's family.

Ali, however, was not yet undisputed master in his own country of Tepelen. Other beys or chiefs existed in or about the place, whom he knew to be his enemies. He charged some of his trusty friends to get up a sham conspiracy against him, which the others were easily persuaded to join. It was agreed that Ali was to be murdered in a wood where he used to rest after hunting. Ali had a goat tied on the spot, and his cloak thrown over it. At the appointed time, the conspirators came and made a discharge of their muskets at the unfortunate goat. Ali had posted some of his men near the place, who, starting up, frightened the conspirators away before they had time to perceive their error. Thinking that they had killed Ali, they entered Tepelen in triumph, shouting out that he was dead, and then went to their house to carouse upon the event. Ali, concealed in his mother's harem, waited until the night was far advanced and his enemies were intoxicated, when, sallying forth at the head of his faithful band, he exterminated all his antagonists, divided their houses and property among his friends, and from that day he was sole master of Tepelen: such is the account Ali afterwards gave of this exploit. He next conquered various districts which he united to his dominions. Several tribes, overawed by his successes and terrified by his ferocity, voluntarily submitted. His riches now gave him the means of intriguing at the Porte. He obtained the secret commission of executing the 'firmaun of death' against Selim, Pacha of Delvino. He insinuated himself into the good graces of the latter, and having thus introduced some of his own men into the palace, he took him one day by surprise, had him beheaded on the spot, and then silenced the Pacha's guards by unrolling before them the sultan's firmaun. In reward for this service he was appointed lieutenant to the new Derwend Pacha of Roumily, in which office he enriched himself by sharing with the klephtis the produce of their spoils. In consequence of this traffic, the roads soon swarmed with robbers; repeated complaints reached the Porte, and the Derwend Pacha was recalled and beheaded. The lieutenant also, being summoned, instead of appearing, sent presents to several members of the divan, and thus evaded punishment.

Ali's reputation for bravery and decision was, however, established at Constantinople, and when the war broke out in 1787, between the Porte and the two courts of Austria and Russia, he was appointed to a command in the army under the vizier Jussuf. Having distinguished himself in the field, he was next appointed to the pachalic of Tricala in Thessaly, and was moreover named Derwend Pacha of Roumily. He now raised a body of four thousand men, all Albanians and all old klephtis, with whom he soon cleared the roads of robbers, and thus won merit with the Porte. He now turned his views towards Jannina, the capital of southern Albania or Epirus, where utter anarchy prevailed. The pacha of Jannina had but a nominal authority, which the beys of the country openly disregarded, while they were continually quarrelling among themselves. Ali, in his pachalic of Tricala, was master of the road leading from Constantinople to Epirus, by which Jannina is supplied with corn from Thessaly. Ali made war on the beys, and when these obtained a firmaun from the Porte enjoining him not to interfere in matters concerning Jannina, Ali stopped and bribed the messengers, and substituted a forged firmaun appointing himself to the command of Jannina, with orders to all to submit to his injunctions. Ali followed close upon this document with a numerous force. Assisted by his friends in the town, he entered it and took possession of the citadel; he then assembled the Greek primates and the aga of the Mussulmans, and made them sign a petition he had drawn up, in which the whole population of Jannina was made to entreat the sultan to grant them as pacha the valiant Ali, the terror of robbers, the protector of public order, and the most zealous and faithful subject of his highness. This petition, being forwarded to Constantinople and supported by Ali's agents with ready money, produced its effect. Ali was confirmed in the pachalic which he had usurped. By a vigorous despotism he extinguished all factions, restored tranquillity, and the people were satisfied with the change; the Porte, seeing this so long a turbulent province reduced to subjection, forgave Ali for a deception of which the divan had been apprized only when it was too late.

Ali extended his dominion over all Epirus, and also into Acarnania and Ætolia or western Greece, by successfully attacking the revolted Armatoles or Greek militias who, under the corrupt and supine Turkish government, infested instead of protecting the country. But Ali was shackled on the sea-side of his dominions. The republic of Venice held of old on the coast of the Adriatic and the Gulf of Arta several strong places, such as Prevesa, Vonizza, Butrinto, and Parga. The Venetian senate had even obtained from the Porte in 1788 a firmaun forbidding the Pacha of Epirus constructing any battery within a mile of the coast, even of his own gulf of Ambracia. These stipulations were maintained as long as Venice remained free; but when that ancient state fell by the hands of the French in 1797, and the latter, in their sharing the spoils with Austria kept for themselves the eastern possessions of the republic, Ali, while he was deceiving the French by professions of friendship, represented to the Porte that neither justice nor prudence required the fulfilment of former treaties with Venice in favour of the usurpers of Venice: accordingly he attacked one after the other the places on the coast. Parga, however, was protected by its impregnable position and the watchfulness of its inhabitants. The French garrison of Butrinto withdrew in time, but the fall of Prevesa was attended with circumstances of aggravated horror. Ali with a large force invested the French, who to the number of 700 were encamped on the site of Nicopolis. Some auxiliaries from Prevesa being broken in upon by the Albanian cavalry, the French were separated, and although vastly outnumbered, fought desperately until reduced to about 100 men, who, from exhaustion, were obliged to surrender. Meantime the Albanians had surprised Prevesa and entered the town, where a dreadful carnage took place. The small French garrison was cut to pieces fighting in the streets; the houses were set on fire, the surviving inhabitants, men, women, and children, to the number of about 400, were taken to the island of Salagora and there butchered without mercy. The French prisoners, after innumerable insults and ill-treatment, were marched to Jannina, and thence all the way to Constantinople; most of them perished on the road. The catastrophe of Prevesa happened in October, 1798. As for Parga, it was successively garrisoned by the French, the Russians, and the English, until, at last, in 1818 it was given up to Ali in consequence of a treaty with the Porte. Ali was also very desirous of obtaining a footing in the Ionian islands, and he intrigued first with the French, and afterwards with the English for this purpose; he even attempted to take Santa Maura by surprise, but he was baffled in his schemes.

Another war of extermination was that which Ali waged against the mountaineers of Souli. It has been called the ten years war; it began in 1792, and ended in 1803, by the destruction of the Souliotes. This Christian population had lived independent for more than a century in four villages, among almost inaccessible mountains, about six hours distance from Gardiki. They numbered only between 500 and 600 families, and could muster about 2000 fighting men; and yet this little band had kept at bay the power of all the successive pachas of Epirus. They had been attacked repeatedly by large forces, but had always repulsed their enemies. The neighbouring districts, and even some of the Mussulman beys, secretly favoured them. Ali could not think of leaving this rallying point for the disaffected of his dominions, almost within sight of his capital. He attacked them, but was beaten like all his predecessors. His hostility now assumed more the character of malignant rage, and he vowed the total extermination of the Souliotes. For years he steadily pursued his plan, which was to cut off all their communications and supplies, and starve them in their mountains; which he effected by surrounding them with a chain of forts guarded by a numerous army. He found means of seducing one of their chiefs, Georges Botzari. The Souliotes were reduced to the last extremities: despair and the bribes of Ali did the rest. Some of the defiles leading to Souli were given over to the pacha, and he was enabled to take possession of the springs from which they drew their water. At last the poor Souliotes were compelled from sheer necessity in December, 1803, to listen to proposals on the part of Ali, proposals which he of course had no intention of keeping. The Souliotes agreed to give up their towns and territory, on condition of being allowed to retire with their arms and all they could carry wherever they chose. The main body immediately took the road to the sea-coast at Parga, knowing that every moment's delay was pregnant with destruction to them. But there were other detachments of Souliotes scattered about who could not rally in time. Ali's soldiers fell upon these, and the scenes that followed were dreadful. None of the Souliotes surrendered; they all perished. In one instance, a small party, being completely surrounded, retreated towards a precipice, the women leading the way; being arrived on the brink, they first threw their children into the abyss below, after which they all, husbands and wives, fathers and sons, brothers and sisters, linked hand in hand, ran down the declivity, and mutually impelled each other into the precipice, in sight of their disappointed enemies. Another band, in like manner, pressed by a body of Albanian cavalry, plunged into the river Acheron and were drowned. The main body, who had marched off to Parga, left behind some men to act as commissaries in delivering the stores into the hands of Ali's agents, agreeably to the capitulation. These men's lives were, of course, guaranteed by the treaty. One of them, a priest, Samuel by name, was left in charge of a powder magazine. The Albanians came in, and began to taunt him with the prospect of the ingenious torments he had to expect at the hands of the pacha as a reward for his obstinacy. Samuel listened coolly, and when he saw the store-room nearly filled with Albanians, he threw the burning snuff of a candle on some powder which was scattered about, and blew up the store-house with himself and his enemies together. The Souliotes who had gone off to Parga reached that place in safety, though pursued by Ali's cavalry, and there embarked for Corfu, at that time occupied by the Russians.

Ali extended his dominions to the north into Albania Proper, by the conquest of the pachalik of Berat, which he effected more by intrigues than by force. Stirring up revolts, and then stepping in as mediator, he dispossessed his old rival Ibrahim, whom he consigned to a dungeon, although their children had intermarried. He likewise occupied the government of Ochrida in Upper Albania, by joining in the attack ordered by the Porte against the rebellious pacha of Skodra, or Scutari, and then kept it for himself. By this means he ensured an excellent military position on the side of Macedonia. The Porte was obliged to wink at these usurpations. Ali was even appointed for a twelvemonth Roumily-Valicy, or supreme inspector of the principal division of the empire, and he went to reside at Monastir, at the head of 24,000 men. His extortions in Roumilia were very great. His own dominions in the latter part of his life extended over all Epirus, one-half of Albania Proper, part of Thessaly, and the whole of western Greece, from the lake of Ochrida on the north, to the gulf of Lepanto on the south, and from Mount Pindus to the Adriatic. Ali was now Vizier or Pacha of three tails · his second son, Veli, was made Pacha of Morea; and his elder son, Mouktar, a thorough soldier, distinguished himself in the service of the sultan during the campaign of 1809, against the Russians. The youngest of all, Salih Bey, who was his father's favourite, and destined to succeed him, was brought up with particular care under good tutors and teachers. Veli Pacha was also a man of some information, and his son Mahmood, who was brought up at his grandfather's court, surprised Lord Byron by his inquiries about England and the English parliament. He was then a boy of fourteen.

Ali Pacha, although hated by the Porte, might have ended his days in peace; his power made him feared, and his advanced age was an inducement to the sultan to wait patiently for his natural death. But an act of daring atrocity on his part brought summary vengeance on his hoary head. One of his confidants, named Ismael Pacha Bey, having incurred Ali's deadly displeasure, had taken refuge at Constantinople, where he had ingratiated himself with the sultan, and had obtained an appointment in the seraglio. Ali, furious on hearing this, hired assassins to murder him in the midst of Constantinople. The attempt failed, and the assassins being arrested, confessed the name of their employer. The sultan was now roused; Ali was excommunicated, and all the Pachas of Europe were ordered to march against him. This was at the beginning of 1820. But the first campaign of the Ottomans against the outlawed Pacha was, as usual in such cases, unsuccessful. At last Kourshid, then Pacha of Morea, was ordered to take the command of the army against Ali in January, 1821. Kourshid laid siege to Jannina, but the Greek revolution, which broke out about this time, and which was secretly favoured by Ali, delayed and embarrassed his operations. Kourshid however persevered, and Ali, unable to defend his capital any longer, took refuge in a castle which he had built on an abrupt peninsula jutting into the lake, where he kept his principal treasures. Here he threatened to blow himself up unless he received the sultan's pardon. This was at last said to be granted, and Ali surrendered. But he was now doomed to experience the same perfidy which so many others had experienced at his hands. He had still his own officers around him, when some of the beleaguering Pachas came to show him the firmaun of death. Ali fired his pistols, wounded Hassan Pacha, and killed two more, but he was shot himself by the selictar of Kourshid Pacha, and fell crying to one of his attendants to go and kill his favourite concubine, 'that her charms might not be abused by his enemies.' Many of his followers fell round him, in defending their master. Ali's head was cut off and sent to Constantinople, where it was exhibited before the gate of the seraglio. His sons shared their father's fate. The Porte became possessed of Ali's treasures, which were very considerable, although absurdly exaggerated by Pouqueville. Thus Ali Pacha, at seventy-two years of age, closed his guilty, but extraordinary career, in February, 1822. A somewhat different account of the mode of his death is given in a book entitled *Sketches in Greece and Turkey*, &c. 1833.

The character of such a man is easily ascertained from the account of his life. It was also stained, like that of most Turkish grandees, by private vices of a disgusting nature. The cruelty of his revenge was truly fiendish. His administration rested upon the principles of terror; he certainly extirpated the robbers and other criminals, and rendered his territories perfectly secure from all depredations but his own. This security, in a country like Turkey, was felt as a boon, and commerce improved in some measure by it. Jannina became one of the most flourishing towns of Turkey, and its population had increased to 40,000 inhabitants. Ali was a Mussulman only by name: he fully protected the Greeks, and other Christians, in the exercise of their religion, and allowed them to have schools, and even a lyceum and a library. Ali treated all his subjects, Albanians, Turks, or Greeks, alike, and without partiality; the Turks were perhaps those who liked him the least, because he did not allow them to ill-use the rest of the people, as in other parts of Turkey.

Greek or Romaic was the language Ali generally spoke, and it was the language of his court; most of his agents and his secretaries were Greeks. His yearly revenue was calculated at about half a million sterling, but no account could be kept of the produce of his confiscations and the forced contributions which he imposed upon individuals.

For more particulars of this extraordinary man, the reader may consult the travels of Dr. Holland, Hobhouse, Hughes, and Colonel Leake. Malte-Brun has also given a good sketch of Ali's life, from which we have borrowed some of the above particulars.

A'LIAS is the term used in legal proceedings to denote a second or further description of a person who has gone by two or more different names. For example, if the same person is known by the name of John Smith as well as the name of John Thomson, he is described in civil and criminal pleadings, and in legal language generally, as John Smith, *alias dictus* (otherwise called) John Thomson. It has been considered in former times that as a person cannot have two Christian names, it would be improper in an indictment to describe the defendant as Elizabeth Newman *alias* Judith Hancock; but that a second surname may be laid under an *alias*, as a person may be known by several surnames. It is doubtful, however, whether at the present day, when a total alteration has taken place in the use of names, and the surname has become the real name of designation, such a distinction would be maintained.

A'LIBI is a term of frequent occurrence in criminal courts of justice. Thus, where a person charged with an offence committed at a certain time and place, shows that he was *elsewhere* at that time, he is said to prove an *alibi*. If true, this is obviously the best proof of innocence: but no kind of defence offers so ready an opportunity for false evidence: and the *setting up an alibi* is, therefore, always regarded in practice with suspicion.

ALICANTE, a modern province of Spain, formed of the southern portion of the kingdom of Valencia and a small part of Murcia.

ALICANTE, a well-built sea-port town in 38° 35′ N. lat. and 0° 24′ W. long., situated in a bay of the Mediterranean, in the kingdom of Valencia in Spain. The town is built on a peninsula, at the foot of a rocky mountain, which has a fortified castle at its summit 400 feet above the sea. Alicante has still a considerable trade, although it has much decreased of late years: this may partly be attributed to the political persecutions which its inhabitants have suffered since 1823, and which have caused a diminution in its population to the extent of nearly one-third. The de-lining state of its commerce may, however, be principally eferred to the prohibitions placed on the importation of various articles of foreign manufacture and merchandize, and to the heavy duties imposed upon such other goods as are admitted. The greater part of its foreign trade consists in imports of linen from France and Genoa, tobacco from the United States of America, and cod-fish from Newfoundland; its exports are, barilla and almonds to England and Ireland, and wine to Brazil and the coast of Barbary. A considerable quantity of wine is also shipped to the port of Cette in Languedoc, whence it is sent by the great southern canal to Bordeaux, to be mixed with the inferior Medoc wines. Alicante likewise exports oil, olives, brandy, and soap: the quality of the last-mentioned article is much esteemed. The communications between the town and the contiguous country are for the most part kept up by means of small coasting vessels of from twenty to seventy tons burthen, the roads being so exceedingly bad, that such goods as are sent by land must be conveyed on the backs of mules and asses. The wheat required for the consumption of the inhabitants is mostly brought from places as far as two hundred miles inland, and for the reason just given, its cost is nearly doubled by the time of its arrival at Alicante. The average price of wheat during the ten years ending with 1831, was equal to 68*s.* 4*d.* per imperial quarter, while its average price in this kingdom during the same period was only 59*s.* 5*d.* Alicante is dependant upon foreign supply for the articles of cheese and butter, the prices of which are usually double what are paid in London; the consumption of these articles is therefore small, and the bulk of the population make use of oil instead. Meat is very indifferent in quality, and the price nearly as high as in England, so that taking quality into the account it is dearer than in England. The town is besides very ill supplied with water.

The number of vessels that entered the port from foreign parts was,
in 1829 . 128 ships, 19,706 tons
„ 1830 . 108 „ 14,840 „
„ 1831 . 157 „ 16,873 „

The Spanish vessels, including those employed in the coasting trade, that arrived in the same years, were as follows:
in 1829 . . 783 vessels 19,875 tons
„ 1830 . . 746 „ 21,681 „
„ 1831 . . 813 „ 22,645 „

Goods may be landed at Alicante, and lie in entrepôt for one year without payment of duty, and at any period during that time may be exported on paying 2 per cent. on their value. At the expiration of the year the duties must be paid, together with 2 per cent. *ad valorem* as an equivalent for warehouse rent.

The port of Alicante is an open bay, between the Cape de la Huerta and Plane Island, distant from each other about ten miles in a north-east direction. Ships on entering the port may steer between these points in any course direct for the castle, and come to anchor in four to eight fathoms water. The port has no pilot, nor indeed is one necessary. There is no perceptible tide in the port of Alicante; the depth of water varies from fifteen to four fathoms, according to the distance from the shore: neither bar nor shallows are to be passed in entering. Ships mostly lie in the bay at the distance of from a quarter of a mile to a mile from the shore. They are not exposed to any danger from winds, currents, or other casualties when at anchor, and during the last twenty years no case has occurred of a vessel being driven from her moorings.

A mole or quay is now in progress of construction, and has already been carried upwards of 300 yards and into fifteen feet water. It is intended to continue it into twenty-four feet water. This mole is constructed with large stones which are dropped into the sea: the western, or inner side, is faced with large blocks of cut stone. Small vessels lie alongside this quay in order to take in or discharge their lading.

Alicante stands on the site of the ancient town of Lucentum. During the peninsular war in 1812, when the French general, Suchet, succeeded in making himself master of the rest of the kingdom of Valencia, Alicante had the honour of successfully resisting the invaders. The population,
in 1810 amounted to 21,463 souls
„ 1820 „ 20,348 „
„ 1830 „ 14,230 „

ALICATA, a city on the south coast of Sicily, in 37° 4′ N. lat., and 13° 55′ E. long. It is used as a military position, and has been tolerably well fortified, but the walls have been suffered to go to decay, and are now lying in large fragments on the beach. Alicata is built on the right bank of the river Salso, which divides the provinces of Noto and Mazzara; it is very favourably situated for trade, and exports considerable quantities of grain and sulphur. The port is a '*caricatore*, or place endowed with immunity for exporting the produce of the country.' Notwithstanding these advantages, the general appearance of the place is that of neglect and poverty. The anchorage is about a mile south-west of the town, in from seven to twelve fathoms water, with a good clay bottom, but ships are much exposed in winter 'to all the winds from east to west round southerly.' This evil might be remedied at a moderate expense. Two reefs of rocks off the west end of the town could easily be converted into excellent moles, for which purpose the neighbourhood affords abundance of stone and lime, and the useless old horn-work of the castle might be excavated, so as to form a wet dock capable of containing in perfect security nearly a hundred sail of small craft.

'The suffrage of custom' has allotted to each of the principal cities of Sicily an agnomen, illustrative of their consideration, and Alicata is known among the inhabitants as *L'Amata*, or the beloved. Its population amounts to nearly 11,000. (Smyth's *Memoir of Sicily.*)

ALICUDI. The most westerly of the Æolian or Lipari islands, a group belonging to Sicily, and situated between the north coast of that island and the continent of Italy. Alicudi was called Ericusa and Ericodes, by the Greeks, from the heath which grows on it. (See Strabo, 276. Casaub.) Alicudi is a corrupted form of Ericodes, as Felicudi, another island of the group, is a corruption of Phœnicodes. It consists of an abrupt conical-shaped crater, about six miles in circumference, which rises at once from the sea. The surface is composed of irregular ravines and precipitous hills; and although its fires have been extinct for so many ages that no history notices its conflagrations, the lava is seen in grotesque forms like a stream extending from the summit to the sea, and retaining the apparent sterility and forbidding aspect of a recent eruption. The island is, nevertheless, cultivated with laborious industry in every spot capable of producing vegetation. Barilla, flax, capers, and pulse are produced, and wheat of a peculiarly fine quality.

The coasts are rude, craggy precipices, affording only two landing places, which are very difficult of access in fresh winds. The best is on the south-east side under Point Palomba; the other is on the north-east coast. The population of Alicudi amounts to about 260 persons, among whom diseases are said to be almost wholly unknown They live so secluded from the rest of the world, that a visit from a stranger is an extraordinary event, and they owe to the peculiar formation of the island their security from the attacks of pirates, who so frequently infest the Mediterranean sea. (Smyth's *Memoir of Sicily.*)

ALIEN. An alien (*alienné, alibi-natus, alienigena*) is a person born out of the allegiance of the king. By such appellation he is distinguished from a native subject, who owes perpetual allegiance to the crown of these realms.

It is not true that every person, born out of the dominion of the crown, is *therefore* an alien; nor is a person born within them necessarily a natural-born subject. It is essential to alienage that the birth of the individual occurred in a situation and under circumstances which gave to the king of this country no claim or right to his allegiance.

It is not intended here to present any view of the subject as founded on the law of nature or of nations, or to detail the municipal regulations which foreign states have deemed it expedient to adopt in reference to their intercourse with strangers; but we shall confine ourselves to the existing state of the law of England, as it regards this class of persons.

The following instances will serve to illustrate the above description of an alien. The native subject of a foreign country continues to be an alien, though the country afterwards becomes a part of the British dominions. Thus, persons born in Scotland *before* the union of the crowns by the accession of James I., were aliens even *after* that event; but those who were born afterwards were adjudged to be natural-born subjects This question was the subject of solemn discussion in the reign of that prince; and the reported judgment of the court has been a landmark to succeeding lawyers in all similar controversies. Persons born in those parts of France which formerly belonged to the crown of England, as Normandy, Guienne, Gascony, &c., were not considered as aliens so long as they continued so annexed; and, upon the same principle, persons born at this day in any of our colonial possessions are accounted native subjects. A man, born and settled at Calais whilst it was in the possession of the English, fled to Flanders with his wife, then pregnant; and there, after the capture of Calais by the French, had a son: the issue was held to be no alien. When an hostile army enters a foreign territory, the children of the invaders, born during such hostile occupation, are to be considered as native subjects of the invading country and not of the country invaded.

The children of ambassadors, and other official residents in foreign states, have always been held natives of the country which they represent and in whose service they are. This rule prevailed even at a time when the law of alienage was stricter than it now is. It has been since so far extended by various enactments, that all children born abroad, whose fathers or grandfathers on the *father's* side, were natural subjects, are now deemed to be themselves natural-born subjects, unless their fathers were liable to the penalties of treason or felony; or were in the service of a prince at war with this country. (25 Ed. III., st. 2; 7 Anne, c. 5; 4 Geo. II., c. 21; 13 Geo. III., c. 21.)

It follows from the general principles of our law, and, it is believed, of the law of most other European states, that a man may subject himself to a double and conflicting allegiance; for, though he may pledge his allegiance to the sovereign of his adopted country, he cannot divest himself of the duty which he owes to his own. So that, in the event of a war between the two states, he can take no active part on behalf of one without incurring the penalty of treason in the other. It appears, too, that this distressing predicament may occur without any default of the party; for the children of aliens are (except under peculiar circumstances) natural subjects of the state in which they were born: yet we have seen above that they may still be regarded as natural-born subjects of the state to which their parents owed allegiance.

Having described the persons whom the law designates as aliens, we shall shortly point out the legal consequences of alienage, and the means by which its attendant incapacities may be either wholly or partially removed. An alien cannot hold property in land without the king's permission; and if it should become vested in him by purchase, it is forfeited to the crown, after the fact of purchase has been regularly ascertained and declared by a jury. The occasional hardship of this rule is usually obviated in practice by a voluntary grant of the lands by the crown, after they have become vested in it by an inquisition under a *commission of escheat*. An alien cannot take land by act of law,—as by descent, dower, or curtesy; nor can he take under a devise. In these cases there is no forfeiture to the crown; for no estate or interest whatever vests in the alien which can be the subject of escheat. Whatever may be the policy of these disabilities at the present day, they seem to have had a reasonable origin in the maxims of the feudal law, which annexed to the tenure of land various services incompatible with foreign allegiance. An alien may, however, possess himself of goods, money in the funds, and other personal effects, to any extent; and as the law has, from a very early period, recognized his right to reside, without molestation, within the realm for commercial purposes, (see *Magna Charta*, art. 48,) he enjoys the incidental right to occupy a house and premises, provided he does not attempt to acquire any permanent interest in them. An alien may dispose of his property by will. The *droit d'aubaine*, or right of succeeding to the effects of a deceased alien, formerly claimed by the crown of France, never prevailed in this country. Nor was it customary to enforce it even in France, except as against the natives of a state in which a similar right was exercised. This doctrine of reciprocity was adopted by the *Code Napoléon*, (*Code Civil*, art. 726,) but has since been abrogated; so that aliens are now on the same footing, in this respect, with native Frenchmen throughout that kingdom. Aliens, who are parties to any proceeding, civil or criminal, in our courts of justice, are in most cases entitled to trial by a jury *de medietate*,—*i. e.*, a jury of which one-half is composed of foreigners.

The disabilities of aliens may be partially removed by the king's letters-patent, constituting the party a *free denizen*. From the date of the grant he is entitled to hold land, and transmit it to his *after-born* children, and to enjoy many other privileges of a native subject. But the most effectual method of naturalizing an alien is by Act of Parliament, called a *Naturalization Bill*, by which he is admitted to every right of a natural-born subject, except the capacity of sitting in Parliament or the Privy Council, or of holding grants and offices of trust under the crown; an exclusion dictated by the jealous policy of the legislature on the accession of the House of Orange.

It is to be observed, that the rights and incapacities attaching to aliens, enumerated above, must be understood to apply only to alien *friends*. Alien *enemies*, or subjects of a foreign state at war with this country, are in a very different condition, and may be said to possess very few civil rights of any kind which the law will recognise or protect.

As examples of the policy which has at different times been pursued in this country, with reference to the reception of aliens, the following historical notices may perhaps be interesting:—

Magna Charta stipulates, in the article already cited, for the free access of foreign merchants for the purposes of trade, and its provisions were enforced and extended under the reigns of succeeding princes.

In the eighteenth year of Edward I., the parliament rolls contain a petition from the citizens of London, 'that foreign merchants should be expelled from the city, because they get rich to the impoverishment of the citizens;' to which the king replies, that 'they are beneficial and useful, and he has no intention to expel them.'

In the reign of Edward III., several beneficial privileges were conferred on aliens, in furtherance of foreign commerce.

Under Richard II., and his successor, statutes were made imposing various restraints on aliens trading within the realm, and especially prohibiting internal traffic with one another. Similar restrictions were introduced in the reign of Richard III., chiefly with a view to exclude them from retail trade; and in that of Henry VIII., violent insurrections against aliens were followed by repeated statutes, reciting the mischievous consequences attributed to the influx of foreigners, and laying severer impediments in the way of their settlement within the realm. Several acts of this description are still in force, though they have fallen into practical disuse; but it has been the uniform policy of the courts of law to put on them a construction the most favourable to foreign commerce, agreeably to the sentiments of Lord Chief Justice Hale, that 'the law of England hath always been very gentle in the construction of the disability, and rather contracting than extending it severely.' (Ventris's *Reports*, vol. i. p. 427.)

In the reign of James I., the king was strongly petitioned to adopt exclusive measures against the aliens, who had flocked into the kingdom from the Low Countries; but James, though he acquiesced to a certain extent in the object of the petitioners, seems by no means to have participated in their feelings of enmity to aliens; for he professes his intention 'to keep a due temperament between the interests of the petitioners and the foreigners; and he especially commends 'their industrious and sedulous courses, whereof he wished his own people would take example.'

In the reign of Charles II., aliens were invited to settle in this country, and to engage in certain trades, by an offer of the privileges of native subjects. (15 Car. II., c. 15.)

In the early part of the last century (1708) a bill was carried in parliament for the general naturalization of all foreign Protestants notwithstanding the strenuous opposition of the city of London: but, after remaining in operation for three years, it was repealed on a suggestion of its injurious effects upon the interests of natural-born subjects. The reasons for and against the measure will be found in the fourth volume of Chandler's *Commons' Debates*, p. 119-122.

Upon a review of the history of our policy, the inference seems to be, that although the maxims prevalent in our courts of law have been generally favourable to the rights of aliens; and although the executive authorities of the state appear to have been at all times sensible of the fiscal and other advantages resulting from a liberal reception of foreign settlers engaged in trade, yet popular prejudices have been, on the whole, successfully exerted in impressing upon the legislature a more jealous and exclusive system.

The temporary restraints upon aliens, introduced during the late wars, had their origin in objects altogether distinct from commerce or political economy. There is reason to believe that the power of banishing them from the realm has at all times existed in the crown: at all events it has undoubtedly been often exerted; and it seems almost to be included in the ampler prerogative of declaring war against the whole, or any part, of a foreign state. However, either from want of recent authentic precedents, or from a desire to accompany the measure with provisions not within the scope of the ordinary functions of the executive, this power has not been called into activity of late years without the previous sanction of parliament. After the expiration of the last of the alien acts, a measure was introduced for the general registration of all aliens visiting this country, which is still in force. (See 7 Geo. IV., c. 54.)

ALIMENT. [See FOOD.]

ALIMONY, from the Latin *alimonium* or *alimonia*, a barbarous word, signifying 'maintenance or support.' By the law of England, which in this respect corresponds with the civil law, a wife is presumed to have surrendered the whole of her property to her husband upon marriage, and consequently to be entirely dependent upon him for her future maintenance. Upon this principle, it is reasonable that if a separation takes place, the wife should have a portion of her husband's estate allotted to her for her subsistence; and this allotment, made by the ecclesiastical courts, is termed in law 'alimony.' The right of a wife to this provision depends, however, entirely upon the truth of the presumption, that she has not sufficient means, independently of her husband, to support her in her appropriate station in life; for in cases where she has a separate and sufficient income, not vested in the husband by the marriage, and therefore beyond his control, the wife is not entitled to alimony.

Alimony, in common with other subjects of matrimonial litigation, falls properly under the exclusive cognizance of the ecclesiastical courts; for though courts of equity have not unfrequently decreed a separate maintenance resembling alimony, yet their interference in such cases seems to have proceeded upon the ground of enforcing some express agreement between the parties, and is not founded upon the legal right of the wife to a portion of her husband's estate, resulting from the general principle above stated. In the ecclesiastical court, the allotment of alimony is necessarily incidental to a decree of divorce *a mensâ et thoro* upon the ground of cruelty or adultery on the part of the husband. It may be either temporary or permanent: in the first case, while the proceedings in the suit for a divorce are depending, the court will, generally speaking, allot alimony to the wife *pendente lite*, or during the continuance of the litigation; and in the second case, when a decree of divorce has been obtained on either of the above grounds, a permanent provision may be given to her; in both cases the allotment is made in the form of a stipend for her maintenance from year to year, and is proportionate to the estate of the husband.

The amount of alimony to be allotted depends wholly upon the discretion of the court, equitably exercised with a view to the circumstances of each particular case. In forming their estimate in this respect, the courts have held, that after a separation on account of the husband's misconduct, the wife is to be alimented as if she were living with him as his wife; they attend carefully to the nature, as well as to the amount of the husband's means, drawing a distinction between a substantial property and an income derived from personal exertion. The station in life of both parties, and the fortune brought by the wife, are also considered; and much stress is laid upon the disposal of the children and the expense of educating them. The conduct of the parties forms also a very material consideration: where the wife has eloped from her husband, or where the sentence of divorce proceeds upon the ground of her adultery, the law will not compel the allowance of alimony; for as adultery amounts to forfeiture of dower after the death of the husband, it is a sufficient reason why the wife should not partake of his estate while living. In assigning the amount of alimony, it should be observed, that in order to discourage vexatious litigation, as well as upon the just principle that innocence of imputed misconduct is to be presumed until the contrary is proved, alimony during the continuance of a suit is always much less in amount than permanent alimony. Thus in the former, the proportion usually allowed is one-fifth of the net income of the husband; in the latter, after a charge of cruelty or adultery has been established, a moiety of the whole income is frequently given. This seems to be the result of numerous cases in which the quantum of allotment has been decided; but no general rule can be laid down upon this subject, as the amount granted must always depend upon the discretion of the judge, exercised upon the infinitely varied combinations of facts brought before him.

The assignment of alimony during the continuance of a suit will not discharge the husband from liability for his wife's contracts; but when the court has allotted her a permanent maintenance upon the termination of a suit, the wife is liable for her own contracts, and the husband is wholly discharged from them. On this ground, and with a view to the protection of the husband, the ecclesiastical court has sometimes granted alimony in cases where the wife, by her own profligacy or extravagance, has thrown enormous expense on her husband, and has thereby forfeited her equitable title to a subsistence from his estate.

ALIQUOT PART. One number or fraction is said to be an aliquot part of a second number or fraction, when the first is contained an exact number of times in the second. Thus, 6, 3, 4, 2, 1½, 3/7, ⅛, &c., are all aliquot parts of 12, being contained in it respectively 2, 4, 3, 6, 8, 28, 96, &c. times. The word is principally used in the arithmetical rule called *practice*, and the convenience of using it is as follows. If we want to know how much 30½ yards cost at 1*l.* 15*s.* 6*d.* a yard, the direct process of common arithmetic would be to turn 30½ yards into half yards, giving 61, and 1*l.* 15*s.* 6*d.* into sixpences, giving 71. Then multiplying 61 by 71, and dividing the product by 2, we have the number of sixpences which 30½ yards cost, which must then be reduced into pounds, shillings, and pence. But if we observe that 1*l.* 15*s.* 6*d.* is made up of 1*l.*, 10*s.* the half of one pound, 5*s.* the half of 10*s.*, and 6*d.* the tenth of 5*s.*, we can proceed as follows:—

	£.	*s.*	*d.*		£.	*s.*	*d.*
30½ yards at	1	0	0	per yard cost	30	10	0
"	0	10	0	"	15	5	0
"	0	5	0	"	7	12	6
"	0	0	6	"	0	15	3
"	1	15	6	"	54	2	9

in which each line is derived from the preceding by simple division, on the obvious principle that at 6*d.* a yard we give the tenth part of what we give at 5*s.* a yard, and so on.

The object therefore is, to be ready in dividing a sum of shillings and pence into parts, each of which shall be the aliquot part of a pound, or of one of the preceding parts. The following table contains the simple aliquot parts of a pound, arranged so that the aliquot part of an aliquot part shall be visible on inspection. Figures written by themselves are shillings, and the semicolons separate shillings from pence. The aliquot parts omitted contain fractions of farthings, and are useless.

		Half.	Third.	Fourth.	Fifth.	Sixth.	Eighth.	Tenth.	Twelfth.	Twentieth.	Fortieth.
	£1	10	6; 8	5	4	3; 4	2; 6	2	1; 8	1	;6
Half,	10	5	3; 4	2; 6	2	1; 8	1; 3	1	;10	;6	3
Third,	6; 8	3; 4		1; 8	1;4		;10	;8		;4	;2
Fourth,	5	2; 6	1; 8	1; 3	1	;10	;7½	;6	; 5	;3	;1½
Fifth,	4	2	1; 4	1		; 8	; 6		; 4		
Sixth,	3; 4	1; 8		; 10	;8		; 5	;4		;2	;1
Eighth,	2; 6	1; 3	;10	; 7½	;6	; 5	; 3¾	;3	;2½	;1½	; ¾
Tenth,	2	1	; 8	; 6		; 4	; 3		;2		
Twelfth,	1; 8	; 10		5	;4		; 2½	;2		;1	; ½
Twentieth,	1	; 6	; 4	; 3		; 2	; 1½		;1		
Fortieth,	; 6	; 3	; 2	; 1½		; 1	; ¾		; ½		

This table shows all the aliquot parts of a pound down to one halfpenny: for example, we see ;2½, signifying two pence halfpenny, opposite to *twelfth* under *eighth*, which shows us that 2½ is the twelfth part of the eighth part of a pound. If, therefore, we wished to find how much 3715 yards cost at 2½*d.* a yard, instead of multiplying by 2½, and dividing by 12 and 20, we should divide by 8 and 12, as follows:—

8) 3715
12) 464 7 6
£38 13 11½ [See PRACTICE.]

ALISMA'CEÆ, a natural order of plants belonging to the monocotyledonous division of flowering plants. It is known from all the other orders of the same division by its genera having the sepals and petals perfectly distinguishable from each other both in colour and situation, and by their carpella being extremely numerous. In many points they approach very nearly to the crowfoot tribe (Ranunculaceæ), from which the structure of their embryo and their endogenous mode of growth distinguish them. [See AGE OF TREES.]

All the species are aquatic plants, with rather broad, ribbed leaves and white flowers. They appear to be destitute of any active properties, except a slight degree of acridity, which, however, does not prevent the rhizoma of some of them from being eaten in China.

[Alisma Plantago—Great Water Plantain.]

The order receives its name from the genus Alisma, one species of which, *Alisma plantago*, a common wild plant, in wet ditches and by river sides, has had the reputation of being a cure for hydrophobia. Its powdered root is given in doses of from half a drachm to a drachm, either infused in wine or mixed with syrup.

A'LKALI. This word is compounded of the Arabic article *al* and *kali*, the name of the plant, by burning which a saline mass is obtained, containing the alkali in question; and in this term are comprehended various other bodies possessing similar properties.

The alkalis are numerous, and they are all compound substances; they do not result, however, from the action of any specific or alkalizing principle, being very variously constituted. All exist in nature, and some may be artificially formed. The alkalis may be divided into three classes:—

1st. *Ammonia*, existing in the animal fluids, and composed of two gaseous bodies, viz., hydrogen and azote; as it readily evaporates, it was formerly called the *volatile alkali*.

2d. *Compounds of certain metals and oxygen*, among which are potash and soda, which, though long known as the *fixed alkalis*, and usually obtained from the ashes of plants, were discovered by Davy to be metallic oxides: this class also comprehends the alkaline oxides or earths, lime, magnesia, &c. No metal yields two alkalis by different degrees of oxidizement; nor does any one become an alkali and an acid.

3d. The *vegeto-alkalis*, produced in plants during vegetation; they are, as far as has been ascertained, quaternary compounds of oxygen, hydrogen, carbon, and azote. This class includes *quina*, an active medicinal principle of cinchona or bark, and *morphia*, one of the narcotic principles of opium, &c.

Ammonia is the only alkali which has a strong smell, and is gaseous in its form, the rest being solid; it is caustic when applied to the skin, and acrid to the taste, and this is the case with the alkalis of the second class except magnesia. Ammonia dissolves readily in water, and so do the alkalis of the second class, except lime and magnesia. The vegeto-alkalis are very sparingly soluble in water.

Heat produces very different effects upon the different classes of alkalis: ammonia evaporates at low temperatures, and decomposes at high ones; the alkalis of the second class are all comparatively, and some perfectly fixed, even at high temperatures, and suffer no decomposition, though some of them acquire oxygen, if heated in the air. The alkalis of the third class are all decomposed at high temperatures, giving rise to new compounds.

The chemical and distinguishing properties of the alkalis are, that their aqueous solutions turn vegetable blues green, and vegetable yellows reddish-brown; and hence infusion of red cabbage and infusion of turmeric, or paper stained with them, are used as tests of the presence of an alkali. The alkalis restore the colour of vegetable blues which have been reddened by acids, and, on the other hand, the acids restore vegetable colours which have been altered by the alkalis.

The alkalis have great affinity for, and readily combine with acids, forming *salts*, and the power of both in altering vegetable colours is generally destroyed. The alkalis are separated at the negative pole of the voltaic trough. Ammonia and many of the alkalis of the second class combine with metallic oxides: thus the oxides of cobalt, copper, nickel, &c. are taken up by ammonia, while potash and soda unite not only with the oxides of lead, zinc, &c., but also with silica, alumina, &c. The nature of the compounds which they form with these substances, and others with which they unite, will be treated of under each particular alkali.

Ammonia is largely employed in medicine and in scientific chemistry; the alkalis of the second class are used for the same purposes, and also extensively in various chemical arts, as in soap and glass making, &c. Some of them act strongly upon vegetable and animal matter, producing changes which we shall notice under each alkali. The alkalis of the third class are principally employed in medicine.

The alkalis and alkaline earths which we shall more particularly notice are the following:—

Ammonia,
Atropia,
Barytes,
Brucia,
Cinchonia,
Delphia,
Digitalia,
Emeta,
Hyoscyama,
Lime,
Lithia,
Magnesia,
Morphia,
Picrotoxia,
Potash,
Quina,
Soda,
Solania,
Strontia,
Strychnia,
Veratria.

ALKANET. [See ANCHUSAS.]

ALKMAAR, is a strongly fortified and well-built town in North Holland, on the Helder canal, 20 English miles N.N.W. of Amsterdam: 52° 38′ N. lat. 4° 43′ E. long. It is intersected by broad canals, and has exceedingly pleasant environs of excellent gardens and rich meadows. This town is the greatest cheese depôt in Holland, and also a great butter market. It has some fabrics of sail-cloth; and a population of 9439 inhabitants on January 1, 1830. Alkmaar is a very old town, and from its position is of great importance to the defence of the province. In the expedition of 1799 the British and Russians, under the Duke of York, advanced as far as Alkmaar.

ALKMAAR (HENRY OF). This is the name assumed by the author of a celebrated old poem, in the Low-German, or Sassich dialect, entitled *Reineke de Vos*, (Reynard the Fox,) in the preface to the first edition of it printed at Lubeck in 1498. It can scarcely be said that any thing more is known of Alkmaar, except that a person of that name seems to have existed about the year 1470, and to have been tutor to one of the Dukes of Loraine. But it is extremely doubtful if this be more than an assumed name. Attempts have been made to show that the true author of *Reynard the Fox* was a person of the name of Nicholas Baumann, a native of East Friesland, who, having been a member of the council of Duke Magnus, of Juliers, and having been driven from the court of that prince by a cabal, wrote this poem to expose the arts of which he had been the victim, and, at the same time, assumed the name of Alkmaar to escape the revenge of those whom he satirised. But whoever was really the writer of the poem published at Lubeck in 1498, it has been clearly established that he was merely the versifier, and not the original author of *Reynard the Fox*. He states himself, indeed, in his preface, that he translated the work from the Welsh (though it may be difficult to say what language it is which he thus designates) and from the French. Two editions of a work in prose, and in the Dutch language, of less extent than the poem of *Reynard the Fox*, but containing the complete groundwork of its story, have been discovered; the one printed by Gerard Leew at Gouda, in 1479, the other (which is exactly similar, and of which there is a copy in the public library of Lubeck) printed at Delft, in 1485. A work of the same nature, and with the same title, appears to have been written in French about the beginning of the thirteenth century, by Pierre de St. Cloud, of which a metrical imitation was published at Lille towards the end of the same century, by Jaquemars Gélée, or Giellee, under the title of *Le Nouveau*

Renard. M. le Grand d'Aussy, in his *Notices et Extraits des Manuscrits de la Bibliothèque de Paris,* contends that these two productions are the true originals of the German poem. The general title of the fable, however, is probably much older than even the date there assigned to it; and it is said that traces of it are to be found in the minstrelsy of Germany long before the time of St. Cloud. *Reineke de Vos,* as already hinted, is a satirical poem, in which the different animals, being assembled at the court of their king, the lion, converse on the vices and follies of mankind. It has always been extremely popular in Germany, the edition which bears the name of Henry of Alkmaar having been repeatedly reprinted at Rostock, Francfort, and Hamburgh. The old poem has also been modernized in its language, and turned into hexameters by the celebrated Goethe. Versions of it have been likewise made into the Latin, Italian, Danish, Swedish, and English languages. Of these the most elegant is the translation into Latin verse, by Hartman Schopperus, under the title of *Speculum Vitæ Aulicæ; de Admirabili fallacia et Astutia Vulpeculæ Reinikes Libri Quatuor, nunc primum ex idiomate Germanico Latinitate donati,* &c., published in 12mo. at Francfort, in 1574, and again in 1584, with cuts, copious annotations, and a dedication to the Emperor Maximilian II. dated 1566. The English translation is one of the productions of Caxton's press, and is without any title page, but concludes as follows: 'I haue not added ne mynusshed, but haue folowed as nyghe as I can my copye, whiche was in Dutche, and by me, Willm Caxton, translated into this rude and symple Englysshe, in thabbey of Westmestre. Fynyshed the vi. daye of Juyn, the yere of Our Lord mccccclxxxi., and the xxi. yere of the regne of Kynge Edward the iiiith.' It may be added that this poem, besides its merit as a work of amusement, has been looked upon as very curious and valuable, for the illustrations which it supplies of ancient manners and customs. M. Dreyer, Syndic of Lubeck, has published a volume, under the title of *De l'Usage qu'on peut tirer de l'excellent poëme Rainier le Renard, pour l'étude des Antiquités du droit Germanique.* 4to, 1768. The latest edition of the poem, we believe, is that published in octavo at Brunswick, in 1825, with explanatory remarks, by Dr. K. Scheller, of which a notice may be found in the *Foreign Quarterly Review,* No. XV. (See the *Biographie Universelle.*)

ALL-HALLOWS, ALL-HALLOWMAS, or simply **HALLOWMAS,** the old English name for All Saints' Day, or the 1st of November. Thus, in Shakspeare's *Two Gentlemen of Verona,* Valentine's servant, Speed, enumerates, among the signs by which he has discovered that his master is in love, that he has learned 'to speak puling, like a beggar at Hallowmas;' and in the *Merry Wives of Windsor,* Simple, when asked by his master, Slender, for the *Book of Riddles,* replies, 'Why, did you not lend it to Alice Shortcake upon All-Hallowmas last, a fortnight afore Michaelmas?' All-Hallowmas was the Saxon term, as may be seen in the rubric prefixed to the fifth chapter of Matthew, in the Saxon version of the Scriptures. Boucher, in his learned and valuable *Glossary of Archaic and Provincial Words,* remarks, that while the other antient forms, Christmas, Michaelmas, &c., have been generally preserved, that of All-Hallowmas is now only used in the northern counties.

Mr. Strutt, in the third volume of his *Horda Angel Cynnan,* has printed an extract from an old manuscript in which it is asserted that this feast was 'by the pope ordained to fulfil our omissions for many a Saint's day in the year we have (leave?) unserved, for there been so many that we may not serve them all; for, as St. Jerome saith, in each day of the year been more than five thousand saints and martyrs, out-take the first day of January.' But Mr. Forster, in his *Perennial Calendar,* affirms that this notion is a mistake, and that 'the church in this great festival honours all the saints rising together in glory.' The institution of All-Hallowmas is said to have originated in the dedication of the Pantheon at Rome as a Christian temple, by Pope Boniface IV. in the seventh century, though it does not appear to have been observed as a holyday till two hundred years later.

All-Hallowmas derives its greatest importance from the popular usages, which in our own and various other countries have distinguished sometimes the day itself, but more generally the night preceding, called its eve or vigil. There is great reason to believe that this was a Pagan before it was transformed into a Christian festival; and there can, at any rate, be no question that the ceremonies to which we refer are exclusively of Druidical origin. All-Halloweven (the 31st of October) was marked, in the natural calendar of our climate, as one of the great epochs of the year. By that day the harvest was generally gathered in, and the work of the husbandman brought to a close. It was natural therefore that it should be celebrated in a manner expressive on the one hand of joy and thankfulness, and on the other of the occupations and amusements appropriate to the season of winter, of which it was the commencement. Bonfires accordingly appear to have been lighted; which custom still is, or lately was, preserved in many parts of Wales, Ireland, the Western Islands, and Scotland. See, in Sir John Sinclair's *Statistical Account of Scotland,* the accounts of the parishes of Callander, Logierait, Kirkmichael, Aberdeen, &c.; and in Hone's *Every Day Book,* vol. ii., p. 1259, a letter from a correspondent describing the fires which are kindled by the children on Halloweve in the midst of the White Cart River, on which the town of Paisley stands. In the latter work, vol. i., p. 1421, &c., and also in Brand's *Observations on Popular Antiquities,* there referred to, the reader will find many curious details respecting the antient popular observances on the eve of All-Hallows in Wales, the North of England, Ireland, and elsewhere. After the introduction of Christianity the ringing of bells seems to have been added to the lighting of bonfires. This noisy ceremony commenced on the vigil of the feast of All-Hallows, and was continued throughout all that day and the next. It was prohibited as superstitious both by Henry VIII. and by Elizabeth; but is said not to be yet altogether abolished. An old sermon, quoted by Boucher, describes the ringing as performed for the repose of all Christian souls.

Besides these out-of-door rejoicings, the eve of the festival was celebrated by much merry-making around the domestic hearth. It has been observed, that in the festivities usual on this occasion, the beverage of the assembled guests was always that called lamb's-wool, that is, ale or wine mixed with the pulp of roasted apples. General Vallancey has ingeniously explained this singular name of the drink used on Hallowmas-eve by deducing it from the old Celtic name of the day, La Mas Ubhal, that is, the day of the apple-fruit. The English term *lamb's-wool* is merely a corruption of this forgotten Celtic designation.

But the eve of All-Hallows is especially famous for those observances which have been wont to take place on it, connected with the superstitious wish of prying into futurity. The same ceremonies of this description appear to have been anciently practised in England, Ireland, and Scotland; but they are now almost universally disused, except in the last-mentioned country. Throughout Scotland, in her towns, as well as in her villages and merely agricultural districts, the old Druidical rites of Hallowe'en, as the 31st of October is there called, were, within these thirty years, almost as universally and as punctiliously observed, as they probably were in the darkest night of popery or heathenism. Nor is the custom, though perhaps now dying away, by any means even yet generally discontinued. In the country, at least, friends and neighbours still, as Burns has expressed it,

> 'Convene
> To burn their nits, an' pu' their stocks,
> An' haud their Halloween,
> Fu' blythe that night.'

The well-known poem from which these lines are quoted, and which is one of the most successful efforts of the inspired Scottish peasant, and among the greatest favourites of his countrymen, will immortalize the memory, if not the practice, of the ancient ceremonies to which it relates. As it is, in a country where all the other festivals of the church have been abolished and forgotten, the eve of All-Hallowmas still continues the most important day in the rural, perhaps we might say generally in the popular calendar. It owes this permanent distinction to the circumstance, which all its peculiar ceremonies announce, of being much older than the church. It derives its origin from the depths of heathen superstition. 'It is thought,' says Burns, 'to be a night when witches, devils, and other mischief-making beings, are all abroad on their baneful midnight errands; particularly those aërial people, the fairies, are said on that night to hold a grand anniversary.' All its observances accordingly imply an application to the agency of evil spirits. But for a particular account of the various modes in which this application is made, we must refer the reader to Burns's poem, and the notes by which it is illustrated.

ALL SAINTS. A cluster of three small islands so called from their having been discovered by the Spaniards on All Saints' Day. They are near the south side of the Island of Guadaloupe, and within its jurisdiction, in 15° 51′ N. lat., and 61° 44′ W. long.

The two largest islands of this cluster are called Terre-en-Haut, or High Island, and Terre-en Bas, or Low Island. The first of these has a small village on its western side, between which and the third island, which is little more than a barren rock to the north-west, there is exceedingly good and safe anchorage in from six to sixteen fathoms water. On the south-west side of Terre-en-Haut is a mountain 813 feet above the level of the sea; and on the north coast is a remarkable promontory which serves as a land-mark for vessels approaching from the northward. This island produces Indian corn for the subsistence of the inhabitants, and a little cotton for exportation. Terre-en-Bas also produces Indian corn and cotton, together with a small quantity of coffee, said to be of the finest quality.

The inhabitants of these islands, who are not more than 300 in number, are very poor, and subsist principally on vegetables and fish, which last are good and abundant. (Purdy's *Colombian Navigator*, and Alcedo's *Dictionary*.)

ALL SAINTS' BAY. A large and commodious bay in the province of the same name in Brazil. The entrance to the bay is in 12° 42′ S. lat., and 38° 42′ W. long.; it is eight miles wide between the points of Tagapipe and Saint Antonio. The province is bounded on the north by the River Real; on the south by the province of Los Ilheos; on the east by the south Atlantic ocean, and on the west by territory still in the possession of aboriginal Indians.

This bay is thirty-seven miles long from north to south, and twenty-seven miles wide in the widest part from east to west, within which space it is computed that secure anchorage could be found for all the navies of the world. The dimensions just given are, however, perhaps a little in excess. The bay contains several fertile islands; the largest of these, called Itaparica, stretches inwards from the mouth of the bay, to which it forms two entrances. This island is eighteen miles long, and about three broad in the widest parts: the coasts of the bay have many small inlets. Two shoals lie near the entrance on the west side, but are not dangerous, as there is a channel of sufficient breadth and depth for ships of any size.

All Saints' Bay, called by the Portuguese *Bahia de Todos Santos*, was discovered by the Portuguese navigators early in the sixteenth century, and an attempt to colonize the surrounding country was made under the auspices of King John III. of Portugal, by several persons of distinction, commanded by Francisco Pereira Cotinho. While their settlement was in its infancy, these adventurers were attacked by a tribe of native Indians and compelled to retire; after this they had the misfortune to be shipwrecked upon an island within the bay, when such as escaped the waves were massacred by the inhabitants.

A second settlement was afterwards made by the Crown of Portugal, and declared to be the capital of Brazil. This settlement appears to have prospered, and to have been the source of much profit to the government of the parent state, which drew from it annual supplies of gold, diamonds, topazes, sugar, and tobacco, with some other articles of minor importance.

This settlement having devolved upon the Crown of Spain, through the inheritance of Philip II., was attacked and captured by the Dutch in 1623, but was retaken in the following year by Don Frederique de Toledo.

The province is at present well cultivated, and produces an abundance of coffee, sugar, cotton, and tobacco, with a variety of medicinal roots, gums, balsams, and dyeing woods: large quantities of lignum-vitæ and mahogany are likewise collected. The labour of the plantations is performed by negro slaves.

The town of San Salvador, commonly known as Bahia, stands just within the bay on the east side. It has a considerable export trade to Europe in the articles just mentioned, and in return imports European goods. It trades likewise with Maldonado and Montevideo, whence it brings back salt beef for the consumption of the negroes, and hides; and with the Coast of Africa, where its tobacco is exchanged for slaves.

Several rivers which flow from the mountains discharge themselves into All Saints' Bay. The principal of these rivers are the Paraguaca, the Sergippe, the Jaguarippe, the Matuim, the Paranamerin, and the Pirajá. These streams add greatly to the trade of the port; nearly 1000 boats being constantly employed upon them in bringing down the various productions of the interior.

Nitre of excellent quality and in great abundance has been found in the south-west part of the province. The Town of Caxoeira, situated fourteen leagues from Bahia on the Rio Francisco, is the spot where the produce of the gold mines of the north is collected. Iron and copper are likewise found in the province. A piece of native copper weighing 2666 pounds, the largest perhaps known to exist in the world, was sent hence to Portugal, and is deposited in the Royal Museum of Lisbon.

The Coast of Brazil in the vicinity of this bay abounds with whales, but the fishing is prosecuted only by a few large boats, and the quantity of oil procured is seldom found equal to the consumption of the inhabitants. (Southey's *History of Brazil*, and Thompson's *Alcedo*.)

ALL SAINTS' BAY, a deep inlet on the Coast of California, in 31° 43′ N. lat., and 63° 34′ W. long., at the point where the Peninsula joins the province of New California. A cluster of detached rocks lies at the distance of three leagues off Point Grajero, the south point of the bay. The Mission of Saint Thomas, established in 1790, is in the immediate neighbourhood of this bay. (Vancouver's *Voyage*.)

ALL SOULS' COLLEGE, Oxford, was founded in 1437, by Henry Chichele, Archbishop of Canterbury; although in the charter of endowment which was obtained for it in the next year, King Henry VI. assumed the title of founder, a term which in the language of the day meant simply patron. The lineal descendants of those who had founded religious houses, and who retained the patronage, in the official returns at the dissolution, were all called founders. According to the charter, the society was to consist of a warden and twenty fellows, with power in the warden to increase their number to forty; and was to be called 'The College of the Souls of all the Faithful Deceased,' *Collegium omnium Animarum fidelium defunctorum de Oxon.* The obligation imposed on the society was to pray for the good estate of Henry VI. and the archbishop during their lives, and for their souls after their decease; also for the souls of Henry V. and the Duke of Clarence, together with those of all the dukes, earls, barons, knights, and esquires, and other subjects of the crown of England who had fallen in the war with France, and for the souls of all the faithful deceased. Sixteen of the fellows were to study the civil and canon laws, the rest philosophy and the arts, and theology. The most remarkable clause in the charter gave the society leave to purchase lands to the yearly value of 300*l.*, a sum of great magnitude for the time, and which has since been increased to 1050*l.* yearly value. Another charter of very extensive privileges was granted soon after the foundation by King Henry VI., and this and the first charter were confirmed by Act of Parliament in the 14th Henry VII., 1499.

The statutes for the regulation of the college were not given till a few days before Archbishop Chichele's death. They were modelled after the statutes which had been given to New College, by William de Wykeham; and ordained that the fellows shall be born in lawful wedlock in the province of Canterbury, with a preference to the next of kin descended from Robert and William Chichele, the founder's brothers. A very ancient copy of the statutes is preserved among the Arundel manuscripts, now in the British Museum. No. 147. In the *Stemmata Chicheleana*, published in 1765, the founder's collateral descendants are traced through nearly 1200 families. To the society were also added chaplains, clerks, and choristers.

The founder gave this institution the manors of Wedon and Weston, or Wedon Pinkney in Northamptonshire, Horsham and Scotney, or Bletchcourt in Kent, the rectory of Upchurch in Kent, and the suppressed Alien Priories of New Rumney in Kent, Alberbury, or Abberbury in Shropshire, St. Clare in Carmarthenshire, and Llangenith in Glamorganshire. The Alien Priory estates are said to have been resumed by King Edward IV., but were afterwards restored. Besides these possessions, the trustees of the founder purchased the manors of Edgeware, Kingsbury, and Malorees in Middlesex; and the founder himself bequeathed the sums of 134*l.* 6*s.* 8*d.*, and 1000 marks, to be banked for the use of the college.

In 1442, the college was capable of receiving the warden and fellows: but it was not finished till the latter end of 1444. The expense of the buildings were estimated at 4156*l*. 5*s*. 3¼*d*.; the purchase of grounds, books, chapel furniture, &c., at 4302*l*. 3*s*. 8*d*. The accounts of the minor items are still remaining.

Among the benefactors to this society of an early date we find the names of James Goldwell, Bishop of Norwich, Cardinal Pole, and David Pole, Bishop of Peterborough: but the acquisitions from these and other persons consisted chiefly in advowsons. The endowment of the college was valued, in 1535, at 392*l*. 2*s*. 3*d*. per annum; in 1592, 500*l*.; and in 1612, the society consisted of ninety-three persons. At present, 1833, it consists of a warden, forty fellows, two chaplains, and seven clerks; the total number, including members not on the foundation, is one hundred and one. At the election of a warden, the society present two of their number to the Archbishop of Canterbury, the visitor, who makes choice of one.

Of the original buildings, as left by the founder, very little now remains. The principal front, towards the High-street, till within a few years retained somewhat more of its ancient character than at present. This front was, at first, 194 feet in length, opening into two quadrangles. It has been recently in part renewed, and its appearance altogether improved. The gate to the westward has figures of Henry VI. and Archbishop Chichele. The great quadrangle, was erected by Hawksmoor soon after the beginning of the last century. The chapel, hall, and library, which have passed through three stages of alteration since the foundation of the college, agree in the general outline of character with the newer buildings. The greater part of the new buildings were constructed at the expense of various benefactors. The hall at the east end of the chapel was renewed in its interior, in 1729; it contains, beside numerous busts and pictures, Bacon's statue of Sir William Blackstone. The new library, which superseded the old one in the original quadrangle, now reduced to chambers, was built from funds supplied by the liberality of Colonel Christopher Codrington, who had been first a fellow of the college, and afterwards governor-in-chief of the Leeward Caribbee Islands. It was begun in 1716, but not finished till 1756, at an expense of 12,101*l*. 5*s*., leaving a surplus of donation, with which an estate, the rents of which are appropriated to the purchase of books, was bought at Lewknor, in Oxfordshire. This noble room is 190 feet in length by 32½ in breadth, except in the central recess where the breadth extends to 51¼ feet; the height is 40 feet, with a gallery surrounding three sides. The collection of books which it contains is one of the finest in Oxford, and is continually increasing. The chapel preserves the exterior only of its ancient state; it underwent much disfigurement in the interior at and after the Reformation, from the circumstance of the founder having directed that on certain occasions it should be appropriated to public use. The last alteration of the interior of this chapel took place about the beginning of the last century, and was accomplished by the combined taste and skill of Dr. Clarke, Sir James Thornhill, and Sir Christopher Wren. Mengs's fine picture of the *Noli me tangere* was afterwards purchased as an altar-piece for it, at the price of 300 guineas.

Among the more eminent members of this college may be enumerated the celebrated Linacre, Leland, the antiquary, Sir Anthony Shirley, Brian Duppa, bishop of Winchester, Archbishop Sheldon, Jeremy Taylor, Tindal, Dr. Sydenham, Sir Christopher Wren, Young, the author of the *Night Thoughts*, Sir William Blackstone, and Reginald Heber the late bishop of Calcutta. (Wood's *Colleges and Halls of Oxford*, by Gutch; Chalmer's *Hist. of the Colleges; Univ. Calendar*.)

ALLA, as used in Music, an Italian preposition, or the dative of the feminine article *la*, which, prefixed to certain words, signifies, or has the power of the phrase, *in the manner of:* e. g. *Alla Capella*, in the manner of chapel, or church, music:—*All' Antica*, in the ancient manner:—*Alla Francese*, in the French style:—*All' Inglese*, in the English style; &c.

ALLA-BREVE, in Music, an Italian term, signifying a quick time, in which the notes take only half their usual length. This is synonymous with *Tempo di Capella*, or time of church music, in which each bar, according to the practice of the old composers, contains one breve, or two semi-breves, or their equivalents. *Alla-Breve* time is very rarely used in modern music. The fine fugue in the Messiah, 'And with his stripes we are healed,' is an example of this measure.

ALLAH is the Arabic name of the Supreme Being, which through the Koran has found its way into the languages of all nations who have embraced the Mohammedan religion. It is properly a contraction of *al-ilâh: al* is the Arabic definite article, and *ilâh*, which corresponds to the Hebrew words *Eloah* and *Elohim*, signifies a deity generally: the prefixed article restricts the meaning, and *al-ilâh* or *Allah* signifies the True God, as opposed to the deities worshipped by idolaters. The word *Allah* is frequently met with as a component part of Arabic proper names: e. g. *Abd-allah*, i. e. the Servant of God. *Allah akbar* (God is great) is the common battle-cry of the Mohammedans. The phrase *Bism Allah* or *Bism-illah* (in the Name of God) is invariably uttered by devout Mussulmans before the commencement of any undertaking, and before their meals: it is also put at the beginning of their books.

ALLAHABAD, a considerable province of Hindostan, lying between the 24th and 26th parallels of north latitude. It is bounded on the north by Oude and Agra; on the east by Bahar; on the south by Gundwana; and on the west by Malwa.

This province is divided into eight districts: viz., Allahabad, which contains the town and fortress of the same name; Benares, Mirzapoor, Jounpoor, Rewah, Bundelcund, Cawnpoor, and Manicpoor. The length of the province from east to west is 270 miles, and its average breadth from north to south, about 120 miles.

According to Abul Fazl, this territory was invaded in the year 1020, by the Sultan Mahmood of Ghizni, who then met with only partial success, and returned again to the attack three years thereafter, but without effecting a permanent conquest. The province fell afterwards under the dominion of the Emperor of Delhi, and in the fifteenth century it became an independent kingdom, of which Jounpoor was the capital. Partaking the lot of other Patan districts, it subsequently came into possession of the Mogul emperors, and was formed into a distinct soubah* by the Emperor Akbar, who, at the same time, gave to the district the name which it now bears.

At the breaking up of the Mogul empire, the northern part of the province was seized by the Nabob of Oude. In 1775, the East India Company acquired the Benares district under a treaty with the Soubahdar of Oude, and in 1810, the Company obtained from the same government the further cession of the city of Allahabad and the adjacent districts. In 1803, the south-eastern districts of the province were received by the British in exchange for territories in Guzerat and the Carnatic.

Allahabad is one of the most populous and productive provinces in the Indian empire. It furnishes diamonds, indigo, cotton, sugar, opium, and saltpetre, besides which the natives carry on very considerable manufactures of cotton cloth. The greatest proportion of the population are Hindoos, only about one-eighth part professing the religion of Mohammed.

The principal rivers of the province are the Ganges, the Jumna, the Goomty, so called from its winding course, and the Caramnassa, with their branches. Major Rennell supposes that the last-named of these rivers is the Commenases of Arrian (*Indica*, chap. 4). The streams are all in the northern part of the province; the country in their vicinity is generally flat and fertile, but the climate is extremely sultry and exposed to the visitation of hot winds. To the south-west the country is hilly. In this quarter, in the district of Bundelcund, the diamond mines of Pannah are situated. These are less profitable now than formerly; only a few stones of superior quality having been found during many years. (Rennell's *Memoir of a Map of Hindostan;* Hamilton's *East India Gazetteer*.)

ALLAHABAD, a judicial subdivision of the province of the same name already described. The territory of which this district is composed is for the most part immediately surrounding the city of Allahabad; some other portions are, however, nearly one hundred miles distant from the capital. The soil, which in general consists of a sandy loam, is very fertile, so that the crop of wheat, which is the grain principally sown, is said to amount on the average to fifty-six bushels to the English acre. To obtain this return, artificial irrigation is resorted to, and this forms the most laborious part of the cultivator's task. Barley, peas, and potatoes are likewise produced, but the most important cultivation of the district consists of indigo, cotton, and opium, which are largely exported. The last-mentioned of these articles was introduced into the district about eight years ago, after considerable opposition on the part of the ryots, who are averse to any kind of innovation. The district contains 16,55,106 begahs (about 550,000 acres) of land in cultivation, the annual revenue from which amounts to 27,93,244 rupees; 11,09,777 begahs of land are waste, and of these about one-third are said to be fit for cultivation.

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* According to the institutes of Akbar, a soubah should consist of twenty-two circars, a circar of twenty-two pergunnahs, a pergunnah of twenty-two tuppahs; and a tuppah of twenty-two villages; but this strictness of division has probably never been carried into effect.

The trade of this district was formerly in great part made up of cotton cloths, which were manufactured in considerable quantities in all the villages, but the course of this traffic has been altered of late years, in consequence of the cheapness of English goods of that description, and this branch of native industry has much declined in consequence. The district enjoys a considerable transit trade, for which it is well fitted by its geographical position between the coast of Bengal and the province of Oude, and the Gorkha territory. The exportable produce of these districts is conveyed down the Ganges for shipment—salt, metals, woollen cloths, and drugs being the principal articles conveyed from the coast in return. (Hamilton's *East India Gazetteer;* Tennant's *Indian Recreations; Parliamentary Papers.*)

ALLAHABAD, the capital of the district and province of the same name in Hindostan, is situated in 25° 27′ N. lat., 81° 50′ E. long., at the junction of the rivers Ganges and Jumna. An extensive fortification is erected on the tongue of land where these streams unite, so as completely to command the navigation. This fort is built of polished freestone with circular bastions at intervals, in which the cannon are mounted on the sides next to the rivers; the land side is a perfectly regular fortification, of strength sufficient to resist all attacks of a native army, and to require a regular siege by European troops. The East India Company has expended considerable sums for improving these fortifications.

The city of Allahabad is supposed to occupy the site of the ancient Palimbothra (Arrian. *Indica*, 10); but this is not certain. A great part of its present buildings are of mud, and are erected on the ancient foundations of substantial brick edifices, while much of the soil in the immediate neighbourhood, consisting of materials used in building and of the fragments of earthenware vessels, attests the former magnitude of the city.

This place is considered by Brahmins to be the most holy of all the sacred confluences of rivers in Hindostan: it is called by them *Bhat Prayag*. It owes this pre-eminence to the belief that it is the point of junction of three rivers, the Ganges, the Jumna, and the Sereswati. It is true that the last-mentioned of these rivers is no where visible in the neighbourhood, but this difficulty is surmounted by the assertion that the missing stream joins the other two underground, and pilgrims who bathe here are held to acquire the same merit as if they were to immerse themselves in all three rivers separately. On arriving at this sacred spot, the pilgrim seats himself on the brink of the river, and has his head shaved so that each hair may fall into the water, the sacred writings of the Hindoos promising a residence in paradise of one million of years for each hair so deposited. After this operation, the devotee must bathe, and the next day must perform the obsequies of his deceased ancestors. Many pilgrims are so impressed with the sanctity of the place, and of the purity which it imparts, that conveying themselves in a boat to the exact spot where the three rivers are supposed to unite, they plunge into the stream with three pots of water tied to the body, so that they must inevitably sink to the bottom. The East India Company levies a tax of three rupees on each pilgrim who visits this sanctified spot; the number of these visiters varies exceedingly in different years; but more than 200,000 have been known to pay the tax in one year.

Allahabad was a favourite residence of the Emperor Akbar, who may be said to have been the founder of the modern city, and of its fortifications. Its situation must in those days have given it a great degree of political importance. In 1765, the fort was taken by Sir Robert Fletcher, but was afterwards restored to the Nabob of Oude, and again was transferred to the Company in 1803. The city now contains a permanent judicial establishment, whence periodical circuits are made through the province. It like contains a school set on foot in 1825, by the subscription of some English gentlemen, which has since flourished having received assistance from the government. In 1836, this school contained sixty-four native students who were studying the Persian and Hindoostanee languages, and had made tolerable proficiency in geography and arithmetic besides acquiring a practical knowledge of surveying. Five of these students have since obtained employment as surveyors under the Company's government. The present population of Allahabad, exclusive of the garrison, is estimated at 20,000 persons.

Allahabad is 820 miles from the sea following the course of the Ganges, but the travelling distance between the city and Calcutta is only 550 miles in a north-west direction. The distance from Benares is 53, from Lucknow 127, from Delhi 212, and from Agra 296 miles. (Major Rennell's *Memoir of a Map of Hindostan;* Bernier's *Travels;* Mill's *History of British India; Parliamentary Reports.*)

ALLAN, DAVID, was born in Edinburgh, and began the study of the arts in an academy founded at Glasgow. He afterwards went to Italy, and in 1773 obtained the prize of the academy of St. Luke, given for the best specimen of historical composition. He returned to England in 1777, and resided some time in London. He practised history, portrait, and landscape. His pictures of the latter class resembled those of Gaspar Poussin. About the year 1780 he went to Edinburgh, and was appointed director of the academy established in that city by the trustees for the manufactures and improvements, and for the diffusion of the principles of the fine arts, in Scotland. His talents were chiefly exercised on works of humour, of which he has left many specimens both in painting and etching. Several of his works have been engraved, and four, representing the sports of the carnival at Rome, were aquatinted by Paul Sandby. Mr. Allan died April 6, 1796.

ALLATIUS (LEO), an eminent literary man of the seventeenth century. He was a Greek, born in the island of Chios, in 1586. Being carried over to Italy at an early age, he was taken under the protection of a powerful family in Calabria, and educated in the Greek college at Rome. Early in life he revisited his native country; but he soon returned to Rome, where, after a succession of literary employments, he was appointed librarian to the Vatican. For this post he was well fitted, by great industry and a retentive memory; and, in a long life, he edited manuscripts, translated Greek authors, and published many original works, which display more learning and power of collecting materials than taste or judgment. A Greek by birth, he was one of the most strenuous and bigoted upholders of the Roman Church and of papal infallibility, and hesitated not to invoke fire and sword as the legitimate means of converting obstinate heretics. (See his treatise *De Ecclesiæ Occidentalis et Orientalis perpetua Consensione.*) He is accused of having softened down the points of difference between the Greek and Latin Churches, in order to gratify Pope Urban VIII., who was bent upon effecting a reconciliation and union between them. He founded a college in the isle of Chios, and died at Rome in the year 1669, aged eighty-three.

ALLEGHANY, a river of North America, one of the tributaries, and generally considered the principal source, of the Ohio; the united waters of the Alleghany and Monongahela, at their confluence at Pittsburgh on the western limits of Pennsylvania, receive the name of Ohio. It rises within 5 miles of Lake Erie, and, fed by numerous branches, pursues a general course south by west for 200 miles to Pittsburgh. Its sources are the extreme north-eastern tributaries of the Mississippi basin, and flow from the highest part of the Ohio valley. (See Darby's *Geography of the United States.*)

ALLEGHANY MOUNTAINS, a subordinate chain of the great system of the Appalachian Mountains, which run through the United States of North America in a north-east and south-west direction. [See APPALACHIAN.]

ALLEGIANCE, or LIGEANCE, is the lawful obedience which a subject is bound to render to his sovereign.

The bond of allegiance (*ligamen*) is mutual and reciprocal; by it the subject is bound to obey, and the sovereign to protect.

The allegiance of a subject, according to the law of England, is permanent and universal; *i. e.*, he can, by no act of his own, abjure or repudiate the duties which it involves: nor can he by emigration, or any voluntary change of residence, escape its legal consequences.

Even an alien owes a local and temporary allegiance so long as he continues within the dominions of the king; and he may, therefore, be prosecuted and punished for treason.

An usurper, in the undisturbed possession of the crown, is entitled to allegiance; and, accordingly, our history furnishes an instance in which a treason committed against the person of Henry VI. was punished in the reign of his successor, even after an act of parliament had declared the former an usurper.

An oath of allegiance has, from the earliest period, been exacted from natural subjects of these realms; but its form has undergone some variations. In its ancient form, the party promised 'to be true and faithful to the king and his heirs, and truth and faith to bear of life and limb and terrene honour, and not to know or hear of any ill or damage intended him without defending him therefrom.' The modern oath, enforced by statute since the revolution, is of a more simple form, and is expressed in more indefinite terms. 'I do sincerely promise and swear that I will be faithful and bear true allegiance to his majesty King William.'

It is not to be supposed that the alteration of the form has, in any degree, varied the nature of the subject's duty, which is, indeed, owing from him antecedently to any oath, and although he may never, in fact, have been called upon to take it. The oath is imposed by way of additional security for the due performance of services inherently due from the subject from his birth, who is, in like manner, entitled to the protection of the king before the latter has formally accepted the duties of sovereignty by taking the coronation oath.

By the ancient law of the land, every male subject of the age of twelve years (with certain exceptions) was bound to take the oath of allegiance when summoned to the inferior criminal courts, called Leets and Tourns; and a variety of statutes, from the reign of Elizabeth down to the present century, have expressly required it from public functionaries and other persons before they enter upon their respective duties, or practise in their several professions. By 1 George I. c. 13., two justices of the peace, or other commissioners appointed by the king, may tender the oath to any person suspected of disaffection.

From a violation of allegiance results the highest offence known to the law of this country, viz., Treason.

Those who wish to become more fully acquainted with this subject, and to obtain an insight into the distinctions between *liege fealty*, or allegiance, and *simple fealty*, or fealty by reason of tenure, may advantageously consult Hale's *Pleas of the Crown*, vol. i. p. 58, *et seq.*, and Mr. Justice Foster's *Discourse on High Treason*.

ALLEGORY, literally, a discourse which has another meaning than what is directly expressed. Thus, the address of Menenius Agrippa to his fellow-citizens of Rome, as recorded by Livy, in which he described a rebellion of the industrious against the wealthier orders of a state, under the figure of a conspiracy of all the other members of the human body against the stomach, was an allegory. An allegory, however, is not intended to deceive or perplex, in which respect it differs from an enigma or riddle.

Allegory has been a favourite mode of composition in all countries and ages. Sometimes it has been recommended by seeming to afford the only or the fittest available means of giving a lively or intelligible representation of certain subjects or notions. The poets of different nations, for example, have resorted to this method, in order to convey sufficiently vivid conceptions of the different virtues and vices, and other abstractions which they have wished to set before their readers. They have personified these notions, as it is termed; that is to say, they have figured them in the shape of living beings invested with the forms and qualities naturally adapted to the character of each. Such pictures are allegories, and are to be found abundantly scattered over nearly all poetry. Some have even conceived that the whole mythology of pagan antiquity is merely a cluster of allegories; but this hypothesis is not favoured either by what we know generally of the birth and growth of superstition in the human mind, or by the earliest and simplest form in which these mystic fables have come down to us. Some of the critics of the Alexandrine school attempted to explain Homer allegorically. A slight examination of what remains of their miserable and feeble efforts will easily console us for the loss of their labours. The reader who is curious may see a specimen of this allegorical interpretation in Villoison's *Scholia*, (*Iliad*, v. 336.)

Of all poets who have dealt in allegories of this description, our own Spenser is the most famous and the greatest: no other has either produced so vast a number of these vivified idealities, or put into them such a spirit of life and air of actual existence. A long allegory, it is commonly said, has been usually unsuccessful as such; and, in illustration of this assertion, the instance of the *Fairy Queen* has been often quoted, as that of a work which, with all its attractions in parts, is wearisome as a whole. The plan of the general allegory upon which Spenser's poem is framed, is certainly in a remarkable degree complicated, cumbersome, and uninteresting; and if he had aimed at composing a mere tale of romance, without fettering himself with any scheme of allusion either to the moral virtues or the achievements of Queen Elizabeth, both of which subjects he has endeavoured to illustrate, he would have doubtless done better, as well as saved himself much needless labour. But, on the other hand, nobody complains of fatigue in reading Swift's *Tale of a Tub*, which is likewise a tolerably long allegory. This, and other examples which might be quoted, seem to prove that, if the allegory be sufficiently simple and natural, it may be protracted, without becoming tiresome, to a considerable extent.

ALLEGRET'TO, in Music, an Italian diminutive of *Allegro* (see Allegro), neither so fast nor so brilliant in manner as the term allegro denotes, though rather quick, and moderately gay.

ALLEGRI (C. ANTONIO). [See Correggio.]

ALLE'GRO, in Music, an Italian adjective, signifying *gay*, *sportive*, and, by inference, quick in time.

Allegro is the fourth in order of the five classes into which musical movement is divided; e.

Adagio,
Largo,
Andante,
Allegro,
Presto.

See Adagio.

An *Allegro* is not understood to be so fast n vocal as in instrumental music. Its quickness is likewise modified by the number and value of the notes in a bar. Thus it is always more rapid, *cæteris paribus*, in two-crotchet time than in four-crotchet—in three-quaver time than in six-quaver; and as the speed of this movement has many degrees of difference, other words are commonly added, more exactly to explain the composer's intention. This term is often found in the imperfect, the frequently barbarous, language of music, united to words utterly incompatible with it: for instance, the contradictory, and indeed ungrammatical, compound, *allegro agitato*, is not unusual. But one of the greatest musical geniuses of our day, or that ever lived, Beethoven, has, in his contempt for the real meaning of language, set common sense at open defiance: in his ninety-fifth opera, he directs the performance of a movement in the following words;—'Allegro assai vivace, *ma serioso*.'—*Very gay and lively, but seriously*.

The word *allegro* is also used substantively; thus we say an *Allegro* of Mozart, of Beethoven, &c. Some of its compounds are—

Allegro Agita'to, in a hurried manner.

Allegro Assai, very quick.

Allegro Brillan'te, quick and brilliantly.

Allegro Giusto, quick, but *just*, *precise*, and not so fast as allegro unqualified.

Allegro Modera'to, moderately quick.

Allegro di Molto (*di molto*, much), very quick.

Allegro Viva'ce (*vivace*, lively, brisk)—one of the tautologies of musical language—the same as *allegro brillante*.

Più Allegro, quicker, *more* quick.

Poco Allegro, rather (*a little*) quick.

ALLELUIA. [See Halleluiah.]

ALLEMANDE, in Music, a dance supposed to have derived its name from the country, Germany, in which, according to the prevailing opinion, it originated. It is written in two-crotchet time, and is now understood to be moderately quick, the word *Allegretto* best indicating its movement. But anciently this was a slow dance, according to Morley, Brossard, and Rousseau. Handel, and other composers of his period, write it in four-crotchet time, and we have always been of opinion that they never intended *their* allemandes to be so fast as they are performed by modern players.

ALLEN, or ALIN, or ALYN, a river which rises in Denbighshire, and flows through Flintshire in North Wales, where it has a subterraneous passage for about a mile; it emerges a little above the town of Mold, and ultimately falls into the Dee.

ALLENDALE, a parochial chapelry in Northumberland, with a population of 5540 inhabitants in 1831; containing the townships of East Allendale, West Allendale, Catton, and Keenly.[*] The first of these comprehends the market-town of Allendale, irregularly built on the right bank of the East Allen brook, (which flows into the South Tyne,) about 10 miles S.W. of Hexham, and 286 N.N.W. from London.

The chief employment of the inhabitants is furnished by the important lead-mines in the neighbourhood, or by the smelting-houses and other establishments dependent upon them. The perpetual curacy of Allendale is in the gift of Mr. Beaumont, who is lord of the manor, and proprietor of the whole of Allendale. The parish, which is in the diocese of York,[†] has lately been divided into four parts, with four places of worship of the Establishment, *viz.* the chapels of St. Peter, in the town of Allendale, and of Ninebanks, both rebuilt within a few years; and those of East and West Allen, recently erected for the use of the mining population. All these are in the gift of Mr. Beaumont. There are also meeting-houses for the Quakers and Wesleyan Methodists. A free grammar-school was founded about the close of the seventeenth century, and endowed by several individuals; a subscription library was founded in 1825. The market is on Friday, and there are three fairs in the year.

ALLERTON, NORTH. [See NORTHALLERTON.]

ALLEYN, or ALLEN (EDWARD), a distinguished actor in the reigns of Elizabeth and James I. By his own account, he appears to have been born on the first of September, 1566. The event, according to Fuller in his *Worthies*, took place in Lombard-street, in the parish of All-Hallows, London, at the sign of the Pye, near Devonshire House. It is stated in Lysons's *Environs of London*, vol. i., that his father was Edward Alleyn of Wyllyn in Bucks, and that his mother was a daughter of James Townley, Esq., of Lancashire. He seems to have very early taken to the stage, being distinguished as an actor before he was twenty-six. His natural talents for the profession he had thus chosen were aided by personal advantages of a high order. Fuller says that he 'made any part, especially a majestical one, become him.' He seems, indeed, to have been looked upon as the first performer of that day. Ben Jonson has addressed to him one of his epigrams, written in a highly encomiastic style, and concluding,

> ———' others speake, but only thou dost act.
> Wear this renown: 'tis just that who did give
> So many poets life, by one should live.'

One of his most celebrated parts was the Jew of Malta, in Marlowe's play of that name. In his prologue to that play, Thomas Heywood speaks of Alleyn as having acquired, by his acting in it, the character of Peerless, 'being a man,' he adds,

> 'Whom we may rank with, doing no man wrong,
> Proteus for shapes, and Roscius for a tongue.'

And a letter of George Peele, the dramatic poet, has been preserved, in which he tells a story of a convivial meeting of Alleyn, Jonson, and Shakspeare, where Jonson charged his brother poet with having been indebted to his observation of Alleyn for the famous directions about acting in Hamlet. The letter is given in Dr. Kippis's edition of the *Biographia Britannica*, as an addition to the original life of Alleyn, in which these and other testimonies in his favour are collected, and which is known to have been written by Oldys.

Alleyn eventually became a theatrical proprietor. He was sole owner of the Fortune playhouse, near Whitecross-street, Moorfields, which he built himself, and which the author of the *Historia Histrionica*, published in 1699, describes as 'a large, round, brick building.' He also, according to Lysons, whose account differs from that of Oldys, held, in partnership with a person named Henslow, a bear-garden, on the Bank-side, in Southwark; and this seems to have been his most profitable speculation. To this he added the office, which he purchased from Sir William Steward, of 'Chief Master, Ruler, and Overseer of all and singular his Majesty's games of bears, and bulls, and mastive dogs, and mastive bitches.' From these different sources he made a good deal of money, his bear-garden alone, Oldys affirms, yielding him sometimes five hundred pounds a year. There was also long preserved a tradition, that he found some treasure in the ground while laying the foundations of his playhouse in Whitecross-street.

According to the weak and credulous John Aubrey, in his *Natural History and Antiquities of Surrey*, (vol. i. pp. 190) it was a sudden apparition of the Devil, while Alleyn was acting the part of a dæmon in one of Shakspeare's plays, that first put him upon the project for which he is now chiefly remembered, the founding of Dulwich College, in the parish of Camberwell, in Surrey. But Alleyn, who had always been a religious man, never, we are told, during his life, neglecting an opportunity of attending church, does not seem to have thought it necessary, on dedicating his wealth to pious purposes, to withdraw from his connexion with the stage. On the contrary, we find him in his Diary recording the income he derived from his theatre and bear-garden, long after he had finished his college, and dutifully thanking God for it, as for all his other bounties. The buildings of the college, which were erected after a design of Inigo Jones, appear to have been in a considerable state of forwardness in 1614, and were finished in 1617. He had some difficulty at first in getting permission to settle his property in mortmain, principally in consequence of the opposition of Bacon, then Lord Chancellor, who, in a letter to the Marquis of Buckingham, dated 18th August, 1618, says, 'I like well that Alleyn playeth the last act of his life so well,' but goes on to state that, nevertheless, on the application made to the king for the requisite licence, he had reminded his Majesty of his late refusal to allow Sir Henry Savile and Sir Edward Sandys to found lectures at Oxford and Cambridge; 'foundations,' he adds, 'of singular honour to his Majesty, and of which there is great want; whereas hospitals abound, and beggars abound never a whit the less.' The licence, however, was at last signed on the 21st of June, 1619; and on the 13th September, in the same year, the college was opened in form, Bacon and many other distinguished characters honouring the ceremony with their presence. Alleyn took upon himself the office of master in the first instance, in so far at least as was implied by living in the house, and restricting himself to the regular allowance of that situation. But his first wife, Joan Woodward, whom he had married on the 22nd of October, 1592, having, on the 28th June 1623, died at the age of fifty-one, although he had bound the future masters to celibacy, he soon after married another lady named Constance, whom Oldys states to have been the daughter of a Mr. Hinchtoe, but whose father Lysons conceives to have been the celebrated Dr. John Donne, the poet. The tradition of the college, indeed, is that he was thrice married; but at any rate, he left no issue. He died at Dulwich, on the 25th of November 1626, and was buried in the chapel of the college.

The members of Dulwich College are a master, warden, four fellows, six poor brethren, and six sisters, twelve scholars, six assistants, and thirty out-members. The original revenues amounted only to 800*l.* per annum, but have since greatly increased. On this account, the situation of master of the institution, who must be of the surname of Alleyn, or Allen, and, if possible, of kin to the founder, is now of considerable value. Dulwich College has, from its foundation, been celebrated for its collection of pictures: Alleyn himself left it some, and many more were afterwards added by Mr. William Cartwright, the comedian, who died about the end of the seventeenth century. But the most valuable accession has been from the bequest of the late Sir Francis Bourgeois, in 1810. For this noble collection of works of the old masters, a new gallery has been built, to which the public are admitted by tickets, which may be easily obtained. Dulwich College also received from Cartwright a large and curious collection of old plays, which the managers gave to Mr. Garrick in exchange for some modern publications. In the present library, the most curious relic is the original Diary of the founder, begun on the 29th September, 1617, and continued to the same day in the year 1622; from this diary Mr. Lysons has printed copious extracts.

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[*] The above division is given from a communication received from the neighbourhood; but in the Population Returns for 1831, the townships of East Allendale, West Allendale, Cotton (Catton), Keenty (Keenly), Broadside, and *Forest*, and the divisions for the collection of the parochial rates, amount to eight: Forest being divided into two, and Park division being added to the number. The difference of the statements is probably owing to the existence of different divisions for different purposes.

[†] The district of Hexhamshire, in which Allendale is included, was once a bishopric, and is now added to the diocese of York. The rest of Northumberland is in the diocese of Durham.

ALLGEMEINE ZEITUNG (i. e. *Universal Gazette*) is the name of one of the principal German newspapers. The plan for this publication was conceived in 1794, by the well-known bookseller, J. G. Cotta, of Tübingen, who invited Schiller to superintend the undertaking. Schiller declined the proposal, (in a letter, a lithographed fac-simile of which was appended to a recent edition of Schiller's works,) and Cotta himself was, for a time, the chief editor of the paper, till Huber, the son-in-law of Heyne, undertook the editorship. The paper appeared under the name of *Neueste Weltkunde*, (*i. e.* Latest Intelligence about the World,) till the 8th of September, 1798, when, in consequence of a prohibition issued against it under that designation, it assumed its present title. The Allgemeine Zeitung was published first at Tübingen, afterwards at Stuttgart, and subsequently at Ulm. Owing to certain difficulties arising from the censorship in the Würtemberg dominions, Augsburg was chosen for its publication, where it still experiences much liberality on the part of the Bavarian government. In allusion to its place of publication, the Allgemeine Zeitung is, in English and French newspapers, often called the *Augsburg Gazette* (*Gazette d'Augsbourg*). After Huber's death, in 1804, the superintendence of the Allgemeine Zeitung was undertaken by Stegmann, who had till then been attached to the Prussian diplomatic service, and had occupied the post of councillor of legation at Turin. The Allgemeine Zeitung has correspondents in all countries of Europe, by whom it is supplied with information; and the several German as well as foreign governments frequently avail themselves of it for the publication of semi-official articles. The supplements often contain literary news, especially brief reviews of works on politics, and biographic sketches of important public characters. Notwithstanding its acknowledged excellence, the Allgemeine Zeitung is said to have but a limited sale: the number of copies sold was, in 1823, stated by some to be 5000, by others only 1500—2000. (See the German *Real-Encyclopädie oder Conversations-Lexicon*, art. *Zeitungen.*)

ALLIANCE, THE HOLY, the name commonly given to the celebrated convention concluded at Paris on the 26th September, 1815, between the Emperors of Russia and Austria, and the King of Prussia. It is understood to have been proposed by the Emperor Alexander, and was signed by the three sovereigns with their own hands, without being countersigned by any minister. The document, which was first published by Alexander on Christmas day following, commenced by an announcement of the intention of the subscribing parties to act for the future upon the precepts of the gospel; which they define to be those of justice, Christian charity, and peace. Then follow three articles, the first of which, after narrating the scriptural command to all men to consider one another as brethren, deduces from it the somewhat limited inference, that the three contracting monarchs will remain united to each other by the bonds of a true and indissoluble fraternity, and that they will conduct themselves to their subjects and armies as the fathers of families; the second article can hardly be said to mean anything; and the third is merely an invitation to other powers to join the confederacy. When this treaty was communicated to the English court, a reply was returned to the effect, that the forms of our constitution did not permit the king formally to accede to it, but that no other power could be more inclined to act upon the principles which it seemed to involve. At this time many liberal politicians throughout Europe, especially in Germany, looked to the Holy Alliance with most sanguine expectations of its happy results. Its true object, however, was not long in beginning to show itself; and it at last became apparent, that the Christian and paternal intentions of its authors meant nothing else than simply a determination to assist one another in governing both their own dominions and as much of the rest of the world as they could, according to their own will and pleasure. This design may be considered as having been first distinctly announced in a circular issued by the three powers on the 8th December, 1820, from Troppau, where they were then assembled in Congress to consider the means of putting down the revolution which had just taken place in Naples. This note, which was addressed to the ministers and chargés d'affaires at the German and northern courts, drew from Lord Castlereagh, the then English minister for foreign affairs, a dispatch addressed to his majesty's missions at foreign courts, and dated the 19th January, 1821, in which it was intimated, that this government could not acquiesce in the principles announced in the circular of the three sovereigns, or in their proposed application. From that time England may be considered as having separated itself completely from the Holy Alliance; and since the death of the Emperor Alexander it may be difficult to say whether or not the convention so called is to be regarded as subsisting at all.

ALLIER, a river in France, called by the Romans Elvaer, which, rising in the mountains of Margeride, near the place where these branch off from the more important chain of the Cevennes, flows, with some trifling bends, in a direction nearly N. by W. Its basin is bounded on the east by the heights of Forez and La Made, which separate it from the basin of the Loire; and on the west by the volcanic mountains of Auvergne, the loftiest in central France. [See Auvergne.] Its broad but shallow stream winds through the rich district of Limagne, until, after a course of 125 miles, the junction of the Dore renders it navigable for a part of the year at least. From this junction it pursues its course until it falls into the Loire, a little below the town of Nevers, which is on the latter. Its whole course may be about 200 miles.

The river gives name to a department, which is bounded on the north by those of Cher, Nievre, and Saône et Loire, and on the south by those of Creuse, Puy de Dôme, and Loire. The Allier, soon after its junction with the Dore, enters the department from the south, and divides it into two parts; while the Loire itself forms its north-eastern boundary; and the Cher, with the Canal of the Duke of Berry, which runs parallel to the Cher, and close by it, crosses its western extremity.

The department comprehends a great part of the ancient province of Bourbonnais, and its productions are much diversified. Its granite rocks are covered with a light but fertile soil; while the valleys contain rich alluvial districts, which, however, owing to the backward state of agriculture, do not yield the crops which a more improved system of husbandry might produce. The vine is not cultivated to any great extent; but in the pastures many oxen are fattened, and the breed of horses is remarkable for strength. The woods are extensive, and furnish oak timber for ship-building. The meres or ponds also are considerable, and the fish taken in them, or in the numerous streams, form an article of trade with Paris. Coal-pits, iron-mines, quarries, from which stone suited for mill-stones is obtained, and pits of clay, adapted for making porcelain, are the chief mineral wealth of the department. Mineral springs attract visitors to the towns of Vichi, which is situated in a romantic country on the banks of the Allier, and to Bourbon L'Archambault, and Neris: the last, under the name of Aquæ Neræ, or Neri, was a watering-place in the time of the Romans; and the remains of an amphitheatre, and some other buildings, show it to have been a considerable place.

The department of Allier contains four arrondissements, those of Moulins, Montluçon, Gannat, and La Palisse. Its population in 1826 was 285,302. It is under the jurisdiction of the criminal court of Riom. This department is crossed by one of the great roads from Paris to Lyons.

The chief town is Moulins, on the banks of the Allier, [see Moulins,] the population of which is 14,500. Gannat, on the Andelot, a branch of the Allier, 35 miles south of Moulins, carries on a considerable trade in cattle, and has a population of 5000. Between these is St. Pourçain, the seat of a large cattle fair in the month of August. Montluçon, near the baths of Neris, mentioned above, has 4500 inhabitants; Cusset, on the Allier, has nearly as many: its ancient walls give it the appearance of a strong place. Bourbon L'Archambault, also mentioned above, has about 3000, and La Palisse rather more than 2000. The department is not particularly distinguished by any manufacture; the inhabitants of the village of Lurcy Levy in the north make porcelain and earthenware, and those of Souvigny, near Moulins, trade in soda and glass. At Moulins itself some cutlery is made, which is in good repute, especially the scissars, and there are some other articles made, for which see the article on that town.

ALLIGATION, derived from the Latin *ad* and *ligare*, signifying to bind together, or unite. It is a rule in arithmetic, by which the price of a mixture is found when the price of the ingredients is known. This is an application to commercial arithmetic only, but the following questions, which fall under the rule, will show its scope better than any general definition.

How much wine at 60*s.* a dozen must be added to a pipe worth 95*s.* a dozen, in order that the mixture may be worth 70*s.* a dozen?

If a cubic foot of copper weighs 8788 ounces, and of zinc 7200 ounces, in what proportions must copper and zinc be mixed, so that a cubic foot of the mixture may weigh 8000 ounces?

For the algebraist we may say, that all questions fall under the rule of alligation which involve the solution of such an equation as,

$$ax + by + cz = n\,(x + y + z)$$

in which n must be intermediate between a, b, and c; which is indeterminate unless further relations between x, y, and z are given. Any person moderately skilled in algebra may reduce a question of alligation to an equation of this form; and as the number of cases is infinite, and several of those given in the books of arithmetic are practically useless, we shall here confine ourselves to an example of one process for the algebraical student, and two rules of the most simple cases for all other readers.

There are three ingredients, worth a, b, and c shillings per ounce: in what proportions must a mixture of m ounces be made, so as to be worth k shillings an ounce; it being understood that the quantities of the two first ingredients must be in the proportion of p to q? Let px be the quantity of the first ingredient; then qx is that of the second; let y be that of the third. Then by the question.

$$px + qx + y = m. \quad . \quad . \quad (1)$$

But px ounces, at a shillings an ounce, cost apx shillings; therefore the price of the whole is

$$apx + bqx + cy \text{ shillings,}$$

which by the question is km shillings: hence,

$$apx + bqx + cy = km, \quad . \quad . \quad . \quad (2)$$

and which two equations, with two unknown quantities, can be solved by the common method.

Rule I. Where the quantity of each ingredient, and its price, are given, to find the price per pound, gallon, or whatever it may be, of the mixture; multiply the quantity of each ingredient by its price, and add; then divide the sum of all these products by the sum of all the quantities in the ingredients.

Example. What is the worth per ounce of a mixture of 25 ounces of sugar at 10*d.* with 15 ounces at 11*d.*?

25 ounces at 10*d.* is worth 250*d.*
15 „ 11*d.* „ 165*d.*
—— ——
40 40) 415 ($10\frac{15}{40}d.$
40
——
15

Answer, $10\frac{15}{40}d.$ or $10\frac{3}{8}d.$ very nearly.

Rule II. To find in what proportions *per cent.* two ingredients must be mixed, in order that the price per ounce, &c. of the mixture may be one which has been previously determined upon. To find the proportion of the *first* ingredient, take the difference of price between the mixture and the *second* ingredient, multiply by 100, and divide by the difference between the prices of the ingredients.

Example. I wish to know in what proportion wines at 45*s.* and 70*s.* a dozen must be mixed, in order that the mixture may be worth 55*s.* a dozen?

Price of the mixture . . 55*s.*
„ second ingredient 70*s.*
——
difference 15
multiply 100
——
difference of price of ingredients 25) 1500 (60
150
——
0

There must be, therefore, 60 per cent. of the first, and consequently, 40 per cent. of the second.

Instead of finding the proportions *per cent.*, the proportion in which any other number must be divided, may be found by using that number of dozen, &c. instead of 100, and the three prices may be *all* multiplied by any number which will clear them of fractions.

Example. How must 80 gallons, worth $6\frac{1}{2}d.$ a gallon, be made of ingredients worth $1\frac{3}{4}d.$ and 11*d.* per gallon?

Price of mixture.	Price of first ingredient.	Price of second ingredient.
$6\frac{1}{2}$	$1\frac{3}{4}$	11
4	4	4
26	7	44

difference of 26 and 44 18
80
——
difference of 7 and 44 37) 1440 ($38\frac{34}{37}$
111
——
330
296
——
34

Answer, $38\frac{34}{37}$ gallons of the first, and $41\frac{3}{37}$ of the second.

ALLIGATOR, a name originally given by the British Colonists of the Southern States of the North American Union, to a large species of reptile closely resembling the crocodile of Egypt, but which modern researches have shown to possess generical characters differing from those of that animal. The word is supposed to be derived from the Portuguese *lagarto*, signifying a lizard, generally; but it seems more probable, as, indeed, some of our older writers on the history and productions of America, affirm, that it is merely a modification of the Indian word *legateer*, or *allegater*. According to its modern acceptation among zoologists, however, the name is no longer confined to the species most commonly found in Carolina, Louisiana, and the other Southern States of the Union; but it is applied generically to all the other American species which agree with it in its most prominent and influential characters, and which have been called caymans, jacarés, &c., by the Spaniards, Portuguese, and Indians of South America. The characters which are proper to the alligators, and by which they are distinguished from the crocodiles of the Old World, are by no means of such importance with respect to the influence they may be reasonably supposed to have upon the habits and economy of these animals, as to warrant the formation of these reptiles into a distinct and separate genus: their manners and habits are precisely those of the true crocodiles, and if they differ in certain minor details of structure, this difference should be considered not as a *generic*, but as a purely *specific* character. Baron Cuvier regarded the alligators not as a distinct genus, but merely as forming a subgenus of crocodiles, differing from these animals in their habitat, but agreeing with them in all the essential parts of their structure and economy. Some later authors, however, have elevated his subdivisions into distinct and separate genera. Without subscribing to their views upon this subject, we shall so far adopt their plan, as to describe the alligators and crocodiles in different articles.

M. Cuvier thus distinguishes the alligators from the true crocodiles: 'the former have the head less oblong than the latter; its length is to its breadth, measured at the articulation of the jaws, as three to two; the teeth are unequal in length and size; there are at least nineteen, sometime even as many as twenty-two, on each side in the lower jaw, and nineteen or twenty in the upper. The front teeth of the under jaw pierce through the upper at a certain age, and the fourth from the front, which are the longest of all, enter into corresponding holes of the upper jaw, in which they are concealed when the mouth is closed. The hind legs and feet are round and neither fringed nor pectinated on the sides; the toes are not completely webbed, the connecting membrane only extending to their middle; and, finally, the post-orbital holes of the cranium, so conspicuous in the true crocodiles, are very minute in the alligators, or even entirely wanting.' The crocodiles, properly so called, on the contrary, have the head at least twice as long as it is broad; fifteen teeth on each side of the lower jaw, and nineteen on each side of the upper. The incisor or front teeth, as in the alligators, pierce through the upper jaw, at a certain age, but the fourth or largest of the lower jaw, instead of being received into a corresponding hole of the upper, passes into a notch on each side of it: and finally, the hind feet are bordered by a denticulated fringe, and the toes are completely united by a swimming membrane.

The characters here reported as peculiar to the alligators and crocodiles respectively, are evidently not of sufficient importance to exert any very sensible influence upon their general economy. Of the characters and organic modifications which they possess in common, the principal is the long taper tail, strongly compressed on the sides, and surmounted towards its origin with a double series of keel-shaped plates, forming two upright denticulated crests, which, gradually converging towards the middle of the tail, there unite and form a single row to the extremity. Its great size, and laterally compressed form, render the tail an organ of the utmost importance to the crocodiles: it is true that its weight materially impedes their motions on dry land, but it is a most powerful instrument of progression in the water, and influences the aquatic habits of these animals much more than their webbed feet. The latter character, indeed, is comparatively of little weight: the hind feet are only used to assist the progression in slow and gentle motion, but in all sudden and violent actions the tail alone is the active instrument; and even when the animal is surprised on land, as we are assured by Adanson, it becomes a powerful weapon of offence. The compression of the tail is not peculiar among reptiles to crocodiles, though so powerfully influencing their habits; but the second character which is common to the entire genus, viz., the palmated or semi-palmated hind feet, is exhibited by no other genus of reptiles, though all are more or less addicted to an aquatic life. This fact sufficiently demonstrates the small influence which the palmated form of the extremities exerts upon the economy of these animals in general. Still this character is by no means devoid of importance, though in proportion to its utility in aquatic progression, it renders the terrestrial motions of the animals extremely slow and awkward; and this effect is still further increased by the length and weight of the tail at one end, and by the anatomical structure of the neck at the other. Each of the cervical vertebræ has on either side a species of false rib, and their meeting at the extremities along the whole neck, completely hinder the animal from turning its head to either side, and render all its movements stiff and constrained. Neither is the pace of the crocodiles on land so swift as to make them objects of fear to ordinary quadrupeds; a man can easily outstrip them, and so sensible are these animals of their own inferiority in this respect, that they immediately retreat to their more congenial element upon the most distant appearance of the human species.

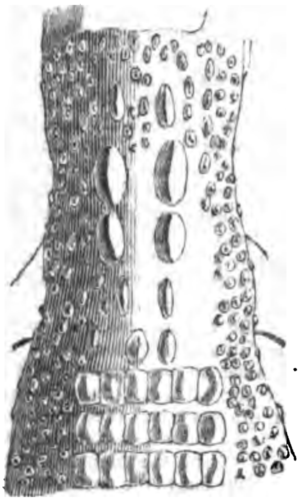
The other general characters of the crocodiles and alligators, consist in their long flat heads, thick neck and bodies, protected by regular transverse rows of square bony plates or shields, elevated in the centre into keel-shaped ridges, and disposed, on the back of the neck, into groups of different forms and numbers, according to the species. The mouth is extremely large, extending considerably behind the eyes, and furnished in each jaw with a single row of conical teeth, all of different sizes, and standing apart from one another: these are hollow within, and never vary in number, but are successively pushed out and replaced by others of larger dimensions, as the animals increase in age and size. The tongue is short and fleshy, and attached to the under jaw throughout its whole extent. It is consequently incapable of protrusion, and from its small size and backward position seldom seen even when the animal opens its mouth, which circumstance occasioned the belief so universally prevalent among the ancients, that the crocodile was altogether deprived of this organ. The eyes are placed on the upper surface of the skull, are much approximated towards one another, and provided each with three distinct lids: the nostrils form a long narrow canal, placed at the extremity of the muzzle; the ears are closed externally by two fleshy valves, and beneath the throat are two small pouches or glands, which open externally and contain a musky substance. Finally, the feet are provided with five toes before, long and separate, and four behind, more or less perfectly united by membranes: of these, the three interior alone on each foot are provided with claws, so that the two outer toes on the fore-feet, and one on the hind, are constantly clawless.

Such are the principal characters which influence the habits and economy of the crocodiles in general; those which more particularly distinguish the alligators or crocodiles of America from the kindred species of the Old World have been already adverted to, and it only now remains to relate the manners of the former sub-genus, and describe the distinctive forms of the different species which compose it. It is reported by Pliny, that the Egyptian crocodile retires to a secret cave or hiding-place, on the approach of winter, and spends three or four of the coldest months in a state of lethargy, and without taking any food: this phenomenon, usually called hybernation, is almost universal among reptiles and serpents, at least in temperate and high latitudes, and has been repeatedly observed with regard to the alligators. On the approach of the cold season these animals bury themselves in the mud at the bottom of some stagnant pond, where they remain concealed and inactive till the return of spring. Travellers assure us that they are never to be found in running streams, but that they frequent in preference some stagnant pond or the creeks of large rivers. Here they may be seen in almost countless multitudes, for they are extremely numerous in the remote, unfrequented parts of South America, protruding their large flat heads through the leaves of the *nymphæa*, *pontederia*, and other aquatic plants which cover the surface of the water, and watching for prey; or sometimes basking in the sun or sleeping on the banks. They never come on shore, except during the hottest part of the day, and always retire to the water on the approach of night, during which time they are extremely active in search of prey. Their food consists principally of fish, and it is conjectured by some physiologists, that the musky fluid, secreted by the glands under the throat which have been already mentioned, acts as a kind of bait to attract their prey. The alligators are seldom known to attack the human species, unless in defence of their eggs or young; the females of these reptiles are reported to exhibit a much stronger degree of maternal affection for their offspring than usually belongs to their class. They usually lay from fifty to sixty eggs in one place, of about the same size as those of a goose, which they cover up with sand, and leave to be hatched by the heat of the sun; never, however, removing to any great distance. When the young ones come forth, they are about five or six inches long, and are immediately conducted to the water by the female alligator. Seldom more than half the entire brood live to reach the water. Many are destroyed while in the egg. The vultures waylay and watch the female alligator when she goes ashore to deposit her eggs, which they scratch up and devour as soon as she retires. Numbers of them also fall a prey to the grown males of their own species, and to various descriptions of ravenous fishes which greedily devour them. The Indians eat the flesh of the alligators, notwithstanding its strong musky flavour; and even Europeans, who have succeeded in overcoming their prejudices so far as to partake of it, report it to be both delicate and savoury. A single peculiarity of habit seems to distinguish the alligators from the real crocodiles: the former never leave the fresh water, whilst the latter are known to frequent the mouths of large rivers, and even to pass between different islands, at considerable distances from one another; and so perfectly is this characteristic of the two subgenera, that the crocodile of the West Indian Isles differs from all the other American species, and exhibits only those modifications which properly belong to those of the Old World.

It was only at the commencement of the present century that the different species of alligators were properly distinguished from one another, or even that they were suspected to be specifically different from the crocodile of the Nile. This distinction is entirely due to the late Baron Cuvier, and since the publication of the first edition of his celebrated work, '*Sur les Ossemens Fossiles*,' little further addition has been made to the subject. He enumerates three species, which he has definitely characterised; and describes a fourth, which he suspects to be distinct, but of which he did not at that time possess a sufficient number of specimens to enable him to determine the question. These are,

1. *The Alligator*, (*Crocodilus Lucius*, Cuv.) properly so called, which inhabits the fresh waters of the Carolinas, the Mississippi, and other southern parts of the United States, and of whose fierceness and voracity Bartram has related such extraordinary accounts. It grows, according to Catesby, to the length of fourteen or fifteen feet, the head being one-seventh of the entire length, and half as broad at the articulation of the jaws as it is long. It appears to be more fierce and voracious than the South American species, often attacks men and quadrupeds whilst bathing or crossing the rivers, and is even said to prefer the flesh of the negro to all other food; probably because the slave is more exposed to its attacks than his master. The alligators prey chiefly by night; they assemble in vast numbers, besetting the mouth of some retired creek into which they have pre-

viously driven the fish, and bellowing so loud that they may be heard at the distance of a mile. To catch the fish they dive under the shoal, and having secured one, rise to the surface, toss it into the air to get rid of the water which they necessarily take in along with it, and catch it again in its descent. When, however, they succeed in capturing a land animal, which is too large to be swallowed at a single mouthful, they conceal the body beneath the bank till it begins to putrify, for as their teeth are not formed for cutting or masticating, they are unable to tear the tough flesh in its fresh state; it is then dragged on shore and devoured at leisure. When about to lay, the female digs a deep hole in the sand, and deposits her eggs in layers, separated from one another by intervening strata of leaves and dry grass. It would appear that she lays only one batch of eggs during the same season, though in the hotter parts of South America, if the report of La Borde is to be depended on, the cayman, or alligator of Surinam and Cayenne, lays at two or even three different periods of the year; but as each batch is said to consist of only twenty or twenty-five eggs, it is probable that the whole does not exceed the number usually assigned to the common alligator. The female of this latter species, it is said, never loses sight of her nest till the young are hatched, and for months afterwards affords them the most unremitting care and protection.

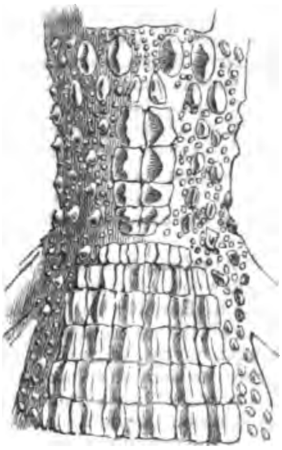


[Cervical Plates of Alligator.]

This species is frequently found up the Mississippi higher than the Red River. Messrs. Dunbar and Hunter encountered one in 32½° N. lat., in the month of December, and during a more than usually severe season. In general, however, as we are assured by Catesby and Lacoudrennière, the alligator of North America buries himself under the mud, at the bottom of the swamps and marshes which he inhabits, as soon as the cold weather fairly sets in, and continues in a lethargic sleep till the return of spring. During the very severe frosts, sensation is so completely suspended, that the body of the animal may be cut into slices without dispelling his lethargy; yet it is never actually frozen, and the partial return of a few hours' bright sunshine is at all times sufficient to restore suspended animation. It is particularly in the rivers, lagoons, and swamps of Florida, Georgia, South Carolina, and Louisiana, that the alligator reaches his greatest dimensions. Bartram found immense numbers of alligators and fish in a mineral spring near the Musquito River, in Florida, though the water, at its exit from the earth, was nearly at the boiling point, and strongly impregnated with copper and vitriol. The same traveller informs us, that the voice of the alligator resembles the bellowing of a bull.

Besides the characters common to all the American crocodiles, this species exhibits the following modifications which distinguish it from others. The snout is flattened on its upper surface, and slightly turned upwards at the extremity; the sides of it are nearly parallel, and the nose forms a regular parabolic curve. It was this similarity to the head of a pike, which led Baron Cuvier to bestow upon the present species the name of *Crocodilus Lucius*, or the pike-headed crocodile. The internal rim of the orbits is large and protuberant, but without being united by a transverse crest as in the *Crocodilus Sclerops or Spectacled Alligator*. The external openings of the nostrils are separated by a long knob; the skull has two shallow, oblique, oval pits, in the bottom of which are two small holes. On the back of the neck are four principal plates, elevated in the centre into keel-shaped ridges; and in front and rear of these respectively, two smaller ones of similar form. The back exhibits eighteen transverse rows of similar plates, the first with only two crests or ridges, then two with four, afterwards three with six, then six with eight, then again two with six, and finally, the last four rows with four crests each. The ridges or crests on the body, are of nearly equal size; those of the tail are much larger, and amount to thirty-eight in all, nineteen before the union of the two lateral series, and as many afterwards. The colour is a deep, greenish-brown above, and light-yellow on the under surface of the body; the sides regularly marked with alternate bands of both these colours.

2. *The Cayman*, (*Crocodilus Palpebrosus*, Cuv.) is at once distinguished from all other species by the bony structure of the eyebrows, which form large knobs of the size of a man's fist; and by the small extent of the membrane connecting the toes of the hind feet, which in prepared specimens can scarcely be recognized. The back of the neck is armed first with a range of four small scales, and afterwards with four transverse rows of plates, each consisting of two ridges, and immediately in contact with those of the back. These consist of one row with two ridges, one with four, five with six, three with eight, two with six, and seven with four. The lateral, denticulated ridges of the tail contain ten plates each before their union, and fourteen after, but as these are much more liable to vary than the transverse plates of the neck and back, little dependence should be placed upon the numbers of them in any species of crocodile. The skull of this species shows not the slightest trace of those post-orbital perforations, which are so conspicuous in the crocodile of the Nile, and more or less developed in all the other species.

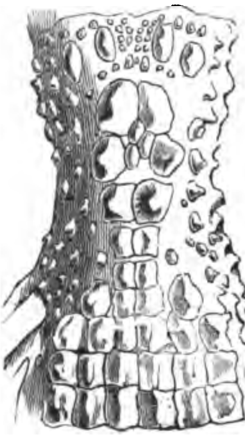


[Cervical Plates of the Cayman.]

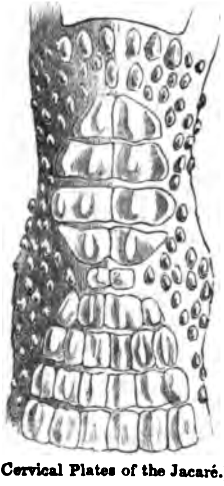
This is the common species of Surinam and Guiana: it is there called cayman, a word most probably of native origin, whilst the following species, which is likewise found in the same countries, though its more appropriate locality would appear to be Brazil and Buenos Ayres, is distinguished by the name of crocodile. Such at least is the report of Stedman and Von Sack, the only travellers who distinctly mention the present species. According to the account given by these travellers, the cayman does not attain so large a size as the other species, nor will he venture to attack a man on dry land, or even in the water, so long as he keeps his legs and arms in motion. The female deposits her eggs in a single layer, and after covering them slightly with sand, abandons them to the vivifying influence of the tropical sun, without taking any further charge either of them or of the young progeny.

3. The *Crocodilus Trigonatus* of Schneider, is a species of crocodile, exhibiting all the peculiar characters which properly distinguish the alligators of America, and yet suspected to be of African origin. It is even so closely allied in form and general characters to the cayman, or eyebrowed alligator, that Baron Cuvier has described it as a mere variety of that species, though the fact of its widely different habitat, if, indeed, it can be depended on, as well

as the different arrangement of its cervical and dorsal plates, are arguments in favour of the contrary opinion. The principal distinction between this and the foregoing species consists in a ridge which rises in front of the orbits, and runs towards the snout, and a small notch in the posterior border of the skull; the second row of cervical plates is larger than the others, and towards its middle are two or three small scales, with irregularly disposed crests; the large ridges assume the form of scalene triangles, which gives the whole animal a rough and bristly appearance; there are sixteen transverse bands on the back, the number of plates appearing to vary according to the species, and from nineteen to twenty-eight on the tail, nine or ten before the junction of the lateral ridges, and from ten to seventeen afterwards. Nothing whatever is known of the manners or habits of this species or variety.


[Cervical Plates of C. Trigonatus.]

4. *The Jacaré* (*Crocodilus Sclerops*, Schneider,) appears to be spread over the whole of tropical America, but is most especially numerous in Brazil, where it attains a very large size, and is found in all the rivers and lakes. Its head is more attenuated than in the alligator of North America; the sides converging towards the snout, so as to form very nearly an isosceles triangle; the surface of the bones of the skull has a rough scabrous appearance, as if arising from disease; the orbits of the eyes are surrounded by large, prominent rims of bone, and these are connected together by an intermediate ridge, giving the whole very much the appearance of a pair of spectacles; finally, the skull is pierced by two very small holes behind the orbits. The cervical plates are remarkably large; they are arranged in four transverse bands, of which the first two contain four each, and each of the others two. The transverse bands of the back vary according to age, and it would even seem according to the individual; they most commonly consist of two rows, with two plates each, four with six, five with eight, two with six, and four with four. The centres of these plates are elevated into ridges, much smaller than in the other species; it is only after the junction of the lateral ridges of the tail, that they become remarkably prominent: their number varies from ten to thirteen before this junction, and from nineteen to twenty-one after it. The colour of the animal is greenish brown above, marbled irregularly with different shades of green, and pale greenish-yellow below. This species grows to the size of from fourteen to eighteen feet in length; the whole length is from eight to eight and a half times that of the head.


[Cervical Plates of the Jacaré.]

The jacarés, according to Azara, are never known to attack men, or even dogs, in passing the rivers, unless it happen to be near the place where they have deposited their eggs; and even then, they are never known to prey upon the body, contenting themselves with the fish and water-fowl, which they find so plentiful in their own element. During the night they are exceedingly active, and always keep in the water, showing only their heads above the surface, but towards the middle of the day they come ashore to enjoy the heat of the sun; they then sleep profoundly, but always retreat to the water on being disturbed. The eggs are about the size of those of a goose; they are white, and much sought after by the free Indians, who also eat the flesh of the jacaré itself, though it has a strong musky smell, and scarcely any juice. The female deposits her eggs in the sand in a single layer, and covers them with straw or leaves; few of them, however, escape the quick eye of the vulture, and even many of the young fall a prey to the full-grown males, which at the period of their first appearance, in the hottest part of summer, are particularly fierce and ravenous, the marshes which they inhabit being then dried up, and their food difficult to obtain. This species appears to have pretty nearly the same range towards the south of the Continent, that the alligator, or pike-headed crocodile, has to the north. According to Azara, it is never found beyond 32° of south latitude. Many interesting facts regarding the habits of this species are recorded in the narratives of Prince Maximilian, Spix and Martius, and other Brazilian travellers.

ALLIGHUR. A district of central India, in the province of Agra, situated between the rivers Ganges and Jumna. This district is bounded on the north by Merut; on the south by the districts of Agra and Ferruckabad; on the east by the last-named district and Bareilly; and on the west by Agra and Delhi.

Allighur is estimated to contain a million and a half of acres, about one-third part of which is in cultivation, principally in the southern division of the district, which is very fertile. The northern portion, on the contrary, contains some of the most desolate tracts of land in India, in which little is to be seen but low, dark jungle.

In addition to the streams by which it is bounded on two sides, as already stated, the district is provided with numerous water-courses and rivulets, which, however, are dry during the greater part of the year.

The principal towns in the district are Allighur, Coel, Hatras, Moorsaun, and Anopsheher.

The first of these places is the capital of the district. It is situated in 27° 56′ N. lat., and 77° 59′ E. long., a little more than fifty miles north from the City of Agra. Allighur was taken in 1803, from Dowlut Row Scindia, by the forces under Lord Lake, and is now the head-quarters of a civil and judicial establishment of the Company's government. Coel, which is properly the town, is distant about two miles south of Allighur, and it is here that the civil authorities principally reside: the two places are connected by a fine avenue of trees. Coel was formerly a station of great importance, and is so spoken of by Abul Fazl in the *Ayin-i-Akbari:* it is still a large and busy town.

Hatras is a fortress of considerable strength, situated 31 miles north from the City of Agra. It was besieged in 1817, and taken by the British after a tremendous bombardment, which did great damage to the town. Hatras has become a place of much commercial activity.

Moorsaun, a town 29 miles north from the City of Agra, was, previous to 1817, the seat of an independent Zamindary, and the resort of tribes of professional robbers. The evil thus occasioned had arrived at such a height that, at the time just mentioned, the place was attacked by the English and dismantled. The country round about Moorsaun is highly cultivated. Anopsheher is built on the west side of the Ganges, 68 miles E.S.E. of Delhi, in 28° 33′ N. lat. 78° 8′ E. long. (Hamilton's *E. I. Gaz.* Mills' *History of British India; and Parliamentary Papers.*)

ALLITERATION. This term is usually employed to signify the juxta-position, or frequent recurrence in composition, of words commencing with the same letter, when introduced with a view to its rhetorical effect. Byron's line in the concluding stanza of the second canto of *Childe Harold*,

'*W*hat is the *w*orst of *w*oes that *w*ait on age,'

may be given as an example; and another instance occurs in the same stanza, in the line

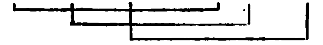
'O'er *h*earts *d*ivided, and o'er *h*opes *d*estroyed.'

Churchill has at once ridiculed and exemplified the figure in his well-known verse

'And apt alliteration's artful aid,'

where every word begins with the same letter. Modern critics have detected numerous instances of alliteration both in the Latin and Greek poets. (See the dialogue entitled *Actius*, in the *Latin Dialogues* of Joannes Jovianus Pontanus; and Harris's *Philological Enquiries*, part II. chap. iv.) Alliteration, however, has been most systematically used as an ornament of diction in the Celtic and Gothic dialects. Gerald Barry, commonly called Giraldus Cambrensis, who lived in the twelfth century, tells us, in his Description of Wales, that in his day, both the English and Welsh were so fond of this figure of speech, which he calls *Annomination*, that they deemed no composition to be elegant, or other than rude and barbarous, in which it was not plentifully employed. The same tendency is also said to have formed a striking peculiarity in the genius of the Irish language. (See Warton's *History of English Poetry*, vol. ii. p. 148. Note d. Edit. of 1824.) Dr. Percy, in an essay published in his *Reliques of ancient English Poetry*, has traced the origin and history of alliterative verse down from the compositions of the old Icelandic poets. Nearly all the varieties of Runic verse, which were very numerous, appear to have depended for their prosodial character entirely upon alliteration. It was necessary that so many words in every line should begin with the same letter; and this was all that was required to make good metre. According to the learned Wormius, there were no fewer than 136 kinds of Icelandic verse formed upon this principle, and without including rhyme, or a correspondence of final syllables. If we may trust the following curious statement, given in a note by Mr. Park to the last edition by Price of Warton's *History of English Poetry* (vol. ii. p. 512,) the harmonies of alliterative verse were sometimes of the most complicated description, and such as were likely, one would suppose, to elude any except the nicest and most practised ears:—'An objection has been taken to the antiquity of the Welsh poetry, from its supposed want of alliteration. But this is not the case: for the alliteration has not been perceived by those ignorant of its construction, which is to make it in the middle of words, and not at the beginning, as in this instance:

Yn las ar ei naws eirian.



This information was imparted to Mr. Douce, by the ingenious Edward Williams, the Welsh bard.' The remains which we possess of Saxon poetry exhibit frequent instances of lines constructed apparently upon the principle of alliteration; but it certainly was not so systematically adhered to in that language, as in the compositions of the Icelandic bards. Mr. Tyrwhitt, indeed, in his essay on the *Language and Versification of Chaucer*, has gone so far as to say, 'For my own part, I confess myself unable to discover any material distinction of the Saxon poetry from prose, except a greater pomp of diction, and a more stately kind of march.' He thinks that we might attribute the introduction of the practice of alliteration to the Danes, if we were certain that it made a part of the Scaldic versification at the time of the Danish settlements in England.

Dr. Percy, in the essay above referred to, has shown that poems continued to be written in English, the verse of which was merely alliterative, or in which, at least, alliteration served as the substitute for rhyme, down to the commencement of the sixteenth century, and in the Scottish dialect, even to a later period. One of the compositions of this description which he cites is entitled *Scottish Field*, and is a narrative of the battle of Flodden, which was fought in 1513. Another is a Scottish poem composed by Dunbar, who lived till about the middle of the sixteenth century. It is preserved in the Maitland manuscript, and has since been published by Pinkerton. The practice of alliterative verse, as Percy has remarked, seems to have been longest preserved in the north. In the *Canterbury Tales*, Chaucer makes his Parson, when asked for his story, reply, with a sneer at this antiquated habit of the northern versifiers of that day,

'————Trusteth well I am a Southern man;
I cannot *geste, rom, ram, ruff, by my letter*,
And, God wot, rhyme hold I but little better
And therefore, if you list, I`woll not glose;
I woll you tell a little tale in prose.'

But the most famous poem in the English language, entirely composed in alliterative metre, is that entitled *The Visions of Pierse Plowman*, written about the middle of the fourteenth century, and attributed to William or Robert Longland, a secular priest, and a fellow of Oriel College, Oxford. This is a long work, consisting of twenty-one parts or books, and composed throughout in verses, the cadence of which appears to be generally anapæstic, but which are evidently designed to derive their chief metrical beauty from a certain artificial disposition, in each, of the words beginning with the same letter. The poem has been frequently printed; but the last and best edition is that published a few years ago by the late Rev. Thomas Dunham Whitaker.

So strongly had alliteration obtained possession of the English ear, that even for some time after the introduction of rhyme, it appears to have been still considered an important embellishment of verse. Some fragments of our old poetry exhibit both the consonance of final syllables, and a rigid observance of all the regularities of alliteration. Even after the latter came to be neglected as a systematic accessory, it was still lavishly employed as an occasional ornament. Our popular ballad and lyrical poetry is full of such lines as those with which the Scotch song commences:—

'*M*erry *m*ay the *m*aid be
That *m*arries the *m*iller;
*F*or *f*oul day and *f*air day, &c. &c.'

Down even to the present day, the use of alliteration, to a considerable extent, has continued to characterise English versification in its most polished form, and in the hands of some of our greatest poets. Nor has the employment of this artifice of style been confined to compositions in verse. In the early part of the seventeenth century it was carried to a greater excess by some of our prose writers, than it ever had been by our poets; grave discourses being elaborated, in which nearly all the words of each separate sentence commenced with the same letter. The longer this torture of the unfortunate sound could be protracted, the greater was deemed to be the feat of eloquence.

Those who recognize rhyme, or what Milton calls 'the jingling sound of like endings,' as one of the legitimate adjuncts of poetry, can hardly repudiate alliteration, which, after the same fashion, may be termed 'the jingle of like beginnings.' There can be no doubt that the latter artifice, judiciously employed, may be made to communicate a portion, at least, of the same sort of gratification which is conveyed by the former. The general principle upon which the pleasure we experience in both cases depends, is the similarity in dissimilarity, as it has been called, or variety combined with regularity, which is the occasion of so many of our intellectual, and of some also of our moral pleasures. Of course, the degree in which alliteration is employed, as an ornament of style, ought to be regulated by its importance, as compared with other rhetorical decorations, and by its appropriateness to the subject and the general character of the composition. Being a mere artifice of diction, it can in no case be compared with the higher beauties of thought and expression, and should never be obtruded so as to interfere with them. It sometimes serves, however, to help in what may be called the setting of a brilliant thought; and, if it have the air of coming naturally, will frequently add to the effect of an otherwise happy phrase. Its aptitude to catch the popular ear is proved by its almost universal adoption in proverbs, traditional rhymes, and other brief sayings of wit or wisdom, which their mere natural vitality has kept alive without the aid of letters, and even in a vast number of those idiomatic expressions which form the sinew and chief strength of our language. Mr. Price, the learned editor of the last edition of Warton, whose premature death is an irreparable loss to more than one department of our national literature, announced some years ago a volume which was to contain, among other matters, an essay upon alliterative metre, together with the Aunter of Sir Gawaine, a romance in alliterative metre, from a MS. of the fourteenth century; but the work, we believe, has never appeared.

ALLIUM, a very extensive genus of bulbous, monocotyledonous plants, belonging to the natural order *Asphodeleæ*. The species are all remarkable for having, in a greater or less degree, the odour of the garlic, and for the agreeable stimulating effects that accompany it. For this reason some of them have been objects of cultivation from the highest antiquity.

As a genus, allium is known among other asphodeleæ, by the flowers growing in round heads or umbels, by the perianthium being deeply divided into six spreading lobes, and by having a capsule with three angles, three valves, and three cells, sometimes so deeply lobed, as to have the appearance of six cells. The number of species is very considerable; they are almost exclusively natives of the northern hemisphere, and are principally found wild in the meadows and groves of Europe, in the north of Asia, and the north of Egypt; a small proportion only inhabiting corresponding latitudes in North America. Many of them are handsome flowering plants, but as they are more important on account of their useful properties, we shall confine ourselves to some account of the kinds commonly cultivated in the kitchen garden.

Allium cepa, the common onion, is too well known to require description. It is not certain of what country it is a native, but it has from time immemorial been cultivated in Egypt. Its varieties are not very numerous, considering that it is almost exclusively increased by seed: the most remarkable are the blood red, which is the most pungent; the Strasburg, which is the hardiest; the silver-skinned, which is the smallest, and the most fitted for pickling; and the Portugal and Tripoli, which are the largest and the most delicate. In this country the bulbs do not generally arrive at the large size of those imported from Portugal and Spain; but skilful gardeners have nevertheless succeeded in procuring them fully as fine. Their method has been to take the small onions of a late-sown crop of the previous year, and to plant them in rows in the beginning of April, laying them *on the surface* of the soil, each surrounded with about a handful of decayed and nearly dry manure. All the time that is usually lost in seed-sowing is thus avoided, and the moment the bulbs push forth new roots, they find themselves in the midst of an abundant store of food, which continues to supply them with nutrition during the whole of the growing season. As they advance in size, the soil round the bulbs is frequently disturbed by the hoe, for the sake of exposing as much as possible the carbonaceous matter of the manure to the action of the atmosphere. This process is only discontinued when the leaves begin to turn yellow; the bulbs are then allowed to ripen as usual. By these means—the copious supply of food, the bulbs being on the surface of the ground, and so enabled to develope without impediment from the pressure of the soil, and the time saved by using small, ready-formed bulbs, instead of seed,—onions have been often obtained in England fully equal in every respect to those of Spain. For further information on this subject, see the *Transactions of the Hort. Soc.* vol. i., p. 158, iii., p. 67, and iv., p. 138.

Allium schœnoprasum, the chive, is a little tufted plant, with slender, cylindrical, taper-pointed, dark-green leaves; its flowers are arranged in a small, compact, round head, and are of a purplish or pale violet colour; the bulbs are small, long, and white, and grow in dense, matted tufts. It is a native of the Alps of Europe, from Lapland to Italy; and is found here and there in Great Britain. It is more employed by the French for their cookery, than in this country. Being a perennial, and increasing rapidly by its roots, it requires no other management than to be taken up from time to time for the purpose of separating its bulbs, which are afterwards replanted at short intervals. The leaves are the part eaten, and are cropped as occasion requires.

Allium fistulosum, the Welsh onion, is a native of Siberia, and is supposed to have gained its English name from having been imported originally from Germany, with the name Wälsch, or foreign, attached to it. It is a perennial, and cultivated chiefly for the purpose of being sold in the markets when very young, at which time its flavour is delicate; its hardiness enables it when young to brave our spring cold better than the common onion. It does not form bulbs, and is known by its tall stem, thick hollow leaves, and pale green very compact head of flowers. It does not appear to be an object of cultivation in any other than northern countries.

Allium ascalonicum, the shallot, a native of Asia Minor, is in many respects similar to the chive, from which it is known by its larger leaves, its smaller and more deeply-coloured flowers, and by its stamens having alternately three points on the filaments. It moreover produces bulbs of sufficient size to be fit for use, and accordingly, while the leaves only are employed in the chive, the bulbs are the parts sought for in the shallot. These multiply abundantly, so that every year, when the crop is taken up, there is plenty of small bulbs which can be reserved for planting the succeeding season, while the fine, fully-formed ones are selected for the kitchen. Two very distinct varieties of this useful plant are known, one of which is much larger and more delicate than the other. To obtain the bulbs in the greatest perfection, they should not be buried in the earth, as is the common practice, but merely placed on the surface of the soil, and treated as already recommended with regard to onions. Upon this subject see an excellent paper by Mr. Knight in the *Trans. of the Hort. Soc.*, vol. ii. p. 97.

Allium sativum, garlic, has been found wild in Sicily, and some parts of Provence. Its stem is simple, erect, and furnished with flat, narrow, pointed leaves; the flower-heads have usually a number of little bulbs lying among the flowers, which are white or pinkish; the bulbs are remarkable for the development of the greater part of the axillary buds of their scales; these buds grow rapidly, and acquire a bulbous state, and form what are called the cloves of the garlic, which are the parts employed in cooking. The mode of cultivating them is the same as that of shallots and onions.

Allium ophioscorodon, rocambole, or Spanish shallot, is very slightly different from garlic, being chiefly distinguished by its larger size in all the parts, and by the upper part of its stem being generally twisted spirally just before flowering. It is a native of most parts of the south of Europe; it is little cultivated in this country.

Allium porrum, the leek, has, like many other cultivated plants, disappeared in a wild state, so that its origin is unknown. It is a broad-leaved, succulent species, not capable of forming a bulb, because the leaves do not perish till the plant itself dies away, but producing instead a cylindrical body composed of the tender, colourless bases of the leaves, which are rolled round each other in a compact manner. As the excellence of the leek depends entirely upon the large size of this part, the attention of the cultivator is exclusively directed to that before all other considerations. It has been found that no method is so successful as to sow the seed early in a light and well-manured soil, and then, when the young leeks have arrived at the thickness of the little finger, or even sooner, to drop them into holes about 2½, or 3 inches wide, and 6 inches deep, in the bottom of which some very fine manure has been deposited. By this means the young plants are copiously supplied with moisture, have abundant food round their young roots, are attracted upwards by the light, and are enabled to develope themselves with rapidity from the absence of all pressure from the surrounding earth; and when they fill up the whole cavity of the hole, as they will in time, they then blanch themselves in all the most valuable part of their stem.

As the sensible properties of the whole genus are evidently much the same as those of the common onion, differing chiefly in degree of concentration or diffusion, the chemical analysis of the bulbs of this species may be considered illustrative of that of all the rest. MM. Fourcroy and Vauquelin found that the common onion is composed, 1st. of a white, acrid, volatile oil, holding in solution sulphur which renders it fetid; 2. of a vegeto-animal matter analogous to gluten; 3. of a good deal of uncrystallizable sugar; 4. of a great quantity of mucilage, resembling gum Arabic; 5. of phosphoric acid, either free or combined with lime, acetic acid, and a little citrate of lime, and 6. of vegetable fibre. It is to the volatile oil that the irritating properties of the onion are supposed to be owing, and they are consequently dissipated by heat.

ALLOA, a sea-port town and parish in the county of Clackmannan, on the north side of the river Forth, twenty-seven miles above Edinburgh, seven below Stirling by land, and fourteen by water. The town is very ancient and the old part of it irregularly built with narrow streets; but in the more modern part are some spacious streets, with handsome houses and good shops. Within the last few years, elegant streets have been formed towards the river, and several neat villas built in the vicinity of the town. The new church, opened in 1819, is an elegant structure in the Gothic style of architecture, and adorned with a fine spire 200 feet high. The inhabitants were chiefly indebted to the late John Francis, Earl of Mar, for this ornament to their town. There are three meeting-houses of presbyterian dissenters, an independent meeting-house, and an episcopal chapel. The town has an assembly-room, in which the public courts of the county are held, some religious associations, and a good subscription library.

The town and parish contain three large distilleries, five breweries, where ale is made which has long been in high repute, and two woollen manufactories, chiefly employed in the blanket and shawl trade. The glass-works are admirably situated at the river side, and they can, by a waggon-way, receive coals directly from the extensive coal-pits in the neighbourhood. Near these are the gas-works for lighting the streets, shops, and public works; and a little more to the westward a great iron-foundry has just been erected, chiefly for the making of steam-engines. The Devan iron-works, in the vicinity of the town, though in the parish of Clackmannan, contribute largely to the trade of this port. Bricks, tiles, and other earthenware, copper goods (especially distillers' apparatus), leather, tobacco, and snuff, are also extensively manufactured. The salmon fishery, although not now so productive as it has been in former times, is still carried on with considerable spirit. Alloa possesses a commodious harbour, which has lately been greatly extended, with a depth of water of sixteen feet at neap, and from twenty-two to twenty-four at spring tides. Its vessels sail to every quarter of the globe; and their tonnage is from 7000 to 8000 tons, giving employment to from 400 to 500 seamen. The coasting trade is also very extensive, the quantity of coals alone, carried coast-wise, and exported, annually amounting to 60,000 tons: the trade in malt also is very great, as Alloa supplies not only the distillers and brewers in the neighbourhood, but also distant markets.

There is a dry-dock next to the harbour, capable of receiving the largest ships; and a ferry over the Forth, with two large steam-boats, where the passage is rendered convenient at all times of the tide, by very complete piers, one on each bank, reaching down to low-water mark. In the river, which is here 500 yards broad, and separates into two branches, there are two low islands called *inches*, one of which, nearest the town, is a valuable farm of 80 acres. There is a daily communication by steam-boats with Edinburgh and all the towns on the Forth. Above Alloa, to the N.E. is a *dam*, called Gartmorn, made originally about the commencement of the eighteenth century, and covering about 160 English acres, being probably the largest artificial lake in Scotland. From it issues a stream which turns several mills, and serves other important purposes, besides cleansing the harbour. In the immediate neighbourhood of Alloa is an ancient tower, built prior to 1300, ninety feet high, with walls eleven feet thick, once the residence of the Earls of Mar, and the place where some of the princes of Scotland were educated. Some royal relics were consumed in a fire, which, about thirty years ago, destroyed the family mansion adjoining this tower. The present Earl of Mar has taken up his residence in a temporary house near the tower, till a proper mansion be built. Shaw-park, a seat of the Earl of Mansfield, purchased from the late Earl of Cathcart; and Tullibody-House, a seat of Lord Abercromby, are also in the parish. The population of the town in 1831 was 4417, of the town and parish, 6377. 56° 7′ N. lat. 3° 46′ W. long. from Greenwich.

ALLODIUM, or **ALODIUM**, property held in absolute dominion, without rendering any service, rent, fealty, or other consideration whatsoever to a superior. It is opposed to Feodum or Fief, (see FIEF, FEUDAL SYSTEM,) which means property, the use of which is bestowed by the proprietor upon another, on condition that the person to whom the gift is made shall perform certain services to the giver, upon failure of which, or upon the determination of the period to which the gift was confined, the property reverts to the original possessor. Hence arises the mutual relation of lord and vassal.

When the barbarian tribes from the northern parts of Europe overran the Western Roman Empire, in the fifth and sixth centuries, they made a partition of the conquered provinces between themselves and the former possessors. The lands which were thus acquired by the Franks, the conquerors of Gaul, were termed allodial. These were subject to no burthen except that of military service, the neglect of which was punished with a fine (called Heribannum) proportioned to the wealth of the delinquent. They passed to all the children equally, or, in default of children, to the nearest relations of the last proprietor. Of these allodial possessions there was a peculiar species denominated Salic, from which females were expressly excluded. Besides the lands distributed among the nation of the Franks, others termed *fiscal* lands (from Fiscus, a word which, among the Romans, originally signified the emperor's treasury, but was afterwards applied to all imperial property, both real and personal) were set apart to form a fund which might support the dignity of the king, and supply him with the means of rewarding merit and encouraging valour. These, under the name of *benefices*, (beneficia,) were granted to favoured subjects, upon the condition, either expressed or implied, of the grantees rendering to the sovereign personal service in the field. It has been supposed by some writers, that these benefices were originally resumable at pleasure, that they were subsequently granted for life, and finally became hereditary. But there is no satisfactory proof of the first stage in this progress. (Hallam, *Middle Ages*, vol. i. p. 161, *note*.)

From the end of the fifth to the end of the eighth century, the allodial tenures prevailed in France. But there were so many advantages attending the beneficiary tenure, that even in the eighth century it appears to have gained ground considerably. The composition for homicide, the test of rank among the barbarous nations of the north of Europe, was, in the case of a king's vassal, treble the amount of what it was in the case of an ordinary free-born Frank. A contumacious resistance on the part of the former to the process of justice in the king's courts, was passed over in silence; while the latter, for the same offence, was punished with confiscation of goods. The latter also was condemned to undergo the ordeal (see ORDEAL) of boiling water for the least crimes; the former for murder only. A vassal of the king was not obliged to give evidence against his fellow-vassal in the king's courts. Moreover, instead of paying a fine, like the free allodialist, for neglect of military service, he had only to abstain from flesh and wine for as many days as he had failed in attendance upon the army. (Montesquieu, *Esprit des Loix*, lib. xxxi.)

The allodial proprietors, wishing to acquire the important privileges of king's vassals, without losing their domains, invented the practice of surrendering them to the king, in order to receive them back for themselves and their heirs upon the feudal conditions. When the benefices once became hereditary, the custom of what is called subinfeudation followed as a natural consequence; that is to say, the possessors of them carved out portions of their estates to be holden of themselves by a similar tenure. This custom began to gain ground even in the eighth century; but the disorders which ensued upon the death of Charlemagne in the ninth century, paved the way to the establishment of the feudal system upon a more extended basis. The vast empire which had been held together by the wisdom and vigour of one man, now crumbled into pieces. The provincial governors usurped the authority, and tyrannized over the subjects of his feeble descendants. The Hungarians, a tribe that emerged from Tartary at the latter end of the ninth century, spread terror and devastation over Germany, Italy, and part of France. The Scandinavian pirates, more commonly known by the name of Normans, infested the coasts with perpetual incursions. Against this complication of evils, the only defence was in the reciprocity of service and protection afforded by the feudal system. The allodial proprietor was willing, upon any terms, to exchange the name of liberty for the security against rapine and anarchy which a state of vassalage offered. In the course of the tenth and eleventh centuries (a period of the worst barbarism that Western Europe has known since the fall of the Western Roman Empire) allodial lands in France became for the most part feudal; *i.e.* either they were surrendered by their owners, and received back as simple fiefs, where the owner was compelled to acknowledge himself the *man* or vassal of some lord, on the supposition of an original grant which had never been made, or as *fiefs de protection*, where the submission was expressly grounded upon a compact of mutual defence. Similar changes took place in Italy and Germany, though not to the same extent. But in most of the southern provinces of France, where the Roman law prevailed, the ancient tenure always subsisted, and lands were generally presumed to be allodial unless the contrary was shown. And in Germany, according to Du Cange (*Gloss.*—tit. Barones) a class of men called *Semper Barones* held their lands allodially. With respect to England, it has always been a question whether the feudal system was established there before or after the Norman conquest. This subject will be more properly discussed under another head. (See Feudal System.) It is sufficient at present to observe, that at this day allodial possessions are unknown in England, all real property being held mediately or immediately of the king. The name for the most absolute dominion over property of this nature is a Fee, (Feodum,) or an estate in fee; a word which obviously implies a feudal relation. Hence it is, that, when a man possessed of an estate in fee dies without heirs, and without having devised his property by will, the estate escheats, *i.e.* falls back to the lord of whom it was holden, or, where there is no intermediate lord, to the king, as lord paramount. The term allodium is also sometimes applied to an estate inherited from an ancestor, as opposed to one which is acquired by any other means. (Spelman, *Gloss.* see Alodium.) The etymology of the word has given rise to much controversy. Sir H. Spelman, Dr. Robertson, Sir W. Blackstone, and others, have proposed several ingenious solutions of the difficulty, which are, however, founded on mere conjecture.

ALLOWANCE, in commerce, a deduction from the gross weight of goods, agreed on between merchants, according to the customs of particular countries and ports, the chief of which is known by the name of tare.

ALLOY. This word is employed to designate either a natural or artificial compound of two or more metals, except when mercury is one of them, and then the mixture is termed an *amalgam*. The natural alloys are far less important substances than those which are artificially procured: thus, arsenic occurs combined with the following metals, *viz.*, antimony, bismuth, cobalt, iron, nickel, and silver; there is also found a native alloy of antimony and nickel, and of antimony, cobalt and nickel; some others might be mentioned. But there is no instance of a native alloy, strictly speaking, being applied to any useful purpose, whereas the artificial alloys are of the highest importance both for the uses of common life and for manufacturing purposes; by uniting different metals, compounds are formed which possess a combination of qualities not occurring in any one metal. Platina is always employed in a pure state, and copper, iron, lead and zinc, are also very commonly so used; but gold, silver, tin, antimony and bismuth are generally alloyed; the first three, on account of their softness, and the two latter because they are extremely brittle. Gold and silver are hardened by alloying with copper; copper is hardened by zinc, &c.

The formation of alloys appears to depend upon the chemical affinity of the metals for each other; and in some instances it seems to be wanting, for no combination occurs: thus, according to Gellert, bismuth and zinc do not combine. Various facts may be assigned for supposing the combination to be the result of chemical affinity. M. Boussingault (*An. de Ch. et de Ph.* t. 34, p. 408) has described and analysed six different native alloys of gold and silver, and he found in all cases that the metals were combined in definite proportions. The change of properties which metals undergo by combining, furnishes strong evidence of its arising from chemical affinity and action: thus, with respect to colour, copper, a reddish metal, by union with zinc, which is a white one, gives the well-known yellow alloy brass: the fusing point of a mixed metal is never the mean of the temperature at which its constituents melt; and it is generally lower than that of the most fusible metal of the alloy.

All alloys formed of brittle metals are brittle; those made with ductile metals are in some cases ductile, in others brittle; when the proportions are nearly equal, there are as many alloys which are brittle as ductile; but when one of the metals is in excess, they are most commonly ductile. In combining ductile and brittle metals, the compounds are brittle, if the brittle metal exceed, or nearly equal the proportion of the ductile one; but when the ductile metal greatly exceeds the brittle one, the alloys are usually ductile. The density of alloys sometimes exceeds, and in other cases is less than, that which would result from calculation; the following alloys afford examples of increased and diminished density.

Increased.	Diminished.
Gold and zinc	Gold and silver
Gold „ tin	Gold „ iron
Gold „ bismuth	Gold „ lead
Gold „ antimony	Gold „ copper
Gold „ cobalt	Gold „ iridium
Silver „ tin	Gold „ nickel
Silver „ bismuth	Silver „ copper
Silver „ antimony	Iron „ bismuth
Silver „ zinc	Iron „ antimony
Silver „ lead	Iron „ lead
Copper „ zinc	Tin „ lead
Copper „ tin	Tin „ palladium
Copper „ palladium	Tin „ antimony
Copper „ bismuth	Nickel „ arsenic
Copper „ antimony	Zinc „ antimony
Lead „ bismuth	
Lead „ antimony	
Platina „ molybdenum	
Palladium „ bismuth	

Not only are the properties of metals altered by combination, but different proportions of the same metals produce very different alloys. Thus, by combining ninety parts of copper with ten parts of tin, an alloy is obtained of greater density than the mean of the metals, and it is also harder and more fusible than the copper; it is slightly malleable when slowly cooled, but on the contrary when heated to redness, and plunged into cold water, it is very malleable: this compound is known by the name of *bronze*. If eighty parts of copper be combined with twenty parts of tin, the compound is the extremely sonorous one called *bell-metal;* an alloy consisting of two-thirds copper and one-third tin, is susceptible of a very fine polish, and is used as *speculum metal.*

It is curious to observe in these alloys, that in bronze, the density and hardness of the denser and harder metal are increased by combining with a lighter and softer one; while, as might be expected, the fusibility of the more refractory metal is increased by uniting with a more fusible one. In bell-metal, the copper becomes more sonorous by combination with a metal which is less so: these changes are clear indications of chemical action.

It has been already observed, that the natural alloys, considered as such, are not important bodies; the only one, if indeed that may be so reckoned, is the alloy of iron and nickel, constituting meteoric iron, and of which the knives of the Esquimaux appear to be made. The artificial metallic alloys are of the highest degree of utility: thus, gold is too soft a metal to be used either for the purposes of coin or ornament, it is therefore alloyed with copper; silver, though harder than gold, would also wear too quickly, unless mixed with copper; and copper is improved, both in hardness and colour, by combination with zinc, forming brass.

The following, among other useful alloys, will be treated of under their specific names, viz., Bell-Metal, Brass, Bronze, Gun, Pot, Prince's, Speculum, and Type Metal, Tutenag, and Solders. Other alloys will be described when the more important metal entering into their composition comes under consideration.

ALLSPICE. [See Eugenia.]

ALLU'VIUM, a name given to those accumulations of sand, earth, and loose stones or gravel brought down by rivers, which, when spread out to any extent, form what is called *alluvial land.* The word is derived from the Latin verb *alluere*, signifying 'to wash upon,' as the sea does upon the coasts, or a river upon its banks, and is chiefly used as a term in geology. Many geologists restrict the expression to such water-worn materials as have been deposited either recently or within the historical æra, and which do not include the remains of extinct species of organized bodies: but as there are similar accumulations of transported materials, belonging to almost every geological period in the history of the earth, it is an unwarranted restriction of the term to confine its use to the recent period only. There is, no doubt, this distinction between modern alluvia and those of ancient periods, that in the latter, besides the remains of extinct species of animals and plants, there is more frequently a consolidation into stone. To these last accumulations of water-worn materials some geologists apply the name *diluvium*, which is objectionable, because it expresses, not a particular state of the materials, but *a theory* of their formation; that is, that they were produced by a deluge—some indeed go so far as to assert that they were accumulations by the Mosaic flood. The word alluvium might be conveniently used as a general term, and we might say *ancient alluvium* and *modern alluvium*, as the French geologists say *terrains de transport—anciens* and *modernes*. We might go farther, and say secondary and tertiary alluvium, and the alluvia of particular groups of strata.

In treating of this subject we have to consider three operations: 1. the disintegration and decay of the superior crust of the earth by the action of meteoric agents, of tides, currents, and streams of running water; 2. the transportation of the loosened materials by streams and currents; and 3. the deposition of the matter at the bottom of rivers, lakes, æstuaries, and the ocean. The surface of the earth is subject to unceasing changes from the operation of three great classes of agents, viz., the meteoric, the aqueous, and the igneous. Under the first of these classes are comprehended, the air of the atmosphere, the vicissitudes of heat and cold, moisture and rain, light, electricity, and the wind: under the second class, running water of every kind on the surface of the land, the tides, waves, and currents of the sea as they strike against its shores: the third class comprehends volcanos and earthquakes, which will be discussed under another head. It is with the second class which we have chiefly to do at present, and we shall only briefly touch upon the first as subservient to the subject with which we are occupied.

All rocks, and indeed almost all mineral substances, have a greater or less tendency to combine with the oxygen of the atmosphere, especially when under favourable circumstances of heat and moisture, and probably also of electricity and light: carbonic acid and water also are absorbed by rocks in considerable quantity; and the effect of these combinations, whether chemical or mechanical, is to loosen the cohesion between the particles of the stone, and induce a tendency to disintegration. This separation of the parts is very much accelerated by those sudden expansions and contractions which are occasioned by vicissitudes of temperature, and especially during frost, when the imbibed moisture is converted into ice. This slow and silent work of waste is unremittingly going on wherever rocks are exposed to the weather. No species of stone is exempt; and even granite, which in general is so little subject to change as to be proverbially a symbol of endurance, and is selected for our bridges and other great works of architecture, under particular circumstances of constitution and exposure, is remarkably disposed to disintegration. 'The granite of some parts of Finland,' says Mr. Strangways, 'is so liable to decomposition, that a great boulder of it may often be seen with a hole cut in it large enough to admit a cart and horse; and the stone, though at a small distance it seems calculated to last for ages, is cut down and shaped away with the same ease, and much in the same manner, as a hay rick.' The same agents sometimes give more marked proofs of their destructive power, when lightning shivers a pinnacle of rock, or when a mass of water, enclosed in a cleft and converted into ice, rends, by its great expansive force, vast blocks asunder. The effect of these several indefatigable agents, all working together, with gravity in their favour, is a system of universal decay and degradation, which may be traced over the whole surface of the land, from the mountain-top to the sea-shore. The wind, though it may sometimes detach particles, is chiefly instrumental in transporting to a distance matter already separated. Every drop of rain that falls, as soon as it touches the earth becomes an instrument of destruction, and the minute fragments which every shower washes away are hurried along the streams into a river, and are either deposited at a lower level, or are transported to the sea: thus, a solid body which once formed a part of a mountain-top among the Andes, after being swept along for thousands of miles through the bed of a river into the waters of the Atlantic, may, by ocean currents, be deposited at the bottom of the Gulf of Mexico, while the fragment with which it was once united may be carried far into the depths of the Pacific.

To this assertion of the constant waste of the land, and the conclusions which are drawn from it, it has been objected, that we can hardly discover any change in the shapes and altitudes of mountains, that the forms of many lands have continued unaltered since the earliest records, and that even productions of human art exposed to the action of the weather for many centuries have undergone no perceptible decay. No doubt the process is slow, if compared with the progress of events in which the human race has had concern, but no one will deny that rivers are loaded during every flood with solid matter; and, as the matter so suspended can only be derived from the land, it necessarily follows that a continuance of the process must in time wear down the loftiest mountains, where the rocks are not protected by a covering of turf from the action of the destructive agents. Of the rapidity of this waste we have no means of judging, and any attempt to express our conjectures by figures would be little better than an idle occupation. It is almost within our own time that any accurate measurements of heights have been made; and as two estimates of the same mountain, made with all the accuracy of which our instruments are capable, often give a difference of several feet, we are not even now able to leave behind us data by which posterity may mark the progress of this species of geological change; for the removal of such a mass of matter as should diminish the height of a mountain by three or four feet, by ordinary agents, may require thousands of years for its accomplishment. If Mont Blanc, by our most accurate measurements, be now 15,744 feet above the level of the sea, and if the geologist, many centuries hence, by newly-discovered methods not liable to error, should find it only 15,740, it would be impossible for him to know whether the difference was to be set down to geological change, or to the imperfection of the instruments of his ancestors.

In geological speculations we must lay aside all considerations as to time: we have only to do with that element when our inquiries relate to man; and if we are to be guided by analogy in our reasonings, we must be satisfied that a space of time of vast duration must have been requisite to produce any great amount of geological change. We see even in many chemical processes, that long-continued action gives birth to substances which could not otherwise be obtained,—as, for example, crystals of felspar are formed if the heat be maintained for some weeks, but not otherwise; and long-continued action in the great laboratory of nature has no doubt been an equally powerful instrument.

Although we can, in strictness, only say that certain geological events must have preceded others, we are not warranted in withholding any length of time for the accomplishment of the change, merely because we are unable to form a conception of an indefinite period: it would be as irrational as if we were to withhold our assent to some of the established truths in astronomy, merely because we are incapable of forming an idea of indefinite space. It has been eloquently said by Playfair, that 'it affords no presumption against the reality of the progress of decay, that, in respect of man, it is too slow to be immediately perceived. The utmost portion of it to which our experience can extend, is evanescent, in comparison with the whole, and must be regarded as the momentary increment of a vast progression, circumscribed by no other limits than the duration of the world. TIME performs the office of *integrating* the infinitesimal parts of which this progression is made up; it collects into one sum, and produces from them an amount greater than any that can be assigned.' But slow and silent as the work of these agents of destruction is, we have only to direct our view towards those parts of the earth where the machinery of nature is to be found on its grandest scale, to be sensible of the prodigious effects which their unceasing operation must produce in the long lapse of ages.

The force of water, when directed against any obstacle in its course, is very considerable, even by its own weight alone, especially if it be flowing over a highly-inclined surface, but its destructive power is greatly augmented if it be loaded with sand and gravel. In floods, very considerable blocks are carried by the stream to great distances, for it must be remembered that these are much more easily moved in water than on land, in consequence of the law in hydrostatics, that a solid body fully immersed in water weighs so much less than it does in air by a sum equal to the weight of the mass of water which it displaces. If the water flows with a velocity of three inches per second, its force, when free from suspended matter, is sufficient to tear up fine clay; six inches per second, fine sand; twelve inches per second, fine gravel; and three feet per second, will tear up beds of loose stones of the size of an egg. The flood occasioned by the bursting of the barrier of a lake in the valley of Bagnes near Martigny, in the Vallais, moved at first with the tremendous velocity of thirty-three feet per second, afterwards diminished to eighteen and eleven, and at the end of its course, when the water reached the Lake of Geneva, it was still running at the rate of six feet per second. From the barrier to this point, the fall is 4187 Paris feet, the distance is forty-five miles, and the mass of water passed over this space in five hours and a half. It swept along houses, bridges, and trees; masses of rock equal in dimensions to houses, which it tore out of an ancient alluvial soil, were carried a quarter of a mile down the valley. A flood, that happened in the north of Scotland in 1829, afforded numerous examples of the power of running water to transport large blocks of stone. On the river Nairn, a fragment of sandstone rock, 14 feet long, by 3 feet wide and 1 foot thick, was carried above 200 yards down the river. The river Don forced a mass of 400 or 500 tons of stones, many of them 200 or 300 pounds weight, up an inclined plane, rising 6 feet in 8 or 10 yards, and left them in a rectangular heap, about 3 feet deep, on a flat ground. The small rivulet, called the College, in Northumberland, swollen by a flood in August, 1827, carried several masses of stone, weighing from a half to three-quarters of a ton, 2 miles down its course; a large block, weighing nearly 2 tons, was transported to the distance of a quarter of a mile.

Thus it appears that the instruments of waste employed by Nature are far more powerful in their effects than is generally supposed. It is also evident that such powers, unremittingly exerted, must, after a long period, cause changes in the configuration of the earth's surface, and we shall now proceed to point out some of the effects which are produced by the working of this powerful machinery.

The cause of the formation of valleys is a subject of great controversy among geologists. Some ascribe their formation to extraordinary floods, waves, or deluges, which in their sudden passage scooped out the land; others, to the gradual effect of those natural agents, of whose existence and power we have had experience. It may fairly be presumed that, when the continents were raised out of the sea, their surfaces did not present a uniform plain, but were broken by numerous ridges and inequalities, and that the ridges themselves were traversed by numerous fissures, one of the effects of the power by which they were raised. The first rains that fell, and the first springs which burst forth, would necessarily collect in the lowest levels, and thus the direction of the great trunk of a river would be determined; and it might also happen that other clefts—depressions at a higher level—would communicate with this main channel. But that every such great depression would have a direct communication with the sea, and that such a combination of subordinate valleys as compose a river system, could have been formed by the breaking up of the earth's crust, either by elevation or subsidence, can hardly, we think, be maintained by any one. A river-course, or system, may be not inaptly compared to a picture of a great tree, whose branches gradually diminish in size, but increase in number, as they recede from the stem. The great trunk of the river is divided into many branches, which spring from it at various distances from one another; and these again are subdivided into an infinity of smaller ramifications, each diminishing in size as it increases in distance from the main trunk,—a regular communication being kept up between every point and the line of greatest depression; 'forming together, a system of valleys communicating with one another, and having such a nice adjustment of their declivities, that none of them join the principal valley either on too high or too low a level.' Some idea may be formed of the extent to which the surface of the land has thus been furrowed by means of the subordinate streams that feed a great river, from what Riede says of the tributaries of the Isar, which, flowing from the Tyrolese Alps and passing by Munich, joins the Danube some miles above Passau. This river is fed on its right bank by 433 streams, on its left by 800; the former joining the main bed by 59 channels, the latter by 44. But the Isar is only *one* of the thirty-four great branches of the Danube, and holds only a fourth rank among them; and even the Danube is a river of the third magnitude in the physical history of the earth.

We have direct proofs of the power of water to wear a channel in the hardest rocks in almost every country, and even in a remarkably short time. A stream of lava, poured out from Ætna in 1603, flowed across the bed of the Simeto, the largest river in Sicily, which flows along the base of the mountain, and falls into the sea near Catania. The stream has now cut a passage through the hard rock, which is only a little less compact than basalt, to the depth of from 40 to 50 feet, and from 50 to several hundred feet wide.

The Nerbuddah, a river of Hindostan, has worn a channel in a basaltic rock to the depth of 100 feet. Messrs. Sedgwick and Murchison state that, in the enormous masses of horizontal, coarse conglomerate, found in many of the valleys of the Eastern Alps, rivers have often scooped out gorges to the depth of 600 or 700 feet; and that in the valley of the Inn, near Innspruck, and in that of the Drave, between Klagenfurt and Marburg, there are splendid examples of these phenomena.

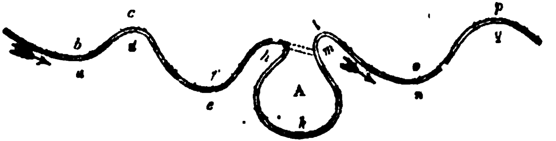
The rock, over which the water of the Niagara is precipitated at its celebrated Falls, is undergoing a daily waste; so that the cataract has receded nearly 50 yards in the last 40 years. The river below the Falls runs in a channel above 150 feet deep, and 160 yards wide, for a distance of 7 miles, where it emerges into a plain; and this channel has evidently been formed by the same operation as that which is now in progress. The waste is accelerated by the action of the water at the Falls on an under-bed of soft clay, which being washed away leaves the superincumbent limestone strata unsupported, when they fall down in huge masses. A similar effect is produced, even in mountains of considerable elevation, when the superficial water, or underground springs, obtain access to an inferior bed of soft materials, and gradually wash it away. This took place in 1806 at the Rossberg, near the lake of Zug, in Switzerland, a mountain more than 5,000 feet above the level of the sea. The stony masses which were undermined were inclined at an angle of 45°; and thus slid down, covering the valley below with an enormous heap of blocks of stone and earth, and overwhelming several villages, in which above 800 persons perished.

There are many valleys and narrow defiles which, on account of deep lakes that occur in them, the barriers by which they are enclosed, and the levels of the adjoining country, could not have been formed by the action of the waters now passing through them, however much we may suppose them to have been swollen by floods. In such cases, elevations and subsidences of the land, brought about by those subterranean agents which give rise to earthquakes, must be looked to as the most rational explanation. But there is, perhaps, not one of these which has not been subsequently modified in a considerable degree by the action of running water operating during a long period.

The wearing and transporting powers of rivers depend upon the volume of water, the quantity and size of the solid matter suspended, and the velocity with which it moves. A river generally runs with greatest rapidity in the higher parts of its course, where indeed it often consists of a succession of torrents and cataracts for many miles, but it has not yet acquired its full destructive force, because the mass of water is still comparatively small, nor has it yet become loaded with solid matter. In the lower part of its course, long before it joins the sea, it has usually reached a level country, and there its velocity becomes greatly retarded. The Senegal in Africa does not, according to Adanson, fall more than two feet and a half from Podor to the sea, a distance of sixty leagues. The destructive force is thus lessened by the diminished velocity, and by the consequent inability of the stream to drag its heavy artillery along with it. It is, therefore, in the middle part of its course that a river commits the greatest waste—after it has acquired a considerable volume, has become loaded with solid matter, and, from the inclination of the ground, still possesses power to wield its more mighty weapons of destruction.

The increase of the volume of water in rivers during the flood seasons is often prodigious. The bed of the Mississippi, at Natchez, about 300 miles above New Orleans, measuring along the course of the river, scarcely exceeds a mile in breadth when the water is low, whereas in the flood season the mass of waters is nearly thirty miles wide. The Orinoco, at St. Thomas's, 200 miles from its embouchure, is about three miles and a half wide in the dry season; but when flooded, its waters, according to Dupens, stretch out to the enormous breadth of seventy miles.

The loss of destructive power, by diminished velocity in the level country, is sometimes compensated, in a considerable degree, by the effects produced by the weight of the great volume of water impinging upon certain parts. This will be better understood by the annexed diagram.



When the river, in its oblique course at the entrance of the plain, strikes against the bank *a*, it speedily forms a steep or vertical cliff which turns off the water in its downward course into an opposite direction. The river now falls with its whole force against the point *c*, which, in its turn, becomes precipitous, and deflects the water towards the point *e*; and in this manner the process is repeated, at short intervals, producing a series of salient and re-entering angles.

The diagram represents a river after the process of erosion has considerably advanced; at first the course would be much less tortuous. If the country be composed of rock, both banks are usually steep; but if the ground consist of looser materials, the spaces between the precipitate parts of the banks—that is, between the salient angles—consist of flat, fertile, alluvial land, with a gravelly bottom, the gradual creation of the stream. Sometimes the course of the river is so tortuous that two points, *h* and *m*, may be within a few hundred yards of each other, and yet, following the line of the stream, they may be some miles asunder. In this case, the narrow neck of land is acted upon doubly; for the force of the water is directed against it on each side. In time this isthmus is breached, and the river either flows entirely through the new channel, or, dividing, forms the land A into an island.

Such tortuous courses, when they are cut through solid rock, as in the case of the Moselle, whose banks are sometimes 600 feet high, are among the strongest proofs of the destructive power of running water, for no sudden deluge, however powerful, could have scooped out such a trough; and that a cleft of such a nature should be occasioned by any disruption of the earth's crust, is not less improbable. More sudden, and therefore more striking, instances of the waste of the land occur where a river flows through a lake, and by its wasting action causes a breaking-down of the barrier. We have already alluded to the bursting of a lake in the valley of Bagnes in Switzerland. That flood was produced by the melting of ice which, falling in successive seasons from neighbouring glaciers, had formed so continuous a mass as to dam up the water of a stream which flowed in the bottom of the valley. If the barrier of a lake consist of strata of rock, supported by beds of clay or sand, and if, by any change of circumstances, the running water get access to this inferior bed, and gradually wash it away, the superincumbent rock, thus undermined, suddenly breaks down, and devastation and ruin overwhelm the country below. Such an event took place, in the year 1810, in the state of Vermont, and is described minutely by the Rev. S. Dwight, in *Silliman's Journal* for June, 1826. By the washing away of an under-bed of sand, the barrier of a lake suddenly burst, making an opening a quarter of a mile wide and 150 feet deep, through which the whole contents of the lake, a mile and a half long, three-quarters of a mile wide, and from 100 to 150 feet deep, were emptied in a few minutes. The liberated water rushed down a declivity to a lower lake, excavating a channel of a quarter of a mile in width, and from fifty to eighty feet deep. The accumulated torrent swept away the retaining mound of the lower lake in a moment, and, following the course of the insignificant stream which flowed out of the lower lake, rushed along a rapid descent of five miles, and then strewed its spoils over a flat country. Through all the descent it hollowed out for itself a path from 300 to 600 feet in width, and from twenty to sixty feet in depth, so that every trace of the original bed of the river disappeared, which was left to choose for itself a new bed, many feet below the old one, in the bottom of the valley. Seventeen miles below the lake the torrent retained so much of its force as to move a rock (estimated at 100 tons in weight) several rods from its bed. Thirteen years afterwards, Mr. Dwight found the former bottom of the lake dry; the original water-level marked by strong lines on the sides of the valley, a counterpart of the celebrated parallel roads of Glen Roy, in Scotland; and the small streamlet which fed the lakes flowing as before, and little more than a yard in breadth.

The distance to which the detached fragments are carried depends upon the volume of water, and the nature of the ground over which it flows. The torrents from the south-western Alps, rushing over a steep uninterrupted slope, transport large blocks to the sea; but a river that runs through a long stretch of level country deposits the grosser matter in the upper part of its course, and carries to its mouth only that which is more easily held in suspension. The larger stones, after being detached from their parent rock, have therefore to undergo an intermediate process of abrasion, by being rubbed against each other in the bed of the stream before their particles are finally committed to the deep. If a river pass through a lake in its course, the solid matter will be deposited in that trough until it has filled it up; and if the lake be very large, even the lighter particles will have time to fall, and the water will flow out clear from the other extremity. The Lake of Geneva affords a remarkable instance of this process; for the Rhone, where it enters, is extremely turbid; but at Geneva, where it leaves the lake, it is beautifully transparent. At the upper end there is a tract of alluvial land nearly eight miles in length, which has been gradually formed by the deposits from the river; and some measure of its progress is obtained by the change in the situation of the town of Port Vallais, which was once at the water's edge, but, in the course of about 800 years, has been left a mile and a half inland. Other torrents, on both sides of the lake, likewise pour in large quantities of solid matter; and thus, although, from its great depth, a long period must elapse if the present order of nature remains undisturbed, the Leman Lake will be converted into green meadows, and cattle will graze where there are now 160 fathoms of water. Nor is this an extravagant expectation, or more than has taken place elsewhere in past times. The vast fertile valley between the Vosges Mountains and those of the Black Forest, through which the Rhine flows for above a hundred miles, between Strasburg and Worms, without falling more than two feet in a mile, is in great part covered with alluvium, and is filled to an unknown depth under the soil with sand and gravel similar to that now transported by the Rhone. There is every reason to believe that this valley was at one time the site of a lake far greater than that of Geneva, and probably quite as deep.

The Rhine, in the higher part of its course, is filling up the Lake of Constance, where a considerable tract of alluvial land has been formed; and after issuing pure from the lower end, it appears from the observations of Hammer to have carried on the work of destruction so powerfully in the comparatively short distance between the Lake of Constance and the bottom of the falls at Schaffhausen, as to have supplied materials sufficient to fill up several lakes between Schaffhausen and Strasburg, besides the great lake below Strasburg already spoken of. There are numerous instances of this gradual filling up of lakes, especially in the courses of the greater rivers, as in the Danube between Ulm and Neuburg above Vienna, and most eminently so in the case of the St. Lawrence. Simond states, that the river Linth, in Switzerland, is perpetually filling up its old channel, and overflowing into a new one, in consequence of the mass of rubbish and stones brought down from the Glarus mountains; and that the level of the Lake of Wallerstadt has been actually raised ten feet in the last sixty years by this accumulation. If the river does not meet with lakes in its course, and flows over a great extent of country having a slight degree of inclination, the transported matter very often so accumulates as to raise the bed of the stream itself. One of the most striking instances of this kind is afforded by the Po, the common receptacle of the waters of the numberless torrents which rush down on both sides of it, loaded with spoils from the Alps and Northern Apennines. The effect of this has been that the river has frequently shifted its course; and, to prevent the damage that ensues from such events, the inhabitants of Lombardy have protected their lands by embankments, which confine the river to its channel. This, however, is a work of incessant labour, and deceptive security, for the accumulation of matter in the bed goes on with unremitting constancy; and, to prevent the water from overflowing, the matter must be taken from the bottom and thrown upon the banks, sometimes as much as a foot in a season. The effect of this has been, that in the lower parts of its course the Po runs on the top of a high mound, which even overtops the houses in Ferrara.

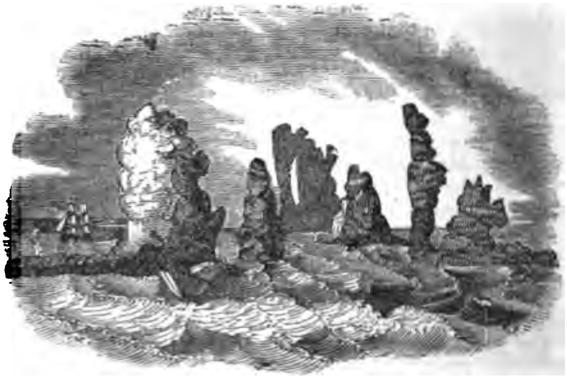
In a mountainous country where the land rises rapidly from the shore, the rivers descending over a steep bed sweep all the contents into the sea. If the neighbouring sea be deep, and the tides be strong, an æstuary or inlet is formed at the mouth of the river—that is, the sea forms a deep indentation into the land, of a triangular shape, forming what Rennell and other geographers have fancifully called a 'negative delta.' If, on the other hand, a low shelving shore, and the absence of strong tidal currents favour the gradual and tranquil deposit of the solid matter brought down by the river, an extensive level of alluvial land is formed. In this case the main river, at a distant point inland, often divides itself into two streams, which, gradually diverging until they reach the sea, inclose a triangular space of land having the form of the fourth letter of the Greek alphabet, Δ, and hence called a *delta*. The mass of water does not, however, long continue divided into two streams only, the process of separation is repeated several times, and thus the delta is traversed by several channels, and the great river empties itself into the sea by many mouths; as may be seen by the inspection of the Nile and Ganges in any map of Egypt or Hindostan on a tolerably large scale. In this way a delta is formed at the mouths of the Rhine, Rhone, Po, Danube, Wolga, Nile, Indus, Ganges, Orinoco, and many others. The magnitude of the delta, generally, although not always, corresponds to the volume of the waters by which it has been created. The head of that of the Rhine is about ninety miles distant from the general line of seacoast of Holland; and although the name of the main river be almost lost by the subdivision of its waters and the junction of other rivers, we include within the Rhine delta the whole of the low land from the neighbourhood of Calais to the north-eastern shores of the Zuyder Zee, which makes the base of the triangle nearly 200 miles. The head of the delta of the Ganges is 220 miles from the sea, its base is 200 miles long, including the space occupied by the two great arms of the Ganges which bound it on either side. The tract in the lower part of this delta, called the Sunderbunds, a wilderness infested by tigers and alligators, is, according to Rennell, equal in extent to the principality of Wales. The whole of a deposit within a delta, as well as much above and on each side of it, is, therefore, an encroachment of the land upon the sea, and in many rivers this growth of the land is in a steady progress of advancement; as, for example, the city of Ravenna, formerly a seaport of the Adriatic, is now four miles inland. There are causes, however, which often prevent the further increase of a delta after it has advanced a certain length: such seems to be the case with the delta of the Nile, which does not advance with the rapidity that might be expected from the quantity of matter brought down by the river. [See NILE.]

Great as is the amount of new land thus formed, it is but insignificant in comparison with the quantity of solid matter carried down by rivers and deposited in the depths of the sea. It is impossible to form any estimate of this upon which reliance can be placed, because no accurate observations have been made to supply the data. To come to anything like a satisfactory conclusion, it would be necessary to have a vertical section of the river at a given point, obtained by numerous soundings, so as to get the profile of the bed, and by observations at different seasons, to get the mean height—we must also have the results of experiments throughout the year, to ascertain the mean velocity, and the volume of solid matter contained in a given bulk of the water. Such experiments conducted with accuracy have not yet been made, as far as we are aware, upon any great river, and in the absence of such information we can do no more than form a conjecture; but the phenomena upon which that is founded show that the annual amount of solid matter carried away from the land must be enormous. The quantity of mud and sand poured by the Ganges into the Bay of Bengal is so great, in the flood season, that the sea recovers its transparency only at the distance of sixty miles from the coast. Mr. Lyell, in his *Principles of Geology*, makes a calculation (founded upon the computations of Major Rennell) as to the mean quantity of water discharged by the Ganges into the sea, by which he shows that supposing the water to contain one hundredth part of solid matter, a mass equal in bulk to the greatest of the Pyramids of Egypt is brought down by the Ganges every day. The sea is discoloured for many leagues from the mouths of the Orinoco, and the solid contents swept by ocean currents through the Gulf of Paria, after being partly deposited on the shores of Guiana and the island of Trinidad, are carried into the Caribbean Sea and Gulf of Mexico. By the observations of Captain Sabine, it appears that the muddy waters of the Amazons river may be distinguished 300 miles from its mouth. The great basin of the Amazons, which is drained by that mightiest of rivers and its vast and countless tributaries, embraces an area, according to Humboldt, only one-sixth less than the whole of Europe, and through this the main stream flows for nearly 3400 miles. The river, at the point where its waters unite with those of the Atlantic, is according to the same illustrious traveller forty miles broad.

If a river loaded with sand encounters a marine current at its mouth, the effect frequently is to throw up a great sand-bank or bar, often to the detriment of the navigation in the adjoining sea, and sometimes to the entire destruction of a harbour. If such sand-banks be thrown up opposite to the delta of a great river, they accelerate its formation, for the matter brought down, in place of being carried far out to sea, is deposited in the intermediate space, and the sand-bank in time becomes united to the delta.

An extensive waste of the land is in constant progress along every line of coast which presents an abrupt face to the sea. The amount and rapidity of that waste depend upon a variety of circumstances; the nature of the rocks of which the cliffs are composed, according as they are capable of long resistance, or are easily acted upon by the weather and the sea; the force of the tides and currents; the greater or less frequency of storms;—all these accelerate or retard the destructive force of the ocean. In this case also, as well as in the action of running water on the land, the force is greatly augmented when the water is charged with solid matter. The violent surge of a tempest dashing against a cliff, detaches large blocks, and sweeps them away; but the next returning wave hurls them back again against the cliff, and thus a powerful artillery is supplied by the land for its own destruction. When we look upon a map of the world, and see the irregular form and indented line of coast of every continent and island, we have before us the most irresistible proof of the powerful force of the waves, and that the line of the shore must have been formed, in a great degree, by the action of the sea. Although this be so evident that no one can entertain any doubt of the fact, a few instances of extensive waste, especially within a comparatively recent period, may put the matter in a clearer point of view to those who are not familiar with such considerations.

The east and south coasts of Great Britain, from the nature of the rocks of which they are composed, and from the violent storms to which they are exposed, are extremely subject to decay. The Shetland and Orkney Islands are laid open to the whole violence of the waves of the Atlantic, and the ocean current runs in the Pentland Frith in ordinary spring-tides, at the rate of ten miles and a half an hour, and about thirteen miles during storms. The steep cliffs on the shores of the Shetland Islands are hollowed out into caves, so that the sea enters in some places to the depth of 250 feet, lofty arches are worn in projecting rocks, and almost every promontory ends in a cluster of pillars, obelisks, and towers, the last fragments of extensive continuous strata. In stormy winters, vast blocks are moved from their seat, overturned, dashed into the sea, or carried considerable distances up acclivities. In this case even rocks of the hardest composition have been unable to withstand the force with which they have been assailed. Islands have been wholly destroyed, and the remains of others rise like the ruins of a Palmyra in the desert of the ocean. Representations of these have been given by Dr. Hibbert in his description of the Shetland Islands; and the following is a copy of one of the most striking



In the year 1795, a village on the coast of Kincardineshire was swept away by a storm in one night, and the sea penetrated 150 yards inland, where it has maintained its ground ever since. Almost the whole coast of Yorkshire, from the

Tees to the Humber, is in a state of constant decay, especially between Flamborough Head and the Spurn Point; the rate of encroachment at Owthorpe being at present about four yards in a year. An inn at Sherringham, on the Norfolk coast, built in 1805, seventy yards from the sea, in 1829 was separated only by a small garden from the edge of the cliff. There is now a depth of water sufficient to float a frigate at one point in the harbour of that place, where, only half a century ago, there stood a cliff fifty feet high with houses upon it. The whole site of ancient Cromer now forms a part of the German Ocean. Dunwich, once a flourishing and populous town, and the most considerable sea-port on the coast of Suffolk, has been gradually swept away, so that there now only remain about twenty houses. The church of Reculver, on the coast of Kent, was nearly a mile inland in the reign of Henry VIII.; it is now little more than sixty yards from the water's edge.

The whole coast of Sussex has been incessantly encroached upon by the sea from time immemorial; tracts of 400 acres have been carried away at one time, and the old town of Brighton, which stood between the site of the present cliff and the sea in the reign of Elizabeth, has been wholly destroyed. By the undermining of the sea on the coast of Dorsetshire, in 1792, a portion of land 600 yards from E. to W., and a mile and a quarter from N. to S., sunk fifty feet in twenty-four hours. The island of Heligoland, off the entrance of the river Elbe, has been reduced to the fourth part of its size in the last 500 years, and since 1770 has been divided into two parts, the channel between them being navigable by large ships. Nowhere has the sea made greater inroads than on the coast of Schleswig. The island of Nordstrand, in the earlier part of the thirteenth century, was separated from the main land by a narrow stream, was fifty miles long and thirty-five broad, and was populous and highly cultivated. In the year 1240 a great part of it was destroyed, and at the end of the sixteenth century it was reduced to an area of twenty miles in circumference. The industrious inhabitants endeavoured to save their territory by the erection of lofty dikes; but in October, 1634, a great storm devastated the whole island, destroyed 1340 people and 50,000 head of cattle; and three small islets, which have since considerably diminished, were all that remained of the once fertile and populous Nordstrand.

It would be superfluous to give, in this place, farther instances of the like nature: those we have already mentioned have all occurred within the historical æra; others, however, still more remarkable in extent, date from a much earlier period of the earth's history, and the evidence of their occurrence is supplied by the identity in composition of the opposite portions of the separated lands. There is every reason to believe that England once formed a part of France: the cliffs on the opposite sides of the channel are identical at the straits of Dover, and between Folkestone and Boulogne, a submarine chain of hills is, in some places, only fourteen feet below the surface at low water. From the German Ocean to the Straits, the water becomes gradually more shallow, diminishing, in a distance of 200 leagues, from 120 to 18 fathoms; and in the same manner from the Straits to the mouth of the English Channel there is a gradual increase of the depth of the water, so that at the strait there is a ridge with a fall to the west and to the east. In the wearing of the sides, and consequent widening of the straits which is now going on, we see only an advanced stage of a work of destruction which has been many thousand years in operation. That Sicily was at one time united to Italy, was a tradition in the time of Virgil (*Æneid*, III. 414):—

> 'Hæc loca vi quondam et vasta convulsa ruina
> Dissiluisse ferunt, quum protinus utraque tellus
> Una foret: venit medio vi pontus et undis
> Hesperium Siculo latus abscidit.'
>
> ———————'Th' Italian shore
> And fair Sicilian coast were one before
> An earthquake caused the flaw: the roaring tides
> The passage broke that land from land divides;
> And where the land retired, the rushing ocean rides.'
>
> Dryden's *Trans.* v. 529.

All modern observations on the structure of the opposite shores, the bottom of the intervening sea, and the violence with which it is often agitated, give every degree of credibility to the tradition. But as Sicily is in that part so frequently convulsed by volcanic fires, it is very probable that subterranean movements have greatly contributed to the formation of the Straits of Messina. In like manner, there is every reason to believe that the island of Ceylon was at one time united to the continent of Hindostan. [See ADAM's BRIDGE.] Humboldt is of opinion that the Caribbean was once a mediterranean sea, inclosed by a circuit of land, of which the Caribbee Islands, St. Domingo, Jamaica, and Cuba, are the remains; and the whole form of the land from the promontory of Yucatan, through the above-named islands to Trinidad, and the coast of Cumana, with its deeply indented shores, the numerous islets and shoals, gives countenance to the conjecture, and justifies the belief that we see in the West India islands the monuments of the irresistible force of the waves of the Atlantic, co-operating with subterranean agency, through an indefinite succession of ages.

To what, it may be asked, does all this lead? If such a constant destruction of the land be a part of the system of nature, it necessarily follows that, if her laws continue to endure, the whole of our present continents must in time disappear under the surface of the sea. Undoubtedly to that, and to no other conclusion must we arrive; but such a transference of the land which *now* rises above the surface of the sea is in perfect accordance with what geology tells us has been the economy of nature in times past. All the stratified masses of which the crust of the earth is composed, however high their position may now be, must at one time have been at the bottom of the sea; and the materials of which they are composed must have constituted the component parts of other rocks which, in a former condition of the earth's surface, must have been acted upon and abraded by similar agents. In every great group of strata we find beds composed of large water-worn fragments, materials supplied, most probably, by rivers which had a rapid descent to the sea; but as such water-courses form but a small proportion to those which traverse low and level countries, and carry only the finer particles to the sea, so we find that the beds of conglomerates bear only a small proportion to those strata the materials of which are in a comminuted state,—an additional fact in support of the doctrine, that the formation of strata in past times took place under circumstances analogous to those which are now in progress; that is, that the laws of the material world have continued unaltered. But renovation as well as decay is a part of the economy of nature; and the same subterranean forces which raised our present continents, may, in after ages, repeat the process, and other Alps and other Andes may be produced from the materials which are now washed from our shores, and are accumulating in the unfathomable depths of the ocean. We can in no way conclude these observations so well as by quoting the following eloquent passage from the *Illustrations of the Huttonian Theory*. 'How often these vicissitudes of decay and renovation have been repeated, it is not for us to determine: they constitute a series, of which we neither see the beginning nor the end—a circumstance that accords with what is known concerning other parts of the economy of the world. In the planetary motions, where geometry has carried the eye so far both into the future and the past, we discover no mark either of the commencement or the termination of the present order. It is unreasonable, indeed, to suppose that such marks should anywhere exist. The Author of nature has not given laws to the universe, which, like the institutions of men, carry in themselves the elements of their own destruction. He has not permitted, in his works, any symptom of infancy or of old age, or any sign by which we may estimate either their future or their past duration. He may put an end, as he no doubt gave a beginning, to the present system, at some determinate period; but we may safely conclude that this great *catastrophe* will not be brought about by any of the laws now existing, and that it is not indicated by any thing which we perceive.'

ALMACANTER, an Arabic term, now disused, but which, with many others, was formerly employed in astronomy. The name is given to all the small circles parallel to the horizon; so that two stars which have the same almacanter have the same altitude. Almacanter would now be called a circle of altitude, in the same way as a small circle parallel to the equator, all whose points have therefore the same declination, is called a circle of declination.

ALMADEN, Cisapona Cetobrix of the Romans, a town of Spain in the province of La Mancha, is situated upon a hill of cinnabar, between two mountains which form a part of the chain of Sierra Morena. It belongs to the Archbishopric of Toledo, is fifteen leagues distant from Ciudad-Real, eighteen from Cordova, and forty-four from Madrid, It comprehends in its district six villages, and has a parish church, an hospital, and barracks for the galley slaves.

Almaden is famed for its mines of quicksilver, which, according to Bowles, are the richest in their produce, the most instructive as to the mode of working them, the most curious for their natural history, and the most ancient in the world. We find them mentioned by Theophrastus, who lived more than 300 years before Christ, and Vitruvius also speaks of them. Pliny places Cisapona, or as it is sometimes written Sisapona, in Bætica, and says that this mine was kept sealed with the greatest care, and was only opened to take the quantity of cinnabar necessary for the consumption of Rome. (*Plin.* xxxiii. 7.) The Romans considered this mineral poisonous, but, notwithstanding this, their matrons painted their faces with it, and their painters employed it as a pigment. The Romans certainly worked this mine, but no traces remain of their labours. The Moors, owing perhaps to some prejudice, did not work them.

The direction of the hill is from north-east to south-west. Bowles says, that he compassed the mine with the watch in his hand, and counted twenty-four minutes in length and fourteen in breadth. The elevation of the hill is 120 feet. It is formed by two inclined planes resembling the back of an ass, and though the elevation appears to be perpendicular, the hill has an inclination of 14°, like all the rocks entering into its formation. Upon the summit of the hill are some naked rocks, on which spots of cinnabar are seen, which, probably, led to the discovery of the mine. Over the rest of the hill some strata of slate with veins of iron are discovered. All this country abounds in iron mines, and what is more surprising, in the same mine of Almaden we find iron, mercury, and sulphur mixed so as to form one mass. The neighbouring hills are formed of the same stone, and on all of them the same species of plants grow, from which we may infer that the mercury does not possess any poisonous qualities, as is generally supposed, injurious to vegetation. Neither do the animals suffer in the least, for a miner sleeps with safety upon a vein of cinnabar. The galley-slaves, who work in these mines, are not exposed to any hardships, as is commonly believed. They only work three hours a day, and do nothing but take out the earth in wheelbarrows. Some feign convulsions and others fits, to excite the compassion of those who visit the mines. The inhabitants of Almaden work willingly double the time, and receive only half of what every slave costs the government.

The stone of these veins is similar to that of the rest of the mountain, and the mineral which it contains is more or less abundant as the grain of the stone is finer or coarser. Every pound of stone gives from three to ten ounces of mercury. Pyrites and quartz, beautifully crusted with cinnabar, are also found. The hornstein is pierced with mineral-like points: finally the pure mercury appears in the crevices of the sandstone and slate.

Two veins, from two to fourteen feet in breadth, cross the hill vertically and meet, or, as the miners express it, kiss each other on the most convex part of it, extending to the breadth of 100 feet, and forming the very rich mine called *Del Rosario*, which gives every year many hundred tons of mercury.

A stratum of limestone, from two to three feet in breadth, traverses the mountain, and serves as a boundary to the mineral. This mine supplied the silver mines of Mexico with mercury, and those of Guancavelica the mines of Peru, but the latter ceased about 1775.

We are indebted to the Spaniards for the mode of separating the silver from the earthy particles by means of mercury, which they have applied to practice since 1566. [See Amalgam.]

The brothers Mark and Christopher Fuggar, of Germany, undertook to work this mine, and contracted to give the government 4500 quintals (of 100lbs. each) of mercury annually; but not being able to fulfil their promise, they abandoned it in 1635, together with the silver mine of Gualcanal, which they also had. While connected with these mines, however, their riches became proverbial in Spain, and their descendants live at present in Germany with the rank of princes. A branch of this family afterwards took the mine, and worked it until 1645. In the following year the government undertook the management of it. Don Juan Bustamante established the ovens and also troughs for cooling the mineral. These ovens are twelve, and are named by the names of the twelve apostles. Each is capable of containing 10 tons weight of stone. The oven is kept burning for three days, and the same time .s required to cool.

There is another mine of cinnabar near Alicante, and another of *mercurio virgen*, (pure mercury,) not far from St. Felipe.

See Bowles's *Introduccion á la Geografia Fisica y á la Historia Natural de España.* Miñano.

ALMAGEST, a name given by the Arabs to the *μεγάλη σύνταξις*, or *great collection*, the celebrated work of Ptolemy, the astronomer of Alexandria. For a particular description of the contents of this work see the article Syntaxis. It was translated into Arabic about the year A.D. 827, under the patronage of the Caliph Al Mamun, by the Jew Alhazen ben Joseph, and the Christian Sergius. The word is the Arabic article *al* prefixed to the Greek word *megistus*, 'greatest,' a name probably derived from the title of the work itself, or, as we may judge from the superlative adjective, partly from the estimation in which it was held.

ALMAGRO (ORETO), a town of Spain in La Mancha, twelve miles from Ciudad-Real, and thirty from Madrid. It is situated in a fertile plain, which produces corn, oil, wine, potatoes, and grass. It is celebrated for its mules, which are considered among the best in Spain, for the sale of which an annual fair is held on the day of St. Bartholomew. About six miles from it springs a fountain of mineral water, of a bitter taste, which it loses if not kept in a glass vessel.

ALMAGRO (DIEGO DE), one of the adventurers who went from Spain to the conquest of America. He was a foundling and brought up by a clergyman of Almagro, according to Gomara; but according to Zarate, of Malagon. When the success of Columbus's voyage became known in Spain, numbers of adventurers, prompted either by religious zeal, or by ambition for military glory, or the desire of gain, flocked to the new world; and many remained in obscurity until an opportunity was offered to them to become known. Of Almagro, nothing is said by the historians previous to the year 1525, when he entered into a sort of partnership with Pizarro and a wealthy clergyman, named Hernando de Luque, at Panamá, to undertake jointly the conquest of Peru. Pizarro took the command of the troops; Almagro engaged to procure the supplies of men, arms, provisions, &c.; and Luque was to remain at Panamá, to forward with the governor of that place, the interests of the company. Pizarro set out first, and Almagro afterwards joined him. Some time after, the execution or murder of the Peruvian Atahualpa, Francisco Pizarro was informed of the arrival of Pedro de Alvarado with some troops to undertake the conquest of Peru, and sent Almagro to them to ascertain their intentions. Almagro met them on the coast, near the present port of Callao. After some negotiation, the greater part of the troops of Alvarado being from Estremadura, and tempted with the offer of 100,000 gold crowns to be divided among them, joined their fellow-countrymen, and marched together to Cuzco.

Almagro was informed by one of this party that he had been appointed governor of *Nueva Toledo.* He interpreted this to mean that Cuzco also was part of his governorship, and assembling the ayuntamiento, openly declared to them his views. The two brothers of Pizarro, Juan and Gonzalo, refused to obey the self-made governor, and were put under arrest. Francisco Pizarro, upon hearing this news, left Truxillo, where he then was, and proceeded to Cuzco in great haste; when Almagro acknowledged his fault, and Pizarro not only pardoned him, but even lent him a considerable sum of money. Pizarro and Almagro entered now into an agreement by which the latter promised upon his solemn oath to leave Cuzco, and never to return within thirty leagues of it, even though the emperor Charles should order him to do so. Upon this he was sent to the conquest of Chili.

In 1535 he set out on his march, in which he crossed the Andes from Cuzco, and traversed the deserts of Atacama to the plains of Chili, a march of 350 leagues. After having suffered much fatigue and privation, he subdued several tribes of Indians; and it is said that he was presented by several caciques with 600,000 ducats in pieces of gold.

Five months after, Juan de Rada and I ui Diaz, whom he had left at Cuzco to recruit men for his army, brought him the intelligence that Fernando Pizarro, whom his brother Francisco had sent to Spain to solicit honours and titles for the discoverers, had returned from thence, bringing the title of Marquis of Peru for Pizarro, Governor of Nueva Toleda for Almagro, and Bishop of Peru for Luque. Some of Almagro's friends advised him to return to Cuzco. On his way thither he met Noguera, an officer who had been sent by Pizarro to ascertain whether he was in want of any assistance to pursue his conquests, Pizarro himself being then employed in building Lima. Almagro availed himself of this opportunity to get full information of the state of affairs at Cuzco, the safety of which, at that time, was much endangered by a revolt of the Indians; and having ascertained that he might easily obtain possession of that city, he immediately proceeded thither. Having subdued the Indians, he entered Cuzco without opposition, imprisoned Gonzalo and Fernando Pizarro, and pillaged their house. Francisco Pizarro, upon hearing of these events, sent from Lima two successive detachments against Almagro, and after having obtained the liberty of his two brothers, joined the army with the rest of his forces, successfully attacked Cuzco, and, having taken Almagro prisoner, caused him to be tried by a court-martial, which condemned him to death for having rebelled against his general, and abandoned his post. This sentence was executed at Cuzco on the 25th April, 1536, Almagro being then in the 75th year of his age.

Almagro is described both by Gomara and Zarate as a brave, liberal, and open character. He never married, but left a son by an Indian woman, who was also called Diego de Almagro, and had as eventful a life and as tragical an end as his father. (See Gomara, *Historia General*, &c., ch. 125—128. Zarate, *Historia de la Conquista del Peru*, book iii. Pizarro, *Varones Ilustres del Nuevo Mundo.*)

AL-MAMUN. [See Abbasides.]

ALMANAC. The derivation of this word has given some trouble to grammarians. The most rational derivation appears to us to be from the two Arabic words *al*, the article, and *mana* or *manah, to count.*

An almanac, in the modern sense of the word, is an annual publication, giving the civil divisions of the year, the moveable and other feasts, and the times of the various astronomical phenomena, including in the latter term not only those which are remarkable, such as the eclipses of the moon or sun, but also those of a more ordinary and useful character, such as the places of the sun, moon and planets, the position of the principal fixed stars, the times of high and low water, and such information relative to the weather as observation has hitherto furnished. The agricultural, political, and statistical information which is usually contained in popular almanacs, though as valuable a part of the work as any, is comparatively of modern date.

It is impossible that any country in which astronomy was at all cultivated could be long without an almanac of some species. Accordingly we find the first astronomers of every age and country employed, either in their construction or improvement. The belief in astrology, which has prevailed throughout the East from time immemorial, rendered almanacs absolutely necessary, as the very foundation of the pretended science consisted in an accurate knowledge of the state of the heavens. With the almanacs, if indeed they had them not before, the above-mentioned absurdities were introduced into the West, and strange to say, it is only within these few years that astrological predictions have not been contained in nine almanacs out of ten. It is not known what were the first almanacs published in Europe. That the Alexandrian Greeks constructed them in or after the time of Ptolemy, appears from an account of Theon, the celebrated commentator upon the Almagest, in a manuscript found by M. Delambre at Paris, in which the method of arranging them is explained, and the proper materials pointed out. It is impossible to suppose that at any period almanacs were uncommon: but in the dearth of books whose names have come down to us, the earliest of which Lalande, an indefatigable bibliographer, could obtain any notice, are those of Solomon Jarchus, published in and about 1150, and of the celebrated Purbach, published 1450—1461. The almanacs of Regiomontanus, said by Bailly, in his *History of Astronomy*, to have been the first ever *published*, but which it might be more correct to say ever *printed*, appeared between 1475 and 1506, since which time we can trace a continued chain of such productions, of which our limits will not allow us to give even the names of the authors. They may be found in the *Bibliographie Astronomique* of Lalande, and in Hutton's *Mathematical Dictionary*, article Ephemeris. The almanacs of Regiomontanus, which simply contained the eclipses and the places of the planets, were sold, it is said, for ten crowns of gold. An almanac for 1442, in manuscript we presume, is preserved in the *Bibliothèque du Roi* at Paris. The almanacs of Engel of Vienna were published from 1494 to 1500; and those of Bernard de Granolachs of Barcelona, from about 1487. There are various manuscript almanacs of the fourteenth century in the libraries of the British Museum, and of Corpus Christi College, Cambridge.

The first astronomical almanacs published in France were those of Duret de Montbrison, in 1637, which series continued till 1700. But there must have been previous publications of some similar description; for, in 1579, an ordonnance of Henry III. forbade all makers of almanacs to prophesy, directly or indirectly, concerning the affairs either of the state or of individuals. In England, the royal authority was less rationally employed. James I. granted a monopoly of the trade in almanacs to the Universities and the Stationers' Company, and under their patronage astrology flourished till beyond the middle of the last century, but not altogether unopposed; the humorous attack of Swift, under the name of Bickerstaff, upon Partridge's almanac, is well known, both from the amusement which the public derived from the controversy, and the perpetuation of the assumed surname in the *Tatler*. But though Swift stopped the mouth of Partridge, he could not destroy the corporation under whose direction the almanac was published. The Stationers' Company (for it is but fair to state that the Universities were only passive, having accepted an annuity from their colleagues, and resigned any active exercise of their privilege) found another Partridge, as good a prophet as his predecessor: nor have we been without one to this day.

The Stationers' Company appears to have acted from a simple desire to give people that which would sell, whether astrological or not; and not from any peculiar turn for prophecy, inherent in the corporation. Thus even in 1624 they issued at the same time the usual predictions in one almanac, and undisguised contempt of them in another; apparently to suit all tastes. The almanac of Allstree, published in the above-mentioned year, calls the supposed influence of the moon upon different members of the body 'heathenish': and dissuades from astrology in the following lines, which make up in sense for their want of elegance and rhythm:

'Let every philomathy (*i.e.* mathematician.)
Leave lying Astrology,
And write true Astronomy,
And Ile beare you company.'

In 1775, a blow was struck which demolished the *legal* monopoly. One Thomas Carnan, a bookseller, whose name deserves honourable remembrance, had some years before detected or presumed the illegality of the exclusive right, and invaded it accordingly. The cause came before the Court of Common Pleas in the year above-mentioned, and was there decided against the Company. Lord North, in 1779, brought a bill into the House of Commons to renew and legalize the privilege, but, after an able argument by Erskine in favour of the public, the House rejected the ministerial project by a majority of 45. The absurdity and even indecency of some of these productions was fully exposed by Erskine; but the defeated monopolists managed to regain the exclusive market, by purchasing the works of their competitors. The astrological and other predictions still continued; but it is some extenuation that the public, long used to predictions of the deaths of princes and falls of rain, refused to receive any almanacs which did not contain their favourite absurdities. It is said (Baily, *Further remarks on the defective state of the Nautical Almanac*, &c., p. 9) that the Stationers' Company once tried the experiment of partially reconciling Francis Moore and common-sense, by no greater step than omitting the column of the moon's influence on the parts of the human body, and that most of the copies were returned upon their hands. For more detail upon the contents of former almanacs, see the *Companion to the Almanac* for 1829, and also the *London Magazine* of December, 1828, and *Journal of Education*, No. V.

The *British Almanac* was published by the Society for the Diffusion of Useful Knowledge in 1828. Its success induced the Stationers' Company to believe that the public would no longer refuse a good almanac because it only predicted purely astronomical phenomena, and they accordingly published the *Englishman's Almanac*, which is unexceptionable. We may also add that the other almanacs are diminishing the quantity and tone of their objectionable parts, so that before long it may be hoped that the latter will disappear entirely.

Of the professedly astronomical almanacs the most important in England is the *Nautical Almanac*, published by the Admiralty for the use both of astronomers and seamen. This work was projected by Dr. Maskelyne, then Astronomer Royal, and first appeared in 1767. The employment of lunar distances in finding the longitude, of the efficacy of which method Maskelyne had satisfied himself in a voyage to St. Helena, required new tables, which should give the distances of the moon from the sun and principal fixed stars, for intervals of a few hours at most. By the zeal of Dr. Maskelyne, aided by the government, the project was carried into effect, and it continued under his superintendence for forty-eight years. During this time it received the highest encomiums from all foreign authorities, for which see the French *Encyclopædia*, art. Almanach, and the Histories of Montucla and Delambre. From 1774 to 1789 the French *Connoissance des Tems* borrowed its lunar distances from the English almanac. On the death of Maskelyne it did not continue to improve, and, without absolutely falling off, was inadequate to the wants either of seamen or astronomers. From the year 1820, various complaints were made of it in print. It was latterly stated that officers employed in surveys were obliged to have recourse to foreign almanacs for what could not be obtained in their own; that Berlin, Coimbra and even Milan were better provided with the helps of navigation; and finally that the calculations were not made from the best and most improved tables. In consequence of these complaints, which were almost universally allowed by astronomers to contain a great deal of truth, the government, in 1830, requested the opinion of the Astronomical Society upon the subject, and the Report of the Committee appointed by that body, which may be found in the fourth volume of their *Transactions*, is a sufficient proof of the opinion of practical astronomers on the previous state of the work. The alterations proposed by the society were entirely adopted by the government, and the first almanac containing them, viz., that for 1834, has just appeared. The contents of the old Nautical Almanac may be found in the *Companion to the Almanac* for 1829. We subjoin a list of the principal alterations and additions which appear in the new work:—

1. The substitution of *mean* for *apparent* time throughout, the sun's right ascension and declination being given for both mean and apparent noon.
2. The addition of the mean time of transit of the first point of Aries, or the beginning of the sidereal day.
3. The moon's right ascension and declination given for every hour, instead of every twelve hours. We must mention, however, that the intervals of twelve hours were diminished to three hours in the *Nautical Almanac* for 1833, by Mr. Pond the Astronomer Royal.
4. The distances of the moon from the planets for every three hours.
5. The time of contact of Jupiter's satellites and their shadows with the planet.
6. Logarithms of the quantities which vary from day to day, used in the reduction of the fixed stars.
7. Lists of stars which come on the meridian nearly with the moon; of occultations of the planets and stars by the moon, visible at Greenwich.
8. The places of the old planets for *every* day at noon instead of every tenth day; and those of the four small planets for every fourth day, which were previously not mentioned at all.
9. The 60 stars, whose places were given for every ten days, are increased to 100.
10. The number of lunar distances given is very much increased.

Besides these principal alterations, there is a large number of minor additions, tending for the most part to save labour in calculation; and the extent to which the results have been carried is materially enlarged. We mention, in order to diffuse a knowledge of the fact, that any *errata* discovered in any mathematical tables which are generally or even occasionally of use, will be published in the *Nautical Almanac*, if communicated by the finder.

It should also be noticed that the *Supplements* which it has been customary to publish during the last few years are now discontinued. It is intended to bring out the *Nautical Almanac* four years in advance, but, at present, (July, 1833,) owing to the time which it has taken to consider and arrange the alterations, the Almanac for 1834 has only just appeared.

This country has been forestalled in most of the important changes just mentioned, by the Berlin *Ephemeris*, published under the superintendence of Professor Encke. Its predecessor, the *Astronomisches Jahrbuch*, was conducted for fifty years by the celebrated Bode; and was entirely remodelled by Encke in 1830. Of other works of the same kind, published on the continent, those of Coimbra and Milan are among the most valuable; the latter was commenced in 1755, by M. de Cæsaris; we have not been able to learn the date of the first establishment of the former.

The oldest national astronomical almanac is the French *Connoissance des Tems*, published at present under the superintendence of the *Bureau des Longitudes* at Paris. It was commenced in 1679 by Picard, and continued by him till 1684. It then passed through the hands of various astronomers, till 1760, when the conduct of it was given to Lalande, who, besides other alterations, first introduced the lunar distances, which have been already alluded to. At present the plan is very similar to that of the new *Nautical Almanac*, with the addition of very valuable original memoirs which appear yearly. In fact we may say generally, that the original contributions to the various continental almanacs are among their most valuable parts; and as Professor Airy remarks, *Reports of the British Association*, &c., p. 128, 'In fact nearly all the astronomy of the present century is to be found in these works,' that is, in certain periodicals which are mentioned, 'or in the *Ephemerides* of Berlin, Paris, or Milan.'

Next to the *Nautical Almanac*, the private publication which is most entitled to notice as an astronomical almanac is White's *Ephemeris*, a work which is nearly as old as the monopoly previously described. For many years past, this publication has given astronomical data sufficient to enable the seaman to find his latitude and time. The *Gentleman's Diary*, commenced in 1741, and the *Ladies' Diary*, in 1705, have powerfully aided in keeping up a mathematical taste, to a certain extent, throughout the country, by annually proposing problems for competition: several, who have afterwards become celebrated in mathematics, have commenced their career by the solution of these problems.

At present, all almanacs published in this country are subjected to a heavy stamp duty of fifteen-pence per copy. The average number of stamps issued for this purpose between the years 1821 and 1830 inclusive, was about 499,000, producing an average revenue of about 31,000*l*. When almanacs were almost wholly devoted to purposes of imposture, the heavy duty might be defended upon the ground that it obstructed the diffusion of a pernicious commodity, and was, in truth, only a lawful spoiling of the monopolists. At the present time the tax prevents the free competition of respectable publishers in almanacs; and further, is so enormous, that many individuals are tempted to evade the law, and unstamped almanacs are circulated in as large numbers as those which pay the tax. We are enabled to state this, without hesitation, upon the authority of information which we have collected from every part of the United Kingdom. We may well smile at a tax which promotes fraud both among those who obey and disobey the law; that is, astrology among the honest, and smuggling among the unprincipled.

ALMANSOR, properly Al-Mansur; or, with his complete name, Abu Jafar Abdallah al-Mansur, the second caliph of the Abbaside dynasty, [see Abbasides,] was born at Homaima in Syria, A.D. 713. During the short reign of his brother and predecessor Al-Saffah, he had been governor of Mesopotamia, Armenia, and Azerbijan. When Al-Saffah died, A.D. 753, Al-Mansur, who was then on a pilgrimage to Mecca, was called to the throne. At the very beginning of his reign, Al-Mansur had to encounter an opponent in the person of his cousin Abdallah, who claimed the caliphat. After a hard struggle, the forces collected by Abdallah were defeated by Abu Moslem, a commander who had already under Al-Saffah given signal proofs of his adherence to the cause of the Abbasides. At that time Abu Moslem was governor of the province of Khorasan, where he enjoyed much popularity. Al-Mansur now appointed him prefect of Syria and Egypt, and on Abu Moslem's refusal to accede to this arrangement, Al-Mansur became so incensed against him that he summoned him to Madaïn, where he was murdered in the presence of the caliph. Abdallah, who had retired into Irak, was afterwards taken and killed.

In 754 Sinan, of Nishapur, revolted in Khorasan. The caliph sent an army under the command of Jamhur against him, who soon suppressed the tumult. But when the caliph somewhat unceremoniously called on him to send home the booty that he had made during this expedition, Jamhur himself revolted, and occupied Ispahan. He was, however, soon obliged to retire into Azerbijan, where he was ultimately defeated, A.D. 755.

The year 758 was marked by a disturbance of a peculiar kind at Kufa. The Ravendites, a tribe of Khorasan, the descendants of Abdallah ben Ravend, who believed in a sort of metempsychosis, had from the beginning been in favour of the Abbaside family, but a dispute had arisen between them and Abu Moslem, in consequence of which they were obliged to keep themselves concealed during his lifetime. Now, after Abu Moslem's death, they came in considerable numbers to the court, where they mixed up harangues about their dogmas with absurd flattery of the caliph. The caliph being disgusted by their proceedings, imprisoned about 200 of these enthusiasts. This measure gave great offence to the whole party: they liberated their comrades by force, and raised a tumult at Kufa, which could only be repressed by much energy on the part of the caliph. It is said that in consequence of this disturbance, Al-Mansur took a dislike to his residence at Kufa, and laid the foundation of the town of Bagdad, which became from this time the abode of the caliphs.

In the year 762, an unsuccessful attempt to overthrow the dominion of the Abbasides, was made at Medina by Mohammed, a descendant of Hossain, the son of Ali ben Abi Taleb. Mohammed was soon vanquished by Isa ben Musa, whom the caliph had sent against him. But Mohammed's brother, Ibrahim, excited disturbances of a more serious nature at Basra. The governor of that town was compelled to surrender the fort and treasury to the insurgents, who soon made themselves masters also of the towns of Ahwaz and Wasit. Ibrahim was actually marching against Kufa, when he was met by Isa ben Musa, who defeated him in a sanguinary battle near a place called Ahmaza. Ibrahim lost his life in the engagement, 18th of February, 763.

Al-Mansur died, September, 775, at Bir Maimuna, on a pilgrimage to Mecca: his son Al-Mahdi succeeded him in the caliphat. Al-Mansur first showed that predilection for literature, which for several centuries became a distinguishing feature in the character of the Mohammedan sovereigns. During his reign translations were commenced of the works of antient Greek writers on metaphysics, mathematics, astronomy, and medicine into Arabic. The Arabs were thus made familiar with the works of Aristotle, Euclid, Ptolemy, and Hippocrates, and had the opportunity of reading, in their own language, several Greek authors of which the originals are now lost.

ALME, or AL-MAI, *i. e.* ‘the learned,’ the name given by the modern Egyptians and Arabs to the dancing and singing girls of Egypt. The word *alma* seems to be corrupted from the Arabic *âlimah*, the feminine form of the active participle *âlim*, *sciens*, *sapiens*. They form a particular class or society, living together in bands, who are distributed in the various towns, or travel about the country in quest of employment. They are present at all festivals and marriages, and other ceremonies. The girls who are admitted into this society have generally a fine voice; they learn by heart the best songs on romance and love; and some are also able to sing extempore verses, after the manner of the Italian *improvisatori*. But they chiefly excel in pantomimic dances, which represent the various incidents of life, and above all, the passion of love. The suppleness of their bodies is very great, as well as the flexibility and expression of their features; but the indecency of their attitudes is excessive. ‘When they begin to dance, they wear a long and very light silk robe floating to the ground, negligently girded by a sash; their long black hair, perfumed and in tresses, descends over their shoulders; the shift, transparent as gauze, scarcely conceals the skin: as the action proceeds, the various forms and contours the body can assume seem progressive; the sound of the flute, the castanet, the tambour, and cymbals, regulate, increase, or slacken their steps. Words, adapted to such scenes, inflame them more, till they appear as if intoxicated, and become frantic bacchanals. Forgetting all reserve, they then abandon themselves to the disorder of their senses, while the indelicate and licentious spectators, who wish nothing to be left to the imagination, redouble their applause.’ (Savary's *Letters on Egypt.*) These Almai are admitted into the harems of the great, where they instruct the women in dancing and singing, or amuse them by reciting poems. They excel in singing pathetic ballads: dwelling upon plaintive tones, they inspire a feeling of melancholy which, insensibly increasing, draws tears from the eyes. The Turks, enemies as they are to the arts, pass whole nights in listening to them. Two girls sometimes sing together, but, like their orchestra, they are always in unison: accompaniments in music are only for enlightened nations; on the contrary, people whose feelings are oftener appealed to than their understandings, delight in simple sounds which immediately affect the heart, without engrossing their minds by the modulations of a well-supported harmony.

The Almai also accompany funerals, at which they sing dirges, and utter groans and lamentations, like the *præficæ* of Sardinia, Corsica, and other European countries. The higher and more accomplished class of the Almai attend none but wealthy people, and their price is high. The common people, however, have also their Almai, who try to imitate the superior class, but have neither their elegance, grace, nor knowledge. They are seen everywhere; the public squares and the walks round Cairo abound with them. Their morals are as licentious as their songs; they are, in fact, the common courtezans of the country. Although there are Almai in Syria and other parts of the Ottoman empire, yet Egypt seems to have been at all times their favourite, and as it were, their native country. The Bayaders of India are a sort of Almai.

ALMEIDA, a strongly-fortified city of Portugal, in the province of Beira, and *comarca* of Pinhel: 40° 37′ N. lat. 6° 52′ W. long. Population 1150. It lies between the rivers Coa and Turones, both tributaries of the Douro, and the latter forming the boundary between the kingdoms of Spain and Portugal. Its position, therefore, on the frontier, has always made it a post of great military importance, the more so as it is in some measure opposed to the Spanish fortress of Ciudad Rodrigo, from which it is less than thirty miles distant. In the peninsular war, Almeida was more than once an object of contention. In the month of August, 1810, it was invested by Massena, and the English governor, Colonel Cox, with his Portuguese garrison was prepared for a determined resistance, but, on the evening of the 26th, only eight days after the trenches were opened, the magazines, either through accident or treachery, exploded. The whole town was consequently in ruins, the batteries breached, and the greater part of the guns thrown into the ditch. Still the governor refused the terms of Massena, when some of the Portuguese officers, who were in treasonable communication with the French, headed a mutiny of the garrison and compelled him to surrender. In the following spring Massena again retreated within the Spanish frontier, and was unable to throw supplies into Almeida to prepare it for a siege. When the British commenced the blockade, he made an unsuccessful attempt to relieve it by the battle of Fuentes de Oñoro, but succeeded in sending orders through the British posts of blockade for the French governor, General Brennier, to abandon the fortress. This order was executed with great skill and success. After destroying the ramparts and guns, without exciting any suspicion on the part of the British, Brennier sprung his mines at midnight on the 10th of May, and made his way with 1500 men through the British troops without much loss. On the banks of the Agueda he joined one of the main divisions of the French army. (Miñano. Napier's *Peninsular War.*)

ALMEIDA, FRANCISCO, seventh son of the Conde de Abrantes, was the first Portuguese viceroy of India. In his youth he distinguished himself against the Moors in the Peninsula, particularly in the conquest of Granada. In 1505, while paying a visit to his brother, the Bishop of Coimbra, he was sent for by King Manoel, or Emanuel, and intrusted with the important office of viceroy of the recently acquired possessions in India. On the 25th of March, 1505, he set sail from Lisbon. His embarkation, says Barros, was the most brilliant that had ever taken place in Portugal. His force consisted of 1500 men, all belonging to very respectable families; many of them were noblemen of the king's household, all anxious to serve under so distinguished a leader.

After a prosperous voyage Almeida arrived at Quiloa, on the 22nd of July. The Moorish king of that city Habraemo.

or Ibrahim, was not friendly to the Portuguese. Almeida complained to him of his not having paid due respect to the Portuguese flag, when Ibrahim apologized for his fault, and promised to visit the viceroy on the morrow. But instead of the king, a messenger from him came to make a fresh apology for not having fulfilled his promise, on account of a black cat having passed before him as he was coming, which circumstance he considered as a very bad omen. Almeida told the messenger to inform his master, that he himself would pay him a visit at his own house. At the approach of the Portuguese, Ibrahim fled, and Almeida gave the crown of Quiloa to Mohammed Anconi, a worthy man, and a great friend of the Portuguese. Almeida received the homage of the new king in the name of his master, built a fortress to keep the inhabitants in subjection, and then proceeded to the town of Mombaza, which he destroyed. On his arrival at Cananor on the Malabar coast he received an embassy from the King of Bisnagar, who was desirous to form an alliance with the Portuguese. Almeida erected here another fortress to protect the factories, or commercial establishments of Cananor, Cochin, and Coulan, and loaded eight vessels with spicery, which he sent to Portugal. This squadron in its way to Europe discovered the island of Madagascar.

The governor of Cochin, Trimumpara, had resigned in favour of one of his relations, and the viceroy went to that town with the object of renewing the alliance with the new king. Almeida sent his son Lorenzo against the King of Calicut, who had offered some injuries to the Portuguese merchants. Lorenzo, after having taken ample satisfaction for the insult, went to make an establishment at Ceylon, and also took the Maldive islands. At the same time, four vessels, which had come from Portugal, formed a commercial alliance with the King of Malacca, and established two factories in the island of Sumatra.

The soldan, or caliph of Egypt, with the aid of the republic of Venice, which always looked with an envious eye on the success of the Portuguese, had fitted out a naval expedition, and given the command of it to an experienced Persian, named Mir Hocem. The King of Calicut, expecting this assistance, made preparations for war, upon which the viceroy sent his son against him. When Lorenzo was in the port of Chaul, the Egyptian fleet, which had been reinforced with twenty-four vessels of the governor of Diu, appeared. Lorenzo at first mistook them for the squadron of Albuquerque, which he was expecting. The fire of Mir Hocem, however, soon made him discover his error. The two squadrons fought till night-fall without any considerable advantage on either side. Some of his officers advised Lorenzo to avail himself of the obscurity of night in order to cross the bar, and get out into the sea; but the gallant young man, though severely wounded, said, that to go away at night was nothing else than to run away, and that was a thing which he never would do. As the Portuguese squadron was sailing out in the morning, the Egyptians opened a brisk fire upon it. Lorenzo's vessel was the last, and the enemy directed their principal fire against her. At last she was separated from the rest of the vessels in a very sandy and rocky place. As the tide was running out with great rapidity, the other vessels could not render her any assistance, and the enemy showered their fire upon her with a sure aim. Lorenzo was requested by his men to save himself in the boat, but he would not consent to abandon them. A shot carried off one of his legs. He caused himself to be tied to the mast, where he continued to animate his men until another shot carried off the left side of his chest. The galley was by this time upon a sandbank; it was boarded without difficulty, and twenty-four men, who remained in it, were carried away captives. The rest of the vessels proceeded to Cananor, and informed Almeida of the disaster. He bore it with fortitude, and was making preparations to revenge his loss, when Alfonso de Albuquerque, who was appointed governor of India in his place, arrived. Almeida received him very coolly, and a quarrel ensuing, Albuquerque was sent to Cochin, where he was kept three months under arrest. [See ALBUQUERQUE.]

Almeida, whose only object now was to gratify his vengeance, sailed to Onor, where he burnt some vessels of the King of Calicut, entered the port of Dabal, or Dabul, belonging to the King of Goa, on the 13th of December, 1508, took the town, and after having plundered it reduced it to ashes. He then went in search of the Egyptian fleet, and found it near Diu in the kingdom of Cambay, and obtained a complete victory over it. Mir Hocem, with only twenty four men, escaped; eight of his vessels were taken, and the rest sunk.

Almeida, having thus punished his enemies, returned to Cochin, where Marshal Coutinho, who had arrived from Portugal, urged him to return home. The viceroy released Albuquerque, surrendered his government, and sailed from Cochin on the 13th of November, 1503. On his way to Portugal, after having doubled the Cape of Good Hope, he stopped at Saldanha bay to procure a supply of fresh water. His soldiers had a dispute with the natives, and an affray ensued. One of his officers, Mello, seeing the venerable old man alone in the midst of that inhospitable country, observed to him in a sarcastic manner, 'Here I should wish to see by your side one of those whom you favoured in India.' Almeida very composedly answered, 'This is not the time to think of that; think rather how to save the royal standard; as for me, I am old enough, both in years, and in sins, to die here, if that be the will of the Lord.' From this moment Mello never abandoned either the standard or his general, until Almeida fell pierced by a lance.

'That the man who had trampled over countless thousands of the Asiatics,' says a contemporary writer; 'who had humbled their sovereign princes, and annihilated in the seas the powers of the Egyptian Soldan, should perish on an obscure strand, by the hands of a few savages, should be a salutary lesson for human ambition.'

Almeida was a man of noble appearance, prudent, courteous, and very much esteemed for his generosity. During his administration of India, he made the Portuguese name respected. He is represented by some writers as a conceited man, who thought nobody so well qualified to govern India as himself; but, perhaps, we only do him justice in believing that his ruling motive was a desire to elevate the fame and power of his native state. (See Barros, *History of the Portuguese Conquests in the East*, decade i., book 8 to the end—ii., book 1—4; Damian á Goes, *Chronica do Senhor Rey Dom Manoel;* Mariana, book xxix. chap. 16.; Lardner's *Cabinet Cyclopædia, History of Spain and Portugal*, vol. iii. p. 306.)

ALMERIA, a modern province of Spain formed out of the eastern part of the kingdom of GRANADA.

ALMERIA, the antient Murgis, the capital of the province is near the outlet of the river Almeria, 36° 51′ N. lat., 2° 33′ W. long. It has a convenient well-sheltered port, and some manufactures of saltpetre, soda, and cordage made of Spanish broom During the time of the Moorish kings of Granada, it was one of the most opulent commercial towns in their dominions. Cotton is now cultivated to some extent along the coast of Granada, about Motril, and as far as Almeria. The culture was introduced by Mr. Kirkpatrick, while acting as consul for the United States of America at Malaga, in the beginning of the present century.

ALMOHADES, the name of a Mohammedan dynasty, which began in Africa and Spain with Abdelmumen, in the year 542 of the Hegira, A.D. 1147. Mohammed ben Abdallah, a native of Herga, in Africa, was the son of a lamplighter in a mosque. He received his education at Cordova; and having finished his studies, he travelled to the east to improve his knowledge, and visited Cairo and Bagdad. In Bagdad he attended the school of the philosopher Abu Hamid Algezali, who had written a book on the revival of learning and of the law, which was condemned at Cordova as dangerous to the faith of Islam. Ali, the Almoravidian king of Cordova, approved of this decision, and the book was given up to the flames. Algezali perceiving a stranger in his school, and having ascertained that he was from the west, asked him, whether he had ever been at Cordova, and heard of his book. Abdallah informed him of the fate of his work. The doctor turned pale, tore the book which he had in his hands, and, looking to heaven, exclaimed, 'May God thus tear the kingdom from the impious Ali!' Abdallah joined him in his prayer, and added, 'Pray God to make me an instrument of thy vengeance.'

After three years' residence at Bagdad, Mohammed returned to Mauritania in 510, (A.D. 1116,) where he rendered himself conspicuous by the simplicity of his dress, by his austerity, and by his bold preaching against the vices both of the king and the people. On his arriving at a village called Tejewa, he met a youth of prepossessing appearance, by name Abdelmumen, who was going with his uncle to study in the east. Abdallah promised to give him the instruction which he desired, but taught him all that was most conducive to his own designs. He communicated to him a prophecy in which it was foretold, that the empire of life and of the law would only arise with Abdelmumen. Having thus prepared him, he named him his vizier. They both went to Fez, and thence to Marocco. Entering one day into the mosque of the latter city, Mohammed placed himself in the seat of the Imam. One of the ministers represented to him, that nobody could occupy that place except the king of the faithful. Mohammed answered him with much gravity in these words of the Koran, '*Inna'l-mesajida lillahi*;' 'certainly the temples only belong to God.' Shortly after the king entered, and prayers being said, Mohammed arose, and addressing himself to Ali, said to him, 'Put a remedy to the evils and injustices prevailing in thy kingdom, for God will require of thee an account of thy people.' The king, at first, treated him with contempt; but as he continued to preach and attract the multitude, Ali at last assembled his council; and though severe measures were proposed, the king contented himself with expelling him from the city.

Mohammed now built a hut in a burial-ground, and multitudes flocked there to hear his doctrine. He preached to them about the coming of the great Mehedi, who was to establish the empire of justice upon earth. The king ordered him to be imprisoned and beheaded, but he escaped to Agmat, and thence to Tinmāl in the land of Sous. One day while he was expounding the prophecy of the coming of the great Mehedi, Abdelmumen observed, 'That prophecy evidently applies to thee; thou art the true Mehedi.' Upon this, Abdelmumen, with fifty others of his disciples, acknowledged him as their Mehedi. After these, seventy more swore allegiance to him. Mohammed established two councils. The fifty who first acknowledged his authority were those with whom he entrusted the affairs of greater consequence, and to the latter seventy he confided those of less importance.

He then went to the mountains, preaching the unity of God, and was followed by 20,000 men of the tribe of Masamuda, to whom he gave the name of *Mowáhedun*, that is, Unitarians, from which the name of Almohades is derived. The command of this army was given to Mohammed Alakhir.

Abu Is'hac Ibrahim, Ali's own brother, marched against the rebels; and the two armies were ready to fight, when a sudden terror seized the foremost ranks of Ibrahim, who, turning their horses, began to fly in all directions, trampling down their own fellow-soldiers. The Almohades possessed themselves of the rich baggage, and in consequence of this success several other tribes joined them. Ali now called his brother Temin from Spain, and with a powerful army sent him against the Mehedi, who had retired to the mountains. This general, though more successful than the preceding, never could defeat the Almohades. They fortified themselves at Tinmāl, and from this place they sallied forth to devastate the surrounding country.

In 1125 A.D., 513 of the Hegira, they laid siege to Marocco, but were defeated in a vigorous sally made by the besieged. Three years afterwards Abdelmumen marched at the head of 30,000 men, and obtained a complete victory over the Almoravides. On his return to Tinmāl, the Mehedi came out to greet the victorious general; and the next day he called his men at the mosque, and took his last leave of them. Shortly after Abdelmumen waited upon him. The Mehedi gave him the book of Algezali, and departed from this world. He had made several reforms in the Mohammedan religion, among which was the adoption of a more simple profession of faith, and of prayers which they were allowed to say on their march and even when fighting, which gave them a superiority over their enemies.

The chiefs of the Almohades now assembled to determine the form of government they should adopt after the death of the Mehedi; and having decided in favour of a moderate monarchy, the election fell upon Abdelmumen, who was declared Imam and Amir-al-Mumenin. He pursued his conquests with vigour, and in three years reduced the empire of the Almoravides to very narrow limits. He took Oran and Fez, and laid siege to Marocco, the only city now left to the Almoravides in Africa. Whilst Abdelmumen was engaged in reducing that city, he sent Abu Amran with a numerous army to invade Andalusia. Many of the petty chiefs of Spain joined the Almohades. In the mean time the siege of Marocco was pursued with vigour, and the inhabitants defended it heroically. The besieger swore he would not retire until he had sifted the town through a sieve. Famine had carried off three-fourths of the population, and the remaining part could make but a feeble defence, when the city was taken by a general assault in the year 543 of the Hegira, A.D. 1148. The young emperor Ibrahim was put to death, the few surviving inhabitants inhumanly massacred, and the town demolished. According to Marmol, Abdelmumen literally fulfilled his oath. He afterwards rebuilt the city, and called some tribes from the desert to re-people it.

The arms of the Almohades were not less successful in Spain than in Africa. Almost all Andalusia acknowledged their dominion. Cordova, the last hold of the Almoravides, was taken by Abu Amran, and Abdelmumen was proclaimed sovereign both of Mauritania and Spain.

Not content with the territory he possessed in Spain, Abdelmumen published, in 557, (A.D. 1161,) the *jihád*, or holy war, with an intention of subduing the whole of the Peninsula. He levied an army of 100,000 horse and 300,000 foot, but in the midst of his preparations death overtook him, in 558.

His youngest son, Yussef Abu Yacub, succeeded him. This prince, not being so warlike as his father, dismissed the army, which he had assembled at Sulé, and in the first few years of his reign he cultivated the arts of peace. In 566, (A.D. 1170,) however, he invaded Spain, and, after conquering the rest of the Mohammedan dominions in the Peninsula, fell in an engagement with the Christians.

Yussef ben Yacub, better known by the name of Almansor, landed at Algeciras, and defeated Alonso III. of Castile in the plains of Alarcos. The prisoners he had made in this battle he immediately restored to liberty—an example of very rare occurrence among the Mohammedans. After this signal victory he took Calatrava, Guadalajara, Madrid, and Salamanca, and afterwards returned to Africa, where he died in 595, (A.D. 1198.) This prince was the ornament of his age, and the most liberal and magnanimous of the Almohadian dynasty.

His son Mohammed Abu Abdalla, who succeeded him, though an effeminate and weak prince, was not insensible to the glory of arms. He mustered a most powerful army, one of the five divisions of which, if we are to give credit to the Arabic and Spanish historians, amounted to 160,000 men: his design was to conquer the whole Peninsula. Such was the terror which this vast armament inspired among the Christians, that Innocent III. proclaimed a crusade, and several bishops went from town to town to rouse the Christian princes. The kings of Castile, Aragon, and Navarre, with a numerous body of foreign volunteers, advanced to stop the progress of the Moslems. The two armies met in Las Navas de Tolosa, between Castile and Andalusia; and on the 12th of June, 1211, the Christians obtained so complete a victory over the Africans, that Mohammed himself had a narrow escape, and left no less than 170,000 men on the field; the rest fled for safety. After this signal defeat he retired to Marocco, gave up the care of the government to his son, Yussef Abu Yacub, who was only eleven years of age, and passed the last days of his life in licentious pleasures. He died in 610, (A.D. 1213.)

Abu Yacub died without issue in 620, (1223.) His death was the signal of a civil war which ended with the destruction of the Almohades. After several disputes Almamun Abu Ali, brother of the governor of Valencia, was proclaimed emperor. He projected a reform in the constitution, and prepared the way towards it by writing a treatise against the institutions of the Mehedi. The two councils instituted by the Mehedi, against whom Almamun's reform was principally directed, deposed him, and chose Yahya ben Anasir in his stead, supplying him with troops to oppose Almamun. Yahya landed in Andalusia, and was defeated by the emperor near Medina Sidonia. Almamun speedily crossed over to Africa, and arriving at Marocco unexpectedly, assembled the senate, and after upbraiding them for their conduct, caused them to be beheaded in the court of the palace. All the walis suspected of partiality for this body underwent the same fate, and their heads were left to putrefy on the ramparts of Marocco.

In Spain, Ibn Hud, an Andalusian sheik, who had formed the project of rescuing the country from the yoke of the Almohades, after a series of victories expelled them from the Peninsula. Almamun, harassed by so many disasters, died in 629, (1231.) His successors in Africa lived in a continual state of intestine warfare. The last of them was Idris, who fell in a battle against the Marini, and with him ended the dynasty of the Almohades. (See Casiri's *Bibliotheca Arabico-Hispana;* Conde, *Historia de la Dominacion de los Arabes en España*, vol. ii. ch. 26-58.; Marmol's *Descripcion General de Africa;* Rodericus Toletanus, *de Rebus Hispanicis;* D'Herbelot, *Bibliothèque Orientale.*)

ALMOND. [See AMYGDALUS.]

ALMONDBURY, an extensive parish in the North Riding of Yorkshire, containing, in 1831, 30,606 inhabitants, and comprehending several townships: the principal township, of the same name with the parish, which contains 7086 inhabitants, is within two miles of Huddersfield. The original parish church is at Almondbury, (the living, a vicarage, is in the gift of the governors of Clitheroe school,) but new churches have been built at Crossland, Linthwaite, and Nether Thong, three townships in the parish. At Almondbury is a free grammar-school, founded in the time of James I., and on a hill in the neighbourhood may be seen the remains of an ancient castle. It is a place of very great antiquity, and said to have been the residence of some of the Saxon kings. Whether it was the Campodunum of the Romans is a matter of dispute among antiquarians.

ALMONER, anciently written Amner, was an officer in a king's, prince's, prelate's, or other great man's household, whose business it was to distribute alms to the poor. Previous to the dissolution, every great monastery in England had its almoner. The almoner of the king of France was styled his *grand aumonier*, and we find a similar officer at a very early period attached to the household of the popes.

Fleta, a juridical treatise of the time of Edward the First, describes the duties of the high almoner as they then stood in England. He was to collect the fragments of the royal table, and distribute them daily to the poor; to visit the sick, poor widows, prisoners, and other persons in distress; he reminded the king about the bestowal of his alms, especially on saints'-days, and was careful that the cast-off robes, which were often of high price, should not be bestowed on players, minstrels, or flatterers, but their value given to increase the king's charity.

In modern times the office of lord high almoner has been long held by the archbishops of York. Chamberlayne, in the *Present State of Great Britain*, octavo, London, 1755, gives an account of the lord almoner's office as it then stood. 'The lord almoner disposes of the king's alms, and for that use receives (besides other monies allowed by the king) all deodands and *bona felonum de se* to be that way disposed. Moreover, the lord almoner hath the privilege to give the king's dish to whatsoever poor men he pleases; that is, the first dish at dinner, which is set upon the king's table, or instead thereof 4*d. per diem*. Next he distributes to twenty-four poor men, nominated by the parishioners of the parish adjacent to the king's palace of residence, to each of them 4*d.* in money, a twopenny loaf, and a gallon of beer, or instead thereof, 3*d.* in money, to be equally divided among them every morning at seven of the clock at the court-gate; and every poor man, before he receives the alms, to repeat the Creed, and the Lord's Prayer, in the presence of one of the king's chaplains, deputed by the lord almoner to be his sub-almoner; who is also to scatter new-coined twopences in the towns and places where the king passeth through in his progress, to a certain sum by the year. Besides, there are many poor pensioners to the king and queen below stairs, that is, such as are put to pension, either because they are so old that they are unfit for service, or else the widows of such of his majesty's household servants that died poor, and were not able to provide for their wives and children in their lifetimes: every one of these hath a competency duly paid them. Under the lord high almoner there are a sub-almoner, a yeoman, and two grooms of the almonry.'

An account of the lord almoner's annual distribution in the king's name, on the Thursday before Easter, will be found under MAUNDY THURSDAY.

The great almoner of the king of France was once the highest ecclesiastical dignitary in that kingdom. To him belonged the superintendence of all hospitals and houses of lepers; the king received the sacrament from his hand; and he said mass before the king in all great ceremonies and solemnities. At the establishment of the imperial household in 1804, Napoleon restored the office of Grand Almoner to France in the person of Cardinal Fesch; and the office was continued till the exile of Charles X. No Grand, or other Almoners, except that of the Queen, now occurs in the *Almanach Royal et National* of France.

Ducange, in his *Glossary*, gives other meanings of the word almoner. It was sometimes used for those who distributed the legacies of others, and who have been since called executors; sometimes for a person who had left alms to the poor; and sometimes for the poor upon whom the alms were bestowed. The *eleemosynarii regis*, or persons who were supported by the king's bounty, occasionally noticed in the Domesday Survey, were of this last description. Almoner is a name also given in ecclesiastical writers to the DEACONS of churches.

ALMORAH, the capital of the province of Kumaon, in Northern Hindostan, is situated in 29° 35′ N. lat., and 79° 44′ E. long. This is the most considerable town possessed by the East India Company in that quarter of Hindostan: it stands on the ridge of a mountain 5,337 feet above the level of the sea, in the midst of a bleak and naked country, with scarcely a tree visible within four miles from the walls of the town.

Almorah is approached by a long and steep, zigzag road, which a few resolute men might defend against an army. The place was taken by the Gorkhas in 1790, at which time the inhabitants were divided into two political parties, in consequence of the succession being disputed. When in 1815 it was successfully attacked by the British, the cruelties of their Gorkha conquerors insured to our countrymen the good-will of the natives. The fortifications are very indifferent, being commanded from two points of land, and having no water within the walls. A new citadel, named Fort Moira, was built on a small eminence at the western extremity of the town, after its capture by the British, but having been constructed of loose micaceous schistus, of which the hill whereon Almorah stands is composed, the walls are already out of repair.

The town principally consists of one street fifty feet wide, and three-quarters of a mile long, with a gate at each end: this street has a natural pavement of rock. The houses stand on a lower story of stone, the superstructure being of wood; an arrangement which is rendered necessary by the frequent recurrence of earthquakes: the roofs of most of the buildings are slated, which would give a neat appearance to the town, if the inhabitants were not accustomed to pile on them stacks of straw as winter provender for their cattle.

On the conquest of Almorah, the East India Company ordered several small bungalows to be built in airy situations around it, which are appropriated to the use of such of its servants as repair to this northern hilly region for the benefit of their health.

The heat in the summer is considerable, but is always tempered by a fine breeze, and the nights even in the hottest season are chilly; frosts are common in winter, but it is remarkable that they are not so severe as 2500 feet lower down. Such vegetation as there is approaches to that of Europe. Raspberries, blackberries, cranberries, and bilberries are common. Up to a certain elevation on the hills, the birch and the willow are found, and at their base the silver fir grows abundantly.

The native inhabitants are honest, peaceable, cheerful, and industrious, but extremely dirty, and partake largely of the prevailing dislike of all innovation. Their little advancement in civilization is shown by their treatment of women, who are employed in performing the most laborious tasks. Almorah is ninety miles north by east from the city of Bareilly, and about 106 miles travelling distance north-east from Moradabad. (Bishop Heber's *Narrative of a Journey through the Upper Provinces of India*. Hamilton's *East India Gazetteer.*)

ALMORAVIDES, an Arabian tribe, who came out of the country of Himyar, and established itself in Syria in the time of the first Caliph Abubekr. They passed afterwards into Egypt, penetrated into Africa towards the west, and settled about the desert of Sahara. They extended themselves gradually, and gave the name to a sect called Molthemin or Molathemin, on account of their wearing veils. Their religion seems at a very early period to have been Christian, but, by mixing with the Mohammedans, every trace of it was lost; and even of the religion of Islam they hardly knew anything beyond the formula, *La ilah illa Allah Mohammed rasul Allah;* that is, 'There is but one God and Mohammed is his envoy.'

Yahya ben Ibrahim, a very patriotic man of the tribe of Gudala, which was one of these tribes, on his return from Mecca, meeting with Abu Amran, a famous Fakih (*i.e.* lawyer and theologian) of Fez, informed him of the state of ignorance of his tribe, and of their tractable disposition, and requested him to send some teachers. None of the disciples of the Fakih felt disposed to undertake so long and perilous a journey. Abdallah ben Yassim, a disciple of another Fakih, offered to accompany Yahya. Having met with an enthusiastic reception from the tribe, he induced them to wage war against the tribe of Lametounah, who were made to acknowledge his spiritual authority: and he gave his followers the name of *Murabuuth* or *Morubitin*, which signifies men devoted to the service of religion. Abdallah having fallen in battle in the year 450 of the Hegira, A.D. 1058, Abubekr ben Omar Lametouni was appointed sovereign prince. This chief led his tribe westwards, established the seat of his empire at the city of Agmat, and laid the foundation of Marocco.

The tribe of Gudalla had declared war against that of Lametnounah, and Abubekr marched speedily to its assistance, leaving the command of the army to his relation, Yussef ben Taxfin. Yussef subdued the Berbers, completed the building of the city of Marocco, and entirely expelled the Zeïerides, commonly known by the name of Zegries, from Mauritania. Having by his exploits and by his affability won the affections of his men, he declared himself sovereign prince, and married the beautiful Zainab, sister of Abubekr. This chief having returned from his expedition, encamped before Agmat, but finding his opponent too strong to be attacked, had an interview with Yussef, and returned to his native deserts. Yussef made him a magnificent present, consisting of gold crowns, horses, mules, turbans, rich stuffs, and fine linen, with 150 black slaves, and 20 beautiful young maidens, besides a quantity of perfumes, corn, and cattle, which he continued to send to Abubekr every year till his death.

Yussef now assumed the title of Amir-al-Muslemin, or 'Prince of the Believers.' Some of the Mohammedan kings of Spain imprudently invited this ambitious adventurer to assist them against Alonso VI., who threatened to overthrow their dominion in the Peninsula. Yussef required of them to place the town of Algeciras in his power, to secure his retreat in case of a failure; but to this proposal they would not consent. The King of Seville, however, went to Marocco to hasten the expedition.

Yussef sailed for Spain in 1086, at the head of a numerous army, landed on the coast of Andalusia, and marched to Estremadura. King Alonso hastened from Aragon to stop his progress, and met the Almoravides in the plains of Zalaca. Yussef summoned him by a letter to embrace the faith of the Prophet, and to pay him an annual tribute, or prepare for battle. 'I am told,' said the Moor, 'that thou wast desirous to carry the war into my country: I spare thee this trouble. Allah brings thee into my presence that I may punish thee for thy haughtiness and presumption.' The Christian prince, indignant at this insolence, trampled the letter under his feet, and answered the messenger,—'Tell thy master what thou hast seen! and tell him also not to hide himself during the battle; let him meet me face to face.' After this the two armies engaged, and the battle was obstinate on both sides. The Christians fought like heroes, but were compelled to retreat at nightfall, and the king himself was severely wounded.

Yussef was called back to Africa, and left the command of the Almoravides to Syr ben Abubekr. The next year he returned with considerable reinforcements, and defeating, one by one, the Moorish kings of Spain, established the seat of his empire at Cordova, and caused his son Ali to be proclaimed his successor. Yussef died at Marocco, in the year 1106, at the advanced age of ninety-seven. Clemency and humanity were prominent virtues in his character. Contemporary historians state that he never pronounced a sentence of death. The vast empire of the Almoravides, which now reached from Mount Atlas to the Sierra Morena, was destroyed by the Almohades in the year 541 of the Hegira, A.D. 1147. [See ALMOHADES.] (See D'Herbelot, *Bibliothèque Orientale*. Condé, *Dominacion de los Arabes en España*. *The Chronicle* of Rodericus Toletanus. Casiri, *Bibliotheca Arabico-Hispana*.)

ALMS-HOUSE, an edifice, or collection of tenements, built by a person in a private capacity, and endowed with a revenue for the maintenance of a certain number of poor, aged, or disabled people. England is the only country which possesses alms-houses in abundance, though many such exist in Italy. In England, they appear to have succeeded the incorporated hospitals for the relief of poor and impotent people, which were dissolved by King Henry VIII.

ALNUS, or **ALDER**, is the generic name of a small group of plants belonging to the natural order *Betulineæ*. It was formerly united with the birch in the same genus, but modern botanists have separated it, because its fruit is wingless and its stamens only four.

Several species are described in botanical works, most of which are found in America, between the mountains of New Granada and Hudson's Bay: a small part belongs to Europe, and northern and middle Asia. Of these, the only species that need be noticed here, are the common, the Turkey, and the heart-leaved alders.

Alnus glutinosa, the common alder, is an inhabitant of swamps and meadows in all Europe, the north of Africa and Asia, and North America. Its favourite station is by the side of rivulets, or in the elevated parts of marshy land where the soil is drained; it does not thrive so well if placed in absolutely stagnant water. Next to the charcoal from black dogwood (*Rhamnus frangula*), that supplied by the common alder is of the best quality; and this tree is in consequence extensively cultivated in plantations belonging to the manufactories of gunpowder. Its juice contains a great abundance of astringent matter, which renders the bark valuable for tanning, and the young shoots for dyeing various colours when mixed with other ingredients; the veiny knots of its wood are cut into veneer by cabinet-makers, for ornamental purposes; and its stems, hollowed out, are among the best materials, next to metal, for water-pipes and underground purposes.

Its foliage being large, and of a deep healthy green, the alder is rather an ornamental tree; and when old it frequently becomes a picturesque object, if unbroken or uninjured by the hatchet of the woodman.

An Old Alder Tree.

Several varieties of the common alder are met with in collections, and among them one, called the *cut-leaved*, which is extremely ornamental when young: there is also another, with very much lobed leaves, called the *hawthorn-leaved*, in which almost all trace of the usual appearance of the alder has disappeared.

Alnus incana, the Turkey alder, or upland alder, is distinguished from the preceding by its more erect mode of growth, and by its leaves being destitute of clamminess, but covered instead with copious white down on the under side. It is found all over continental Europe, from Sweden to the north of Italy, and east beyond the Caucasus, as far even as Kamtchatka. Like the common alder, it shows itself in a number of varieties, among which several are of dwarfish stature; but its general character is to grow more rapidly, and to acquire a larger size than the common alder. What makes it particularly valuable is, that it will grow on light land where there are neither rivulets nor ditches; an important property, as it can scarcely be doubted, from its appearance, that it possesses whatever useful qualities are found in the common alder. Botanists seem to suppose that the Turkey alder is their *A. oblongata*, but this is a manifest error.

A. cordifolia, the heart-leaved alder, resembles but little in appearance either of the preceding. It forms a rather large, and very handsome round-headed tree, with broad, deep-green, shining leaves, deeply heartshaped at the base. It grows with rapidity, and is one of the most interesting ornamental trees that have of late years been introduced into cultivation. Though a native of the kingdom of Naples, and a most distinct species, its very existence was unknown till within a few years. It is a perfectly hardy plant, notwithstanding its southern station.

All the alders are increased with great facility by layers; they will also strike readily enough from cuttings, but the latter are longer in becoming handsome plants. Common alder is obtained by the nurseryman from seed; which should, if possible, be sown in very light, rich, damp soil, in the autumn, soon after it is ripe. If kept till the spring, even if preserved in sand, it loses in a great degree its power of vegetating; and if not kept in sand, it will scarcely ever grow at all.

ALNWICK or **ALNEWICK**, a considerable town in the county of Northumberland, 34 miles N. by W. from Newcastle, and 310 N. by W. from London, on the great road to Edinburgh through Berwick-upon-Tweed. It is situated on a declivity on the south bank of the river Aln, over which is a stone bridge of three arches. The town is well laid out; the streets spacious, well paved, and lighted with gas; the houses chiefly of stone, of modern date, and some of them of considerable elegance. The chief entrance to the town is by the four streets, 'Bond-Gate,' 'Narrow-Gate,' 'Potter-Gate,' and 'Clayport.' In the first, the ancient gate, from which it derives its name, and which was erected by Hotspur, is still standing. It would have been taken down some years since, (when another gate which had stood till then was removed,) being regarded by the town's-people as a nuisance; but it was preserved by the then Duke of Northumberland from respect for the memory of its warlike founder. In the centre of the town is the market-place, a spacious area or square: on one side of the square is the town-hall, a large and commodious stone building, surmounted with a square tower; and on another side is an elegant modern structure, erected by the present Duke of Northumberland, the under part of which is used as stalls or shambles for the sale of butchers' meat, with a fish and poultry market at the east end, and above is a very elegant assembly-room, and also a spacious reading-room, which his grace has appropriated to the use of the gentlemen of the town and neighbourhood. The church is a very handsome edifice with a neat tower, dedicated to St. Mary and St. Michael.—The living is a perpetual curacy, of which the Bishop of Durham is patron. There are several meeting houses for dissenters; and chapels for the Wesleyan and primitive methodists, and Roman catholics.

The most remarkable object connected with Alnwick is the ancient castle to the N.W. of the town, the residence of the Duke of Northumberland. This had been suffered to go very much to decay till it was completely repaired several years since; and it is now one of the most magnificent specimens in the kingdom of an old baronial residence. The building is of freestone, and as well as the repairs and ornaments is in the Gothic style, and in excellent taste. The grounds, which are five miles long, and through which flows the Aln, exhibit every species of natural and artificial beauty, including the remains of two ancient abbeys. The interior of the castle is splendid; and the chapel, with its exquisitely painted east window, its ceiling copied from that of King's College chapel at Cambridge, and its gilded and painted mouldings and stucco work, is an object worthy of attention.

The trade of Alnwick and its manufactures are not very considerable. A woollen manufactory was once established, but the undertaking failed. The market is on Saturday, chiefly for corn; and there are fairs on the 12th of May, the last Monday in July, and the first Tuesday in October. On the eve of the July fair deputies from the adjacent townships attend the bailiff of Alnwick during the ceremony of proclamation, and keep watch and ward during the remainder of the night.

The municipal government of Alnwick is in the hands of a corporation, consisting of a bailiff, (nominated by the Duke of Northumberland, as constable of the castle,) four chamberlains, and twenty-four common-councilmen. The common-councilmen are chosen from among the freemen of the incorporated companies, and the chamberlains from among the common-council. The freedom is inherited by the eldest sons, or acquired by servitude. Upon taking it up, the candidates are subjected to a ludicrous ceremony of passing through what is called 'Freeman's Well.' This is a miry pool some twenty feet across, and said to be from four to five feet deep in many places. On St. Mark's day (25th of April) the candidates, clad in white, with white night-caps, mounted, and with swords by their sides, accompanied by the bailiff and chamberlains similarly mounted and armed, and preceded by music, proceed to this pool, which is said to be deepened and stirred for their especial benefit. They then dismount, scramble through the pool, several, perhaps, being tumbled over in the bustle, and after changing their befouled garments, ride round the boundaries of the town. The tradition is that the observance of this absurd custom was enjoined by King John, as a penalty, it is said, for their carelessness in neglecting to keep up the roads near the town, owing to which he was bemired in a bog in this neighbourhood. The municipal officers have no magisterial authority, the town being under the jurisdiction of the county magistrates; but they have considerable revenues, part of which has been employed in erecting pumps to supply the town with water, and part is devoted to keeping up three free-schools for the children of freemen, to which other children are also admitted on payment of a small fee. The quarter-sessions for the county are held here in turn with Newcastle, Hexham, and Morpeth; and there is a county court monthly for the recovery of small debts. The elections for Northumberland took place here previous to the passing of the reform bill; and it is still one of the polling places for the northern division of that county. It has been said that it once returned members to parliament, but finding their salary burdensome, petitioned to be relieved from the charge.

There are several schools in Alnwick, besides those already mentioned as supported by the corporation. A national school for 200 boys was founded by the late Duke of Northumberland in 1810, on the completion of the fiftieth year of the reign of George III. There is a school for clothing and educating girls, under the patronage of the Duke and Duchess of Northumberland, and several Sunday schools.*

The situation and strength of Alnwick castle rendered it in early times one of the strongest defences against the invasions of the Scots. Malcolm III. (of Scotland) besieged it in 1093; but was killed by a soldier from the garrison, who approaching, with the keys on the point of his lance, as if he were going to surrender them, slew the king, and escaped by the speed of his horse. The story that he pierced the king in the eye, and hence obtained the name of *Pierce eye* (Percy) is a mere fable. Prince Edward, son and heir of Malcolm, attempting to revenge his death, was defeated and lost his life. In 1174 William the Lion, one of Malcolm's successors, besieged the castle with a large army, but being surprised at a distance from his camp, he was taken prisoner, and his army in consequence retreated. There was at Alnwick an abbey of Premonstratensian canons, the revenue of which, at the dissolution, was about 190*l*. The Earl of Beverley takes the title of Baron from this town: it is in 55° 24′ N. lat., 1° 43′ W. long. Population of the parish in 1831, 6788.

ALOE, a genus of succulent plants belonging to the natural order *Asphodeleæ;* it comprehends a very considerable number of species which differ from each other exceedingly in the size, form, and surface of their leaves, in stature, and in the colour, size, and structure of their flowers. The greater part of them are mere objects of curiosity, and are only seen in collections of succulent plants; but among them are species of much value, on account of their yielding the well-known medicinal drug of the same name.

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* A mechanic's institution was established a few years ago, and the members of the society have lately erected a handsome building.

From what particular species the resinous substance called Aloes is procured, and whether the different samples known under the name of Hepatic, Soccotrine, and Horse Aloes are yielded by different species, or are only different qualities of the same species, are points not settled.

All that appears certain is that plants nearly related to *Aloe perfoliata* of Linnæus, which some consider distinct species, while others pronounce them mere varieties of each other, are what the drug is prepared from. In all probability, all the species of the genus having an arborescent stem and thick succulent leaves will yield the substance equally well.

That which has the reputation of producing the best aloes is *A. Soccotrina;* a plant having, when old, a round stem three or four feet high; leaves of a sword form, a foot and a half to two feet long, sharp-edged, sawed, hard, and pungent at the apex, often collected in clusters at the top of the stem; and red flowers tipped with green, borne in clusters on tall stalks which rise erect from among the leaves.

[Aloe Soccotrina.]

This is a native of the Cape of Good Hope, and the Island of Soccotora, but it is now commonly cultivated in the West Indies. The processes of preparing the drug are various. Sometimes the leaves are cut off at their base and placed in iron vessels to drain, until they have discharged all their juice, which is then inspissated; in other places, the leaves are cut into slices and boiled for ten minutes, after which the water in which they have been boiled is evaporated; occasionally pressure is resorted to for the purpose of procuring the greatest quantity of juice.

Soccotrine aloes seem to be the purest kind obtained by draining only; hepatic or Barbadoes aloes are less pure, and may be obtained by boiling or slight pressure; while horse-aloes are undoubtedly a coarse preparation of the dregs of the last-mentioned.

No plants can be more easy to cultivate artificially than the aloe tribe. They are incapable of parting rapidly with water, and therefore require to be planted in a soil that is very slightly retentive of moisture, so that they may not be gorged with it by their roots; for this reason, they are potted in a compost consisting of little more than lime rubbish mixed with a small quantity of ordinary soil, and carefully drained. They require a green-house which is capable of being maintained at a temperature not less than 40° in the depth of winter, at which time they should have no water whatever; in the summer they want no fire heat, but may be watered regularly, the supply being always in proportion to their rate of growth and to the temperature of the air, that is to say, when in full growth and in a high temperature, they may have abundance of water, and when growing slowly in a low temperature they should have but very little. [See Agave.]

ALONSINE or ALPHONSINE TABLES, an astronomical work, which appeared in the year 1252, under the patronage of Alonso X., in the first year of his reign. They contain the places of the fixed stars, and all the methods and tables then in use for the computation of the places of the planets: but they are not made from original observations, nor is there any material difference between the astronomy contained in them and that of Ptolemy, except in two points. The length of the year is supposed to be 365 days, 5 hours, 49 minutes, and 16 seconds; which is a more correct value than had been given before, being only 26 seconds over the best modern determinations. The mean precession of the equinoxes is stated at half its real amount; being such as would carry the equinoctial points round the circumference of the globe in 49,000 years. An inequality, however, is supposed, having a period of 7000 years, by which the mean precession is alternately augmented and retarded 18 degrees. It is difficult to say whence a theory so utterly at variance with the phænomena could be derived. The general opinion is, that these tables were constructed by Isaac Ben Said, a Jew, but others suppose that Al Cabit and Aben Ragel, the preceptors of Alonso, were the real superintendents. The numbers above cited, in speaking of the precession, have been supposed from their connexion with the number 7, and the difficulty of accounting for them otherwise, to have been the ideas of a Jew. These tables are constructed for the meridian of Toledo, and the epoch 1256. They were not held in much esteem by succeeding astronomers. Regiomontanus says, 'beware lest you trust too much to blind calculation and Alphonsine dreams.' And Tycho Brahé, who reports that 400,000 ducats had been spent upon them, laments that this sum had not been employed in actual observation of the heavens. A full account of their contents may be seen in Delambre, *Hist. de l'Ast. du Moyen Age*, p. 248. Till the time of Copernicus and Tycho Brahé they continued in general use, being in truth, with some modifications, a body of Ptolemæan astronomy. They were first printed in 1483 by the celebrated Ratdolt of Venice. A copy of this *editio princeps* is in the Royal Library at Paris. Subsequent editions appeared in 1488, 1492, 1517, 1521, 1545, 1553.

ALONSO is the name of several kings of Spain and Portugal. This name is written by the Spaniards, Ildefonso, Alphonso, Alfonso, and Alonso, and by the Portuguese Affonso. We have chosen the form Alonso, as being that in most common use.

ALONSO I., surnamed the Catholic, was chosen king of Leon in 739. He was the son-in-law of Pelayo, and a descendant of King Leovigild. He wrested from the Moors Lara and Saldaña, in Castile, and extended his confined empire over nearly one-fourth of Spain. He is blamed for his cruel conduct to his enemies, whom he exterminated to a man, and formed new colonies of Christians. His cruelty may be extenuated when we consider it as a just retribution on the head of the descendants of the equally sanguinary hordes of Tarik and Muza. Alonso founded new churches in the towns which he conquered, and rebuilt or repaired the old: it is owing to his zeal for the glory of God, that the epithet of Catholic was given him. He died lamented by his subjects, in 757, and was succeeded by his son, Fruela I. (See Mariana, book vii., chap. 6.)

ALONSO II., called the Chaste, elected king of Leon in 791, was the nephew of Bermudo the Deacon. His reign was a continual scene of warfare both against the Moors and against his rebellious subjects. To this king is attributed the abolition of the disgraceful tribute of a hundred maidens, which the Spaniards were bound, from the time of Mauregato, to pay to the Moors.

The amours of his sister Doña Ximena with the Count of Saldaña—the wonderful exploits of Bernardo del Carpio, who was the offspring of this love, against the no less famous French hero Roland—also belong to this period. All this history, however, is considered by the best critics as belonging to the region of fable and romance. Alonso died about the year 843; he was succeeded by Ramiro I., son of Bermudo the deacon. (See Mariana, vii. 9, 12.)

ALONSO III, surnamed *El Magno* (the Great), King of Leon, succeeded his father Ordoño I. in 866, at the age of fourteen. In the beginning of his reign, the Count of Galicia Fruela invaded his kingdom, and forced Alonso to fly to Alava; but the citizens of Oviedo formed a conspiracy against the usurper, assassinated him, and Alonso entered the town in triumph. The Count of Alava Eilon also revolted, but was defeated and imprisoned at Oviedo, where he died a natural death. Alonso gave Navarra in fief to Iñigo Arista, with a view to oppose a bulwark to the ambition of the French, and to be better able to pursue the war against the Moors. To strengthen this compact, he married the Princess Ximena, a relation both of Iñigo and of the French kings.

Alonso now turned his attention to the Mohammedans; and in thirty years of continual warfare his arms were always crowned with victory. He extended the boundaries of his empire to the banks of the Guadiana. But Alonso, though successful against his natural foe, was not so against his domestic enemies. His own son Garcia, aided by the ever-rebellious barons, by his father-in-law the Count of Castile, by his brother Ordoño, governor of Galicia, and even by his own mother, attempted to dethrone the aged monarch. Alonso succeeded in crushing the rebellion. The son was delivered up to his father by a detachment of his own troops, and consigned to a prison; but the rebels, far from being discouraged by this misfortune, availed themselves of this to forward their cause. They roused the feelings of the people by representing to them the cruelty and tyranny of the father, and extolling the innocence of the son. Alonso, fearing the evils of a civil war, called a junta in 910, and abdicated the crown in favour of Garcia. The government of Galicia he entrusted to his second son Ordoño, and the youngest, Fruela, had that of Oviedo bequeathed to him.

Alonso, after having paid a visit to the shrine of Santiago, in Galicia, whose church had been built and enriched by him, asked troops from his son, and won, as a private individual, a fresh triumph in his old age over the infidels. Shortly after this victory, he died at Zamora, in 910. He reigned forty-eight years, and was a brave, just, and generous prince; he was succeeded by his son Garcia. (See Mariana, book vii., ch. 17—20; and the *Chronicles* of Alonso el Sabio, Rodericus Toletanus, and Lucas Tudensis.)

ALONSO IV., called El Monge, the Monk, king of Leon, succeeded Fruela II. in 925. Six years after his accession to the throne, he abdicated in favour of his brother Ramiro, and retired to the monastery of Sahagun. Two years had scarcely elapsed when he left his cell again to claim the kingdom; he was defeated by his brother, who consigned him to a monastery, and sentenced him to the loss of his eyes, according to the Visigoth code. Alonso died ten years after, and was succeeded by his brother, Ramiro II. (See Mariana, book viii., ch. 5; and the *Chronicles* of Alonso el Sabio, Rodericus Toletanus, and Lucas Tudensis.)

ALONSO V. succeeded his father Bermudo on the throne of Leon in 999, being only five years of age. The government, during his minority, was entrusted to a regency, which was a very eventful one. During it, the great Almansor was defeated, and this success led to the conquest of Cordova. Notwithstanding this victory, the Moors invaded his territories, and caused great devastations. When Alonso came of age, he made a treaty with Mohammed, king of Toledo, and gave him his sister Theresa in marriage. He endeavoured to repair the losses caused by the Saracens during his minority, rebuilt and repeopled the city of Leon, and transferred to it his residence. He attempted also to unite the crowns of Leon and Castile by marrying his son Bermudo to Ximena, the sister of the Count of Castile, and his daughter to the count, offering to the latter the title of king. This unfortunate count was inhumanly murdered on paying his first visit to his intended father-in-law, by the son of a certain Count Vela, a vassal of his father, who had fled to Leon, and had been kindly received by Alonso. This unfortunate event prevented the projected union of the two kingdoms. Alonso was killed at the siege of Viseu in 1028; his son Bermudo III. succeeded him. (See Mariana, book viii., ch. 10, 11; and the same authorities as before.)

ALONSO VI. was the son of Fernando I. He was crowned king of Leon in 1066. Fernando had committed the same fault as his father in dividing his states among his children. He left Leon to Alonso, Castile to Sancho, Galicia to Garcia, and the cities of Toro and Zamora to Urraca and Elvira, his two daughters. Alonso and Sancho lived in peace with each other only two years. In 1068, Sancho invaded the states of his brother, and defeated him on the banks of the river Pisuerga. After this battle, they made a truce for three years, at the expiration of which another engagement took place, in which the Leonese were defeated by the Castilians. Alonso was made prisoner, and confined in the monastery of Sahagun, from which, however, he escaped, and sought a refuge at the Moorish court of Toledo. In 1072 Sancho was assassinated while besieging Zamora, and Alonso hastened from his exile to take possession of the vacant throne. Asturias, Leon, and Castile acknowledged his authority. He invited his brother Garcia to his court and shut him up in the castle of Luna, where he remained until his death, and Galicia was thus added to the states of Alonso.

Having remained undisputed lord of so large a portion of the Peninsula, Alonso turned his arms against the Saracens. He invaded Portugal, and made most of the Moorish petty chiefs his tributaries. He afterwards took Coria, and then attacked Toledo; and had not the Almoravides with a powerful army invaded Spain, he would have expelled the Moors from the peninsula. He gave his illegitimate daughter, Theresa, in marriage to Henry, Count of Besançon, with his conquests in Portugal, and the title of count. During his reign, the famous hero Rodrigo Diaz de Vivar, surnamed the Cid or Sidi, the Moorish word for Lord, performed those exploits which have furnished abundance of materials to romance writers.

King Alonso died in 1109, at Toledo, in the seventy-ninth year of his age, and forty-third of his reign. He was a prince modest in prosperity and constant under adversity, and suffered with patient resignation the vicissitudes of fortune. His son Sancho having fallen in a battle against the Moors, the crowns of Leon and Castile fell to his eldest daughter, Urraca. (See Mariana, books ix., x., ch. 8—20; 1—8.)

ALONSO VII. [See ALONSO I. of Aragon.]

ALONSO VIII., king of Castile and Leon, styled the Emperor. At the death of his mother, Queen Urraca, he became king in 1126. The misrule of that princess's government, and the wars which had devastated Castile during the latter part of the preceding reign, rendered the beginning of his own very stormy. He was obliged to conquer several places which still acknowledged the authority of his step-father, Alonso VII. At last the two princes were reconciled, and Alonso VIII. remained sovereign lord of Castile and Leon. About the year 1137 he was obliged to march an army into Gallicia against the Count of Portugal, Alonso Henriquez. Though the Portuguese had the advantage, Henriquez sued for peace, which Alonso readily granted.

In 1140, he formed the project of conquering the kingdom of Navarre, but was compelled to make peace with its king, Garcia. The two kings cemented this treaty by the double marriage of Garcia with a daughter of Alonso, and a son of the latter with a princess of Navarre In his wars with the infidels, Alonso was more successful. He obtained many signal victories over them, and advanced the Castilian frontiers to Andalusia. His last battle against the Almohades was undecisive; after which he returned towards Toledo, but near the village of Fresneda he was seized with a mortal disease, and died in his tent in August, 1157. Alonso VIII. was a prince of no common qualities. He deserved the praise of great firmness and valour, by which qualities he made his state respected by his neighbours, while he enlarged it by his conquests. At the close of his reign, the military order of Alcántara, to which Christian Spain owed so much, was instituted. He was succeeded in Castile by Sancho III.; and in Leon by Fernando II.; (See Mariana, books x., xi., ch. 8—20., 1—7.)

ALONSO III. of Castile was only three years of age at the death of his father, Sancho III., in 1158. His minority was a very stormy one. The two families of Castros and Laras quarrelled for the guardianship of the young king, and caused much blood to be shed. Alonso married Eleanor, daughter of Henry II. of England, in 1170, and from that time he exercised the regal authority without control. In 1195, he was defeated by the Almohades at Alarcos, but he avenged this affront in the famous battle of *Las Navas de Tolosa*, where he destroyed the most numerous army that ever crossed the strait of Gibraltar, after the first invasion.

[See ALMOHADES.] Shortly after this memorable victory, he died at Garci Muñoz, in 1214; he was succeeded by his son Enrique I. (See Mariana, books xi., xii., and the same authorities as before.)

ALONSO IX., king of Leon, succeeded his father Fernando in 1188. He was dubbed a knight by his cousin, Alonso III. of Castile. For a short time the two relatives lived on good terms; but in 1189, there was a dispute between them about the possession of some territory in Estremadura. To strengthen himself against his powerful antagonist, Alonso IX. married the Princess Theresa of Portugal. This lady being his near relative, Pope Celestine III. annulled the marriage, and the parties not being willing to separate, both Leon and Portugal were placed under an interdict. In 1195, however, they complied with the order of the pope.

Alonso continued a most distressing warfare against his cousin, the king of Castile, but at last this prince gave him his daughter Berengaria in marriage, from whom Alonso IX. was also forced by the pope to part on the same plea of relationship. The marriage, however, was not dissolved without first having obtained from the pope a declaration of the legitimacy of their children. This measure led again to a war between the two princes, but by the mediation of the pope, a reconciliation was effected.

Alonso now directed his arms against the Moors, and conquered Merida, Caceres, and other important places in Estremadura. After having subdued almost all that province, he dismissed his army; and while on his road to Santiago, he died at Villanueva de Sarria, in 1230, after a very stormy reign of forty-two years. His son Fernando III. succeeded to the crowns of both Leon and Castile. (See Mariana, books xi., xii., ch. 16—22; 1, 2; *Chronicle* of Alonso el Sabio.)

ALONSO, or **ALFONSO X.**, surnamed *El Sabio*, (the Wise,) King of Castile and Leon, was the son of Ferdinand III., called the Saint. He was born in 1222, and on the following year was acknowledged crown prince by the Cortes at Burgos. While crown prince he took the kingdom of Murcia from the Moors, and accompanied his father to the conquest of Seville. In 1252 he was proclaimed King of Castile and Leon, in the city of Leon, after his father's death. The first act of his reign was to renew the alliance with Alhamar, the Moorish king of Granada, and to relieve him from the tribute which he paid to Castile, in acknowledgment of the eminent services which that king had rendered to his father.

The public treasury was exhausted by the long wars of the preceding reign, and Alonso, in order to improve his finances, had recourse to a measure, which must always prove dangerous. He caused the *escudo burgales* to be put in circulation, instead of the *pepion*. Both these coins were of equal nominal value, but the former much inferior in intrinsic worth. This measure increased the distress, obliged the king to raise the salaries of the public functionaries, and was the cause of the civil discord which ended with his dethronement.

In 1256, the Emperor of Germany being dead, some of the electors proposed Alonso as a candidate, on account of his literary qualifications, but more particularly for his relationship to the deceased emperor by his mother's side. The Archbishop of Cologne, in his name and in that of the bishop of Mayence, and the count Palatine, chose Richard, Earl of Cornwall. The Archbishop of Treves and the Elector of Saxony considered the election as invalid, and chose Alonso. Ambassadors were sent to Castile, but the king, owing to some domestic embarrassment, was unable to be present in Germany.

The Moors of Spain having received considerable reinforcements from Africa, made an irruption in the territory of Castile, and reconquered Jerez, Arcos, Medina-Sidonia, Bejer, San-Lucar, and other places; but their triumph was of short duration. On the following year, Alonso, with a considerable force, marched against them, defeated them in a succession of battles, and forced the King of Granada to do homage to Castile, and pay a considerable sum as an indemnification for the expenses of the war.

In 1265, his first cousin Maria, the wife of the unfortunate Baldwin II., Emperor of Constantinople, came to Spain, to implore the assistance of her relative for the delivery, according to some historians, of her husband, who was detained in captivity by the sultan of Egypt: and, according to others, of her son, retained by the Venetians as a pledge for a certain sum lent by them to Baldwin when he was reduced to great distress by the King of Bulgaria. Alonso generously gave her 30,000 marks of silver.

In 1269, the marriage of Fernando de la Cerda, Alonso's eldest son, to Blanca, daughter of St. Louis, King of France, was solemnized; and in 1271, Castile began to experience the terrible scourge of a civil war. Alonso had reconquered Murcia, and was occupied in organizing that province, when the King of Granada came to complain of the injury that Alonso had done him by secretly countenancing the rebellion of his subjects in Guadix and Malaga. The answer of Alonso sent Alhamar back more dissatisfied than he came. The restless Laras, and Philip, the unnatural brother of Alonso, now saw an opportunity of gratifying their resentments, by urging the Moorish king to take up arms against Castile, and by promising that they, with other barons, would openly pass over to his side.

The king having been acquainted with this plot, left Murcia and went to Valencia, to consult with his father-in-law, the king of Aragon; he also sent his ambassador, Arana, to the turbulent nobles assembled at Palencia, and ordered his son, Don Fernando, then at Seville, to prepare himself for the impending war. Arana was unsuccessful in his mission. The king now convoked the Cortes at Burgos, and summoned the rebellious grandees, offering them a safe conduct. In order that the Cortes might deliberate with more freedom, he ordered it to be held at the Hospital Real, out of the city. After several tumultuous debates the assembly was dissolved, and the parties separated, more embittered against each other than before. The insolent barons in leaving Burgos devastated all the country round, and several of them went over to the Moors. The complaints of the nobility were chiefly these:—that their privileges had been sacrificed to please the people; that their military service was too long continued: that their contributions were too heavy; and that they could not submit to be judged by the supreme courts of Castile.

In 1273, Rudolph of Hapsburg was elected emperor of Germany. The King of Granada also having died this year, the plans of the nobles were partly frustrated: and Alonso felt the more desirous to settle his domestic affairs at any cost, in order to be better able to forward his pretensions abroad. He therefore again convoked the states at Avila. Some of the grandees visited him privately, and appeared better disposed for peace. The queen and the Archbishop of Toledo went to Cordova, and endeavoured to reduce the others to obedience. Alonso then proceeded to Seville. The new King of Granada, the rebel barons, and the prince Fernando, his son, came from Cordova to Seville, and being very kindly received by the king, civil discord was for a time appeased.

The King of Marocco, Aben Yussef, availing himself of the absence of Alonso in France, where he had gone to have an interview with the pope, made a descent on Andalusia with a powerful army. Nuño de Lara wrote to the prince regent to come to his assistance, and, inviting the nobility of Andalusia to unite against the common enemy, offered battle to the Moors near Ecija, but lost it, with his life. Prince Don Fernando, hastening to his assistance, died at Villa Real. The Archbishop of Toledo was also defeated near Jaen. Don Sancho, the king's second son, undertook with more success the defence of the country. He conquered the Africans in several encounters, and at last made a truce for two years with Yussef, and the Moorish king reembarked with the rest of the army for Africa. Sancho immediately hastened to Toledo, under the pretence of visiting his father on his return, but his true object was to establish his claims to the throne against his nephew, the son of Don Fernando. At the request of Alonso's brother, who was in favour of Sancho, the Cortes were assembled at Segovia to settle the question. This body, in consideration of the services rendered by Sancho, and to avoid the danger of a long minority, decided that Sancho should succeed his father. The king refused to sanction this proceeding, and the country became the theatre of a disastrous civil war.

To meet the exigencies of this war, Alonso had again recourse to an alteration of the circulating medium, and a coin of inferior intrinsic value to the standard was put in circulation. This measure greatly irritated the people; and notwithstanding a recent victory over the Moors of Granada, he was every day more disliked. In 1282, he summoned the Cortes to Toledo, with the view of bringing his son to obedience by pacific and legal means. Sancho, instigated by his uncle and the nobility, called the Cortes to

Valladolid, which was more numerously attended than the meeting at Toledo. This body offered him the crown, which he refused to accept; but his uncle in the name of the nobility pronounced the sentence of deposition against his aged brother, and proclaimed Sancho king of Castile and Leon and father of the country.

Alonso, seeing himself now abandoned by the nobility and the people, deposed by his unnatural relations, and deserted by all his friends, went to his ever-faithful Seville, and from that place wrote a letter to Alonso Perez de Guzman, who was at Marocco, and enjoyed the favour of Aben Yussef, describing to him in the most affecting manner the terrible situation in which he was placed, and requesting the aid of the African monarch, as a pledge for which Alonso sent to Yussef his royal crown. This prince immediately dispatched Guzman with a considerable sum to Seville, and soon after himself, at the head of a numerous army, made a descent at Algeciras. At Zahara the two kings had the first interview. Alonso rose from his seat and offered it to Yussef, but the African monarch would not accept this honour, and courteously said to the Castilian, 'Sit thou there, who art a king from the cradle: I am one only through my valour.' After treating about the best manner of conducting the war, the Africans marched to besiege Cordova, where the prince was.

Alonso returned to Seville, and collecting as great an army as he could muster, proceeded to join the besiegers. The garrison defended the town with courage, and after twenty days the siege was raised. The Moors retired to Ecija, having done nothing but devastate all the country round. Alonso, while on his march towards that place, being informed that Yussef intended to keep him prisoner, secretly went to Seville. The African chieftain, feeling offended that his loyalty should be put in doubt, re-embarked for his country, not, however, without leaving to his friend a thousand chosen horsemen, and requesting to be permitted to keep them in his own pay.

Alonso now held a solemn *junta* at Seville, and disinherited Sancho, pronouncing a curse against him as a rebellious and unnatural son. Sancho, however, was not at all affected by this proceeding; on the contrary, his party became every day stronger. His father again called Yussef, but, to give a better colour to this step, he was advised to direct his arms against the King of Granada, who had embraced the cause of Sancho. He also endeavoured to obtain assistance from France. At last he employed the arms of religion, and requested of Pope Martin V. to excommunicate his son. The pope complied with his wishes, and the rebellious towns were placed under an interdict. Sancho began to be deserted by all his friends: the first who set the example were his two brothers. Some of the towns revolted against him and returned to their allegiance. His kind father again tried means of reconciliation, and an interview was planned, but did not take place.

Alonso returned to Seville, and, overpowered by so many misfortunes, died on the 21st of April, 1284. In his will he expressed his desire that his grand-children, the sons of Fernando, should succeed him, and in case of their death, the King of France, and made no mention of Sancho, who, however, succeeded him. Alonso was buried at Seville. 'His sepulchre,' says Mariana, 'is not very rich, nor was it necessary that it should be so; for his life, notwithstanding his faults and the calamities that happened to him, renders his name and memory eternal. He would have been a greater king if he had possessed the knowledge of himself, and had not stained his excellent qualities by ambition and severity. He was the first king of Spain who ordered all public documents to be written in Spanish, with the view of polishing and enriching the language. He caused also the Bible to be translated. It is indeed astonishing,' adds he, 'that a king who had been brought up in war, and exercised in arms from his early youth, should be acquainted with astronomy, philosophy, alchemy, jurisprudence, and history, to a degree scarcely attained by men enjoying a life of leisure, or having no other occupation than study.' He has left us a monument of his learning, or of his patronage of learning, in his *Chronica de España*, in the astronomical tables called *Alfonsinas*, in a code of laws denominated *Las siete Partidas*, and in some poems and other productions, which are still unedited.

His enemies have endeavoured to deprive this learned prince of the merit of having been the author or compiler of *Las Partidas*, pretending that this code was written by his father. It is, however, worthy of remark, that every one of the Partidas begins with one letter of his name, forming the following acrostic:—

1st. A l servicio, &c.
2d. L a fé católica, &c.
3d. F izo nuestro Señor, &c.
4th. O nras señaladas, &c.
5th. N ascen entre, &c.
6th. S esudamente, &c.
7th. O lvidanza y atrevimiento, &c.

The accusation of blasphemy, with which they have also branded his name, is, in our opinion, a fabrication. It rests on no other authority than a revelation which an Augustine monk at Molina had from heaven. This miracle is related at full length in the History of Spain and Portugal in Lardner's *Cabinet Cyclopædia*, Appendix I., vol. ii., p. 317. (See *Chronica del Rey Don Alonso* (British Museum); Mariana's *Historia de España; Garibay's Compendio Historial de las Chronicas;* Nicolao Antonio, *Bibliotheca Hispana vetus; &c.*)

ALONSO XI. king of Castile and Leon, succeeded his father Fernando IV. in 1312, being only a few months old. A long series of convulsions attended his minority. When he came of age he quieted the intestine disturbances, and seriously pursued the wars against the Infidels. He took Tarifa and Algeciras from them, but died of the plague while besieging Gibraltar, in 1350. His memory would have for ever been cherished by the Spaniards, had he not stained it by the murder of his kinsman Juan el Tuerto, and his amours with Doña Leonor de Guzman. He was succeeded by his son Pedro the Cruel. (See Villasan's *Cronica del Rey Don Alonso el Onceno.* Mariana, book xv.)

ALONSO I., King of Aragon, surnamed El Batallador, the Battler, succeeded his brother Pedro in 1104, and having married Queen Urraca of Castile and Leon, was styled king of those provinces also. The unprincipled conduct of his wife was not calculated to render so virtuous a man as Alonso happy. He applied to the pope to annul his marriage; and in 1114, a council assembled at Palencia solemnly decided on the separation of the ill-sorted couple.

Alonso, now free from internal troubles, turned his attention to the war with the infidels, and in a succession of victories rescued from their grasp almost all the territory south of the Ebro. He laid siege to Saragossa, and after four years of struggle he entered it by capitulation, in 1118, and made it the capital of Aragon. In 1120 he defeated a numerous army of the Almoravides near Daroca. Tarragona, Meguinenza, and Calatayud were also among his conquests; and he carried his victorious arms even to Andalusia.

In 1134 he invested Fraga, when the wali of Valencia, Aben Gama, advanced with a considerable force to relieve the town. The latter offered battle to Alonso, which he gallantly accepted, but the Christians were defeated, and their king killed. Alonso I., notwithstanding the charge of cruelty, in his wars against his wife and step-son, made against him by the Castilian chroniclers, was a brave and virtuous prince. He was succeeded by his brother Ramiro II. (See Florez's *España Sagrada; Chronica Adefonsi Imperatoris*, vol. xi.; Rodericus Toletanus, *De Rebus Hispanicis;* Mariana, x. 8.)

ALONSO II. succeeded his mother Petronila on the throne of Aragon when he was only eleven years of age. In 1167 he became Lord of Provence, by the death of his cousin, Count Gerard. He extended the frontiers of his kingdom on the side of the Mohammedans, penetrated into the territory of Valencia, and aided Alonso IX. of Castile in investing Cuenca. For this important service Aragon was made exempt from paying homage to Castile. Alonso died in 1196; and according to a custom very prevalent in Spain at that period, he divided his states between his children, leaving Aragon, Catalonia, and Roussillon to his eldest son, Pedro II.; and Provence to the second son. (See Rodericus Toletanus. Mariana, xi. 9—13.)

ALONSO III. was the son of Pedro III. King of Aragon. At the death of his father, in 1285, he was at Mayorca, where he had been sent by his father to dethrone his uncle Jaime, who had usurped the sovereignty of that island. Having succeeded in his expedition, he returned to Aragon, and found the Cortes assembled at Saragossa. This body sent a deputation to meet him at Valencia to express their surprise at his having assumed the title of king previous to his taking the customary oath before the Cortes of the realm. Not without great difficulty, and after many tumultuous debates, Alonso was acknowledged king, upon submitting to all the conditions required by that body.

Having thus settled matters at home, he turned his attention abroad. The dethroned King of Mayorca, now Lord of Roussillon and Montpellier, invaded Catalonia, but on the approach of Alonso he retreated. The Aragonese crossed the frontiers and laid waste the French territory. Besides this enemy, Alonso had to contend with the pope and the King of France, who strongly advocated the cause of Charles of Anjou, Prince of Salerno, then a prisoner of Alonso. Through the mediation of Edward I. of England, Charles obtained his liberty upon the promise of renouncing his right to the throne of Sicily, and obtaining the approbation of the pope and the King of France to this measure; in case he could not succeed, he was to return voluntarily to his confinement. Charles was unsuccessful, and Alonso, though he saw the united power of France and the pope threatening him, was not inclined to yield; but at the persuasion of Edward peace was obtained, although on conditions somewhat humiliating to Alonso. Edward offered him the hand of his daughter Leonora, but before the negociations were terminated Alonso died at Barcelona, in 1291, and was succeeded by his brother, Jaime II. (See Zorita's *Anales de Aragon*, vii.; Mariana, xiv.)

ALONSO IV., son of Jaime II., ascended the throne of Aragon in 1327. The Genoese not only fomented dissension in his new conquests of Sardinia, but even dared to attack him in his own kingdom. They made various descents on Catalonia and Valencia, but were repulsed. At home, his son and successor Pedro raised the standard of revolt against him, because his father had given some possessions to his half-brother Alonso. These dissensions were in a great measure the cause of his death, which took place in Barcelona in 1336. He was succeeded by his son, Pedro IV. (See Zurita's *Analès*, book vii.; Mariana, book xvi.)

ALONSO V. [See ALFONSO I. of Sicily.]

ALONSO I., King of Portugal, was the son of Henry, Count of Besançon, who held Portugal in fief with the title of Count. At his father's death Alonso was only two years old, and his mother governed the state in his minority. This princess was not very exemplary in her conduct, and when her son became of age, he was forced to apply to arms and wrest the sovereignty from her, or rather from her paramour, Fernando Perez. He was also several times at war with his cousin Alonso VIII. of Castile, but in 1137 they made peace, and the Portuguese count being disengaged from his domestic enemies, turned his mind to foreign affairs.

He assembled his army at Coimbra, with a view to attack the infidels. The King of Badajos and four other Moorish chieftains also mustered an army, far superior in numbers to that of the Portuguese. Though the count had the advantage of a superior position, his soldiers, seeing the immense number of the unbelievers, began to show signs of fear. Alonso encouraged them with the assurance of the protection of Heaven. The struggle was severe on both sides, and at last victory declared for the Christians. An incredible multitude of Africans remained dead on the field, the number of which is estimated by the Portuguese historians at 200,000. In the exultation of victory, the count was proclaimed king by his followers, which title he assumed from that day. This battle was fought in the plains of Ourique, in the province of Alemtejo, in the year 1139.

In 1146 Alonso took by assault the fortress of Santarem from the Saracens, and put to the sword all its inhabitants without distinction of age or sex. In the next year he took Lisbon, when the fleet of English crusaders, who were going to the Holy Land, rendered him very effectual assistance. He afterwards reduced Cintra, crossed the Tagus, and possessed himself of several towns in Estremadura and Alemtejo. In 1158 he reduced Alcazar-do-Sal after a siege of two months. In short, Alonso almost freed all Portugal from the yoke of the Saracens.

This king, the founder of the Portuguese monarchy, was not a warrior only—he was also a legislator. Under his reign a code of laws was promulgated at the Cortes of Lamego. These laws chiefly treated on the succession to the crown, the duties of the nobles and the people, and the independence of the kingdom.

Alonso died in 1185, at Coimbra, in the 91st year of his age. His memory is deservedly held in the highest veneration by every true Portuguese. He was succeeded by his son Sancho I. (See Brandaon's *Monarchia Lusitana, Chronicon Lusitanum*; Mariana, book x.—xi.; Lemos, book ix.)

ALONSO II. ascended the throne of Portugal in 1211, on the death of his father Sancho I. He began his political career by endeavouring to deprive his sisters of the castles bequeathed to them by their father. This step led to a war with the King of Leon, who espoused the cause of the infantas. This war was productive of many evils to his kingdom. In his conquests over the Saracens he did not signalize himself so much as his predecessors had done. Alonso seemed not to have held the church in very high veneration, as he subjected the clergy to personal military service, and their possessions to contribute the same as the laity towards the support of the state. In fact, he attempted to abolish entirely all ecclesiastical immunities. The consequence of these measures was that Pope Honorius III. placed the kingdom under an interdict. Alonso was forced to yield, and was pardoned on his promise of making ample satisfaction for his past offences. Before he could fulfil his promise he died, in 1223, and was succeeded by his son, Sancho II. (Rodericus Toletanus, book viii.; Lemos, book xii.)

ALONSO III. succeeded his brother Sancho II., in 1248. Before his accession, through some cause not sufficiently stated by the historians, he was a poor exile in France, when Matilda, Countess of Boulogne-sur-Mer, not only gave him protection, but, together with her hand, conferred on him her states and property. His brother having attacked, like his father, the immunities of the church, was, by a decree of Innocent IV., deprived of the regal authority, and Alonso entrusted with the administration of the government.

Having sworn allegiance to the pope, Alonso sailed for Lisbon, and on his arrival was received with enthusiasm by all classes of the nation. His brother finding himself deserted by his subjects fled to Castile, and after some fruitless attempts to procure his restoration, retired to Toledo, where he died in 1248.

Alonso embroiled himself with his namesake of Castile about the possession of Algarve, but finding his antagonist too powerful for him he sued for peace. The treaty was confirmed by Alonso's marriage with Beatriz de Guzman, a natural daughter of the Castilian, the Portuguese king shamefully deserting his great benefactress, the virtuous Matilda, on the plea of her barrenness. Alonso's conquests from the Mohammedans were not very numerous. He died in 1279, after a reign of thirty-one years, and was succeeded by his son Dennis. (See *Chronica Conimbricensis*; Mariana, book xiii.; Lemos, book xiii.)

ALONSO IV., surnamed the Brave, ascended the throne of Portugal on the death of his father Dennis in 1325. During his father's lifetime he rebelled against him through jealousy of the partiality shown by Dennis to his illegitimate son Alonso Henriquez. Several times both father and son were reconciled, and again gave way to their uncontrolled passions, plunging their unfortunate nation in all the horrors of civil discord. Shortly after their last reconciliation Dennis died, and his son Alonso was acknowledged king of Portugal.

His first act was to exile his illegitimate brother, and deprive him of his honours, and even of the Duchy of Albuquerque, which he held by his marriage with the heiress of that family. In the early years of his reign he almost entirely abandoned the concerns of the nation to devote himself to his favourite amusement of hunting. Through the intrigues of the Infante Juan Manuel, he was embroiled with his son-in-law Alonso XI. of Castile. Scarcely was his dispute with the Castilian settled, when he had to encounter disturbances of a more serious nature, in the unlawful intercourse of his son Pedro with Inez de Castro his mistress. His own weakness, and a mistaken zeal for the welfare of his kingdom, induced him to give his consent to the barbarous murder of that unfortunate lady, which plunged the state into a civil war. Pedro raised the standard of rebellion against his father, and possessed himself of almost all the north of Portugal. After much bloodshed a reconciliation was effected between father and son, and not long after Alonso died tormented by the remembrance of his murderous deed. As he had been a disobedient and rebellious son, so Heaven permitted his crime to be visited on him, by the same conduct from his own son. His death took place in 1357, after a stormy reign of thirty-two years, and he was succeeded by his son, Pedro I. (See *Chronicon Conimbricense;* Lemos, book xvii.)

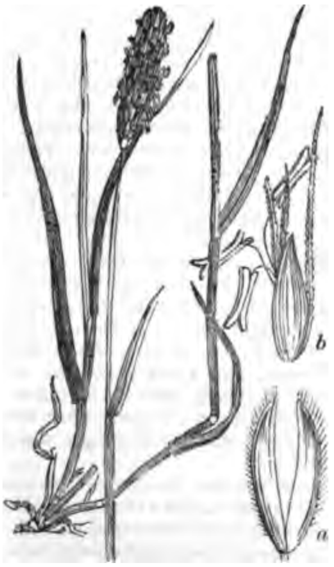
ALONSO V. was the son of Duarte. At the death of his father in 1438 he was only six years of age. His minority was very disturbed and eventful. His mother, Leonora of Aragon, who was appointed regent by her husband, was, as a foreigner, obnoxious to the Portuguese nobility. Three uncles of the young king disputed the regency with her, and, after much bloodshed, she was obliged to quit Portugal, leaving the government in the hands of the Infante Pedro, the most politic and ambitious of the young king's uncles. In 1446, Alonso having reached his fourteenth year, seized the reins of government. The conduct of the young king, at first, was such as to promise a happy reign; but the enemies of the regent Pedro soon gained his favour and kindled the torch of a civil war, which ended with the death of the ill-fated regent.

In 1457 Alonso fitted out an expedition against the Moors. He landed in Africa with 20,000 men, and took Alcazar, Seguer, and Tangier. Notwithstanding his partial success, he encountered many reverses. He also engaged in an unfortunate war with Castile; and not long after, having concluded a peace with that nation, died of the plague in 1479, in the forty-ninth year of his age, and forty-third of his reign.

Alonso V. collected a copious library, and gave his protection to all literary persons. He was succeeded by his son Joaõ II. (See Ruiz de Pina's *Chronica do Senhor Rey Dom Affonso V.;* Mariana, book xxi.; Lemos, book xxvi.)

ALOPECU'RUS is a genus belonging to the natural order *Gramineæ*, or grasses, and is distinguished from all other British kinds, by its flowers, which grow in close cylindrical heads, consisting of two glumes (*a*) of equal size and a keeled, compressed figure, enclosing a single palea (*b*), from the base of which arises an arista or beard. It contains many species, the only important among which is

Alopecurus pratensis, the meadow foxtail grass, a valuable plant to the farmer. It is so much larger than any other British alopecurus as to be easily recognised, and from *Phleum pratense*, which it resembles, it may be immediately known by its not having two paleæ, and by its beard proceeding from its palea and not from its glumes. It grows commonly in meadows, where it forms rather a coarse, but an abundant and early herbage, of which cattle are very fond. In such situations it is invaluable, but it becomes worthless if sown on light dry soil.



[Alopecurus Pratensis.]

ALOST, or AALST, a town of East Flanders, on the Dender, fifteen English miles W.N.W. of Brussels, 50° 56′ N. lat. 4° 5′ E. long., has a population of above 12,000, who carry on a considerable trade; vessels of small size being able to ascend the river as far as Alost. Good hops are grown in the neighbourhood, and there is a considerable hop-market in Alost.

The streets of Alost are kept very clean by a number of volunteer male and female scavengers who sweep up the dirt into small heaps and carry it off to certain places assigned for this purpose, where it lies till they can dispose of it to the farmers in the neighbourhood. The farmers have a kind of religious feeling in favour of the manure collected by these poor people, and think that their charity in purchasing, at a somewhat higher rate, from these industrious scavengers will ensure them a better crop. The street-sweepers show a most conscientious scrupulousness in not invading the dung-heaps of their neighbours.

ALP ARSLAN, (*i. e.* the Brave Lion,) or with his complete name, Mohammed ben Dāud Alp Arslan, born A.D. 1030, was the nephew of the Seljukide Sultan Togrul Beg, whom the Abbaside Caliph Kaïm-biamr-illah had, for the protection of his throne, invested with the dignity of Emir al Omara, or Commander-in-chief of the whole empire, and who, when nearly seventy-five years old, had also married a very young daughter of that caliph. Togrul Beg died in 1063, and as he left no children, his nephew, Alp Arslan, who had till then been governor of Khorasan, succeeded him as sultan of the Seljukes. Alp Arslan restored the youthful widow of Togrul Beg to her father, demanding, at the same time, to be appointed Emir al Omara in the place of his uncle, a request which the caliph could not refuse. One of the first acts of Alp Arslan's reign was to put to death the grand vizir of Togrul Beg, together with six hundred of his adherents. Nizam al-Mulk, who was chosen for that office by Alp Arslan, has earned the reputation of one of the greatest statesmen of the East. Alp Arslan was about to extend his dominions by conquests in Transoxiana, when a revolt in Azerbijan, instigated by Kutulmish, required his presence there. He defeated the rebellious prince near the city of Rei, and resumed in the ensuing year (1065) his conquests in Transoxiana, while his vizir Nizam-al-Mulk endeavoured to promote the welfare of the interior, and to advance the interests of literature and education by establishing colleges in the principal towns of the empire. The greater part of Syria was at this time already in the hands of the Turks, and the troops of the Greek emperor offered but little resistance to their further progress. Romanus Diogenes, who came to the throne in 1068, resolved to take more vigorous measures against them. He joined his army in person, and defeated the Turks in several battles in Cilicia and near Malatia; but he was unsuccessful in an expedition against Khelat, and was, in 1071, taken prisoner in a battle near Malazkurd (or Melezghird) in Armenia. Alp Arslan treated him generously, and on his promise to pay a considerable ransom, released him and all the noble prisoners from their captivity. But the Greeks had, in the mean time, placed Michael Parapinacius upon the throne, by which circumstance Diogenes was prevented from fulfilling his engagement. This caused a renewal of hostilities. Alp Arslan's son, Malek Shah, conquered Georgia, while the sultan himself was preparing an expedition against Turkestan. He crossed the Jihon, and commenced the war by taking the fort of Berzem; its governor, Yussuf Kothual, was led before Alp Arslan as a prisoner, and when reproached by him for the trouble he had given him by his long and useless resistance, became so incensed, that he rushed upon the sultan, and with a dagger inflicted a mortal wound upon him, of which he died (1072.) Alp Arslan was buried at Merw in Khorasan. His son Malek Shah succeeded him in the government.

ALPES, BASSES, (*The Low Alps,*) is one of the departments formed out of the old Provence, with the addition of the rich valley of Barcelonette, which was in Dauphiné. It is on the frontier, and has the county of Nice, in the continental dominions of the King of Sardinia, on the E.; on the S. it is bounded by the department of the Var, on the W. by that of Vaucluse, and on the N. by that of the *Hautes Alpes* (High Alps). It lies between 43° 41′ and 44° 40′ N. lat.

The chief river is the Durance, a rapid stream which rises near Mont Genèvre, passes through the department of the Higher Alps, and, after separating it from that of the Lower Alps, enters the latter, and crosses it from N. to S., ultimately falling into the Rhone a little below Avignon. The tributaries of this stream are the Ubaye, the Bléone, the Asse, and the Verdon, which last forms the southern boundary of the department. These successively fall into the Durance on its left bank. The rivers and streams of this department often cause great mischief when they overflow their banks. The surface of the department includes 2811 English square miles, with 153,000 inhabitants, being about

54 persons to a square mile,—a smaller proportion than in any other department except Corsica. It sends two deputies. This scanty population may be taken as indicating a barren soil and an unfavourable temperature, which we should also expect from the mountainous character of the district. The high valleys are covered with snow during six months of the year. Some of the valleys are, however, more fertile; that of Barcelonette, watered by the Ubaye, affords pasturage to numerous flocks of sheep and herds of oxen; while Digne, in the otherwise desolate valley of the Bléone, is surrounded by meadows and orchards, vineyards and olive plantations. Nearly 25,000 acres are devoted to the culture of the vine, and about 140,000 are occupied by wood. The potato is cultivated to a considerable extent. There are salt springs near Castellane, but it does not appear whether they are now turned to account; and mineral waters at the village of Greoux, in the S.W. angle of the department. The department contains lead, calamine, some coal, copper, and iron. A singular custom prevails among the peasants between Sisteron and Digne, of wrapping the dead in a winding-sheet, placing them on the roofs of the huts, and covering them during the winter with snow. There are several antiquities in the department, especially the remains of some ancient temples near the little town of Riez, near the southern border. Digne is the capital of the department, but, excepting on this account, has few claims upon our notice. It is situated in the midst of mountains, and has steep and narrow streets, enclosed by old walls. Its chief buildings are the cathedral, and the residences of the prefect and the bishop. It carries on a trade in dried fruits, and has a population of about 4000. There are a college and a library, as well as a society of agriculture. Digne is 465 miles S. E. by S. of Paris. There are some tolerably well-frequented warm springs in the neighbourhood; and the small village Champtercier, not far off, was the birth-place of the philosopher Gassendi. Sisteron, about equal to Digne in population, is 24 miles N.W. of the town, measuring by the road, which takes a considerable circuit. The altar of the cathedral is adorned by a fine painting by Wanloo. Barcelonette, N.E of Digne, has a population of 17 or 1800; Castellane, S.E. of Digne, is rather more populous: Forcalquier, S.W. of Digne, has rather more than 2100 inhabitants. Each of these four is the capital of an arrondissement, of which divisions there are five, the remaining one being that of Digne. Riez, noticed above, has nearly 3000 inhabitants.

ALPES, HAUTES (*The High Alps*), a department, lying along the northern boundary of the last-mentioned, which it resembles in its physical character. The branches of the magnificent mountain chain from which it takes its designation, pervade it, and form valleys, through which the Durance, and the minor streams which fall into it or into the Isère, (another tributary of the Rhone.) take their way. The upper part of the course of the Durance is entirely in this department; it rises near Mont Genèvre on the eastern frontier: it receives on the right the Gursane, the Gyronde, and the Buech, a longer stream than the other two, and which does not join the Durance till after it has entered the department of the Low Alps: on the left it receives the Servies and the Guil. The Drac flows first in a westerly and then in a northerly direction, and falls into the Isère, in the department so called, which adjoins that of the High Alps on the N.W. The N.E. boundary is formed by the main chain of the Alps, which separates the French and Sardinian dominions; and the communication between these at this part is by the pass of Mont Genèvre, about 6480 feet above the level of the sea. [See Genèvre, Mont.] To the W. of the department is that of Drome.

Several of the summits in this department are among the loftiest of the Alps. The highest point is Mont Pelvoux de Vallouise, which is 13,438 English feet above the level of the sea. Mont Viso, which, if not in the department, is upon the Piedmontese frontier, is about 12,580 feet high. Mont Genèvre is 11,788 feet high, (M. Brun.) The mountains cover two-thirds of the department, and in the narrow valleys the snow lies on the ground so long as to impede the operations of the farmer. The slopes, however, furnish pastures for sheep, which have fine wool and flesh, and for goats. About 17,000 acres are devoted to the cultivation of the grape; nut-oil is also made. The quantity of wood-land is greater than in the department of the Low Alps, being about 180,000 acres. The mineral wealth of this department is considerable, and includes copper, lead, zinc, iron, antimony, &c. The population is 125,000, being rather larger in proportion to the surface (2101 square English miles) than in the department just referred to. It sends two deputies.

The department is divided into three arrondissements, *viz.* Gap, Embrun, and Briançon: Gap, the capital, is a town of 7000 inhabitants, situated in a small plain bounded by mountains, which form an amphitheatre. [See Gap.] Briançon is not far from the source of the Durance, and is remarkable for its strong position and its elevation, being about 4280 feet above the level of the sea. Its inhabitants, 2800 in number, carry on a trade in woollen and cotton goods, and cutlery. Embrun, much lower down the stream, has 2300 inhabitants, possesses a fine episcopal palace, (for it was once the seat of a bishopric,) and a still finer cathedral, said to have been built by Charlemagne. In Lake Pelhotiers near Gap is the 'Trembling Meadow,' a small floating island. (For the heights of the mountains, see *Orographie de l'Europe.*)

ALPES, MARITIMES, a department formed out of the county of Nice and the principality of Monaco, while these belonged to France, but which was done away when they were ceded by France in 1815.

ALPHABET is the name given to the series of letters used in different countries at different times. The term is borrowed from the Greek language, in which *alpha, beta,* are the first two letters; or if we go a step further back, we should derive the word from the Hebrew, which gives to the corresponding letters the names *aleph, beth.* Thus the formation of the word is precisely analogous to that of our familiar expression, the *A, B, C;* and some writers have found a similar origin for the Latin name given to the letters, viz. *elementa,* which, it must be allowed, bears an extraordinary similarity in sound to the three liquids, *l, m, n;* but to make this derivation satisfactory, it should be proved that these letters were at one time the leaders of the alphabet, for otherwise it would be difficult to account for the selection of a name from them in preference to the rest.

Among the different causes which have promoted the civilization of man, there is none, we might almost say, which has been so fruitful as the invention of the alphabet; and the very circumstance of the invention being essential to this effect, and therefore preceding it, has made it a task of some difficulty to point out the mode in which the discovery was made, for historical evidence upon such a point must be very imperfect. The present age, however, has nearly surmounted this difficulty, and we begin to see pretty clearly at least how the discovery *might* have been made, perhaps how it actually was made. Oral language itself, we might almost infer *à priori,* originated in an attempt to imitate by the organs of the human voice those different sounds which nature, in her animate and inanimate forms, is constantly presenting to our ears. By his powers of articulation man could imitate those sounds at pleasure, and thus recall to the minds of those around him the notion of absent objects and past actions with which the sounds were connected. Thus, in its various forms and combinations, the single principle of *sound* would afford a vast number of symbols which might be made to represent, at first, the material objects of nature, or the action of those objects upon one another. The transference of these signs from particular objects, that make an impression on the *ear,* to the expression of abstract qualities, would be governed by the same principles of association. That such must have been the origin of spoken language, reason would seem to point out, and the historical investigation of the subject strongly confirms the theory. On the other hand, the language which takes the *eye* for its channel of communication with the mind, would in its first steps be more direct and more simple. The objects of nature and many of the external relations between them were easily represented to the eye with more or less rudeness, by a stick upon sand, and by many other means of graphic imitation which even the savage may command. Yet when we compare these two modes of language with one another, we shall soon perceive that *sound* is a more convenient medium of ordinary communication, if it be only for the reason that the voice is ever with us, and that the ear is ready to receive impressions from every direction, above, below, and around us. A deaf and dumb savage who should wish to depict to a friend an object upon the sand must first catch the attention of his companion by the sense of touch, just as in modern manufactories where the speaking pipe is used, a bell is attached to it, the ringing of which first directs the party who is to be addressed to apply his ear to the other extremity of the pipe. The result of a comparison then between these two forms of language may, perhaps, be fairly stated thus. The language of pictorial symbols is more easily invented and understood at first. The other, when once invented and understood, is better adapted for the ordinary uses of life. The difficulty of invention, however, is a difficulty that occurs but once; the difficulties in the after use of the language, such as they are, never cease. In the last place, sound travels without the aid of light. It is therefore natural to conceive that oral language would approach a comparatively perfect form with much greater rapidity than that which addresses itself to the eye.

But the time would soon come when it would be desirable to record for a shorter or longer time the acts and thoughts, and commands and duties of man; and here the language of the voice would utterly fail, while the other might ensure a continuance of existence, depending upon the nature of the material on which the representation might be made. In less than a second the sound of the human voice dies away, but the picture even on the sea-sand lasts until the next tide washes it away; the waxen tablet would preserve its characters long enough for the purposes of epistolary communication; the papyrus, the cloth of linen and cotton, the bark of trees, the harder woods. the skins of animals, would retain the impressions upon them for centuries; and lastly, bricks, and stone, and metal, under favourable circumstances, might convey their records to a posterity of many thousand years. Now to represent visible actions and visible objects would, as we have already stated, be an easy affair, and the signs for abstract qualities might be obtained, as in sounds, upon the principle of association. But instead of forming a new series of associations, which would not easily become generally intelligible, it would no doubt be found more convenient, occasionally, to turn to account the already existing language of sound. A few examples may perhaps explain our meaning. Visible objects, in the first place, may be directly represented. No pictorial symbol of an *ox* can so readily convey that notion to the mind as the representation of the animal itself. or, in order to save time, that part of the animal which is most characteristic of it might, and would, be selected; in the present case we should propose the head of the animal with its horns. To signify a visible action, such as *fighting*, we should, perhaps, avail ourselves of the *fist*, as the natural organ for that purpose belonging to man, following therein the same direct principle of association which has formed the Latin word *pugnare*, to fight, from the element *pugnus*, or rather *pug*, a fist. In this way we should form a series of symbols altogether independent of the language of sound; but we repeat, it would often be more convenient to make the language of visible signs in part dependent upon the oral symbols. This may be most simply effected by what is in fact a species of punning: If, for instance, a symbol were required of an Englishman for the abstract notion of *friendship*, he might employ the two separate signs for a *friend* and a *ship*; the first of which we will suppose to be *two hands clasped*, the other, of course, *a hull with a mast* and enough *rigging* to distinguish it from other objects. We should thus have two pictorial symbols, which would separately excite in the mind first the *notions*, and then the oral names of *friend* and *ship*, and the combinations of these sounds would recall that new notion, for which the articulate sounds of the word *friendship* are already the conventional symbol. Books of amusement for children have been formed upon this principle, and we have seen in them such a sentence as—*I saw a boy swallow a gooseberry*—formed by uniting the pictures of an *eye*, a *saw*, a *boy*, a *swallow*, a *goose*, and a *berry*.

So far we have only considered what the origin of written language might have been. The records still existing of the Egyptians have enabled modern discoverers to deduce with an evidence closely approaching to certainty what it actually was. The hieroglyphic characters of Egypt bear upon the very face of them decided proof that they are in their origin pictorial emblems; and that they constitute a language, appears incontrovertibly from the triple Rosetta inscription, the Greek version of which expressly affirms, that the decree contained in the inscription was ordered to be written in three different characters; the sacred letters, the letters of the country, and the Greek. The second of these classes has been called the *enchorial*, from the Greek term (ἐγχώριος) signifying *of the country*, or else *demotic*, (δημοτικὸς) i. e. *of the people*. But although the hieroglyphic characters may be for the most part pictorial emblems used directly for the objects which they represent, or metaphorically for other associated ideas, it has been established by most satisfactory evidence, that they were also in some cases representatives of articulate sound, not, however, of the whole oral name belonging to their original object, but solely of the initial letter, or perhaps syllable. This use of the sacred pictorial characters as symbols of sound was perhaps originally confined to the expression of proper names. Such, for instance, is their use in the hieroglyphic division of the Rosetta inscription for the name of Ptolemy and in another inscription for that of Cleopatra. Thus, the former name might be expressed hieroglyphically in our own language by the pictures of *a pig*, *a top*, *an owl*, *a lion*, and *a mouse*. It should be added, however, that when the sacred symbols are used with this phonetic or vocal power for royal names, they are included in an oval ring or cartouche. The enchorial character seems at first to bear little or no resemblance to the hieroglyphic; but a comparison of various manuscripts that have been found in mummies, containing parallel passages in the two characters, has led to the certain conclusion that the enchorial themselves have arisen from the degradation or corruption of the sacred pictorial characters. Dr. Young, in his excellent article on Egypt, in the Supplement to the *Encyclopædia Britannica*. has given specimens which are perfectly sufficient to establish the connexion. The subject, however, of Egyptian writing in its different forms requires an investigation of so many details, that we must refer our readers to HIEROGLYPHICS. We must here be satisfied with stating what appears to us to be a safe conclusion, that a language originally hieroglyphic, would naturally wear away until the characters lost nearly all trace of their original formation on the one hand, and became, eventually, the mere representatives of phonetic powers, first, perhaps, as syllables, afterwards as mere letters.

The Hebrew alphabet again affords double evidence of the same nature. The names of the letters, it is well known, are also the names of material objects, some of the very objects, in fact, which would be well adapted to pictorial representation. A part of these names, it is true, are obsolete in the Hebrew language as at present known, *i. e.* the authority for their meaning is solely traditional, as they are not found in the existing writings of the language; but this fact, while it affords evidence that the names are not the result of forgery, is precisely what must necessarily have occurred in those changes to which all language is exposed in the long course of ages. We have given a table with the Hebrew names of the letters, which it will be seen have been borrowed, with slight changes, for many other alphabets. But it will be objected that, in fact, the letters, whatever they may be called, bear no pictorial resemblance to the objects which it is pretended they represent. If the Hebrew characters alone be considered, this objection will not be unreasonable. But there is strong reason for believing that the present Hebrew characters are of comparatively modern date, and if so, there is nothing very violent in the supposition that they may have been derived by degradation from an earlier pictorial form, as the enchorial of the Egyptians, it is now established, arose from the corruption of their hieroglyphics. But not to rely too strongly upon theory, we may appeal to what are virtually *Hebrew* alphabets, though called Phenician and Samaritan. In Plate I. (p. 382) Nos 2, 3, 4, 5, the reader will see specimens of these alphabets. The first two are taken from Boeckh's *Inscriptions*, pp. 523, 527, and from the coins given by Mionnet. The Samaritan characters are taken solely from Mionnet. Now among these, we find a few at least, which, even to the sober minded, bear considerable resemblance to the natural objects. The first letter in these alphabets, *aleph*, it is well known means *an ox*; indeed, the terms ἐλέφας, *elephas*, *elephant*, of the Greek, Latin, and English languages, seem to be derived from this Hebrew name. If in Syria the name *aleph* was extended to the *elephant*, just as the Greeks applied their term *crocodile*, properly a *lizard*, to the monster of the Nile—when the word came to the western nations in connection with the *elephant*, the original sense would be readily lost in the secondary. The Romans too called the same animal *Bos Lucas*, the *Lucanian Ox*. We have already stated that the most simple mode of representing an ox would be by a picture of its head and horns, and if any one will turn the engraving of our second Phenician character, so as to have the angular point downwards, he will see a very fair picture of an ox's head, with its two horns, and ears into the bargain. Those who are determined to take nothing for a representative of an ox that has not a body, four legs, and a tail, may be asked to account for the astronomical figure of *taurus* in the zodiac.

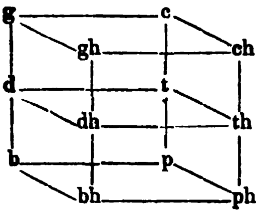
Again the Hebrew name for the letter *m* was *mem*, and this also was the name for water. Now a very ordinary symbol for water is a zigzag line, which is no doubt intended to imitate undulation or rippling. We find this symbol for *aquarius* in the zodiac, and we find it also in Greek manuscripts, both for *θάλασσα* the sea, and *ὕδωρ* water, the former word having the symbol inclosed in a large circle or *theta*, the latter having its aspirate duly placed above the waving line. Indeed every boy in his first attempt to draw water, represents it by a zigzag line. But before we point out in the written characters what we look upon as representing the wave, or (to be candid) as being the corrupted remains of what once was a wave, we must premise a few words on the characters of the older Western languages. We have already asserted our belief, that the Hebrew characters now used are of more recent form than those in the Phenician and Samaritan alphabets—we will now go one step farther, and express our opinion, that in many of the characters, the Greek alphabet and the Etruscan (which, notwithstanding its independent name, is a mere offset from the Greek) generally present a more accurate picture of the original letters than those of the three former alphabets. That all these alphabets are identical in their origin, we will presently show in more detail. It is enough here to rely upon the evidence of Herodotus, (v. 58) who expressly affirms (and he speaks from his personal examination) that the Ionians received their characters from the Phenicians, and that they were actually called Phenician. Now, there is no doubt that the inscriptions from which we have taken the Greek characters of our plate, are older, at least, than either the Phenician inscriptions given in Boeckh, or the coins which furnished Mionnet with his characters. Hence, we may naturally expect to find at times in the oldest Greek characters traces of a higher antiquity and purer forms than in those which pass under the more venerable names of Hebrew, Phenician, and Samaritan. The mere wave, then, we contend, was probably the original form of the *mem*: the initial or concluding stroke of the wave becoming, by a kind of flourish, longer than the others, leads to the so-called Etruscan and Greek forms in columns 6, 9, 14, 15, 16, 18. This long descending stroke takes a bend in the Samaritan and Hebrew characters towards the left; as was not unnatural in a language where the words run in that direction. By a comparison of the *gimel*, *nun*, *ayin*, and *pe*, and perhaps *caph*, with the corresponding letters in the other alphabets, the reader will perhaps be induced to ascribe the bottom strokes, which in these letters also run to the left, to the same accidental origin. This supposition is strongly confirmed by the fact, that the *caph*, *nun*, *pe*, and *tsadi*, when they are the final letters of a word, omit this appendage, and in its place have the perpendicular stroke merely continued in the same direction downwards, a little beyond its usual length. Our last example shall be from *ayin*, which is at once the name of a letter and the word which signifies an *eye*. The eye happens moreover to be an hieroglyphic character of the Egyptians, and, therefore, we cannot be surprised to find it among the Hebrew symbols. Nay, if we may believe Champollion, the picture of an *eye* in the Egyptian hieroglyphics was actually used at times for an *o*, exactly as *ayin* by the Hebrews. Now, though an eye might be represented at first with tolerable precision, it would, in the inevitable course of degradation, soon become a mere oval, or rather circle (for the eyes of animals are generally circular) with a small dot in the centre to mark the pupil. Such a character is actually found in our Greek series of alphabets, Plate II, Column 21, &c. The form afterwards lost its inserted point, and at times was corrupted into a lozenge or even a triangle. In Dr. Young's successive plates of parallel passages from Egyptian MSS. (*Encycl. Brit. Supp.* Pl. 78. N.) the reader may see an emblem, consisting, like our own, of a circle with a point in it, gradually wearing down in MSS. less and less carefully written, until it becomes at first a mere circle, and then something more like a triangle. After what has been said, we need hardly repeat that the Hebrew form appears again in a very corrupted state. A tail has been added, upon the principle explained above, and the careless writer (as in the Greek letter, Plate II, Column 20) has failed to make his circle meet at the top, an accident which may be also traced in the Hebrew *theth*. Indeed, the letters *ayin* and *theth* may be compared in nearly all their forms. Those who examine the changes of letters, will not be surprised, that what was at first an accident, became at last a fixed rule in the formation. We shall soon see other instances of this fact.

But before we proceed to an examination of the alphabets given in our plates, it may be useful to consider the distribution of articulate sounds among the vowels, liquids, and consonants. Attempts have been made by some writers to determine the number of distinct sounds which the human voice is capable of producing. A little consideration would have shown them, that they were attempting to limit that which was essentially infinite. The vowel sounds all run into one another in a continuous gradation. The same is true of those modifications of sound which we call consonants, and likewise of the liquids. At the same time it is, of course, necessary that a limited number of symbols should be employed. Of these some nations will employ more, some less, but few have ever made use of so many as thirty, unless, indeed, we include those alphabets which consist of syllabic symbols, and then, of course, the consonantal syllables will be multiplied in the proportion of the simple vowels. The vowel sounds are usually placed in the order, *a*, *e*, *i*, *o*, *u*, such being their succession in the various alphabets of Europe and Western Asia; but if we wish to place them in that order, which marks their relation to one another, we should write *i*, *e*, *a*, *o*, *u*, or in the opposite order *u*, *o*, *a*, *e*, *i*. Mr. Willis, in a paper in the *Cambridge Philosophical Transactions*, has shown by experiment, that the different vowel sounds may be produced artificially, by throwing a current of air upon a reed in a pipe, and that, as the pipe is lengthened or shortened, the vowels are successively produced in the order above given. When a door creaks, or a cat squeals, we have experiments of the same nature, at least as regards the result, for in both these cases we may often detect the due series of the vowels. Thus, the word *mew* would be more expressively written *mieaou*. In all these remarks we speak of the vowels as possessing those sounds which are common on the continent, not those which are peculiar to ourselves; viz., *i* like *ee*, *e* like *ay*, *a* as in *father*, *o* as in *bone*, *u* as *oo* in *food*.

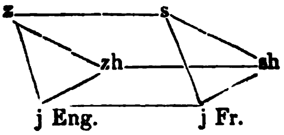
The liquids again should be written in the order *r*, *l*, *n*, *m* beginning from the throat and advancing along the palate and teeth to the lips; or in the reverse order. The other letters have often been divided according to their organs: 1st. the guttural and palatals, *g* (as before *a*), *k* (with *c q*); *gh*, *ch* (as in the Scotch *loch*); *h*, with perhaps *ng*, *y*, and *wh*. 2ndly, dentals, *d*, *t*; *dh* (as *th* in this), *th* (as in *thing*); *z*, *s*; *zh*, (like *ch* in *church*), *sh*; *j* (as in English), *j* (as in French). 3rdly, labials, *b*, *p*; *v*, *f* and *w*. Perhaps the four last of those we have included among the dentals partake in an equal degree of the palatal character. In the above enumeration of the consonants, we have placed first in their respective series, those commonly called the middle (or medial) letters *g*, *d*, *b*; then the *tenues*, or more delicate letters *k*, *t*, *p*; and then the aspirates; but as each class presents two forms of the aspirate readily distinguished by the ear, and as these pairs of aspirates stand in the same relation to one another as the *medial* and *tenues*, we have throughout placed what we may perhaps call the middle aspirate before its delicate relative, viz., *gh* before *ch*, or χ; *dh* before *th*; *v* before *f*. Perhaps among the labials, *v*, *f*, *w*, may be considered as aspirates: if so, they are still in their proper order. So among the six sibilants given after the dentals, it appears to us, that *z*, *ch*, and the English *j*, stand respectively to *s*, *sh*, and the French *j*, in the same relation of *medials* to *tenues*, and they are arranged accordingly. The letters *y* and *w* are *sui generis*, and are, indeed, intimately related to the vowels, having an affinity to the opposite extremities of the vocal series, *y*, *i*, *e*, *a*, *o*, *u*, *w*; and thus we may consider the commencement of the series as connected with the throat, and the termination with the lips.

A tabular arrangement, in which the *medial*, *tenues*, and *aspirated* letters are placed in vertical columns, while those belonging to the same organ are collected in horizontal rows, affords a good view of them. But the parallelopipedon furnishes an arrangement superior to that of the square for the twelve related consonants given below; and for the sibilants, the angular points of the prism may be employed; while the vowels and liquids require nothing more than a simple line.

1. Consonants.



2. Sibilants.



3. Liquids.

r l n m

4. Vowels.

y | i o a o u | w

In the preceding parallelopipedon, the three horizontal planes, beginning from above, represent the guttural or palatal, the dental, and the labial letters. The front vertical plane includes the aspirates, that at the back, the non-aspirates. The left vertical comprehends the medial letters, that on the right the *tenues*. Every letter is, of course, at the intersection of three of these planes, and may be defined accordingly.

A distribution of the letters according to the actual nature of the sounds is of considerable use in the examination of those numerous euphonic and dialectic changes which occur not only in the polished language of Greece, but also in those languages which are inconsiderately called barbarous. But no single distribution will at once present to the view all the relations of the different letters. Not merely are the several letters in each of our horizontal, and to a certain extent also in the vertical, divisions interchangeable with their neighbours, but the twelve consonants arranged in No. 1. are in fact also related to the liquids. and even to the vowels. As these consonants extend from the throat to the lips, so do the liquids, and the vowels also, *y* and *i* being formed in the back of the mouth, *u* and *w* at the lips. In fact, the principle of lengthening the vocal pipe, which gave Mr. Willis the series of vowel sounds, is nothing more than what is done in the human mouth. To produce the first sound, we shorten the tube of the mouth; for the last, we extend it to its utmost length: and in intermediate degrees for the vowels between the two extremes. In comparing, therefore, our ordinary consonants with the liquids and vowels, we find, as we might expect, *g* closely related to *y*. as our language in its older forms, and even its existing dialects, fully establishes. The intermediate *d* again has an affinity for *l*, *n*; and *b*, at the labial extremity of the consonants, is intimately related to *m*, *w*, and *u*, at the corresponding points of the other series. To make our views include the whole body of letters, it remains to be observed in the first place, that had the nasal organ been considered, we should have had a series *m*, *n*, *ng* with their intermediate sounds depending partly upon the nose, and partly upon the lips, teeth, and palate, respectively. In the Sanscrit alphabet, the series of guttural, palatal, lingual, dental, and labial consonants, have an *n* belonging to each class with a distinct symbol. That which belongs to the guttural series is a sound analogous to our *ng* in *ringing*. The nasal of the labial series is of course *m*. The other omission of our tabular view is the letter *h*, which, when pronounced at all, is a faint representative of the guttural aspirate *ch*. In the Hebrew alphabet, the names *cheth* and *heth* are given indifferently to the eighth letter, and the etymology of every language would supply examples of the connexion.

Having endeavoured to arrange the letters of the alphabet upon some principle, we cannot pass over in silence the apparent confusion in the alphabets we have been speaking of, the Hebrew and Greek. That the order observed in the latter is borrowed from the former can scarcely admit of a question. For though the *vau* of the Hebrew has no corresponding character in the later Greek alphabet, it is yet well known that it once had such a correlative in the *digamma*, at least in power; and that the digamma was actually lost from the sixth place is proved from the gap at that point in the numerical use of the Greek alphabet, and the clumsy contrivance of filling it up by the letter ϛ. The position of the letter F in the Roman alphabet is a proof in confirmation. The *tsadi* of the Hebrews can never have had a place in the Greek alphabet, but the following letter *koppa* most assuredly had, as is proved both by the existence of that letter in many of the older Greek inscriptions, and the coins of Croton, and no less decidedly by the insertion, as before, of a numerical substitute, which even retained the name of *koppa*. It may be observed too, that the Latin *q*, of the same power and form, corresponds also in position; and the close connexion between *koppa* and *q* is further confirmed by the fact, that as *q* is generally used solely before *u*, so *koppa* is rarely used except before *o*, as in the coins of Cos, Corinth, and Syracuse. The *schin* and *sin* of the Hebrew have in their own alphabet not merely an identity of form, except in the diacritic points, but bear also the same numerical value, so that they must be considered as one in their origin. At *tau* the Hebrew series terminates, while the Greek adds first a *υ*, then a *φ*, a *χ*, a *ψ* and an *ω*. That some of these did not belong to the early Greek alphabet is proved historically. The *ω* appears rarely before the year 403 B.C.; *ψ*, *χ*, and *φ*, were represented by ΦΣ, ΚΗ, ΠΗ, and *υ* or Υ appears to be only a variety of the *ayin*, to which it bears a strong resemblance in form. The letters *o* and *u* moreover in all languages are so closely related in power, that the one might almost supply the place of the other, as is actually the case in the Etruscan, which had a *u*, but no *o*. It is not, therefore, a very bold thing to assert that the early Greek alphabet terminated at the same point as the Hebrew. There is, however, a difficulty which should not be neglected. It has been a common assertion, that the old Greek alphabet consisted of only sixteen letters. But Pliny and Plutarch seem, in the first place, to be the sole authority for the statement; and the assertion of the former, that Palamedes in the time of the Trojan war (!) added Θ, Ξ, Φ, Χ, and Simonides Ζ, Η, Ψ, Ω, is full of so many difficulties that belief could not readily be given to him, even were there no counter authority. For upon what principle could the Greek letters have attained their present order, if they were introduced according to the chronological arrangement given by Pliny? But fortunately in the very passage of Pliny referred to, (vii. 56, or 57,) he gives another statement from Aristotle, differing from his own in several particulars, but it must be confessed not more satisfactory. They mutually serve, however, to weaken the authority of each other. In enumerating the sixteen letters it may be observed that the long vowels Η, Ω, the double letters Ζ, Ξ, Ψ, the aspirates Φ, Χ, Θ, are excluded by Pliny. In defence of Ω, Ψ, Χ, Φ we say nothing; but the character Η certainly did exist, not indeed as a long vowel, but as an aspirate. Thus with the *digamma*, the letter Η (*cheth*) and the *theta* the old alphabet possessed a complete trio of aspirates: so erroneous is the notion that they should all be excluded. Lastly, as for Ζ and Ξ, the circumstance of their situation corresponding precisely to the *zain* and *samech* of the Hebrew would induce us to defend them, even at the risk of supposing (if such supposition be necessary) that, in their original power, they were not double letters. We do not, however, mean that the very characters existed, but that sibilants of some kind occupied their places. The precise correspondence of the Greek and Hebrew alphabets in the order and power and names of the letters is an argument of much stronger weight than any testimony from such careless and late writers as Pliny and Plutarch.

But we are digressing too long from the question about the principle which governed the first arrangement of the Hebrew or old Greek alphabet, if principle there be. Though we cannot satisfactorily account for the whole order throughout the twenty-two letters, there are certainly traces of some regularity in the arrangement. We find first the simplest of the vowel sounds followed by the three medials, *β*, *γ*, *δ*; then another vowel, followed, with some irregularity indeed, by aspirates corresponding in order to the above consonants, *vau cheth*, *theth*, no bad representatives of *φ*, *χ*, *θ* Then again we have a vowel *ι*, followed soon after by three consonants related to each other, *λ*, *μ*, *ν*. Soon after we find a fourth vowel *o*, and after it, in a little disorder it must be allowed, *pi*, *koppa*, *tau*. It cannot well be a mere accident that the several classes of labials, palatals, and dentals occur so nearly together in the different parts of the series, and always in the same order. It will, perhaps, here be observed, that in these remarks we are unintentionally confirming the assertion of Pliny and Plutarch about the sixteen letters, the more so as Plutarch speaks of four quaternions. The objection to such an explanation of their statements is to be found in the difficulty of imagining a language to exist without a sibilant; otherwise the absence of an r might readily be supplied by *l*, as is actually the case in some languages. As for the sibilant, however, the *th* might possibly represent that sound.

The accompanying plates require a few remarks in addi

Coptic.

			Name.	Power.
1	Ⲁ	ⲁ	Alpha	a
2	Ⲃ	ⲃ	Bita or Vita	b v
3	Ⲅ	ⲅ	Gamma	g
4	Ⲇ	ⲇ	Dalda	d
5	Ⲉ	ⲉ	Ei	e
6	Ⲋ	ⲋ	So	s
7	Ⲍ	ⲍ	Zita	z
8	Ⲏ	ⲏ	Hita	i
9	Ⲑ	ⲑ	Thita	th
10	Ⲓ	ⲓ	Iauda	i
11	Ⲕ	ⲕ	Kappa	k
12	Ⲗ	ⲗ	Lauda	l
13	Ⲙ	ⲙ	Mi	m
14	Ⲛ	ⲛ	Ni	n
15	Ⲝ	ⲝ	Xi	x
16	Ⲟ	ⲟ	ŏ	o
17	Ⲡ	ⲡ	Pi	p
18	Ⲣ	ⲣ	Ro	r
19	Ⲥ	ⲥ	Sima	s
20	Ⲧ	ⲧ	Tau	t
21	Ⲩ	ⲩ	He	e
22	Ⲫ	ⲫ	Phi	f
23	Ⲭ	ⲭ	Chi	ch
24	Ⲯ	ⲯ	Psi	ps
25	Ⲱ	ⲱ	O	o
26	Ϣ	ϣ	Shei	sh
27	Ϥ	ϥ	Fei	f
28	Ϧ	ϧ	Khei	kh
29	Ϩ	ϩ	Hori	h
30	Ϫ	ϫ	Janja	j
31	Ϭ	ϭ	Shima	sh
32	Ϯ	ϯ	Dhei	dh

Ethiopian or Abyssinian.

		Name.	Power.
1	ሀ	Hoi'	ha
2	ለ	Lawi	la
3	ሐ	Haüt	ha
4	መ	Mai	ma
5	ሠ	Saut	sa
6	ረ	Res	ra
7	ሰ	Saat	sa
8	ቀ	Kof	ka
9	በ	Bet	ba
10	ተ	Tawi	ta'
11	ኀ	Hharm	hha
12	ነ	Nahas	na
13	አ	Alph'	a
14	ከ	Caf	ca
15	ወ	Wawi	wa
16	ዐ	Ain	a
17	ዘ	Zai	za
18	የ	Yaman	va
19	ደ	Dent	da
20	ገ	Gheml	ga
21	ጠ	Tait	tha
22	ጰ	Ppait	ppa
23	ጸ	Tzadi	tza
24	ፀ	Zzappa	zza
25	ፈ	Af	fa
26	ፐ	Psa ?*	pa ?

Additional Amharic Letters

ሸ	sha
ቸ	tja
ኘ	nja
ኸ	kha
ዠ	ja
ጀ	dja
ጨ	tsha

Moeso Gothic.

		Power.
1	𐌰	a
2	𐌱	b
3	𐌲	g
4	𐌳	d
5	𐌴	e
6	𐍆	f
7	𐌾	g or y
8	𐌷	h
9	𐌹	i
10	𐌺	k
11	𐌻	l
12	𐌼	m
13	𐌽	n
14	𐍉	o
15	𐍀	p
16	𐍈	q
17	𐍂	r
18	𐍃	s
19	𐍄	t
20	𐌸	th
21	𐌿	n
22	𐌵	cw or e
23	𐍅	w'
24	𐍇	ch or x
25	𐌶	z

Russian.

	Antient.	Modern	Name.	Power:
1	А	А	As	a
2	Б	Б	Booke	b
3	В	В	Vadi	v or f
4	Г	Г	Glaghol	gh
5	Д	Д	Dobro	d
6	Є	Е	Yest	e or ye
7	Ж	Ж	Sevetie	g
8	Ѕ	Ѕ	Zelo	z ?
9	З	З	Zemla	z
10	И	И	Ische	i or e
11	І	і		i or e
12	К	К	Kako	k
13	Л	Л	Liudi	l
14	М	М	Missal	m
15	Н	Н	Nash	n
16	О	О	On	o
17	П	П	Pokoi	p
18	Р	Р	Rtse	r
19	С	С	Slovo	s
20	Т	Т	Twerdo	t
21	Ү	У	Eek	ou
22	Ф	Ф	Phert	f
23	Х	Х	Kher	kh
24	Ц	Ц	Tse	ts
25	Ч	Ч	Tscherv	tsch
26	Ш	Ш	Sha	sh
27	Щ	Щ	Stsha	stsh
28	Ъ	Ъ	Yer	
29	Ꙑ	Ы	Yeri	ui
30	Ь	Ь	Yeer	e
31	Ѣ	Ѣ	Yat	ye
32	Є	Э	Kse ?	x ?
33	Ѯ	Ю	Kse	x
34	Ѱ	Я	Pse	ps
35	Ѳ	Ѳ	Thita	th
36	Ѵ	Ѵ	Ischitse	v

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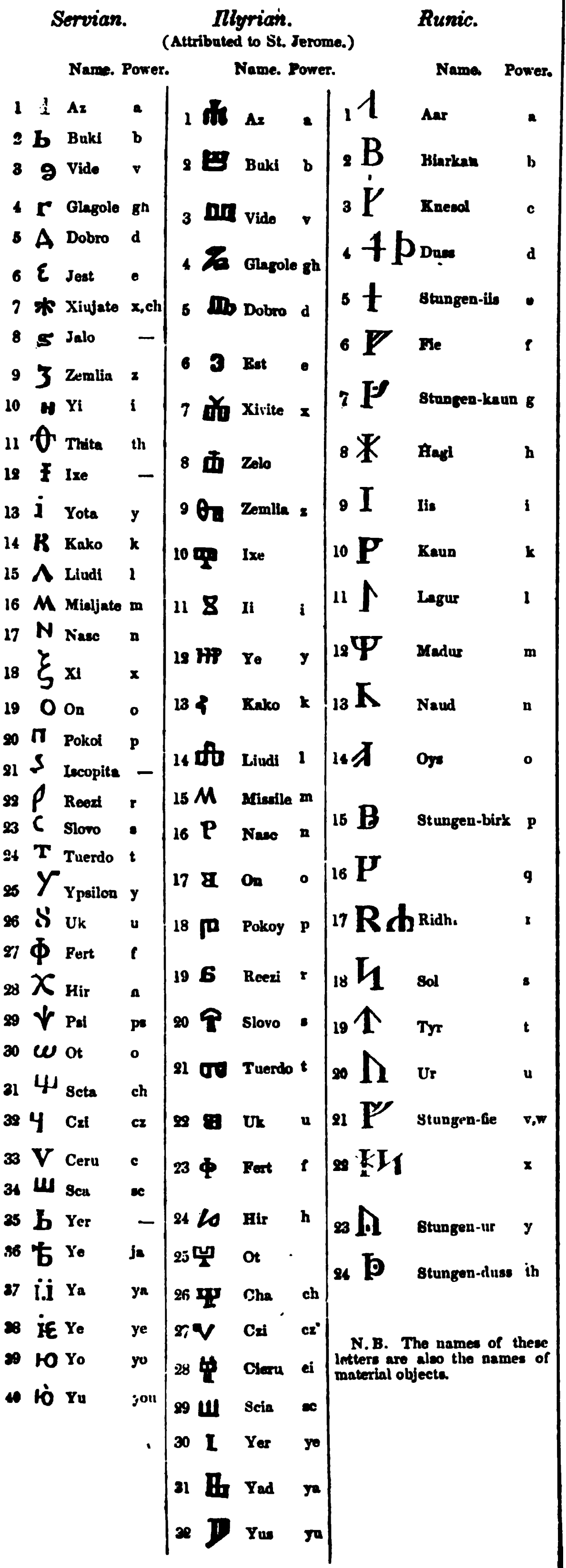
* The name of the 26th letter, and also its power, seem open to doubt, as the use of the same character in the letters 31 36 appears to imply that it has the sound of *ja*, or something similar. The Ethiopic is a syllabic alphabet, and it has a system of additional marks or modifications of the letters, marking a change of vowel, not unlike the points of the Hebrew. We have not thought it necessary to insert these.—*See* Ludolf.

tion to what has been already said. The first plate contains alphabets running from the right to the left, a practice which seems to have been earlier than that which is now generally adopted. Herodotus tells us, (II. 36.) that such, too, was the practice of the Egyptians, and his assertion is confirmed by a considerable number of the existing inscriptions, among which, however, some are found running in the opposite direction, and still more arranged vertically. The Etruscans, it is well known, turned their letters to the left, and there even exist specimens of Latin inscriptions with the same peculiarity. Among the Greeks, there were four modes of writing, one vertical (*κιονιδὸν* or *column-wise*), and three horizontal, *viz.* one with the words running to the left; another, which soon prevailed over the rest, turned towards the right; and a third, in which the direction of the lines alternated, as in the course of a plough, from which idea, inscriptions of this kind are said to be written *βου-στροφη·δον*, or *ox-turning-wise*. This last method must have been much more convenient than our present broad sheet of letter-press, in which the eye, on arriving at the end of a line, requires a nice perception of a straight line to hit the commencing point again. The second and third plates give numerous specimens of the Greek alphabet, which are taken chiefly from Boeckh's great work, now in progress at Berlin, and the numbers written after the titles at the head of each column refer to the order of the inscriptions in that work.

The several inscriptions which have furnished these alphabets exist in the following forms:—

No. 14. In two flutings of a Doric column brought from the island of Melos, now in the Nanian Museum—No. 15. On a bronze tablet found in 1783 in Italy near Petilia, north of Policastro: it is in the Borgian Museum at Naples—No. 16. On a vase discovered in a sepulchre near Corinth. (See Dodwell, ii. 196.)—No. 17. On a votive



Servian.

	Name.	Power.
1	Az	a
2	Buki	b
3	Vide	v
4	Glagole	gh
5	Dobro	d
6	Jest	e
7	Xiujate	x,ch
8	Jalo	—
9	Zemlia	z
10	Yi	i
11	Thita	th
12	Ixe	—
13	Yota	y
14	Kako	k
15	Liudi	l
16	Misljate	m
17	Nasc	n
18	Xi	x
19	On	o
20	Pokoi	p
21	Iscopita	—
22	Reezi	r
23	Slovo	s
24	Tuerdo	t
25	Ypsilon	y
26	Uk	u
27	Fert	f
28	Hir	n
29	Psi	ps
30	Ot	o
31	Scta	ch
32	Czi	cz
33	Ceru	c
34	Sca	sc
35	Yer	—
36	Ye	ja
37	Ya	ya
38	Ye	ye
39	Yo	yo
40	Yu	you

Illyrian.
(Attributed to St. Jerome.)

	Name.	Power.
1	Az	a
2	Buki	b
3	Vide	v
4	Glagole	gh
5	Dobro	d
6	Est	e
7	Xivite	x
8	Zelo	
9	Zemlia	z
10	Ixe	
11	Ii	i
12	Ye	y
13	Kako	k
14	Liudi	l
15	Missile	m
16	Nasc	n
17	On	o
18	Pokoy	p
19	Reezi	r
20	Slovo	s
21	Tuerdo	t
22	Uk	u
23	Fert	f
24	Hir	h
25	Ot	
26	Cha	ch
27	Czi	cz'
28	Cieru	ci
29	Scia	sc
30	Yer	ye
31	Yad	ya
32	Yus	yu

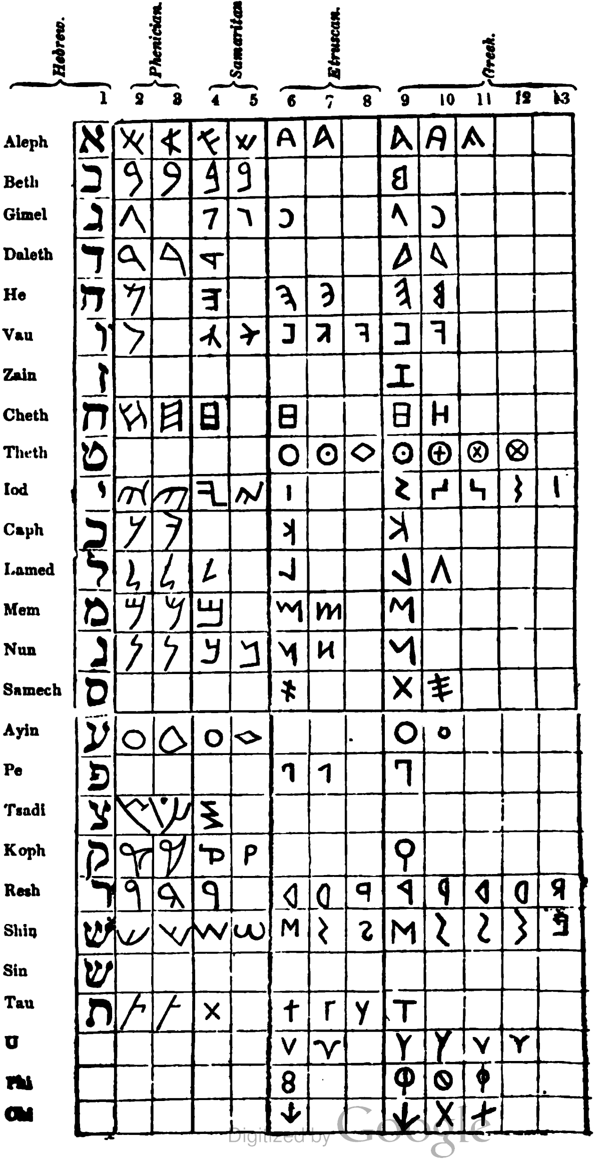
Runic.

	Name.	Power.
1	Aar	a
2	Biarkan	b
3	Knesol	c
4	Duss	d
5	Stungen-iis	e
6	Fie	f
7	Stungen-kaun	g
8	Hagl	h
9	Iis	i
10	Kaun	k
11	Lagur	l
12	Madur	m
13	Naud	n
14	Oys	o
15	Stungen-birk	p
16		q
17	Ridh.	r
18	Sol	s
19	Tyr	t
20	Ur	u
21	Stungen-fie	v,w
22		x
23	Stungen-ur	y
24	Stungen-duss	th

N.B. The names of these letters are also the names of material objects.

PLATE I.

Alphabets from right to left.


Hebrew.
Phenician.
Samaritan.
Etruscan.
Greek.
1
2
3
4
5
6
7
8
9
10
11
12
13
Aleph
Beth
Gimel
Daleth
He
Vau
Zain
Cheth
Theth
Iod
Caph
Lamed
Mem
Nun
Samech
Ayin
Pe
Tsadi
Koph
Resh
Shin
Sin
Tau
U
Phi
Chi

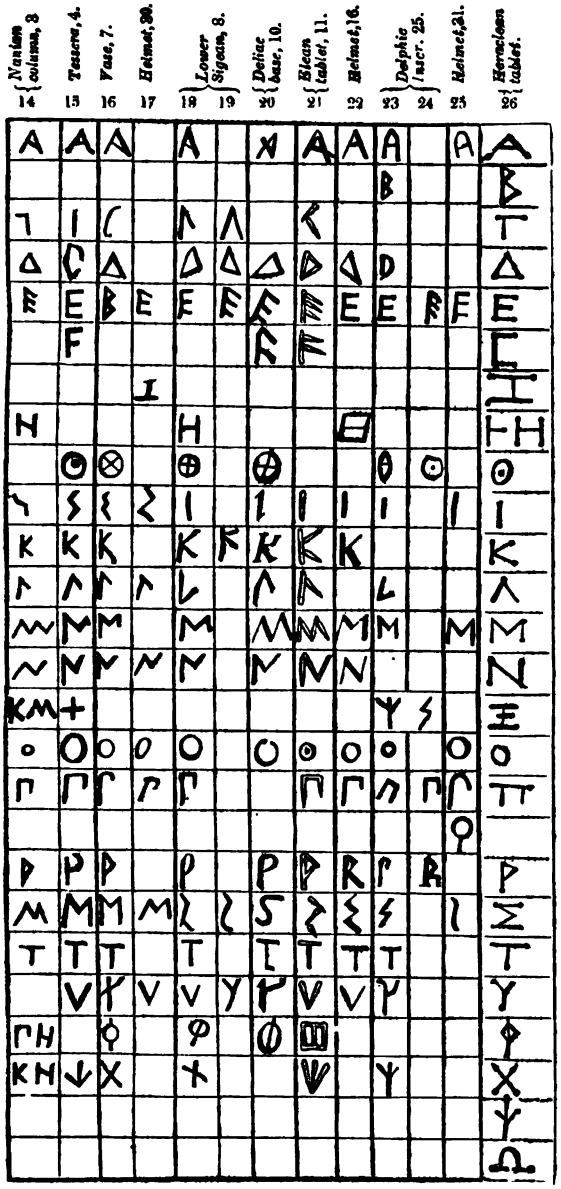
helmet found in the Alpheius.—Nos. 18, 19. On a marble, now in the British Museum, No. 199—No. 20. On a square marble base, near a temple of Apollo, in the island of Delos. (See Tournefort's *Travels*, t. i. ep. vii. p. 360.)—No. 21. On a bronze tablet dug up at Olympia and brought away by Gell in 1813—No. 22. On a bronze helmet found in 1817, in the ruins of Olympia, in the possession of Col. Ross—Nos. 23, 24. Found at Delphi. (See Dodwell, ii. 509.)—No. 25. On a small votive helmet found near Olympia, in the possession of Col. Leake—Nos. 27, 28. Part of a hymn to Bacchus inscribed on an altar, which contains also a representation of a procession in honour of the god, in the Pembroke Museum at Wilton.—No. 29. From an epitaph in elegiac verse on those who fell in the first battle before Potidæa, B.C. 432. (Thucydides, i. 62.) It was found in the plain of the Academy near Athens, and is now in the British Museum, No. 290—No. 30. The alphabet here given is that which came generally into use at Athens after the archonship of Euclides, 403 B.C. Specimens may be seen in the Elgin marbles of the British Museum, for instance in No. 305, the date of which is said to be 398 B.C.

The column No. 26 is from Mazocchi's folio on the Heraclean tablet. The Codex Alexandrinus, No. 36, is in the British Museum. [See ALEXANDRINE CODEX.] The fourth plate relates to the Roman alphabets, including, however, what are often called, but without good reason, Saxon alphabets. These last characters were undoubtedly employed in writing Saxon, but they were the ordinary characters used during the same period for Latin, and were, indeed, thence borrowed for the former language; their identity besides, with the preceding Roman letters, is very evident. Such of the Saxon characters as were not common to the Latin are placed below plate 4. The other alphabets have their names affixed, and also the titles and powers of the letters. The Coptic, Russian, Servian, Mœsogothic are evidently derived, with some exceptions, from the Greek; and the same is perhaps true, in a great measure, of the Ethiopic, Illyrian, and Runic.

In passing the eye along the various forms which the several letters have assumed, we shall see a strong similarity running throughout—from the Phenician through the Greek and Etruscan to the Latin; and nearly all the differences which do exist admit of explanation, if a few points be taken into consideration. The form of a letter must, in the first place, depend much upon the nature of the material upon which it is written, and of the instrument employed. On hard substances where incisions are to be made, straight lines will naturally prevail. When the letter is merely painted or inscribed upon a very yielding material, two or more inclined lines are apt to degenerate into a single curve.

PLATE II.

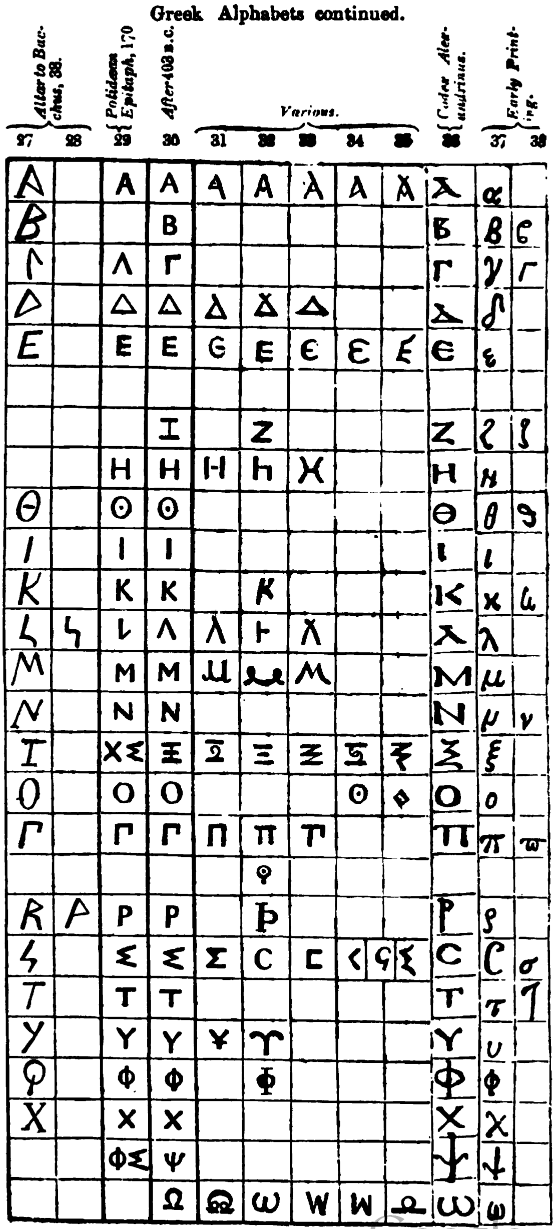
Greek Alphabets.



Nanian column, 3
Tessera, 4.
Vase, 7.
Helmet, 30.
Lower Sigean, 8.
Deliac base, 10.
Elean tablet, 11.
Helmet, 16.
Delphic Inscr. 25.
Helmet, 31.
Heraclean tablet.
14
15
16
17
18
19
20
21
22
23
24
25
26

PLATE III.

Greek Alphabets continued.

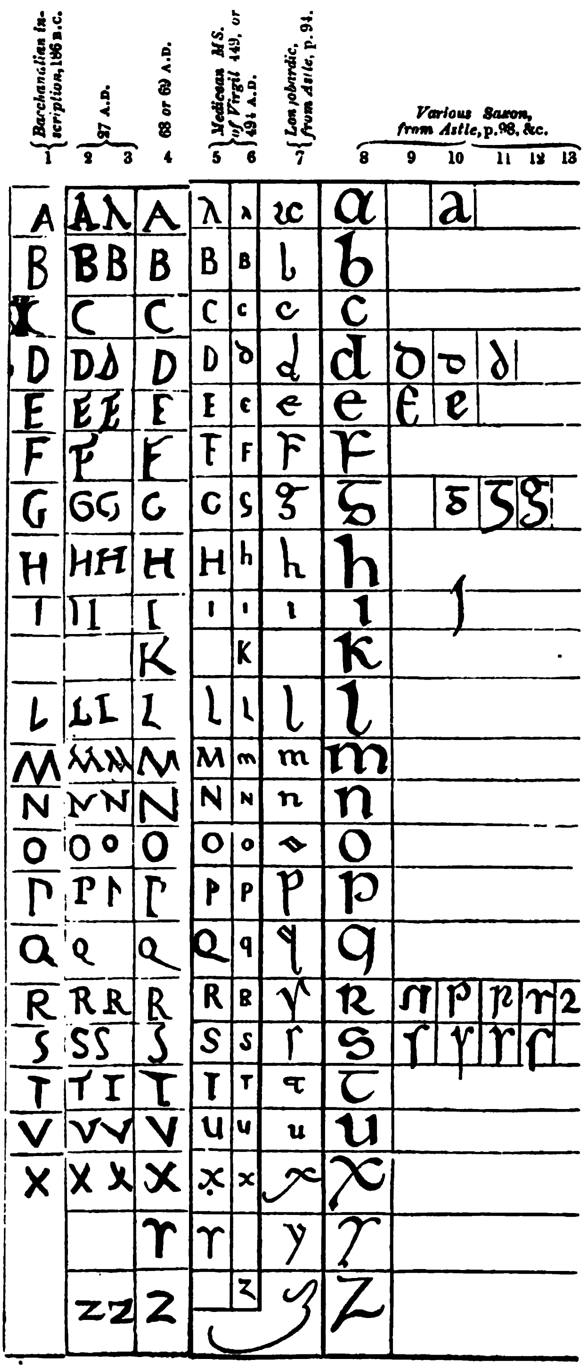


Altar to Bacchus, 38.
Potidæan Epitaph, 170
After 403 B.C.
Various.
Codex Alexandrinus.
Early Printing.
27
28
29
30
31
32
33
34
35
36
37
38

Compare the forms of γ (the third letter) in columns 16 and 21; of δ (fourth letter) in 21, 23, and the Latin *D;* of ε (fifth letter) in 30, 33, and 34; of μ in 30 and 32; of π in 30, and the Roman *P* in 1, 2, 3, 4: of ρ in 20 and 21; of σ in 31, 32, and 33; of our own *u* and *v*, both derived from the same Latin character, &c. Again, in incisions the different lines which constitute a character will be generally of uniform thickness, but when a split reed or quill is employed, the strokes in one direction will be thick, in the other fine. Such has clearly been the origin of the existing Hebrew forms. A principle of corruption, not less powerful, is the desire of rapidity, which is most readily obtained by connecting the different parts of a letter together, so that the whole may be produced by one movement of the instrument, or, more strickly speaking, without raising the instrument from the surface. Thus the ε in 30 seems to be made by four separate strokes, such is certainly the case with the Roman letter in column 3; but that in 33 requires only two movements, and that in 34 but one. In the same way may be compared the forms of η in 36 and 37; of ξ in 30, 33, 35; of π in 37 and 38; of τ in 36 and 37, &c. But there may be several ways of effecting this object; a letter moreover may be commenced at different points, and hence arise double or more forms for the same letter, even at the same period: compare β in 37 and 38; ε in 34 with our own small running *e*, &c. This principle of rapidity carried a step farther leads to the connexion of successive letters. In this way are formed what are called the cursive letters, which run on in continuous succession. Such modes of writing were no doubt common in very early times; and as regards the Romans, we are not left to mere conjecture, as the British Museum contains an inscription of the kind on papyrus, which is referred to the second or third century. Lastly, a fanciful love of variety shows itself in all the works of man, and in none more than the arbitrary variations of letters, particularly those at the beginning and end of words. These several causes of change were more active, when nearly all writings were produced by the pens of individual writers. In modern times, the art of printing has tended strongly to create a unity of form, and will be the best protection against future change.

Plate IV.

Roman Letters.


Bacchanalian inscription, 186 B.C.
97 A.D.
68 or 69 A.D.
Medicean MS. of Virgil 449, or 494 A.D.
Lombardic, from Astle, p. 94.
Various Saxon, from Astle, p. 98, &c.
1
2
3
4
5
6
7
8
9
10
11
12
13

Additional Saxon Letters.

ð dh; þ th; ƿ w.

Having spoken thus generally of the alphabets given in the four plates, we will now remark upon each character in succession.

Of the letter A, one of the oldest forms, it appears to us, is in column 10, 25, or 3. The greater part of the other forms arise from the different inclinations of the cross stroke, which in 7 runs from the extremity of one of the main strokes, and in 2, 4, and 11 is too much inclined even to meet the opposite side. No. 2 again is a mean between 4 and 1, and shows how the Hebrew form has originated. There was also an old Italian form of this vowel, which may be described as formed from the Π in 31, with a diagonal line running from the lower extremity on the right to the opposite angle: it was in fact the character in 14 or 16, with a square instead of a round or pointed top.—Of B it need only be remarked, that the Samaritan and Phenician forms show the progress of degradation between the Greek and the corrupted Hebrew.—The forms of Γ are chiefly remarkable for the different positions of the angle which constitute the letter. The round form in 6, 10, and 16 is also found in the coins of the cities Gela, Agrigentum, and Regium. (See Mionnet.) The third letter of the Latin alphabet has this form, and once possessed the same power. Hence, the oldest orthography of that language presents *macistratus*, *leciones*, for *magistratus*, *legiones*, and it is known that the common name *Caius* was pronounced *Gaius*, and indeed was so written by the Greeks.—The form of the Hebrew *daleth* may be traced through the Samaritan from the Greek, in precisely the same way as the *beth*. The difference between the Samaritan or Phenician letters for *daleth* and those for *beth* consists solely in the lower stroke thrown out by the latter from the perpendicular, and the same is the case with the Hebrew letters; in both, the triangular or circular top has degenerated into a thick line.—The form of E in 10 is very anomalous and very rare. Of the other forms the Samaritan is again purer than the Hebrew.—The next letter has been the subject of much controversy. The form in 8, 10, and 15, may perhaps be considered as the parent of all the rest; and again the Phenician has the advantage over the Hebrew, the form in 2 being intermediate between 4 and 1.—The *zain* bears a faint resemblance to ζ of No. 9, which is the oldest form of that Greek letter, and from which the late forms are derived, upon the simple principle above mentioned, of completing a letter at one movement, and therefore substituting the diagonal stroke for the perpendicular. —The next letter has gone through violent changes both in form and power. Its original power seems to have been a guttural *ch*, which would naturally wear away into an ordinary aspirate; or perhaps more correctly, it may be stated, that its first power, as in the other letters, was syllabic, viz., *che*, which became *he*, and in the Greek language eventually only *e*. The two Hebrew names of the letters *cheth*, *heth*, and the Greek form *eta*, all bear evidence in favour of such a supposition, and it would be difficult otherwise to account for the singular fact, that the same character H was at one time the Greek representative of an aspirate, afterwards of an initial *he*, and finally of a long *e*. In No. 26 of Plate II. H is the long vowel ē, and so in 30 of Plate III. and those which follow. In all the others which precede, it is an aspirated consonant. With regard to the various forms, the character in 3, 4, 6, 9, 22 being supposed to be the purest, No. 2 is half-way between the Hebrew on the one hand, and 18 on the other. But the Greek form did not stop here. When the letter H was appropriated as a vowel, the aspirate gradually lost its second pillar, until at last it appeared in the first of the two forms given in the Heraclean tablet, the second in that column being, as we have just stated, the representative of the long vowel. This form of the aspirate appears in many manuscripts above the initial letter of the word, but was eventually further corrupted into a mere comma, thus (ʽ). There exists, it should be stated, a story, that the Greeks derived their aspirate in a mode somewhat different from the above statement. The letter H, we are told, was cut into two parts, each consisting of a pillar and half the cross stroke; the first half being employed as an aspirate, the second as what they call a soft breathing, by which is meant simply the absence of an aspirate. A character to denote the absence of a sound is, it has been justly remarked, something new in alphabetic writing; and, in fact, it is now a common belief, that the soft breathing and its supposed representative are the mere creation of grammarians: at any rate, the supposed character for the soft breathing is found in no inscription whatever, and in no manuscript of any antiquity.—Of the next letter it need only be stated, that the Hebrew character is generally considered by modern Hebraists as a mere T, and it is often called *teth*.—Of the *iod* the Samaritan form seems even more perfect than the Greek in 9, 10, 11, 14, 15, 16, 17. The third of these, however, bears a close affinity to the Hebrew. The forms in 12 and 16 are gradually approaching the straight line, which afterwards prevailed.—The *kappa* in 21 is a mean between the more perfect in No. 9 and the Hebrew *caph*.—The next letter has a great uniformity throughout, the chief difference turning upon the different position of the angle as in the *gamma;* but it may be observed, that the forms in 27 and 28 closely approximate to the Phenician and Hebrew in 1, 2, 3.—Of μ and ν we have spoken before.—The *samech* and Greek ξ present many difficulties. Their forms, in the first place, have no similarity; the Greek letter is rarely met with in old inscriptions, as it was common to employ in its place the χ and σ, as may be seen in 23 and 29 (or else κσ as in the Nanian column.) The X given in 9, though found in Greek, is more common in Latin; yet even in this language the old inscriptions generally have XS rather than X alone; so that it would seem that here, too, the X had originally the power of the Greek χ. The reason why the Greeks generally wrote ΧΣ rather than ΚΣ or ΓΣ, was most probably because the letter *sigma* has something of the nature of an aspirate, as Payne Knight contends. Upon the same principle they wrote ΦΣ for Ψ or *ps*. (See column 29.)—The letter *ayin* is the subject of controversy, some calling it a nasal consonant, others a guttural, others a vowel *o*. The first and third assertions seem more at variance than they really are, for the close connexion between the two sounds *n* and *o* is well marked in the Portuguese tongue in the pronunciation of such words as João, the representative of our John or Johann. The Romans too thought it enough to write Plato, where the Greeks wrote Platon. Lastly, if the vowel and liquid scales that have been given above be applied to one another, it will be found that the liquid *n* ought to have an affinity to the vowels *o* and *a*,* in the same way that the lip liquid *m* is related to *u* and *w*, and the palatal *l* (witness the *mouillé* sound of the French *ll*) to *y*, *i*, and *e*.—But, to proceed, the Hebrew *pe* has, it has already been observed, a stroke at the bottom which appears to have something of the nature of a flourish. Remove it, and the identity of the remainder with the Greek is self-apparent. The difference between the Greek Π and the Roman P is chiefly due to modern printers. The Greek had almost invariably its second leg much shorter than the first, and the Roman P very rarely had the circular bend completed so as to reach the main shaft. See the plates, and, above all, compare the Etruscan P in 7 with the Roman P in IV. 3.—The letter *tsadi* has no representative in the Greek alphabet, unless, indeed, it bear any relation to the Greek figure called *sanpi*, which, however, was never used, as far as it is known, for an alphabetic character: and secondly, even as a numeral, it does not occupy the place between π and *koppa*.—In the *koppa*, the Hebrew, or perhaps rather the Phenician, has a fuller and a more perfect form than the Greek; but be this as it may, the connexion between them requires no comment.—If the ρ in 9 or 11 be the earliest form, the derivation of the rest is simple. The Hebrew has suffered the same injury as in *beth* and *daleth*, a comparison with which will remove all doubt. In 3, 13, and more fully in 22, 24, 27, we see the origin of the Roman *r*.—The original form of *shin* was perhaps as near the Hebrew as any of our characters; but, in fact, the difference between the *shin* in 1 and 4, and the Greek *sigma* in 9, 14, 15, 16, 17, 26, &c., or the Etruscan in 6, depends solely upon the altered position. The relative situation of the several strokes among each other is the same in both.—The next letter, *sin*, should perhaps have been omitted, as the difference between the power of *sin* and *shin* arises solely from the position of the point which is near the right tooth in *shin*, near the left in *sin*. So completely are the two characters one in their origin, that they stand for the same number in the series of Hebrew letters.—The T in 6 would be a fit and proper parent for all the other forms. In the three characters, 1, 2, 3, 7, 8, the cross stroke has had an unfair preponderance to one side, as is the case again in our modern small character. In the Hebrew a little flourish has added to the difference.—The next letter, it has been already observed, seems to have grown out of the *ayin*. Its forms vary, but not unintelligibly. The modern *u* and *v* are, it has been already said, both derived from the Latin form, which had the double power of our consonant *w*, and our vowel *u*.—With regard to φ and χ, we find in 14 the double forms used before they were adopted.—Of the ψ, mention has been already made.—Ω brings us to the close; and it may be sufficient to observe, that among the forms given to this letter by Mionnet, in his work on antient coins, one consists of an ordinary *o* lying upon a horizontal straight line. This has led to the notion that the letter was thus originally formed to mark a long ō, and, in confirmation of this notion, the letter H, as written in No. 9, was appealed to, which it was contended was formed in like manner from the letter E, with a perpendicular stroke on the right. The form of ω, in 32, would appear to be made up of the letter *ayin* or *o* repeated, precisely as our own *w* has its form as well as name from a repetition of *u* or *v*. The letter ω as well as η were not used in public documents at Athens until the year 403 B.C., when Euclid was Archon, but it must not be supposed that the letters were then invented, for, as Payne Knight has observed, the ω appears on the coins of Gelon, who died 478 B.C., and the η on very antient coins of the Regians. Still in early times it was the ordinary practice to use ο and ε for both long and short vowels.

In forming a table of the real Roman characters, there is some difficulty from the circumstance, that nearly all those who report antient inscriptions take the liberty of using modern characters. Of those given in plate 4, the first is from the fac-simile of the Bacchanalian inscription given by Drakenborch in the seventh volume of his *Livy;* the date of which is fixed at 186 B.C., by the names of the consuls given in the decree. This inscription is in the Cæsarean Museum at Vienna. The second and third columns are from an inscription given by Maffei, in his *Istoria Diplomatica*, p. 38, and here the date is fixed to the year 27 A.D., in the reign of Tiberius, by the names of the consuls, M. Crassus Frugi, L. Calpurnius Piso. Column 4 is from the same work of Maffei, p. 31, and belongs to the year 68 or 69, as is determined by the mention of the Emperor Galba. Both these inscriptions are of very coarse execution. Fac-similes of some very antient inscriptions are also to be seen in the works on Herculaneum and in Muratori. The characters of the Medicean MS. of Virgil, preserved at Florence, are taken from Burmann's engraved specimen, in the first volume of his edition of that author, p. xxxvi. of the Preface. The remaining alphabets of that plate are from Astle's *Origin of Writing*. The separate alphabets, beginning with the Coptic and ending with the Runic, are chiefly from the French *Encyclopædia*.

The Roman alphabet requires but little comment. It has been seen how completely it agrees with the Greek. In the order of the letters the only violent difference consists in the insertion of the G after F, but what place could be better suited to it than the position of Z, a character which had no correlative in the Latin series? Our modern grammars, indeed, give both *y* and *z*, but Suetonius tells us indirectly that the Roman alphabet terminated at *x*, for the Emperor Augustus, he observes, employed a peculiar cypher in his papers. For the letter *a* he wrote *b*, for *b*, *c*, and so on, until for *x* he wrote *a* or *aa*. Some commentators, indeed, scandalized at the ignorance of Suetonius in not knowing his own A, B, C, have substituted *z* for *x* in the above passage. But, in fact, there is not a single Latin word that contains either *y* or *z*. Modern printers have further increased the Latin alphabet by giving in two instances double characters where the Romans had but one. The letter I of the Romans, besides its power as a vowel, represented also the closely-allied sound of our consonant Y, or the German J. When it is used with this consonantal power, modern printers have taken the liberty of substituting the character J, and modern readers have aggravated the error by giving it the sound of that English letter. Thus the Latin word IVGVM is now printed and pronounced *jugum*, instead of *iugum* or *yugum*, so as to destroy the close similarity of the word to the corresponding English term, *yoke*. Again, the Roman letter represented by *v* in inscriptions, and by *u* in the round form of manuscripts, has suffered the same fate. As a vowel, it has *u* for its character in modern books of Latin. But the Romans, as we have already stated, also employed it as a consonant, equivalent to our *w*. In this case the printer has preferred the sharp form *v*, which has again misled the modern reader as to the sound. When pronounced correctly, the Latin words *vespa*, *vastare*, *ventus*, bear a close analogy to our own terms *wasp*, to *waste*, *wind*. The letter K, though it became unnecessary when the third character was changed from a *gamma* to C, is a genuine member of the Roman alphabet, though often excluded from school grammars.

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* The connexion between *a* and the final nasals is exhibited in the Ionic plurals of passive verbs, the double form of the accusatives of the third declension, and the Greek numerals δέκα, ἑπτα, &c., compared with the Latin.

It would be rather an amusing subject of inquiry, to trace to their source the remarkable differences in the magnitude of our modern small characters, some rising above, others descending below the general line. The first attempts of certain letters to shoot out into an undue extent may be seen in several parts of Plate IV., and we will leave the development to any reader who may be disposed to pursue it. It is but right to state further that the remarks we have made, and the alphabets we have given, are by no means sufficient to enable any one to read antient MSS. Independently of the varying forms of letters, there are numberless contractions, which can only be learned by long practice.

ALPHEIUS, one of the chief rivers of Peloponnesus (Morea), which rises in Arcadia, and flows through Elis to the sea, receiving in its course the rivers Helisson, Ladon, Erymanthus, Cladeus, &c., and numerous smaller streams. It is now called Rofea, up to its junction with the Ladon; and above that, the river of Karitena. It drains a large mountain district, bounded by Mount Erymanthus on the north, the central ridge of Arcadia on the east, and the mountains of Laconia and Messenia on the south. Its rise and early course are marked by some singular circumstances. According to Pausanias, the fountain is at Phylace (Krya Vrysi), near the foot of Mount Parthenius, at the south-east corner of Arcadia, where the boundaries of Arcadia, Argolis, and Laconia meet. Near a place called Symbola, (the 'meeting of the waters') it is joined by a considerable stream, and sinks underground; it rises again five stadia from Asea, close to the fountain of the Eurotas. The two rivers then mix their waters, and after flowing twenty stadia, are again swallowed up, and re-appear,—the Eurotas in Laconia, the Alpheius at Pegæ (the Springs), in the Megalopolitan territory, and in Arcadia. Strabo, however, says that the Alpheius sinks, instead of rising, at Abia, and adds a fable, that garlands consecrated to either stream, would re-appear in that particular stream, if thrown into the united waters before they sunk underground. The statement of Pausanias is confirmed, and the course of the upper stream (now the Sarandapotamo) traced by Colonel Leake (*Travels in Morea*, vol. i. p. 121) to the spot where it enters the earth, below Phylace. He confirms the statement of its rise (or at least the rise of some subterranean stream) at Francovrysi, near Asea. Here there are two sources or emissaries, one of which he supposes to be the vent of the lake or marsh called Taki, not far from Tegea, north-east of Francovrysi; the other that of the Sarandapotamo. (Vol. iii. p. 42.) One of these probably is the supposed source of the Eurotas, mentioned by Pausanias. These streams, after joining, enter a lake, and again sink into the earth. Passing under a mountain called Tzimbaru, the Alpheius re-appears at Marmora, near Rhapsonati, probably the Pegæ of Pausanias. These subterranean descents are not uncommon in the Arcadian rivers, and are called by the modern Greeks, *Katavothra*: similar instances are collected in the *Encyclopédie Méthodique*; *Géog. Physique*, art. *Absorbans*. Due south of the Katavothra, and about the same distance from it as the emissary at Marmora, is another emissary in Laconia, in the valley north of Mount Khelmos, which may be considered as the principal source of the Eurotas; and Colonel Leake thinks it not impossible that the statement of Pausanias may be correct; and that in their subterranean passage the waters do, in fact, divide into two streams. The height of the waters in the lake and rivers, however, prevented his examining minutely into the phenomena of the place.

Below Pegæ, the river is joined by the Helisson (now the river of Davia), on which Megalopolis was situated, not far from the confluence. Below this, between the modern towns of Karitena and Andritzena, the Alpheius descends through a ravine, formed by the closing in of the mountains on either side, and called the Straights of Lavdha. This pass separates the upper and lower plains of the Alpheius; in the former of which, the chief city was Megalopolis, in the latter Heræa. Entering Elis, it runs through the plains of Pisa, past Olympia, and falls into the Cyparissian Gulf. At the mouth of the river was the temple of Diana Alpheiusa, or Alpheia. 'From the Straights of Lavdha to the sea, there is a narrow level on either bank, inundated in winter, and planted with maize in summer: the river is wide and shallow, and its banks produce a great number of large plane trees.' (Leake, vol. ii. p. 67.)

This river is very celebrated in song. Ovid tells how the river god, being enamoured of the nymph Arethusa, whom he saw bathing in his waters, sought her love. She fled, and he pursued; till being exhausted, she prayed for help to her patron goddess Diana, who transformed her into a fountain. But Alpheius still sought to mingle his stream with hers; and Diana was forced to open an underground passage for her favourite to the island of Ortygia, a part of Syracuse. The persevering river was fabled to pursue the object of his love even to this distant point, passing under the sea, without mingling his waters with it. Hercules is said to have cleared the stables of Augeas, by turning a part of the Alpheius through them. Frequent mention of this river is made by Pindar. (See Pausanias; Strabo; Ovid, *Met.* v. 572; and for modern authorities, Leake's *Travels in the Morea*.)

ALPS, the name of a large mountain system in Southern Europe, which is generally supposed to derive this appellation from a Celtic word *Alb*, or *Alp*, signifying 'white.' [See ALBION.] It is rather singular that the Swiss give the name of Alps to the high pastures which cover the sides of the mountains, as far as the line of permanent snow. (See *Orographie de l'Europe*.)

The Alpine system, in its full geographical extent, may be considered as connected with the chain of mountains that runs through the Italian peninsula; and the point of its junction with the Apennines cannot therefore be accurately determined. Some fix the commencement of the Alps at the depression of the valley of Savona, and others at Capo delle Melle on the gulf of Genoa. Assuming it to commence at this cape, its general course is westerly as far as the Col de Tende, from which point it takes a N.N.W. course as far as the sources of the Stura, one of the affluents of the Po. From this last point it runs north in an irregular direction to about 45° 45′, separating the upper part of the Po valley from that of the Rhone, and part of France and Savoy from Piedmont. Near the lat. of 45° 50′ we find the highest elevation of the Alps, Mont Blanc, and also a change in the general direction of the range from N. to E.N.E., which in fact is continued as far as the Danube.

The valley of the Rhone, and the great hollow of the Lake of Geneva, separate the Alps from the Jura, which chain, however, is closely connected with the great mass of the Alps, though it will be best described under a separate head. The Jura has a general direction N.N.E., and several points of connexion with the central mass; but the most distinct is that line called the Jorat, which, branching out from the Molesson and Jaman, two calcareous mountains of the Alps, runs in a westerly direction, and forming the steep northern boundary of the Lake of Geneva, joins the Jura near the town of Lassara. This line separates the waters which flow to the Lake of Geneva and thence into the Rhone, from those which join the Aar and descend into the Rhine.

From the great bend of the Alps near Mont Blanc, the central mass runs towards the sources of the Drave and Salzach through the Grisons and the Tyrol as far as the Grand Glockner, where it is divided into two main branches. But between Mont Blanc and the Grand Glockner, and about the meridian of 9° 45′, we find a chain detaching itself northward from about Mount Septimer, and running past the sources of the Inn to those of the Lech. This elevation separates the affluents of the Lake of Constance and the Rhine from those of the Danube. But before reaching the sources of the Lech, this offset sends out another, which runs along the left bank of the Inn. This second range contains the Solstein mountain, which has an elevation of about 9700 feet, and contains the well-known salt-beds of Hall. Of the two great divisions at the Grand Glockner, the northern branch continues its direct course to Vienna on the Danube. The southern branch may be considered as subdivided into two; one of which runs towards the confluence of the Drave and the Danube; the other takes first a southerly direction till it approaches the Gulf of Venice near Fiumi, when it assumes a S.E. course, and under the name of the Dinaric Alps may be considered as a prolongation of the great mountain system of Europe. Indeed the great mountain-chain of the Grecian peninsula, as well as the Balkan which terminates at the Black Sea, may be geographically considered as a prolongation of the Alpine system. The mountains generally considered as comprehended within the denomination of the Alps, lie between 44° and 48° N. lat., and 6° 40′ and 18° E. long. But our description of them is here chiefly confined to the main mass, as far as the division at the Grand Glockner. The other portions will be noticed more particularly in the several countries to which they belong.

By geographers the Alps, in a limited sense, have been divided into—1st, the Maritime, or those extending from the Mediterranean to the Monte Viso, a distance roughly estimated at about 100 miles; 2nd, the Cottian, from the Monte Viso to Mont Cenis, about 60 miles; 3rd, the Graian, from the Mont Cenis to the Col de la Seigne, about 60 miles; 4th, the Pennine, the chain which bounds the southern side of the Valais, from Mont Blanc to the Simplon, about 60 miles; 5th, the Helvetian or Lepontian, the southern boundary of the Upper Vallais, extending to the St. Gothard, about 60 miles; 6th, the Rhætian, which extend from the sources of the Rhine to the Dreyherrn-Spitz, east of the valley of the Adige, about 80 miles; 7th, the Noric, 8, the Carnic, and 9, Julian Alps. The two last branch off east and south from near the Grand Glockner. The Noric is a chain extending to the Danube near Vienna; the Carnic to the confluence of the Drave and the Danube; and the Julian Alps, which enclose the Save, to Belgrade on the frontiers of Turkey. Besides the mountain masses which stand up against the central chain like buttresses and slope down far into the plains on each side, there are some great ranges of mountains which join the main chain of the Alps at acute angles; such are the Bernese Alps, descending from the Gallenstock at the Mont St. Gothard, and extending to the north of the Lake of Geneva; the chain east of the St. Gothard, which divides the Vorder-Rhin from the Hinter-Rhin; and a line of mountains, already mentioned, on the north of the valley of the Inn, extending along the course of that river. The true chain and dividing line of the waters is the southern boundary of the Inn, which it divides from the Valtelline, the Vinchgau, and the Pusterthal. A more southern chain, commencing at Monte Legnône, near the Lake of Como, forms the southern boundary of the Valtelline and the Vinchgau, and after the interruption of the Adige, it bounds also the southern side of the Pusterthal, and again divides where the Save takes its rise. Of the branches beyond the Grand Glockner that may be considered the true chain, which, for some way, forms the northern boundary of the valley of the Drave, and then extends towards the Danube. The whole constitutes an unbroken range which cannot be avoided by any détour in passing out of Italy to France, Savoy, Switzerland, the Tyrol, or Germany.

The geographical position of the main mass of the Alps is remarkable as lying about midway between the equator and the North Pole: the following positions and elevations, between Monte Viso and the Grand Glockner are included within the line which we have described as that properly denominated the main mass of the Alps.

Names.	Lat.	Long.	Height in Eng. feet.
Monte Viso	44° 40′	7° 5′	12,582
Mont Genèvre			11,781
Mont Cenis			11,457
Mont Iséran	45° 30′	7° 18′	13,267
Mont Blanc	45° 50′	6° 51′	15,732
Mont Cervin		7° 43′	14,835
Monte Rosa	45° 56′	7° 52′	15,150
Mont Gothard			12,000
Gallenstock	46° 37′	8° 24′	12,477
Vogel Berg, or Piz Valrhein	46° 29′		10,866
Ortler Spitz	46° 28′	10° 32′	12,852
Gebatsch			12,276
Grand Glockner	47° 7′	12° 43′	12,776

In the great chain which branches off from the Alpine mass, runs along the northern side of the Vallais, and joins the Jorat to the north of the Lake of Geneva, we have the following elevated peaks:—

Names.	Lat.	Long.	Height in Eng. feet.
Finster-Aar-Horn			14,109
Jungfrau (Virgin)	46° 32′	7° 57′	13,716

The great valleys of the Alps lie nearly in the direction of the main chain; such are the Vallais in which the Rhone flows, the valley of the Inn, which is about 150 miles in length, and the still longer valley of the Drave, which is above 200 miles long. The transverse valleys are comparatively short: on the south side where they communicate with the valley of the Po, they are nearly at right angles to the main chain, and terminate in lakes, such as those of Maggiore, Como, &c. The valley of the Adige, the head of which is at the Brenner mountain, has a course within the mountains about S.S.W. and is the longest transverse valley of the Alpine chain. It is observed that in the line of the Alps which runs in the general direction of west and east, and also in those offsets which make a small angle with the main chain, the southern slope is much steeper than the northern. Consequently the valleys on the Italian side are much lower than those on the north side: the surface of the Lake Maggiore is 678 feet above the level of the sea; that of the lake of the four cantons, sometimes called the Lake of Luzern, has an elevation of 1490 feet. The Lake of Brienz is about 1900 feet above the level of the sea, and that of Thun only a little lower. It follows naturally also from the rapid slope on the south and the proximity of the Mediterranean, that the secondary branches of the Alps are principally on the north side of the main mass.

It is very difficult to obtain any precise measure of the breadth of the Alps. If we take the direct distance from Bellinzona, on the Italian side to Altorf, on the Swiss side, which certainly does not comprehend the whole breadth of the Alpine mass, we find this to be about fifty miles of direct distance. The direct distance from Aosta to Fribourg, across the Valley of the Rhone, is above seventy miles; but this measurement comprehends the breadth of the main chain, and the offset which runs from St. Gothard to the Jura, with the intervening valley. East of the Grisons the range increases considerably in breadth; from the Wurm See to a point a little north of Verona, is a direct distance of 150 miles. From the point where the Alps divide near the sources of the Drave and the Salzach, the breadth occupied by each branch requires a separate consideration.

The most remarkable features of the Alps, in a commercial and political point of view, are the passes, which we shall notice in order according to the divisions already made.

The Maritime Alps.—In apparent contradiction to a preceding remark, Italy may be entered from France, and the Alps may be avoided, except as to the capes which terminate the chain, by going along the coast of Liguria, and entering Nice from Provence. The most southern pass across the Alps is that by the Col de Tende; it was made practicable for mules by the Dukes of Savoy, and for carriages by Napoleon. Two great buttresses of the Alps are crossed before reaching the Col de Tende; they are the Col de Brous and the Col de Brovis. The pass of the Col de Tende is very dreary, though the elevation is not considerable, being only 5887 feet above the level of the sea. The route, after descending from the Alps, passes through

Coni and Savigliano to Turin; this is tho only great carriage-road over the Maritime Alps. There are many lines of communication with France practicable for mules: by the valley of the Stura, in Piedmont, and the Col d'Argentière, to the valley of the Ubaye, in France; and by the Val Vraita, in Piedmont, over the Col d'Agnello, to the valley of the Guil in Dauphiny.

Monte Viso, which terminates this division, is one of the most splendid mountains in the chain; its peak rises 12,582 feet above the sea's level. Wherever the line of the Alps can be seen in the basin of the Po, this fine mountain is distinguished. The rivers which have their rise in the Maritime Alps are numerous: on the Piedmontese side they are all tributary to the Po. The Gesso, the Stura, the Maira, and the Vraita, are tributaries of the Po, which rises at the foot of the Viso, and in its course collects all the streams of Piedmont: those which flow into Liguria and France are the Roya, the Var; and the Ubaye, which falls into the Durance.

The Cottian Alps.—The only carriage-road across this division of the Alps is that of the Mont Genèvre, which was executed by order of Napoleon; this pass was known to the Romans. It leads from the valley of the Durance in France, to Susa and the valley of the Dora in Piedmont. At Susa the road to the Mont Genèvre passed under a triumphal arch, which still exists. Another route across the Cottian Alps is by the valley of the Bardonneche, whence a stream flows into the Dora Susanna: this valley leads by the difficult pass of the Col de la Rue to Modane in the Maurienne. It is supposed to have been the pass taken by Julius Cæsar, when he crossed the Alps to attack the Helvetii. The chief rivers which take their rise in the Cottian Alps are the Dora Susanna, on the side of Piedmont, and the Durance and the Guil on the side of France.

The Graian Alps.—Mont Cenis is usually included in this division. It is perhaps the most frequented of all the passes across the great chain. There is no evidence of its having been known to the Romans; it has been frequently confounded by historians with the pass of the Mont Genèvre, as the two roads unite in the descent from their passes into Italy at Susa. The earliest mention of it is by the historians of Charlemagne, who record, that Pepin passed this mountain with an army to attack Astolphus, king of the Lombards. It continued a difficult mule-road until, by order of Napoleon, the present magnificent route was begun in 1803 and completed in 1810. This road leads from Lans-le-bourg in the valley of the Arc, in Savoy, to Turin. The elevation of the pass of Mont Cenis is 6773 feet above the level of the sea. From the upper part of the Valley of the Arc above Lans-le-bourg two or three passes are found leading into the valleys of the Viu and the Lanzo in Piedmont; and from the upper valley of the Isère mountain-passes lead into the Val d'Aosta. The principal of these is the pass of the Little St. Bernard, which was known to the Romans, and appears to have been made practicable for cars by order of Augustus; but though described by Saussure as the easiest of all the passes of the Alps, it is only practicable for mules. Napoleon had ordered a survey of the road preparatory to facilitating the intercourse of people divided by the Alps; this was however delayed. The evidence brought together by various authors to show that by this pass the Carthaginians under Hannibal entered Italy, is considered by some as conclusive; so many essential points confirm the account of Polybius, the nearest historian to the time of the event. But this opinion is not without some difficulties. The Col is nearly a league in length, over a fine pasturage, though at an elevation of 7190 feet above the sea. On it there is a column of great antiquity, supposed by Cambry to be Celtic; certainly it forms no part of a Roman temple, which formerly existed on the mountain, and of which a plan can be traced. There is also a large circle of stones on the plain, called by the people of the country the Cirque d'Hannibal. The route to and from the pass of the Little St. Bernard is by the valley of the Isère in the Tarentaise, and the Val d'Aosta in Piedmont. The Col du Bon-homme is usually the point of division between the Graian and the Pennine Alps; but this col is not across the great chain. It leads, however, by the Savoy side to the Col de la Seigne, where commence the Pennine or High Alps. The chief rivers which rise in the Graian Alps are the Northern Stura and the Orca, both flowing across Piedmont into the Po; towards Savoy flow the Arc and the Isère, which rise in different parts of the lofty Mount Iséran, but unite above Montmelian; and the united stream joins the Rhone above Valence.

The Pennine Alps.—This is the loftiest portion of the range, including Mont Blanc, Monte Rosa, and Mont Cervin, the three loftiest peaks in Europe. On each side of Mont Blanc are cols or passes of the mountains, usually traversed by pedestrians in their tours about Mont Blanc; these are the Col de la Seigne, and the Col de Ferret. From Mont Blanc the chain takes an E. N. E. course, and the first great passage across the Pennine Alps lies between Aosta in Piedmont, and Martigny in the Vallais in Switzerland. This pass, which is by the Great St. Bernard, is of high antiquity, but it has never been practicable for cars: the passage of Napoleon across this col in 1800 has given it historical celebrity. The Hospice, situated on the summit, at an elevation of 7963 feet above the level of the sea, is the most noted of these benevolent establishments throughout the whole mountain chain. Between the Great St. Bernard and the Simplon, there are two other passes: the first is the Cervin, which is the loftiest pass in Europe, being 11,096 feet above the sea's level. It is the path traversed in going from Châtillon in the Val d'Aosta to Visp, in the Valais; the second is the Moro, the pass east of the former, which leads from Visp to the Val d'Ossola: this appears to have been an ancient mule-road, but the advance of the glaciers has destroyed it, and the route of the Simplon superseded its use. The pass of the Simplon is the most eastward of those in the Pennine division. This magnificent work, another of the great benefits accomplished by Napoleon, leads from the Vallais to Milan: its construction was completed amidst difficulties far surpassing those of any other route that has been made across the Alps, though its elevation is only 6578 feet. The principal rivers of this division are the Dora Baltea, the Sesia and the Dovedro, on the side of Piedmont; and the Arve, and numerous other tributaries to the Rhone, on the side of Savoy and Switzerland.

The Helvetic or Lepontian Alps.—East of the Simplon is the pass of the Gries, which can be traversed by laden mules, though it lies across the glaciers; it leads from the upper Vallais to the Val d'Ossola, in Piedmont. But the chief pass of the Lepontian Alps is that of the St. Gothard, which leads from Bellinzona, on the southern side of the chain, through the Val Levantine, to Altorf, and the lake of the Four Cantons in Switzerland. This had long been a line of great commercial intercourse, though only a mule-road; a good carriage-road, however, has just been completed across it, and the benefits of a greater facility of intercourse will soon be felt by all the forest cantons, and others in communication with them. The height of the pass is 6890 feet. This is the only pass in the chain where a road may be made across it at right angles, passing but a single ridge; in any other pass if a direct course were taken it would lead across one or two other ranges. In this division some of the largest Alpine rivers have their sources; the Rhine and the Reuss on the north; the Toccia, the Tessin, and the Maggia, which join the Po; and the Rhone, which enters the Mediterranean.

The Rhætian Alps.—Across this division of the chain there are now five good carriage-roads; first, by the Mont St. Bernardin, at an elevation of 6700 feet, leading from the Lago Maggiore, Bellinzona, and the Val Misocco, to the Rheinwald, and to Coire. This road has just been made by the people of the Grisons. The second is a line from the Lake of Como and Chiavenna, over the Splugen to the Rheinwald, a pass which was known to the Romans: it falls into the route from the St. Bernardin to Coire, at the village of Splugen, whence the road runs through the Via Mala, and the finest Alpine scenery of the Grisons. The new route of the Splugen is lower than that of the St. Bernardin; it was recently constructed by the Austrian government. The third carriage-road leads from Chiavenna up the Val Bregalia, and passes the great chain over the Maloya into the upper valley of the Inn, whence it follows the course of the Inn to Innspruck; this route has been made by the Grisons to communicate with a new road over the Julier, 8130 feet high, a pass which, crossing the northern boundary of the Inn, leads to Coire, the capital of the Grisons. The fourth great road leads from the valley of the Inn across the chain to the source of the Adige; a little above Nauder it attains its greatest height, which is not 4400 feet; it is the lowest of all the passes across the great range.

Descending a little way into the valley of the Adige, it traverses a buttress ridge over the Monte Stelvio, the new Austrian road, which leads to Milan by the Valteline; the elevation of the summit of this pass, though on a secondary range, is 9174 feet; it has been lately constructed by the Austrian government, to obtain an unbroken line of communication, through its own states, with Lombardy; it is the loftiest carriage-road in Europe. The fifth is the great road from Verona, by the Brenner pass, to Innspruck; it ascends by the valley of the Adige to Botzen, thence by that of the Eisach to the Brenner, elevated 4660 feet above the level of the sea; from the Brenner, the road descends by the course of the Sill to Inspruck.

In the length of the Rhætian chain, many minor passes are found, and especially across the northern branch, communicating with Coire; among these are the Septimer, the Julier, and the Albula; and across the southern branch a new road has lately been made by the Austrian government from Piave da Cadore to the Pusterthal.

The chief rivers which rise in the Rhætian Alps, are the Muesa, the Maira, the Adda, the Oglio, the Eisach, and the Adige; these all rise on the south of the great chain, and flow into Lombardy. On the north is the Hinter-Rhein, which joins the Vorder-Rhein at Reichenau, and afterwards collects all the streams on the northern side of the Bernese chain; the Aar, the Linth, and the Reuss, bearing these and a thousand minor tributary streams to the Rhine. East of these, but flowing from the northern side, are the Inn, the Oes, the Sill, and the Ziller, which, united under the name of the first, flow on to the Danube. From the southern chain of the Tyrol spring the Brenta, the Cordevole, the Piave, and the Tagliamento; which, after watering the plains of Friuli, flow into the Adriatic.

The Noric Alps.—These mountains form at their western extremity a lofty range, especially the Grand Glockner, at the head of the Möllthal, which divides the latter valley from that of the Salza. The high road from Venice to Salzburg crosses the great chain at the Radstadter Tauern at the height of 5413 feet, after having passed over the Carnic branch at Tarvis. Farther east, the road from Trieste to Vienna crosses the Julian and Carnic chains, besides a branch connecting itself with the Noric; but so numerous are the ramifications of the Alps here, that the valleys of the Save, the Drave, and the Muhr, and their tributary streams, scarcely define the separations. Many carriage-roads, well constructed and well preserved, traverse these Alps; and the scenery of these lower and eastern ranges, known only to few English travellers, is nowhere surpassed in the whole extent of the mountainous districts from the Rhone to the Danube.

Before the period of Napoleon's power, it was the narrow policy of the European states to leave every barrier as nature made it, and thus to restrain free intercourse between the nations which it divided; this tended to the encouragement of political prejudices, and the withholding of political and commercial benefits between one nation and another. The advantages, however, were soon perceived which sprung from the formation of the routes of the Tende, the Genèvre, the Cenis, and the Simplon; and, following the splendid example which Napoleon set them, the states which have the Alps for their frontier have subsequently formed, and are still forming, admirable carriage-roads across passes formerly considered impracticable.

In the parallels of the Alps, owing to the great elevation of these mountains, we find the summits of many of them perpetually covered with snow. The point where the snow-line commences must necessarily vary in summer and winter, but even during the hottest summer snow is always found at an elevation varying, according to local circumstances, from 9000 to about 9500 feet. These large masses of snow and ice are generally called GLACIERS; a term, however, that is perhaps more properly applied to the masses of snow that fall down into the valleys, and there form large masses of ice, sometimes presenting a tolerably level surface, and sometimes, when the slope of the valley is rapid, exhibiting huge fissures and fantastic varieties of form. These masses of snow and ice are the sources of some of the largest rivers of Europe. They often descend in the narrow transverse valleys considerably below the line of permanent snow. More than four hundred glaciers are reckoned: different portions of the great masses bear separate names, and vary from six or seven leagues to one league in length. There are numerous glaciers of the larger size; in width, they vary from a quarter of a league to a league, and many of them are estimated to be from 100 to 600 feet thick: by a fair calculation their aggregate surface appears to have been taken at 130 square leagues. One of the most terrible calamities to which the inhabitants of the Alpine valleys are exposed, is the sudden descent of masses of snow which sometimes cause dreadful devastation. These are generally termed AVALANCHES, or sometimes lauwines.

A remarkable feature in the Alps is the occurrence of lakes on or near the crests of the passes. A pass is never over a summit of a mountain, but over the lowest traversable point. In determining the direction of the path or road, a valley is ascended to the source of the stream which flows through it; this will generally be found on or near the ridge or col, between two mountains, whence another stream follows the slope or valley on the other side. To this general rule there are few exceptions: there is scarcely a pass which is not commanded by mountains; and where the ridge or col is wide enough to receive the water which streams from them, and retain it, lakes are formed, the sources of the rivers which flow from the passes: such is the Mont Genèvre, where the Durance towards France, and the Dora Susanna towards Piedmont, flow from almost a common source. The lakes on the Cenis, on the Great St. Bernard, the St. Gothard, the Bernardin, are of the same kind.

Many of the loftiest summits and peaks of the Alps have been attained by adventurous naturalists and travellers but these difficult and perilous expeditions have, in general, been undertaken rather for the gratification of the traveller than for the promotion of science. Saussure made various valuable experiments at the greatest elevations, and little or nothing has since been added to the results which he obtained. Many travellers have now ascended Mont Blanc; and Monte Rosa has been ascended several times by M. Delapierre, Inspector of the Forests of the Val Sesia: the Ortler-Spitz has been surmounted by Dr. Gebdhard of Innspruck; and even the Jungfrau or Virgin Mountain, which rises to the height of 13,716 feet, and owes its name to its supposed inaccessibility, has had her highest peak surmounted by the alpenstock of a Swiss peasant.

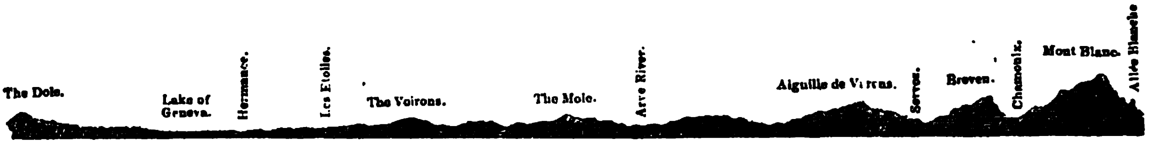
Excursions in the Alps within the last fifty years, and especially since the peace of 1815, have been sources of pleasure and of health to numerous visitors, especially from England. Every summer hundreds are to be found wandering there; and so certain is their return with the season, that guides bred to this employment are always found ready to accompany them into all the sublimest and most beautiful regions of the Alps. There is a spirit in the mountain air, and a degree of buoyant health derived from seeking it, which never fail to gratify the traveller. Many precautions are necessary in regions absolutely dangerous, and in which it is more bold than wise to ramble alone. The advice of the guides should be implicitly followed, as they are the best judges as to the danger or practicability of accomplishing any undertaking.

The number of mines that are worked in the Alps is not very considerable when compared with the great extent of the mountains. Some gold and silver mines are worked, as at the Rathausberg, &c.; and others of copper, lead, iron, alum, and the species of coal called anthracite. The iron-mines of Styria, Carinthia, and Carniola, are very productive: the Bleiberg (lead-mountain of Carinthia) furnishes some of the best lead in Europe. There are also lead-mines in Savoy, at Pesey, and Macot. The quicksilver-mines of Idria, which are about 27 miles N.N.E. of Trieste, are well known from the descriptions of travellers. (See Russell's *Germany*, vol. ii. p. 362, &c.) Salt is procured at Bex in the canton of Vaud, at Hall in the Tyrol, a little below Innspruck; and in the beds of Hallein, Reichenhall, and Berchtesgaden, all in the neighbourhood of the town of Salzburg. (See *Orographie de l'Europe*, p. 166.)

ALPS, *Geology of.* When we contemplate the Alps in the mass, we are struck with the fact, that while these mountains are furrowed by deep valleys, extending in the direction of the main range, they are also broken by other important valleys meeting the central parts of the chain, at an angle which more or less approaches a right angle. This configuration naturally suggests the idea of cracks and fissures produced by forces acting from beneath, and in a line of considerable length. The longitudinal and transverse valleys precisely accord with this view, which, so far from being destroyed by a strict and detailed geological examination, acquires additional strength by such examination.

It was at one time considered that the Alps were produced by a single great effort of nature; this opinion has, however, given way before facts, and it is now very commonly received that they have been elevated at different periods, probably at great and unequal intervals of time, during which most important changes were taking place on the surface of the earth generally.

From the mode in which we usually regard mountain-chains, we commonly receive very erroneous impressions respecting the true relative elevation of such chains above their bases, so that few, unaccustomed to the investigation of geological phenomena on the large scale, are prepared to consider mountain-masses, such as those of the Alps, and which from habit they call enormous, as the result of simple cracks and fissures, squeezed up against each other. The following diagram, which represents a proportional section of a part of the Alps from Mont Blanc, crossing the lake of Geneva to the Jura, may probably assist the reader in estimating the true value of these mountains when compared with the extent of land which they transversely cover, the heights and horizontal distance being on the same scale, viz., $\frac{1}{200000}$ of actual nature.



It will be seen, more particularly if the height of the loftiest Alps be compared with the radius of the earth, that mountain-masses are by no means so enormous as our imagination inclines us to suppose, but that, on the contrary, they really rise but a small relative height, so that at first sight there is much difficulty in considering a real proportional section of a mountain-range to be correct. Such sections are, however, useful in showing that the relative forces required to fracture rocks and elevate them into mountains are by no means necessarily so great as might, at first sight, be supposed.

Proceeding to examine the nature of the geological evidence, from which we infer that the Alps were not produced by one great upburst of rocks, we find that certain beds have evidently been broken and tilted up at various angles before others were deposited, for the latter rest quietly on the fractured edges of the former. In such cases we have merely to inquire what are the equivalents both of the upset rock, and of that quietly resting on it in the series of rocks generally, and we arrive at the relative date of the dislocation or fracture of the first rock, as it must evidently have taken place before the second was deposited. If we now find, still pursuing our investigations in the same manner, that the second rock has itself been broken and tilted up in another part of the Alps, perhaps farther removed from the central chain, and that a third known rock rests upon its disrupted edges, we obtain another relative date, and a proof that the Alps have been produced by more than one elevation. It will be evident that, by continuing these researches, and by thoroughly examining all parts of the Alps, we obtain the number of elevations by which their present general form has been produced.

Although much has been accomplished, it cannot be said that we possess a body of evidence sufficiently clear to enable us accurately to point out all the principal dislocations and elevations to which the present general form of the Alps is due. M. Elie de Beaumont has inferred that the range extending from the Vallais into Austria has been in a great measure elevated after the western Alps had assumed their present general direction; and he observes that, where the two great ranges or lines of fracture cross each other, as they do around the Mont Blanc, the Monte Rosa, and the Finster-Aarhorn, the dislocations are of a very complicated nature. Without entering into the theory of this author, that lines of contemporaneous fracture are parallel to each other, it may be remarked, that the Alps exhibit several great leading lines of dislocation, impressing marked characters on large portions of the chain, and that many of these fractures have evidently been produced at different times.

The contortions and dislocations of strata in these mountains are for the most part on the great scale: in some cases whole mountains are formed of beds fairly thrown over, so that rocks which have undoubtedly been deposited the latest are seen to plunge beneath, and thus support others of more ancient date, and which, in fact, constituted the solid matter on which they were formed. This fact is not only observed for short distances but over considerable spaces, and, before it was well understood, led to frequent errors. Upon the whole, then, we find that the Alps have been formed by the disruption and elevation of strata at different periods; that the elevating forces acted from beneath; and that they were sometimes sufficiently intense to throw masses of matter, now constituting high mountains, so completely over, that the newer rocks are covered by older deposits at angles even amounting to forty-five degrees.

The older rocks of the Alps are more or less crystalline, and belong to the class of non-fossiliferous rocks, a class often termed primary, from the opinion that they were first formed. The central ranges of the Alps are, in a great measure, though not altogether, composed of these rocks, and consist of gneiss, mica slate, talcose slate, and others of the like character. Gneiss may be considered as very abundant, more particularly that variety which has been named Protogine, and is a compound of felspar, quartz, and talc, talcose chlorite, or steatite. This rock constitutes the mass of Mont Blanc and of several other lofty mountains; sometimes it is schistose, while at others, the beds, if such they can strictly be called, are of enormous thickness without a schistose structure. The thick-bedded gneiss of the Alps often contains large imbedded crystals of felspar or albite, and detached portions of it, even huge blocks, have much the same appearance as the granite of Dartmoor and Cornwall. This kind of gneiss forms, however, long continuous beds, which are sometimes contorted and bent, showing that they have undergone disturbance in the same manner as other stratified rocks. Mica slate is also abundant, frequently passing by insensible gradations into talcose slate, and thus offering instructive examples of the mode in which mica and talc are substituted for each other. The mica slates of the Alps, as is the case with mica slates generally, occasionally contain many minerals, among which may be enumerated garnet, staurotide, cyanite, hornblende, tourmaline, and titanite, the first being often so abundant as really to constitute a very important ingredient of the rock. The mica slate and gneiss alternate with each other, but when viewed on a large scale, the gneiss appears to predominate in the lowest parts. Crystalline limestone is occasionally associated with these rocks, but is by no means abundant. The grain is sometimes large, as, for example, that included among the mica slate of the lake of Como, which has been so extensively employed in building the celebrated Duomo at Milan.

Although the great mass of Alpine dolomite is of less antiquity than the class of rocks now under consideration, there are, nevertheless, some portions of it which may be considered as associated with the gneiss and mica slate in the manner of the saccharine limestones. The dolomite of Campo Longo, (St. Gothard,) several hundred feet thick, is described as distinctly included between gneiss and mica slate. The dolomite of St. Gothard is celebrated for containing numerous minerals, among which may be enumerated sulphate of barytes, corundum, tourmaline, tremolite, talc, mica, and titanite. Our limits prevent a proper notice of the various combinations of these inferior stratified rocks, and of their changes and passages into each other, which are often remarkable; but it may be observed that their thickness must be very considerable, for though subject to bends and fractures, they by no means exhibit those very remarkable flexures and contortions, so common in many parts of the great calcareous series of rocks which rests upon them.

In the Eastern Alps, a group of rocks reposes upon those above noticed, which has not yet been detected in the Western Alps. The beds composing it have been referred to the grauwacke series, the lowest portion of the fossiliferous rocks, or those which contain the remains of animals and vegetables. Though the remains of shells, corals, and encrinites are of the character of those detected in this old fossiliferous rock, it would be desirable to obtain a greater number and variety of such organic exuviæ, as the same general zoological character extends upwards in the series of fossiliferous rocks to the zechstein inclusive. [See Geology.] It becomes therefore somewhat hazardous to fix with certainty upon any given portion of such series, without a larger catalogue of organic remains than has yet been afforded us. The group now under notice is described as graduating into the crystalline rocks beneath it.

Next in the order of superposition we find sandstones, slates, and conglomerates, often of a red or variegated colour. These rocks have a considerable range through the Alps; and, though by no means constantly present, occur, when they can be observed, above one or other of those previously mentioned, and beneath the great mass of calcareous rocks to be next noticed. The red colour of these beds is more prevalent in the Eastern than in the Western Alps, though it is also observable in the latter. The celebrated Vallorsine conglomerate, long considered as an example of a mechanically-formed rock among very ancient strata, constitutes a portion of these beds in their continuation through the Savoy Alps. This conglomerate, though tolerably abundant in the Vallée de Vallorsine, disappears somewhat suddenly at the Col de Salenton, where the schist, which contains the rounded pebbles at the former place, occurs without them, the beds consisting simply of sandstones and slates. This series of beds may be referred to the epoch of the red sandstone. [See Geology.] The beds of which it is composed have evidently resulted from the wearing down and partial destruction of the more ancient strata; as is well shown in the conglomerates which contain the rounded fragments of pre-existing rocks, such as gneiss, mica slate, talc slate, &c. Whether this has been accomplished suddenly, by a violent disruption of the older beds, or tranquilly, by a long-continued action of more moderate forces, cannot be considered as well shown; but, at all events, these beds mark a break in the Alpine deposits, for they do not pass into the inferior rocks.

This partial destruction of the older Alpine rocks, however produced, was destined, at least in a great measure, to cease; and an enormous mass of calcareous matter was deposited, necessarily resting upon the various rocks that constituted the floor, or ground, on which the calcareous matter was thrown down; so that it sometimes directly reposes on one and sometimes on another of the various older strata above noticed. This mass, frequently termed the calcareous Alps, because limestone greatly prevails in the mountains which compose it, is intermixed with argillaceous schists and sandstones, both of which vary considerably in their relative proportions to the limestone in different parts of the chain.

In certain schists, sandstones, and limestones, which constitute the inferior beds of the calcareous mass, there is a somewhat unusual mixture of organic remains, particularly in the Western Alps. At the Col du Chardonnet (Hautes Alpes), Petit Cœur near Moutiers in the Tarentaise, Puy Ricard near Briançon, the Buet, the Col de Balme, and other places, a variety of vegetable remains, many of which are also detected in the coal measures of Europe and North America, are associated with belemnites, inasmuch as the latter are discovered in beds both above and beneath those containing the vegetables. Now, according to our present knowledge of other parts of Europe, the organic remains named belemnites, are found only in two great groups of rocks,—viz., the cretaceous and the oolitic. It has been considered that, in the cases here enumerated, the series of beds, containing this curious mixture of exuviæ, should be referred to the oolitic group, as its prolongation, more particularly in the direction of Digne and Sisteron (Basses Alpes), is stated to contain the abundant remains of shells which are commonly detected in the lowest part of the oolitic group, named the lias. Considerable masses of granular limestone and micaceous quartz rock sometimes occur in the lower part of this system.

Many attempts have been made to establish divisions in the calcareous deposits of the Alps, which should correspond with the subdivisions formed in the oolitic and cretaceous groups of Western Europe; but such attempts cannot be considered as having been successful. There can be little doubt that the great oolitic and cretaceous groups constitute a large portion of the mass; but the exact line of separation between these groups, as they exist in the Alps, is far from clear, though, as great accumulations of strata, they may be readily distinguished. When the mineralogical structure of rocks was considered by some a safe guide in geological investigations, the whole of the mass here noticed was referred to what was termed the transition series, as this series was supposed to form a transition or passage between the so-called primary and secondary rocks.

It becomes a point of no small interest to ascertain the reason why the same series of rocks which, even so near as the Jura, is principally light-coloured and often loosely aggregated, should in the Alps be dark coloured and very compact. On the Montagne des Fis, and other parts of a system of mountains which ranges up to the Buet (Savoy), hard, dark, and calcareous rocks represent certain beds of England and northern France associated with the chalk, and probably are also equivalent to a part of the white chalk itself. This is proved both by the geological position of the beds in question, and by the identity, or rather very close resemblance, of the organic remains detected in each. This difference in the mineralogical structure of contemporaneous rocks may be due either to a change in the nature of the original deposit, to the mode in which it was effected, or to alterations produced after deposition. Probably much may be ascribed to the two first; indeed such is evidently the case: but admitting this, we can scarcely consider that these rocks should not have suffered some change from the action of the great disturbing forces to which they have been subjected, and which have often contorted them in such a remarkable manner.

In many parts of this calcareous system, dolomite (a compound of carbonate of lime and carbonate of magnesia, more or less crystalline) constitutes masses of considerable extent and thickness; the stratification often becoming indistinct, and even lost, when the rock becomes highly crystalline. In many cases, this rock seems the result of original deposition, while in others it has the appearance of an altered substance. These dolomites are by no means constant to a particular part of the great calcareous series; sometimes they are associated with the upper, sometimes with the lower part, and consequently occupy parallels equivalent to the oolitic and cretaceous groups, if not to the group beneath these. Gypsum frequently accompanies them; indeed, the association of gypsum and dolomite is common. In the Tyrol and the Maritime Alps the two are so intimately mixed, that crystals of dolomite have been found disseminated through gypsum. The salt of Hallstadt, Hall, Hallein, and Ischel, is subordinate to the lower part of the calcareous Alps, and is consequently on a parallel with some part of the oolitic series of Western Europe.

To present even a sketch of the organic contents of the great Alpine calcareous series would far exceed our limits; but we may remark that a particular genus of fossil shells, named nummulites, once considered as characteristic of those stratified rocks which have been formed since the chalk, descend into the equivalents of the chalk, and probably still deeper in the series. It should also be observed that a fossil sea-weed, named *fucoides*, abounds so much in a particular sandstone, that it has received the name of fucoid sandstone. It is associated with the Alpine cretaceous rocks, and probably, also, with others immediately beneath, and equivalent to the upper portion of the oolitic group. This rock is more particularly observable in the Eastern Alps.

Above the great calcareous mass of the Alps, a series of beds has been discovered, consisting principally of micaceous sandstones and blue marls; the latter alternate with limestones and calcareous grits; and the whole possess much interest from the nature of the inferences which have been deduced from them. The strata in question are well seen in the valley of Gossau, amid the Alps, S.E. from Salzburg, and have hence received the name of Gossau beds. There has been much discussion among geological writers, whether these deposits should be referred to the chalk series, or to the supracretaceous or tertiary rocks above it. The point of difference is, therefore, simply, whether the Gossau beds should be considered as the upper part of one series of deposits, or the lower part of another resting immediately upon it? Less difficulty would probably have attended the consideration of this question, if, during the progress of geological discoveries, it had not happened that a break was observed between the chalk and rocks above it, over a considerable part of the European area, at the time that the chalk was termed the highest part of the so-called secondary rocks. The then newly-discovered rocks were termed tertiary, to distinguish them from those beneath; and it was assumed that the observed break was constant to rocks generally, though upon what solid ground, or even plausible hypothesis, it is difficult to conceive. In the valley of Gossau itself, the beds under consideration are stated to rest unconformably on the older rocks beneath,—that is, the older rocks have suffered disturbance before these beds were deposited.

From the catalogue of the organic remains found in the Gossau, and other equivalent beds in the Alps, by Professor Sedgwick and Mr. Murchison, it appears that out of eighty-nine species enumerated, twenty are considered to resemble certain of the organic remains discovered in the supracretaceous or tertiary rocks, while six are referred to other exuviæ detected in the cretaceous series. Assuming these determinations to be correct, we have evidence that when the Gossau and other Alpine beds of the same date were formed, there was a mixture, in the proportions above noticed, of creatures previously considered to have existed unmixed, the one set living only during the deposit of the chalk series, the other during that of the beds resting upon it. It hence follows that there is at least a zoological passage between the supposed great classes of secondary and tertiary rocks. In the Pyrenees, there are also beds considered to exhibit evidence of the same fact, and at Maestricht, the well-known strata there, so extensively and curiously quarried, are stated to contain organic remains leading to the same conclusions, which are strengthened by facts observable at the contact of the chalk with superior beds in Normandy and elsewhere.

Next, in the order of superposition, we find strata of great collective thickness, known under the names of Nagelfluh and Molasse, the former being conglomerates and the latter sandstones. The various beds are entirely composed of fragments of Alpine rocks, ground down by attrition, and varying in size from a man's head to sand. This variation in size shows that the waters which have transported the fragments into their present relative situations must have possessed different degrees of velocity, and that this velocity must often have been considerable, as the fragments moved are large. Beds of lignites are here and there interstratified with the molasse and nagelfluh, and are worked in various places for economical purposes. In them, or in the strata associated with them, the remains of the mastodon, rhinoceros, palæotherium, and anthracotherium, have been detected. The lignites of the canton of Zürich have furnished a large proportion of these exuviæ. Whether we regard this great accumulation of Alpine detritus as resulting from a series of minor catastrophes, or from the continued action of such causes only as now bear down detritus from the Alps, we still seem to require a great length of time for its production. It is clear, from the organic remains detected in it, that at least a large portion of the mass must have been deposited after great mammiferous animals were called into existence, as it rests upon those beds in which their exuviæ are found. Judging also from the character of the organic remains, some of the strata were formed in fresh waters, while others were accumulated beneath those of a sea.

Such are the stratified rocks which compose the mass of the Alps. It has already been remarked that the crystalline rocks occupy the central part of the chain, though they do not extend continuously through it. In the Eastern Alps, beds that have been referred to the grauwacke series repose on each side, becoming of less importance, and disappearing as they advance westwards. Flanking these last, and the crystalline rocks of the central axis, when the others are not present, are bands of sandstones and conglomerates, for the most part red. These beds are not continuous, at least on the surface, so that the great limestone zones, constituting the two great ranges of the calcareous Alps, one on each side of the central chain, are not always separated by them from the inferior rocks. These two limestone zones are remarkable for the enormous flexures and contortions with which they abound, presenting the appearance of having been doubled back from the central range in consequence of the latter having been upheaved through them. Indeed one is sometimes tempted to believe that if they could be pulled out like crumpled sheets, and the central axis lowered, the two zones would often approach somewhat closely to each other. The Gossau beds are probably far from being known in all their extent. While they are here and there found to intervene between the calcareous Alps and the mass of nagelfluh and molasse constituting the lower and external ranges, as well as the hill country bordering them, they also extend in among the high Alps, as at Gossau itself, filling up pre-existing cavities and valleys. The nagelfluh and molasse, skirting all, are evidently derived from causes acting from the central ranges outwards. The mountains composed of these beds, though low when compared with the central Alps, are still lofty. The well known Righi, which from its base to its summit is formed of them, rises 6182 feet above the sea. This mountain is remarkable for exhibiting the conglomerates and sandstones thrown over in such a way that they appear to dip or plunge beneath the northern zone of limestone, while they are in fact more recent. Although these various stratified rocks may thus be described as forming zones parallel to the central axis, patches of them are often thrust up, or rolled over, out of their general lines of bearing, in consequence of the various disturbances to which these mountains have been subjected.

The granite of the Alps, at least that compounded of the usual minerals not occurring interstratified with the gneiss and mica slate, but, on the contrary, often cutting through them, is by no means that very common rock once supposed. At Baveno, and other places near the Lakes Maggiore, Lugano, and Orta, there are considerable masses of granite, and the quartziferous porphyries of the same district are probably of the same date. Granite veins traversing gneiss and mica slate can be well seen, among other places, in the Vallée de Vallorsine, in the district of Mont Blanc. The granite of these veins sometimes passes into porphyry, and where it cuts through the gneiss, it renders the latter more granitoidal. There can be little doubt that the mass of granite, thus partly visible, has much influenced the direction of the stratified rocks in the same district. M Necker has observed the important fact, that in the Vallorsine conglomerate, above noticed, he has not been able to find any fragments of this granite, though it abounds with those of the other rocks now in contact with it; whence it has been suspected that the granite was thrown up after the formation of the conglomerate, and consequently, if we admit the date of the conglomerate to have been correctly determined, the granite is not older than the red sandstone series.

According to M. Elie de Beaumont, granite rests upon limestones, equivalent to a part of the oolitic series, at the Montagnes de l'Oisans, Western Alps. The granite is described as cutting through the calcareous beds, rising like a wall, and lapping over them. At Predazzo, granitic rocks rest on beds of the Alpine limestones, and dolomite plunges beneath the granite at an angle of 50° or 60°. In the Swiss Alps, gneiss reposes on beds of the great northern calcareous zone, at the Bötzberg, &c.; and the celebrated Jungfrau is formed of an intermixture of gneiss and Alpine limestone, though, as masses, the former constitutes the southern side of this mountain, the latter the northern flank. In both these cases, and in others observable in the same district, the present appearances may be due to the disturbance of the whole mass, amounting sometimes to a complete overthrow.

A very extensive district in the Tyrol, between Botzen and Trent, more particularly to the left of the Adige, is occupied by porphyry, which has greatly disturbed the stratified rocks of the district. Von Buch supposes that much of the dolomite of the Tyrol is a rock altered by its contact with the igneous matter which has broken in upon it. Another district, the shores of the Lake of Lugano, particularly Monte San Salvadore, affords, according to this author, a confirmation of his views in this respect, as the limestone of the mountain becomes dolomitic in its approach to the augitic porphyry of Melide.

Among the other igneous rocks of the Alps, we may notice those in the Vallée de Fassa, where they are singularly mixed with dolomites and limestones, and have supplied a great variety of minerals. Respecting the Alpine serpentine and diallage rock, it is difficult to say, in the absence of good data, whether they should, like the mass of that in the Apennines, be considered of igneous origin, shot up among the stratified rocks, or as having been originally produced among the system of gneiss, mica slate, and others of that character. These rocks are found in the largest masses at the Monte Rosa, Mont Cervin, &c. At the Passo d'Olent, on the southern flank of the former, the mass composed of them is more than two leagues in extent.

Scattered on either side of the Alps, and down the principal valleys, we find huge blocks of rock, evidently detached from the great central range, and frequently accumulated in considerable numbers. It is clear that these principal valleys existed prior to the passage of the blocks, and that they were transported by means of water, for they are lodged against those parts which would oppose obstacles to the passage of waters, and often occur in great numbers precisely where eddies would be produced. These erratic blocks, as they have been termed, have long engaged the attention of geologists, and it has been found that, by tracing them up the principal valleys which they either face or occur in, the parent rocks from which they have been detached will be detected. Numbers of these blocks are discovered on the flanks of the Jura facing the Alps, and have evidently been borne down through the principal valleys into their present situations by water which must have been at a level of at least 2400 feet on those flanks, as erratic blocks are discovered at that height. The size of the blocks varies materially: there is one, among others, on the Vigneule, near Bienne, which is 12 feet high, 30 feet long in one direction, 24 in another, and 18 in a third. The blocks detached from the heights of the Mont Blanc district, and borne down the valley of the Arve, are found upon the Saleve, (near Geneva,) which opposed their progress, to the height of 2760 feet. Numbers of erratic blocks are accumulated upon the shores and the hills round the Lake of Geneva. One of large size, now known as the Pierre à Niton, (once as Ara Neptuni, being dedicated to Neptune,) occurs in the lake near Geneva. The Pierre à Martin, on the hill of Boisi, is 22 feet high, 18 feet wide, and 26 feet long. The erratic blocks are also abundant on the southern side of the Alps. They cover by thousands the northern face of the Monte San Primo, a mountain facing the high Alps on the Lago di Como, where it branches off into the minor lake and the Lake of Lecco. Behind that mountain also, and precisely where eddies would be formed under the supposition that they have been brought by a body of water from the high Alps on the north, they are abundant. They are observed curiously perched upon the flank of the Monte San Maurizio above Como. Many theories have been framed to account for the present situations of these blocks. That they have been water-borne is generally agreed, and that they have been carried outwards from the central Alps at a geological epoch comparatively recent, seems also undisputed, but geologists do not so well agree as to the cause which set them in motion. In all discussions on this subject it should be remembered, that the present glaciers are covered by huge blocks which fall from the heights upon them, and that if these glaciers were floated and carried down by a great body of water through the valleys opened to them, the blocks might become scattered as we now find them.

ALPS.—The *Vegetation* of the Alps differs in many respects from that of the plains beneath. Every traveller who has crossed into Italy knows that the beauty of the meadows and of the rich turf increases as he ascends the mountains; and gardeners have a whole class of Alpine plants. Some idea of the nature of Alpine vegetation has already been given under the head of ÆTNA; we shall in this place make a few general observations upon the subject.

As we quit the base of the Alps and rise into the higher regions, we find the temperature gradually diminish, and this phenomenon is accompanied by the disappearance of certain trees, the absence of which, as producing a striking effect upon the scenery, is one of the first circumstances that is usually noticed. At the foot of the Alps, for instance, are rich vineyards, and wine is one of the staple products of the country; the forests consist of most of the common European trees, especially of sweet chestnuts, oaks, birches, spruce firs, and many sorts of pines, while the usual proportion of bushes is scattered among them. But at the low elevation of 1950 feet, the vine is no longer capable of existing; at 1000 feet higher sweet chestnuts disappear; 1000 feet farther, and the oak is unable to maintain itself; at the elevation of 4680 feet, less than one-third of the height of Mont Blanc, the birch as well as almost every other deciduous tree ceases, the spruce fir alone attains the height of 5900 feet, after which the growth of all trees is arrested, not by perpetual snow, which does not occur for more than 3000 feet higher, but by the peculiar state of the soil and air. At the line where the spruce fir disappears, the mountains are ornamented by the *Rhododendron ferrugineum*, which covers immense tracts like our English heath and furze, but even this hardy mountaineer cannot ascend beyond 7800 feet. The herbaceous willow creeps two or three hundred feet higher, accompanied by little except a few saxifrages and gentians and grasses, which struggle up to the imperishable barrier of eternal snow, on whose border lichens and mosses and the most stunted and imperfect forms of vegetation alone exist.

Changes of a less striking but not less important kind simultaneously occur in the herbage of the Alps; their limits are, however, far from being so well defined as those of the trees, neither have they in the same degree occupied the attention of botanists. The middle region of vegetation on the sides of the Alps is that which is richest in the peculiar flora of such regions; it is here that the numerous species of pedicularis, the gentians with their vivid blue, the white or purple neat-leaved saxifrages, with the gay-flowering euphrasias, and the alpine compositæ find their principal station; what lowland forms are there associated with them gradually cease to grow as the snow is approached, till at last the region is occupied by strictly mountain plants alone.

The causes of this difference between the vegetation of the foot and of the summit of the Alps is doubtless owing to several circumstances combined. By many writers diminished *atmospheric pressure* has been thought a principal cause of the effects we have described; that it is a powerful *concurring* cause is highly probable, but, unconnected with others equally important, it is difficult to suppose that it can produce any very great effect; for the only way in which we can understand it to act is, firstly, to augment evaporation, in consequence of the rarity of the air, and, secondly, to diminish the supply of oxygen.

Temperature is doubtless here, as in every thing else, second to nothing in its influence. At the foot of Mont Blanc, the mean temperature of the year is 53° Fahr.; at the height of 6695 feet it is 32°; and between these points, as well as beyond the latter, the temperature of the year is in due proportion. By this plants are essentially affected; and the vine and chestnut, for instance, are probably stopped by it alone.

Light, again, is a third agent, to which the peculiar nature of alpine vegetation is due; for it is under the action of light that plants feed, (that is, decompose their carbonic acid,) and the quantity of food they are able to digest is in proportion to the intensity of the light to which they are exposed. Constant darkness during the state of rest is a condition to which alpine plants are periodically subject: buried in snow, they remain cut off from every ray of light during the whole of the winter, and it is only when the snow melts, and the spring has really commenced, that they again emerge into day. Now light, among other things, is the great stimulator of the vital actions of plants: if applied when they are able to execute their functions, it is of the most essential service to them; but if its influence is exercised only at intervals and at unfit seasons, plants are alternately stimulated and checked till their very excitability is itself destroyed, and thus they perish; or they are excited prematurely into growth, and are cut off by succeeding cold Plants of the plains accustomed always to a certain amount of light are not very excitable, and therefore do not suffer from constant exposure to the weak light of winter; but those of the mountains, never feeing a ray of the sun during the whole of their long winter, are excitable in the highest degree.

Humidity of the soil, gentle, but perpetual, never stagnant, but in a constant state of renewal by the melting of the snow, is the fourth circumstance that may be supposed to cause the peculiar appearance of the flora of the Alps. Under such circumstances no drought can be known, and a flood only sweeps over the surface, leaving nothing but its nutriment behind.

Such are, as far as we at present know, the conditions under which the botany of the Alps is produced. They should be attentively considered by gardeners, if they would possess the lovely flowers of the Swiss mountains, or, indeed, of any other mountains, in perfection; for the most skilful cultivation is that which most nearly resembles nature in her operations.

ALPUJARRAS, a smaller chain of mountains in Granada, lying between the Mediterranean and the Sierra Nevada or principal chain, to which the Alpujarras are parallel. They run between Motril and Almeria, a distance of about 60 miles: their rapid descent is on the north side; that towards the sea is long and gentle. The highest point of the Alpujarras is about 5000 feet. The mountain country is in general barren, but furnishes some pasture for sheep. It is said that the Alpujarras contain many thousand descendants of the Moors, who took refuge there after they were driven out of Granada.

AL RASHID. [See ABBASIDES.]

ALRESFORD, NEW, a market town in the County of Hants, on the river Itchin, fifty-seven miles from London, on the high road to Winchester. It was formerly a town of far greater importance than at present, and sent a representative to parliament. It probably owed its prosperity to the circumstance of the river having been rendered navigable by a head or pond of 200 acres, formed by Godfrey de Lacy, Bishop of Winchester, early in the thirteenth century. At present the navigation does not extend above Winchester, and is there confined to a few barges.

During the present summer, (1833,) a large quantity of English silver coins, all of the reign of William the Conqueror, were found in a leaden box in a field a short distance from this town. About 7000 of these coins are now in the British Museum.

It has been twice destroyed by fire, once in 1690, and again in 1710. It has a manufactory of linseys; the population in 1831 was 1437, or if we include that of Old Alresford, a village in the immediate neighbourhood, and which some consider as another parish of the same town, it may be taken at nearly 1900. Alresford has a national school. The market, which is held on Thursday, is chiefly for corn.

ALSACE, a fertile province of France, comprehending part of the basin of the Rhine, by which river it is bounded on the east. The Vosges, or Wasgau mountains, form the western boundary, and separate it from the ancient district of Lorraine [see VOSGES]; a continuation of the chain of Jura divides it from Switzerland on the south; on the north it extends to that part of the Bavarian territory which is west of the Rhine. It is nearly equivalent to the present departments of UPPER and LOWER RHINE. It is watered by the various streams which flow from the above-mentioned mountains into the Rhine; but none of these attain any size, except the Ill, which has a course of about eighty English miles.

The Rauraci, the Tribocci and the Nemetes, the two last German tribes, were the ancient occupants of this district, which passed with the rest of Gaul under the Roman yoke. Upon the rise of the Frankish monarchy, under Clovis, it fell into the hands of that prince; and after his dismembered territories were reunited under Charlemagne, it was included in the empire of that prince. When that empire, after many convulsions, was divided, Alsace became part of the German empire, and continued so until the seventeenth century. By the treaty of Munster in 1648, a considerable part of it was ceded to France, and nearly the whole of the remainder by the peace of Ryswick, in 1697. The territories of Montbelliard and Mühlhausen have been acquired by France since the revolution. German is still the common language of the country; but the French is generally understood, and is spoken in the towns among the more educated classes.

Alsace is a fruitful country. Corn, wine, flax, tobacco and madder, are produced. It is thickly wooded. The forests in the Vosges produce firs in abundance, with beech, oak, and hornbeam. The mountains on the side of Switzerland are lower and well wooded. The horses are suited for cavalry and posting.

The wealth of the country chiefly arises from its mines and manufactures. It yields copper, iron, lead, and coal; and near Soultz sous Forêts, in the northern part, is a spring, from which a considerable quantity of salt is obtained. Seltz, another town in Alsace, exports many thousand casks of mineral waters to Paris and elsewhere. The staple manufacture appears to be cotton; other woven goods, linen and woollen, are also made; and the mineral riches of the district have made it the seat of a considerable manufacture of swords, fire-arms, and other hardwares.

The inhabitants are distinguished by their adherence to a peculiar dress, and to old customs and manners. The chief towns are Strasburg, Colmar, Mühlhausen, and Schlett stadt (which see); for the rest, as well as for other particulars, we refer to UPPER and LOWER RHINE.

ALSEN, a small island in the Baltic, belonging to the duchy of Schleswig and the kingdom of Denmark. It lies in the Little Belt, and is separated from the main land only by a narrow channel. It is about 20 miles long, and from 3 to 8 broad. The 55th parallel and 10th meridian E. long. pass through the island. The soil is very fertile, and produces grain, fruit, potatoes, and flax, some of which form articles of exportation. The island is one of the most pleasant in the Baltic, containing some fine woods and small fresh-water lakes, well stocked with fish.

Sonderborg, the chief town, is on the south-west coast of the island situated on the slope of a hill, and is a place of some antiquity. It has one of the best ports in Denmark, and about 3000 inhabitants.

The population of Alsen is stated at about 15,000.

AL-SIRAT (*i. e.* literally, 'The Path'), in the theology of the Mohammedans, is the name of a bridge extending over the abyss of hell, which must be passed by every one in order to enter paradise. It is described as being narrow like the edge of a sword. Some, it is said, will pass it with the rapidity of lightning, others with the swiftness of a horse at full gallop, others like a horse at a slow pace, others still slower, on account of the weight of their sins; and some will fall down from it, and be precipitated into hell.

ALSTON, or ALDSTON, a town almost at the eastern extremity of Cumberland, in a mountainous and sterile district, which contains rich lead mines; many of these mines at present belong to Greenwich Hospital, having been forfeited by the Earl of Derwentwater, who was engaged in the rebellion of 1715.

Alston is on the declivity of a hill on the bank of the South Tyne River, over which is an ancient and narrow stone bridge of one arch. The houses are chiefly of stone and roofed with slate; the town has one church, rebuilt in 1790, and there is a chapel-of-ease at Garrigill, four miles S. E. of the town. There are also a Presbyterian, a Quaker, and two Methodist (Wesleyan and Primitive) meeting-houses. The grammar-school was erected in 1828, but the endowment appears to be much older. There is a similar school at Garrigill; and at Alston a Lancasterian school for 200 children. The market day is on Saturday, and there are three fairs in the year, in May, September, and November.

The mines of the neighbourhood supply some copper, and a little silver is extracted from the lead-ore. But the lead is the principal metal obtained, and it is said that the present supply is about 9000 tons per year. Alston is, by the nearest road, 272 miles N.N.W. from London, and 25 E.S.E. from Carlisle. The population of the parish, including the chapelry of Garrigill, was, in 1831, 6858.

There are some Dissenting meeting-houses and an Episcopal chapel. Considerable sums were left by Lady Charlotte Erskine for educating and catechising the children of the town, and supporting schools about the collieries. Lat. 56° 7′ N., long. 3° 46′ W. of Greenwich.

ALT, in Music, (from the Latin *altus*, high,) that part of the scale beginning with F, the fifth line in the treble clef, and ending at E, the third leger, or additional, line above the same clef.

ALTA, in Music, (Italian, *high*,) generally used in addition to the word *ottava*, as *ottava alta*, an octave higher, *più*, more, being by custom omitted.

ALTAI MOUNTAINS is the name given to that extensive range which forms the northern border of the *high lands* of Upper Asia, (a region composed of high table-lands, mountains, and valleys,) and which divides them from the *low lands* that extend northwards to the arctic ocean.

This mountain-range begins on the eastern banks of the *River Irtish*, 80° E. long., and here it occupies all the space between the *Lake of Zaizang*, (47° 30′ N. lat.) and *Semipalatinsk* (53° N. lat.), consequently, about 5½ degrees of latitude. From 80° E. long., it extends eastwards till it reaches the *Sea of Okhotzk*, a gulph of the Pacific ocean. It grows broader as it advances towards the east; its northern declivities extend, on the banks of the river Yenesei, to Krasnoyarsk (56° N. lat.), and from that town to a point about 200 miles north of the most northern extremity of the *Lake of Baikal*, where, between 57° and 58° N. lat. they join the *Aldan Mountains*. How far this range extends to the south is not exactly known, as it traverses countries subject to the Chinese empire, whose jealous politics exclude foreigners from their dominions. But as far as we may judge from the geography of the imperial court of Peking the ranges of the Altai Mountains extend even farther to the south than to the north; and it is probable that, between the meridians of 88° and 105°, the mountains occupy no less than 12° of latitude, from 45° to 57°, a distance equal to that between the Pyrenean Mountains and the Cheviot Hills, or the whole extent of France and England from south to north. About the 105th degree of longitude, or the meridian of the lake of Baikal, the great Desert of Gobi, or Shamo, advancing to the north, narrows the mountain-range considerably, and changes its direction from east to north-east. Between the plain to the north of *Irkutzk*, and the valleys about Nertshinsk, it occupies not more than about 500 miles in breadth. In the parallel of the northern part of the lake of Baikal, (*i. e.* between 54° and 56° lat.) it runs again to the east till it arrives at the Pacific Ocean, at the southern extremity of the sea of Okhotzk, opposite the island of Tarakaï. In this latter part of its extent, the breadth of the range cannot be determined; for here it joins the Aldan Mountains, which may be considered as a branch of the Altai, nearly filling up the whole space between the *Lena* and the Sea of Okhotzk, an extent of more than 1000 miles from west to east, and running to the north-east, till they terminate at *Cape Tshukotshoi-Noss*, the north-eastern extremity of Asia.

If we consider the Altai Mountains to terminate at the southern extremity of the sea of Okhotzk, their whole length from the banks of the Irtish to that point is equal to 62°, or about 2480 miles (at forty miles the degree); and if we add the Aldan Mountains, which extend obliquely, between the parallels of 55° and 67°, and the meridians of 135° and 190°, we may still add about 2000 miles, so that the whole length of the Altai Mountains may be esteemed to amount nearly to 4500 miles.

Our knowledge of this immense range of mountains is very imperfect, and as the principal parts are subject to the Chinese empire, even their geographical position would be entirely unknown, had not the Emperor Kang-hi, in the beginning of the last century, employed some Jesuits to survey part of these countries. Their surveys were sent to Europe, and used by D'Anville in his *Nouvel Atlas de la Chine, de la Tartarie Chinoise et du Tibet: à la Haye*, 1737, fol. About ten or twelve years ago, the archimandrit Hyacinth brought from Peking the *Tay-thsing-y-thoung-tshi*, or the *Great Imperial Geography of the Dynasty of the Mandshu Race*, published at Peking, in 1790. This work was translated and explained by Klaproth, and by means of it, and the information furnished by Pallas, Meyer, de Ledebour and Humboldt in Siberia, we are able to form a general, though doubtless still imperfect and inexact view of these mountains.

It was once thought that the Altai were connected with the Ural mountains, as well as with the *Thian-Shan*, a range which traverses the interior of Asia in the parallel of 42°. But according to the Geography, the latter supposition is not probable, and it is very well known that an immense tract of low country separates the western extremity of the Altai from the southern ranges of the Ural.

It is true, that on the left bank of the river Irtish, and opposite the western extremity of the Altai mountains, between 49° and 50° N. lat., a range arises, which extends from east to west for upwards of 700 miles to the 64th meridian. Though composed of several chains running parallel to one another, the mountains do not occupy a great space from north to south: their height is reckoned by Humboldt to be from 1200 to 1600 feet; but Dr. Meyer thinks that one summit, the *Kar-Karali*, rises to 3000 feet above the level of the sea, or 2000 above the steppe of the Kirghis, which extends on its northern side. This range, however, ceases entirely in the meridian of 64°, so that between it and the nearest range of the Ural, which is called *Mughodjar Kara Edir Tau*, nearly 10° of a flat country intervene, covered with a great number of lakes. This smaller continuation of the Altai mountains is called *Tshinghis-Tau*.

There is still another branch, more important in every respect, the *Tarbagatai*. Its north-eastern extremity is about twenty miles distant from the Lake Zaizang; whence it extends towards the south-west to the neighbourhood of the Lake Balkhash, a line of nearly 500 miles. It rises to a much greater height than the Tshinghis-Tau. In some places, on its north-western summits, snow, it is said, lies all the year round, which indicates, in this parallel, an elevation of about 6000 feet above the level of the sea. A chain of low hills, running at a distance of about twenty miles along the southern banks of the Lake Zaizang, unites this range to the Altai mountains. The Tarbagatai is considered as forming the north-western boundaries of the empires of China and Russia.

The *Altai Mountains* occupy, as we above observed, uninterruptedly, the whole space between the right bank of the river Irtish, a tributary of the Ob or Oby, to the southern extremity of the sea of Okhotzk. The most western part of this great range, between the Irtish and the Tshulyshman, the most eastern tributary of the Ob or Oby, all the space between the meridians of 80 and 86, consists of one extensive mass of high rocks, furrowed by narrow valleys and rapid rivers; this part is called by Ritter the *Egtag Altai*.

To the east of the Tshulyshman, between the meridians of 86 and 87, the great mountain mass divides into three distinct ranges, of which the central, called the *Tangnu Oöla*, extends nearly due east, under the parallel of 49°, bending a little to the south, and terminates at the mountains which inclose the Lake of Baikal and its southern tributaries on the west. The northernmost chain, called the *Sayans kean*, or *Mountains of Sayan*, runs W.N.W. of the Yenesei, but, on the right bank of that river, resumes its eastern direction, which towards the mountains on the south-west of the Lake Baikal inclines to the south, and in this direction it joins the *Baikalean Mountains*. This chain forms the boundary between Russia and the Chinese empire. The most southern chain, called *Ulan gom Oöla*, deviates to the south, but soon resumes its eastern course, and running nearly parallel to the Tangnu, reaches the Baikalean mountains farther to the south, in the parallel of the sources of the *Orkhon*. All these three chains join, between the meridians of 98 and 102, the mountains that encompass the great Lake of Baikal, and are called the *Baikalean Mountains*. The Chinese Geography calls those to the west of the river Orkhon, *Kangai*, and those on the east, *Kentei Mountains*. These Baikalean mountains may be considered as an extensive mass, in the middle of which is the lake.

To the east of the Lake of Baikal, between the meridians of 108 and 109, the chain that shoots out from the Baikal runs for a few degrees N.E., after which it follows an eastern direction till it reaches the Pacific. This chain is called by the Russians *Yablonnoi Khrebet*, and *Stannowoi Khrebet*, and by the Chinese *King-han-Oöla*.

The *Egtag Altai*, or that system of mountains in which the tributaries of the *Irtish* and *Oby* take their rise, is better known than any other part of the Altai. It occupies 5½° of lat., and 6° of longitude, consequently much less than half the extent of the Alps from east to west, but more than three times their range from north to south. The greatest elevations are between the parallels of 50 and 51, where, on the *Korgon table land*, they rise to near 9900 feet above the level of the sea (Humboldt), or more than 3000 feet above the line of eternal snow. But their mean height ranges between 4000 and 6000 feet, and consequently only a few places of considerable extent are always covered with snow. No glaciers are formed on them.

Compared with the mountains of Europe, the Altai Egtag exhibits a peculiar character. Whilst the highest parts of the Alps are peaked, rugged, and irregular, the summits of the Altai are nearly level plains of considerable extent. Some of them spread twelve and sixteen miles in every direction, as on the Korgon table-land. These table-lands may be considered as broad rays issuing from one common centre between the sources of the rivers *Bukhtarma* and *Tshuya*, and extending west, north, and east. The mountain-plains, where they have no snow upon them, are commonly covered with swamps, interrupted by some ridges of low rocks and lakes filled with snow. Rarely a peak 100 feet high rises above them; but in many places great pieces of granite are scattered about, which are often so scarped, that the snow which covers the plain does not stick to them, and thus their dark masses offer some variety in the uniformity of the scene. This characteristic formation, though different from that of the mountains of Europe, seems to be common to all the ranges of Asia, and indeed to belong to the nature of the steppes which prevail in that part of the world.

The valleys which intersect these mountains differ no less in their formation from those of the great European mountains. They commonly take the form of large, oblong, flat basins, with gradually-sloping sides, each basin being followed by another somewhat lower. The course of the rivers in these valleys is slow, and only becomes rapid where they descend from one basin into another. But as the extent of the whole range is considerable, and its mean height only half that of the Alps, the rivers have rarely a rapid course, and still less rarely do they form cataracts. These facts will explain the want of those majestic and beautiful views, which the traveller meets at every step in the Alps. The Altai upper valleys are commonly without thick forests, and only covered with a few trees and grass. But as these mountains are everywhere surrounded by extensive and dry steppes, they make an agreeable impression on the traveller who arrives at them. The valleys, which open to the west, on the bank of the Irtish, however, have steeper sides, and offer more variety than those turned to the north or east.

All the rivers which rise in these mountains contribute their waters to one stream, the Ob or Oby, which may perhaps be considered as the largest river of Asia, with the exception of the *Hoang-ho* and *Yantse-kiang*. Those that descend from the northern declivity join the main stream; those that issue from the western sides fall into its large tributary, the Irtish.

The Irtish (Ertshis of the Mongols) has its numerous sources on the south-western declivity of the Altai; its waters take a westerly course, and fall into the lake of Zaizang, 70 miles in length, and about 200 in circumference. Issuing from the north-western extremity of the lake, the river runs along the western declivity of the Altai mountains nearly due north, up to the place where the Bukhtarma joins it. Here the mountains advancing farther to the west, oblige it to change its course to the north-west, which direction it preserves till it leaves the mountains to the north of Semipalatinsk. Here, running to the N.N.W., it enters the low lands of Siberia, and traverses the steppes of *Ishim* and *Barabinsk* up to the town of *Tara*, whence it again directs its course to the north-west, and after having joined the *Ishim* meets the *Tobol*, descending from the Ural, after the junction of which it runs to the north, and mingles its waters with the Oby. At their junction, the Irtish is rather the larger river, but its name is merged in that of the Oby.

Among the rivers which descend from the Altai and join the Irtish, the *Narym*, the *Bukhtarma*, and the *Uba* are the most remarkable. The Narym is rather a small river, running little more than 100 miles, but it is remarkable as forming near its junction with the mouth of the Irtish the boundary between the empires of Russia and China. The sources of the Bukhtarma are in the Chinese territories, and not known but from Chinese maps: this river seems to run upwards of 400 miles; which is also confirmed by the statement of the natives. It also forms for some distance the boundary of both empires. The Uba joins the Irtish before it enters the low lands, after a course of between 200 and 300 miles.

The numerous rivers which rise in the eastern parts of the Altai mountains, and form the Oby, unite before their junction in two considerable rivers, the *Katunya* and the *Biya*, of which the former receives all the waters collected in the central region of the mountains, and the latter those which descend from its eastern parts. The river Katunya, before it leaves the mountain region, mingles its waters with those of the *Tshuya*, a river which runs at a great distance in the Chinese territories; and the Katunya, on entering the low land, receives another considerable river, the *Tsharysh*, which carries with it all the waters collected between the tributaries of the Irtish and those of the Katunya. It enters the Katunya on the left, and the united stream runs to the north, and joins the Biya.

The Biya, which comes from the east, has comparatively short course, and may be considered as the channel by which the Alpine *lake of Teletzkoi* or *Altyn Nor* discharges its waters. This lake, which is everywhere inclosed by high mountains, and has only been seen by one traveller Bunge), receives a considerable river, the *Tshulyshman*, which rises to the south of the boundaries of the Russian empire, and, according to the Chinese maps, has its sources considerable distance in their country.

After the junction of the Biya with the Katunya, the river takes the name of *Oby* or *Ob*. It then runs to the north-west for a great distance, nearly parallel to the Irtish, and afterwards changes its direction to the north-east, until, below the town of *Tomsk*, it gradually inclines to the north north-west, and west. At its junction with the Irtish, it again is turned to the north, in which direction it continues till near its embouchure in the Arctic Ocean, where it forms a large gulph. Its whole course is thought to amount to upwards of 2000 miles.

In the Altai mountains, as in the Alps, the general direction of the valleys follows that of the main range. Nearly all of them run from east to west, or *vice versâ*, and are only united by a few transverse valleys, in which the rivers run which carry off the water to the low lands. Besides the Irtish, only four such rivers cut the northern declivity of the mountains, three of which we have already named the Tsharysh, the Katunya, and the Biya. The fourth, called the *Anui*, is much less considerable, and runs between the Tsharysh and the Katunya, and joins the former.

Our geological knowledge of this mountain mass is very imperfect. The following facts, collected by a practical miner, and able observer of nature (Mr. Shangin), refer to the geological formation of the mountains in the valleys of the Tsharysh, and of the *Korgon*, a tributary of the former.

The summit of the mountain-mass is covered with a breccia of jasper, mingled with pieces of chalcedony, carnelian, &c., and under it lies a bed of slate-formation only two feet thick. This rests on a bed of breccia of red jasper, which contains many pieces of jasper of a darker colour, and is about sixty feet thick. Then follows a pure red jasper. In the lower part of this jasper a few cubes of felspar are inclosed, but they are of very small size, and the lower down the more frequent is the appearance of such cubes. These layers occupy about 300 feet of perpendicular depth, and have a substratum of the most perfect red porphyry, containing white and yellowish cubes of felspar, among which the very small cubes of felspar abovementioned are disseminated. Sometimes the breccia is found between the jasper and porphyry, and at others the jasper is found between the beds of porphyry, or the porphyry between those of jasper, but these formations only occur at the external and remoter protuberances of the mountain-mass. The granite is never found over the porphyry, chalk, or slate; the chalk likewise does not appear on the summit, but only in a few places calcareous hills join the mass, especially those which contain the coralline species. The granite is only visible on the lower part of the mountains, where it forms regular strata dipping somewhat towards the principal valleys.

This is the formation of the mountain-mass near its centre, but on its outskirts, near the lake of Kolywan, the granite-formation, for about ten miles, is unaccompanied by any other rocks, and only when it approaches the centre do we find the naked irregular summits formed by black porphyry. On the western edge of the mountains along the Irtish and the Bukhtarma, the granite likewise occupies the exterior heights, and behind it rise higher mountains composed chiefly of greenstone slate. Here the granite forms thick layers nearly horizontally stratified, but also split nearly at right angles, so as to form rhomboidal figures; and it is observed that its surface is much affected by the air and greatly decomposed. In the same quarter Humboldt observed a district extending more than 16,000 feet in length, on which the granite, lying horizontally, has been burst through by a mass of porphyry which now overtops it; while the granite covers on the sides of the porphyry great masses of argillaceous slate, which in part form an angle of 85°, and in part stand in an entirely vertical position.

All these facts concur to prove that the porphyry masses covered with layers of jasper have been heaved up by a powerful agency through the granite lying on them; but as the granite has great hardness and weight, it was not carried to the top, but fell down on all sides, where at present it rests, and in some parts covers the slate-formation that formerly lay upon it.

Humboldt recognized the same geological formation in the *Tshinghis-Tau*, which ridge he considers as an effort of nature to raise on the steppes a mountain-mass of the same description, and in the same direction as the Altai. This mountain-range shows likewise granite in regular layers and without gneiss, argillaceous slates and slates of grauwacke in contact with greenstone, porphyry, and jasper in layers, close-grained transition limestone, and even the metallic riches which are found to the east of the Irtish: among the latter, the lead-ore containing silver, and the red copper-ore with dioptas has attracted the attention of mineralogists.

The produce of the mines of this district consists of silver containing some gold, copper, and lead. The mines from which these metals are extracted have been worked on a large scale, at some unknown period, and by an unknown nation. In the middle of the last century the Russians began to work them. The mines which were first worked are all situated within the northern edge of the mountain-mass, and at no great distance from it; but gradually they became exhausted, whilst towards the close of the last, and in the course of the present century, very rich mines have been discovered on the western side, on the banks of the rivers that fall into the Irtish, and, according to all appearance, many more will be found in that quarter.

The principal mines are, 1. *That of Syranow* on the southern banks of the Bukhtarma, about forty miles from the Irtish, and not far from the boundary of the Chinese empire; it produces considerable quantities of silver and lead. 2. The *mines of Riddersk* and *Krukow* on the banks of the *Ulba*, which joins the Irtish between the Bukhtarma and Uba. They produce silver and lead, and are at present the richest in this quarter. 3. The *mines of Semenof*, farther to the north-east, on the lower ridges of the range, produce silver and copper, but are not considerable. 4. The *mines of the Schlangenberg*, famous for the great quantity of silver which in the last century was got from them, likewise on the northern lower ridges of the mountain-mass to the west of the river Tsharysh. It is remarkable, that the metalliferous veins are here imbedded in rocks of dark porphyry. In many mineralogical collections very fine specimens of gold-ore, silver-ore, and copper-ore, brought from these mines, are met with, but at present their produce is less considerable, and they begin to be exhausted. 5. The *mines of Woskresensk*, which produce copper, are at present not worked. 6. The *mines of Loktewsk*, to the west of those of the Schlangenberg, produce a great quantity of copper. In the neighbourhood of these mines, Pallas discovered in the sandy banks of a small river teeth of elephants, of rhinoceros, buffalos, and antediluvian animals: this is a single instance we believe in this mountain-range, though frequently met with in the low lands.

The quantity of silver extracted from the *Kolywan* mountains, as they are called by mineralogists, amounts annually to 1000 puds, which are nearly equal to about 36,000 pounds weight; but the quantity of copper and lead is not known. The former is in part coined in Siberia, in the mint of Susansk, on the bank of the Oby.

We may here notice the extensive *polishing works* at Kolywano-Woskresensk, where the finest granites, porphyry, jaspers, agates, and marble, brought from the river Korgon, are worked into tables, vases, basins, chimney-pieces, columns, &c. They employ 300 workmen, and are carried on at the Emperor's cost.

The *botany* of this mountain-region has only in a few places been examined with care, but has enriched our knowledge with some species, as cimifuga fetida, trollius Asiaticus, &c. On the low banks of the Irtish and other rivers, poplars, willows, loniceres, (*Lonic. tartarica*,) medlars, privets, white thorns, wild roses, and other bushes are found in abundance. In the lower parts of the valleys grow different kinds of poplar, birch, willows, hawthorn, *Lonicera tartarica*, currants, and some kind of roses. The slopes are covered with large forests of larch, mingled with birch, fir, &c. Birch ceases to grow at 4500 feet, but other forest trees extend nearly 1000 feet higher. Higher up, only *Pinus cembra*, *Pinus larix*, and *Juniperus sabina* and *nana* are found. But the larch, though still from 9 to 12 feet high, is stunted in its growth, and the other trees are dwarfish, and extend their branches along the ground. The *Pinus-cembra* was found 6187 feet above the level of the sea. On the table-lands of the summits, only a few dwarfish firs are found.

The dried leaves of the *Saxifraga crassifolia* are used in Siberia and other parts of upper Asia as a substitute for tea. They are chiefly gathered in the valley of the Tsharysh on a mountain, which, on that account, is called by the Russians *Tshaynaya Sopka*, the 'Tea-mountain.' The leathery, spongy leaves of this plant fall off in the fourth year, when those only are gathered which are quite black. They require no other preparation to be used. The infusion is reddish and of an astringent taste, similar to that of tea, but the aromatic flavour is wanting.

Agriculture was introduced into the valleys of this mountain-range about 100 years ago, and its progress has not been rapid. The best cultivated places are near the mines, or the towns which have sprung up in their neighbourhood. But in no part is cultivation carried higher than 4000 feet above the level of the sea. Rye, spring-wheat, buck-wheat, barley, oats, and millet; and cabbages, onions, gherkins, poppies, and pumpkins, are the chief grains and vegetables cultivated.

The natives of this mountain-region are altogether occupied with their cattle, which they conduct in spring to the high table-lands, which then give good pasture, and in autumn to the banks of the rivers. Their cattle are chiefly horses, sheep with fat tails, and a few camels. From the milk of the mares they make an intoxicating beverage, called *cumiss*.

The wild animals of these mountains are numerous. Bears abound in every part, as likewise elks, stags of a large size, red deer, wolves, foxes, lynxes, sloths, mountain-hares, (*Lepus alpinus*,) and squirrels; and on the rivers beavers, which, however, at present are less frequently met with, and otters. The best furs are obtained from the sables, which here are small and with a short hair, but their black skins are much valued; and also from martins, and from kulonkis (*Mustela Sibirica*). The highest parts are inhabited by the *musimon*, and the argali, a kind of wild goat. It is not ascertained whether or not the wild goat of the Alps, the dshiggetai (*Equus hemionus*), and the wild ass are to be included in the zoology of these mountains: the chamois does not occur.

The variety of birds is not great. The most remarkable bird is the mountain swallow (*Hirundo alpestris*, or *daurica*, Pall.) which makes its nest in the hollows of rocks.

Many people living on the banks of the rivers gain a competent livelihood and even riches by fishing. The most important are the fisheries in the river Irtish, and the Russians, by the connivance of the Chinese governor in these parts, extend them over the lake of Zaizang up to the sources of the Irtish. In the lake, and the small rivers falling into it, some kinds of salmon, (*Salmo nelma*, Pall. and *salmo fluviatilis*,) quabs or eel-pouts, (*Gadus lota*,) and pike are taken. The latter are also found lower, where, however, the sterlets (*Accipenser ruthenus*) and the sturgeons (*Accipenser sturio*) are very abundant. The former are often two feet long, and the latter weighs sometimes two or three puds (at about thirty-six pounds English each). Of the former 3000, and of the latter 30,000 fish are annually taken. Isinglass is made of their air-bladder.

Mosquitoes, in summer, are so numerous in many places, that they torment both men and animals, especially in the low lands. When Pallas, about sixty years ago, travelled in this country, he found no bees there; but they were soon afterwards introduced, and have so rapidly increased, that many peasants along the Irtish and other rivers now possess from 50 to 100 beehives, and consider them the best part of their fortunes. The introduction of these insects is the greatest benefit the Russians have conferred on these countries, next to the introduction of agriculture.

No mountain-chains run from the Egtag Altai to the north; but the Chinese Geography describes a very long and high mountain, which, parting from the south-western end of it, traverses a great part of the country between the Altai mountains, and the Thian-shan-Oöla. It assigns no name to it, probably because it considers these mountains as the true Altai, and the mountain-mass which we have till now been describing as its most northern extremity. Therefore the name of *Great Altai*, which in our maps is given to a mountain-chain which does not exist, may with propriety be transferred to this range.

The Great Altai joins the Egtag Altai at the sources of the Narym, (whose course, as we have already observed, forms for some distance the boundary between the Russian and Chinese empires,) and runs for a considerable distance to the south, or south-east, with some bends. The chain then turns to the east till it arrives at about the 92nd or 93rd meridian, where it divides into two branches, which form the boundary-edges of the desert Gobi or Shamo. Here they do not appear like mountain-ranges, but are only black rocks of inconsiderable height, whose continuity is often broken and interrupted. The chain of rocks which runs to the north-east is called *Kooke Sirke Oöla*, and joins the Baikalean mountains. The other chain running to the south-east bears several names, and seems to cease not very far from the place where the Thian-shan Oöla joins the Great-Desert.

According to this description, the Great Altai, before it joins the desert, runs for many degrees of longitude parallel to the *Ulangom Oöla*, and as they are some degrees of latitude distant from one another, a valley of great extent is formed between them, which is every where inclosed by high mountain-ranges. This valley is watered by two considerable rivers, of which the larger, *Zabgan*, rises where the Kooke Sirke Oöla joins the Baikalean mountains, and runs for about 200 miles to the south-west, receiving the waters of many rivers which descend from the Great Altai and the Ulangom Oöla. It then changes its direction to the north-west, and after a considerable course falls into the Kirghis-Nor, (lake of the Kirghis,) which, according to the Chinese Geography, has a circumference of upwards of 100 miles, and lies at the foot of the Ulangom Oöla. The other river is the Khobdu or Khobdo, which takes its rise in the Egtag Altai, and after running to the south-east along the eastern declivity of the Great Altai, falls into the *Yke Aral Nor*, or *Ekaral Nor*, a lake not much less than the Kirghis Nor, and situated probably not far from the southern declivity of the Egtag Altai. This country has never been visited by Europeans, and is not further known.

We now pass to the description of the three mountain-chains which unite the Egtag Altai and the Baikalean Mountains. Their general direction is from west to east, nearly parallel to the Great Altai, and as they are placed at a considerable distance from one another, the valleys which intervene between them are extensive and run in the same direction as the mountains.

The valley between the Ulangom Oöla and the more northern chain, the Tangnu Oöla, is, according to Chinese authorities, traversed by a considerable river, the *Tess*, which has its source in the northern range, the Tangnu Oöla, receives many small rivers from the north and from the south, and falls, not very far from the place where the Tangnu Oöla joins the Egtag Altai, into a lake of considerable extent, called the *Upsa Nor*. This lake receives likewise, on its western side, other rivers descending from the Egtag Altai mountains. As we do not know exactly the distance between the Ulangom-Oöla and the Tangnu-Oöla, we are not able to form a conjecture as to the breadth of this valley, which in all other respects is entirely unknown to us, being situated within the limits of the Chinese empire.

The same observation may to a certain extent be applied to the great valley which lies to the north, between the Tangnu-Oöla and the mountains of Sayansk, and contains the sources of the Yenisei. But here the Chinese geography gives more minute particulars, and as the northern range (the Mountains of Sayansk) belong in great part to the Russian territories, they have been visited by a few Europeans.

The Tangnu-Oöla seems to extend chiefly to the south of the 50th parallel, and the mountains of Sayansk occupy the country between the 51st and 53rd parallel. In the valley between them, which extends from 420 to 450 miles from east to west, the river Yenisei has its sources. They are at the north-eastern corner of the valley, where the mountains of Sayansk, here called *Erghik Targak Taiga*, join the Baikalean mountains a little to the north-west of the lake of *Kossogol*. Two rivers here rise near one another, the *Hua-Kimu* and *Peï Kimu*. The former has the more eastern source and runs along the mountains, which separate the valley from the lake Kossogol, towards the south, but afterwards declines by degrees to the south-west and west, and at last turns to the north and joins the other branch, the *Peï-Kimu*, whose course is chiefly to the south-west from its source up to its junction with the *Hua-Kimu*. Both rivers are increased by the waters descending from both the mountain-ranges, in which a great number of alpine lakes exist. After the junction of these principal branches the river, flowing from east to west, takes the name of *Ta-Kimu* (the great Kimu or Kem,) which is the only name of the Yenisei known in the Chinese empire. The Ta Kimu receives likewise many tributaries from the south as well as from the north, till at last it unites with the *Kemitziki*, (or Little Kem, the Kemtshyk of the Russians,) a river running in a quite opposite direction from west to east, and having its sources in the Egtag Altai, at the point where this mountain joins the Ulangom-Oöla, not far from the sources of the Tshulyshman. The course of the Great Kem, from its source to its junction with the Little Kem, may be upwards of 260 miles, and that of the Little Kem upwards of 170 miles.

The river formed by their union is called by the Russians *Yenesei*, and runs north, traversing the mountains of Sayansk in all their breadth, and forming some considerable cataracts. It enters the lowlands of Siberia below the town of Krasnoyarsk, and before it reaches Yeniseïsk it receives on the right a large river, the *Upper Tunguska*. The rivers, which rise in the mountains of Sayansk, and fall into the Yenisei before its junction with the Upper Tunguska, run all of them parallel to the principal river, and are, therefore, not considerable, except the *Abakan*, which carries down the water of nearly all the rivers rising between the Tshulyshman and the Yenesei in the western chain of the mountains of Sayansk. The Upper Tunguska is formed by rivers rising farther to the east in the Baikalean range, to which, therefore, its description belongs. After its union with the Upper Tunguska, the Yenesei having made a great bend to the east, resumes its northern course and receives another great tributary, the *Lower Tunguska*, whose sources likewise belong to the Baikalean range. From this point the river continues its northern course till it reaches the Arctic Ocean, forming at its outlet a large gulph. The whole course of the Yenesei amounts to upwards of 1800 miles.

The mountains of Sayansk have not been examined with the same care as the Egtag Altai. About the middle of the last century some mines of silver and copper were discovered and worked; but they were soon abandoned, because the veins of silver were found to be irregular, and the copper, though much more abundant, did not promise great advantages. A few scientific travellers have visited the outskirts, and the smaller branches which advance into the lowlands; but none of its heights have been measured, and the opinion that only a few of its summits attain the point of perpetual congelation rests chiefly on the statement of the natives. It is likewise uncertain whether the summits of the ranges exhibit large level plains like the Egtag Altai, or such pointed peaks and narrow ridges as are observed in the Alps. The latter seems to be implied by the name of Erghik Targak Taiga, (the indented mountain,) which is given by the Chinese to nearly the whole range, extending from the Yenesei to the Baikal mountains.

The botany of the lower ranges has been examined by Pallas. The forests consist of birch, larch, fir of different kinds, and mountain-ash. Among the shrubs there are bilberry-bushes, and many kinds of wild roses, especially *Rhododendron chrysanthem*, which cover with its beautiful yellow flowers all the rocks of the mountain, and *Rhododendron dauricum*. Some of the plants belonging more properly to the Da-urian region were also found, especially some kinds of *Astragalus*.

Among the domestic animals, the rein-deer must be added to those of the Egtag Altai. The wild animals are the same; the red wolf and the sable are very numerous. According to the statement of the natives, the wild goat of the Alps is common in the higher parts. The rivers abound with fish, especially salmon and trout.

The Russians have lately introduced agriculture, which has made some progress; some of the natives, who formerly lived only on the produce of their herds, now begin to cultivate rye, barley, oats, &c.

The three mountain-chains, the Ulangom-Oöla, the Tangnu-Oöla, and the mountains of Sayansk, terminate to the east in an immense mountain-mass, which, from the sources of the Orkhon in the south, to those of the Upper Angara in the north, extends from the parallel of 48 to 59 north. In the middle of it is imbedded the *lake of Baikal*, the largest of all mountain-lakes, and hence the whole mountain-range is called by geographers the *Baikalean mountains*. The southern part of this mountain-mass about the sources of the Selenga, and the whole course of the Orkhon belongs to the Chinese empire, and is called by its inhabitants (the Kalkas Mongols) *Khangai* to the west of the Orkhon, and *Kentei* to the east of that river. The latter is properly only a part of the Khing-han-Oöla, a name applied by the Mongols to the high mountains that run to the south and to the north of the river *Amur*. The Russians call the range of mountains which separates this river from the lake of Baikal and its tributaries Yablonoi Khrebet, (Stone mountains,) or the *Mountains of Da-uria*.

On the south, the Baikalean mountains join the Great Desert, called the *Gobi* by the Mongols, and the *Shamo* (sea of sand) by the Chinese; or more properly, the mountains are only to be considered as the extreme northern edge of the desert. For though they offer a truly alpine aspect, and all the difficulties of mountain-passes to travellers who enter them on the north, no descent is made on the south side. No sooner has the traveller attained the highest part of the mountains than he discovers before him the high table-land, extending as far as the great wall on the north of China. Only on the east, between the tributaries of the Selenga and those of the Amur, they may be called a chain, for here they decline on both sides. Farther to the north they form one immense mass with the *Stanowoi Khrebet* and the Aldan Mountains; and on the north-western side, towards the river Yenesei, they gradually terminate in the lowlands of Siberia, not far from the junction of the Upper Tunguska with that river.

Even in those parts where the mountains do not join the table-land of the desert, the single ranges of the mountains present on their highest surface horizontal, or nearly horizontal plains, like those of Egtag Altai; on the plains, however, a few elevations rise which sometimes attain the line of eternal snow. This appearance is presented by the Yablonoi Khrebet, and the ranges that enclose the lake of Baikal on the east and north. The latter are higher, and many summits, though probably no plain, are always covered with snow, but without glaciers. These high table-lands do not descend towards the lake by a steep slope, but by terraces, so that the upper course of the rivers on the plains is slow and quiet, but when they arrive at the descent from one terrace to another, they run with great rapidity and frequently form cataracts, till they come to a lower level.

There are probably few countries, if any, on the globe of equal extent which can vie with this mountain-region in the number of rivers and lakes. It is stated that 177 rivers fall into the lake of Baikal, and on a new chart of this lake published by the Russian government, 160 of them are inserted. Besides the rivers falling into the lake, the sources of five large rivers are in this range. The Upper Tunguska rises on the south-west, the Lower Tunguska and Lena on the west, and the Witim, a large tributary to the Lena, on the east of the lake, and all of them at no great distance from it. The sources of the Amur are to the south of those of the Witim.

Three large rivers fall into the lake, the *Upper Angara* at the northern extremity, the *Bargusin* on the east, and the *Selenga* on the south: none of them has a course of less than 300 miles. The Upper Angara runs about 450 miles. Its sources lie to the east of its mouth, nearly at an equal distance from the sources of the Lena and those of the Witim. About seventy miles from its embouchure it enters a wide and low valley, only a little elevated above the level of the lake, and at a distance of about sixteen miles from it the river divides into three branches. The *Bargusin* runs from north-east to south-west, nearly parallel to the north-eastern shore of the lake, and rises not far from the sources of the Upper Angara and the Witim. In its upper course between high mountains it receives some considerable tributaries; in its lower course there are extensive levels on its banks. Towards its mouth it is again narrowed by rocks. Its course is upwards of 300 miles. The *Selenga* is the most important and largest of the tributaries of the lake, and receives the waters from a great extent of country. It rises, according to the Chinese Geography, on the northern range of the Khantai, south of the lake of *Kossogol*, and has six sources. After running about 100 miles, these branches unite and form one river, which running to the east for upwards of 120 miles, receives from the north-west the *Ekhe*, which rises in the lake of Kossogol, and joins the Selenga after a course of about 100 miles. Hence the Selenga runs to the north-east, and meets, after a course of 120 miles, the Orkhon running from the south, but the Selenga continues its course to the north-east after its junction with that river, and even after it has made its entry into the Russian empire, where it receives the *Tshikoi*, the *Khilok*, and the *Uda* from the east. About fifty miles from its mouth it enters a large valley widening gradually towards the lake, in which the river divides and forms a large delta. The whole course of the Selenga cannot be less than 700 miles, consequently longer than that of the Rhine, and at Selenginsk, 120 miles from its mouth, it was found by Bell twice as wide as the Thames (at London we suppose). The largest of its tributaries is the Orkhon, whose sources are far to the south, close to the northern edge of the Great Desert; with many windings, it runs to the north till it reaches the Selenga after a course of upwards of 350 miles. This river is greatly venerated by the Mongols, because on its banks at Karakorum was the seat of the dynasty of Tshingis-Khan. The Tshikoi, the Khilok, and the Uda run, on an average, 200 miles; the Khilok is the largest of these rivers; and the Tshikoi forms for a considerable space the boundary between the two empires.

The *lake of Baikal* extends between the parallels of 51° and 56°, and cuts the meridians of 99° and 106° obliquely. Its length is upwards of 350 miles, but its mean breadth only about thirty six; in some places the breadth may be forty-eight miles. Its surface covers more than 14,800 square miles, or half the extent of Scotland. [See BAIKAL.]

The water of this lake is carried off by one outlet, the *Lower Angara*, which issues from the lake on the western side, not very far from the southern extremity, and after a course of about forty-five miles, unites with the river *Irkut*, at the town of Irkutzk. Lower down it receives the waters of the *Uda*, a river descending from the mountains called Erghik Targak Taiga, and then its name is changed into that of the *Upper Tunguska*. At this junction it changes its course to the north, till again by a great bend it resumes its western course, nearly under the 60th parallel, and finally joins the Yenesei. Two or three miles from the lake the Lower Angara enters high and steep mountains, runs in a narrow channel, and forms considerable and long rapids for many miles, which render the navigation of this river very difficult.

The *Lower Tunguska*, another tributary of the Yenesei, rises to the north-west of the sources of the Lena, on the lower ridges of the mountain-mass, where they approach the low lands of Siberia. The first part of its course is north-east, but it gradually declines to north-north-east and north, and again to north-north-west and north-west, till it joins the Yenesei after running for a great distance due west. It does not receive any considerable river.

The Lena rises, like the lower Tunguska, in the mountains enclosing the lake of Baikal on its western side, at about twenty or twenty-four miles distance from the lake, nearly as far from the southern as from the northern extremity. It first directs its course to the north till it reaches the parallel of the sources of the Upper Tunguska, and afterwards to the north-east, in which direction it continues more than one-half of its course up to the town of *Yakutzk*, receiving two of its great tributaries, the Witim and the Olekma, of which the former rises in the Baikalean, and the latter in the Aldan Mountains. Below Yakutzk, it makes a great bend, by which its course is changed from north-east to north-west, and here it is joined by the greatest of its tributaries, the *Aldan*, which descends from the Aldan Mountains. Afterwards it turns to the N.N.W., and does not change this direction till it falls into the Northern Ocean. Its whole course may amount to about 2000 miles.

The Witim, a tributary of the Lena, rises at a distance of about thirty or forty miles from the eastern shore of the lake of Baikal, not far from the sources of the Upper Angara. It first runs with many bends to the north-east, nearly parallel to the mountain-chain that extends between it and the sea of Okhotzk; it then declines rapidly to the north-west, and in this direction it joins the Lena. The length of its whole course may be between 400 and 500 miles.

The third river system, which originates in the Baikalean mountains, is that of the AMUR. Nearly all the considerable rivers which form it rise in that part of the Baikalean mountains, which by the Russians is called *Yablonnoi Khrebet*, and by the Chinese Khing-han, and in which, though of a moderate mean height, the *Tshokondo*, an insulated peak, rises far above the region of eternal snow, to 7670 feet above the level of the sea.

The *geological* formation of this mountain-mass is much less known than that of the Egtag Altai. The lower ranges near Irkutzk are covered with a soft, fine, granulated sandstone, running from east to west, and dipping somewhat to the north. It rests on a conglomerate of granite, quartz, and pieces of felspar, united by a fine, granulated sandstone, and stratified like the layer above it. But not far from the lake of Baikal, it is changed into granite, which on the banks of the lake passes into gneiss. The same formation was observed round the lake, granite forming the principal base, but often passing into gneiss; and in some places chalk-hills rise between the mountains and the bank of the lake—this chalk is commonly of a soft, porous nature—and form capes which stretch far into the lake. On the eastern side of the lake, the granite and gneiss formation extends to the range of the Aldan mountains, and the direction of its masses is everywhere from east to west. In passing the Yablonnoi Khrebet, Pallas observed on the highest ridge a very fine-grained granite mixed with a small quantity of mica, which decreases towards the east. Gradually the granite passes into white stone, which is replaced by green stone, and the latter by gneiss. But the ranges through which the rivers forming the Amur pass are principally composed of granite and gneiss; the lower part, however, is covered by the slate-formation, and in some places by chalk; the two latter are even found alternating with one another. On the tops of some mountains jasper has been observed, and a few lower rocks consist entirely of this material.

Around the lake of Baikal, especially on its southern shore, there are unequivocal signs that this region once has been agitated by volcanic agency. In some places lava has been observed, and in the southern and eastern mountains hot and sulphurous springs are of rather frequent occurrence. Besides, this region is subject to strong earthquakes, and the peculiar motion which the waters of the lake experience is attributed to a similar cause. [See BAIKAL.]

The *metallic* wealth of the Baikal mountains is small, and almost limited to some indications of copper and iron ore, which latter does not seem to be very abundant, and is only worked in two or three places. In this mountain-region, a kind of mica is found which splits into very thin and transparent laminæ, and is used all over Siberia and in some parts of European Russia as window-glass. The best is met with on the banks of the small river Mana, a tributary to the Witim, and here alone, at present, it is worked to any considerable extent. In the mountains on the east of the lake are many salt lakes, some of which contain Epsom salts. In one place on the south-western mountains, not far from the lake, on the banks of a small stream, is found a quantity of *lapis lazuli* of every shade of colour.

The mineral riches of the mountains to the north of the rivers which form the Amur, or of the Da-urian mountains, are more important. The lower ridges consist probably of the flötz-formatiom of chalk, and contain abundance of litharge, which, however, is only worked for the silver and gold it contains. There are twenty-one mines, of which Captain Cochrane names the thirteen principal. From 1704 to 1809, only 17,020 puds of silver were extracted. As, however, in the first fifty-five years the whole produce amounted only to 1624 puds, we find for the remainder the annual produce of 235 puds, or 16,500 marcs. This produce, however, has been decreasing of late, not because the mines are exhausted, but because wood begins to be scarce in the neighbourhood of the mines. The lead is not used on account of the difficulty of transporting it over the mountains. According to Captain Cochrane, an iron mine has lately begun to be worked. In the mines on the mountains, the carnelian, onyx, amethyst, topaz, quartz-crystals, and other stones are frequently met with. Some lakes contain salt, and in one of them a great quantity is procured.

The slopes of the mountains about the lake of Baikal are covered with trees, most of them of the genus abies and pinus, of which the larch (*Pinus larix*) occupies the lower part of the slopes, and the *Pinus cembra*, whose fruits are gathered and eaten as a dainty, the higher part nearly up to the line of eternal snow. Some species of deciduous trees are found; the most common is the birch, (*Betula alba* and *nana*,) the poplar, and some species of willow. The trees of these regions do not much differ from those of the Egtag Altai. The shrubs and plants offer some peculiarities. Pallas was surprised at finding on the low delta of the river Selinga the plants of high mountains, and tries to account for this phenomenon by the shores of the lake being covered even in summer by cold and foggy air, and backed by high mountains.

In the mountains around the lake of Baikal wild animals are very numerous. The wolf is smaller and whiter than in Europe, the bear (*Ursus arctos*) is found in great numbers; both these animals produce an excellent fur. Besides these there are found, though in less numbers, foxes, lynxes, wild cats (*Felis onca*), and the glutton (*Ursus gulo*). The rivers contain otters and beavers; but the latter are not frequent, except in the Upper Angara. The musk-goat is still abundant; but its musk has much less strength than that of Thibet or India. Elks, stags, and red deer are frequent; but the rein-deer not. The wild rein-deer is of an ash-grey colour; but the domestic is always white, rarely spotted, never grey. Hares are most numerous, and besides the common, the mountain-hare (*Lepus alpinus*), and the hare of Da-uria (*Lepus dauricus*), are frequently found, especially on the eastern ranges of the mountains. Casan marmottes, alpine marmottes, and other animals of that genus, as also sables, abound. The skin of the latter, however, is not greatly valued, except it be from the animals killed on the Upper Angara. Of the squirrel, which is exceedingly numerous, there are different species found; some of them produce excellent fur, especially those of a dark-grey colour.

The birds and fish of this region belong almost exclusively to the lake of Baikal, and may be seen under the article BAIKAL. But we must notice the red salmon (*Salmo erythrinus*), a fish found only here in a small lake (the lake of Frölikha), not far from the Upper Angara. It is two feet long, and of the most beautiful red colour, varying in its shades.

The wild animals of Da-uria differ greatly from those of the Baikalean mountains. On the steppes bordering on the former, the dshiggitai (*Equus hemionus*) is met with, and in the narrow valleys the *argali*, or *mountain-goat*. Wolves and foxes abound, and likewise tiger-cats (*Manul*, Pall.). Among the hares is observed a very small species, called *Lepus pusillus*, covered with soft, yellowish hair. Red deer are abundant, and also the *dseren* (*Antilope gutturosa*). Among the birds are especially noticed by Pallas, Indian (*Ardea antigone*) and Numidian cranes (*Ardea virgo*), a large kind of bustards, the beard-vulture (*Vultur barbatus*), rock-pigeons, rock-thrushes (*Turdus saxatilis*), *Lanius phoenicurus* (Pall.), rock-nightingales, common cuckoos, rock-ravens, with red feet and beak (*Corvus graculus*). The lakes and rivers abound in fish, but not so much by far as those which fall into the lake of Baikal. Many fish not found to the east of the Uralean Mountains, reappear in Da-uria; but they are not generally of the same species as in Europe. No carp is found in Siberia: but in the Onon, Pallas met with two new species, *Cyprinus leptocephalus* and *Cyprinus labio*. The barbels are of less size than those of the Wolga, and likewise the shade fish (*Silurus asotus*). Neither of these are met with in Siberia. A kind of beluga is found in the rivers of this country. The common pikes have a gold-yellow colour and are spotted, so that Pallas in the beginning was induced to take them for a different species. The sturgeon is rare, as also *Salmo oxyrynchus*. Some smaller kinds of salmon, and other fish, are abundant. Craw fishes are not known to the east of the Ural; but two or more species are caught in the rivers of Da-uria. They, however, are of a smaller size than in Europe.

Lastly, we shall observe, that this country, like all those which are contiguous to deserts, suffers much from the locusts, which often destroy the scanty crops of the inhabitants. Serpents are not found on the table-lands, but they are frequent in the valleys; and some are said to be venomous. Pearl-oysters, of considerable size, are found in the river Onon, as also some other shells.

The *Stannowoi Khrebet*, or that range of mountains which, from the Yablonnoi Khrebet and the neighbourhood of Nertshinsk, runs to the Pacific Ocean and terminates on its shores opposite to the island of Taraikai, ought only to be considered as the southern extremity of the *Aldan Mountains*, which, with their lateral ridges, fill up the immense space between the sea of Okhotzk and the banks of the river Lena up to the town of Yakutzk. At this place, or rather at the mouth of the river Aldan, the Lena withdraws from the mountains, which afterwards fill up the whole region, extend over about the sources of the rivers *Yana*, *Indighirka*, and *Kolyma*, accompanying these rivers the greater part of their courses, so that only a flat coast of about 100 miles extends along the Arctic Sea: but, towards the north-eastern promontory of Asia, which terminates at the *Straits of Behring* with the Cape Tshukotshoi-Noss, the mountains draw nearer the Arctic Sea, and occupy, literally, the whole promontory and the sides of the river *Anadir* up to its embouchure.

The highest part of this mountain-range, and that which separates the waters, runs along the shores of the sea of Okhotzk, and at so small a distance, that all the waters descending to that sea from the eastern declivity of the mountains are mere rivulets. Only where the town of Okhotzk is situated, and to the east of that town, a few small rivers descend, among which the river *Okhota* is the largest, and even navigable for a short extent. Towards the west and north, the mountains descend, like all the ranges of the Altai, in terraces, and long-extended broad plains, overtopped by a few elevated summits of no great height. Few of them arrive at the line of eternal snow. A modern traveller has found a summit rising to upwards of 5000 feet. The valleys run here likewise mostly in the direction of the mountain-chain, from south-west to north-east, and are joined together by a few transverse valleys, which carry the waters to the west. But this observation holds only good for the southern portion of the range up to the sources of the Indighirka, for from hence to the Cape Tshukotshoi-Noss the mountains in all their length seem to be cut by long transverse valleys.

Two large tributary rivers of the Lena rise in this chain, the *Olekma* and the *Aldan;* the former of which, rising to the north of Nertshinsk nearly in the meridian of that town, runs upwards of 300 miles through a desolate country, nearly due north, till it reaches the main stream. The *Aldan* is a large river, whose course is upwards of 900 miles from its source, under about the 55th parallel, to its junction with the Lena, under the 63d. It receives nearly all the waters issuing from the principal chain between the tributaries of the Amur, and the sources of the Indighirka. From its source it runs in a north-west direction, cutting eight degrees of latitude and nine of longitude, and in this tract it receives, from the right, the waters brought down by the *Maya,* a river that runs upward of 400 miles, and joins, not far from its mouth, the *Yudoma,* which is not inferior in size and length. The inferior course of the Aldan is in a transverse valley, nearly due west, for about 250 miles, and here it receives still a considerable tributary from the left, the *Anga,* whose course is from 400 to 500 miles parallel to that of the Aldan. The Aldan is of great importance for the communication between Yakutzk and Okhotzk; the merchandise ascends the Altan, the Maya, and the Yudoma, and is, from the latter, transported over a ridge of comparatively small extent to the Okhota, and on that river to Okhotzk.

The Yana, the Indighirka, and the Kolyma run nearly parallel to one another to the north, with a declination to the east, which is greatest in the last, and smallest in the first. The Yana may have a course of about 400, the Indighirka of between 600 and 700, and the Kolyma of about 900 miles.

The *Anadir,* which falls into the sea of Kamtshatka, the most northern portion of the Pacific Ocean, traverses a very mountainous country, and makes so many bends to every point of the compass that it is difficult to indicate its course farther than by stating, that in the upper part of its course its general direction is from north to south, and in the lower from west to east. Its whole length exceeds 600 miles.

The distribution of the plants and animals on this extensive range, and their gradual disappearance towards the north, is almost entirely unknown; at least, not so far known as to enable us to form a proper enumeration. In no part of the world are sables so numerous as here; but they are not of the first quality, and much inferior to those of the Upper Angara. The wild rein-deer, which forms here the principal object of the chase, has a spotted skin.

We cannot leave this region without observing, that in the low country, which extends between the northern extremity of this chain and the Arctic Ocean from the west of the mouth of the Lena to the east of that of the Kolyma, innumerable heaps of fossil bones of elephants, rhinoceroses, buffaloes, and other animals of the torrid zone, and also antediluvian remains are imbedded in a soil which apparently is alluvial. (See SIBERIA.)

The chain of mountains which traverses the peninsula of Kamtshatka may be considered as an appendage to the Aldan mountains, but as its description is closely united with that of this peninsula itself, it will be found under the article KAMTSHATKA.

The Altai mountains are situated between two regions, which, by their nature, are unfit for agricultural purposes, except in a few isolated places, and which, therefore, from time immemorial have been inhabited by wandering nations, who draw their subsistence from herds. The mountains, however, contain many valleys well adapted for agriculture, and there exist some indications that these valleys have once been cultivated, very probably by the same nation that has worked the mines all over the range to a great extent. This nation, which is known under the name of the *Tshudes,* is not named in history, and has entirely disappeared, though the immense number of antient tombs found everywhere, but especially on the mountains of Sayansk, evidently prove that this region was once better peopled. The nation probably was destroyed by its Nomadic neighbours, and with it agriculture disappeared from the valleys. But since the two most extensive empires of the world, the Chinese and the Russian, have taken possession of these ranges, and peace has been established in a region which, doubtless, for many centuries had not enjoyed it, agriculture has again been introduced, and as it would seem with better success by the Chinese than by their more northern neighbours. (See Baron Humboldt's *Fragmens Asiatiques;* Klaproth's *Tableau Historique de l'Asie;* the *Travels* of Timkowsky, Pallas, and Ledebour; and Ritter's *Erdkunde von Asien.* Of maps, only those found in the works of Baron Humboldt, Julius von Klaproth, and in the *Travels* of Ledebour, have been used here.)

ALTAMURA, a considerable town of the kingdom of Naples, in the province of Bari, near the borders of Basilicata. Its population is reckoned at 16,000 (in 1789 it was 15,890). It was a baronial estate of the Farnese family, after the extinction of which it devolved on Charles Bourbon, Infante of Spain, and afterwards King of Naples. It is built on a hill at the foot of the Apennines, and has an old castle. It has a fine cathedral, founded by Frederic II. and ornamented with pictures. It lies on the high road from Puglia into Basilicata. In 1799 it was a stronghold of the republican party in that district, and being summoned by Cardinal Ruffo, who was advancing by that road at the head of his Calabrians, refused to open its gates, and after an obstinate defence it was taken by storm, when a dreadful massacre of the inhabitants took place, attended by rape and other horrors. Since that time, however, it has recovered, and is now a place of considerable trade in the agricultural produce of the country; good wheat is grown in the neighbourhood. Its fairs are well attended. It is stated by some authorities that many of the inhabitants are Greeks. It is in about 40° 47′ N. lat., and about 30 miles S.W. of Bari.

ALTAR, an erection to offer sacrifice upon. The first altar mentioned is that set up by Noah, to offer sacrifice when he quitted the ark; and throughout the history of the Jewish patriarchs altars are continually said to have been erected by them, in different places, as circumstances rendered it expedient. These seem to have been built of earth, or unhewn stone, like the altars which God commanded Moses to raise: *Exod.* xx. 24, 25. But when the Jewish law was given, the right of raising altars and offering sacrifice was no longer left common to all men; but one altar of burnt-offering, at which alone victims were slain, was made for the whole nation, and the priests, as ministers for the nation, offered sacrifice upon it for all. This in the first instance was constructed of wood, covered with brass, and always followed the ark, while the ark was migratory; but when Solomon built the temple, he placed a stone altar, with a brazen hearth, in the court before it. The Jews had two other altars, one solely appropriated to burning incense, called the altar of incense; the other called the altar of shew-bread, because loaves were placed upon it, and changed every Sabbath. Both of these stood in the interior of the temple.

We constantly meet in the Bible with the expression of the 'horns of the altar.' Some suppose that these were really the horns of animals; others that they were merely projections at the corners. One use of is them obvious: victims might be conveniently bound to them. *Psalm* cxviii. 27. But horns were an emblem of power and authority throughout the east; and probably they were also meant to indicate the greatness of him to whom the altar was sacred. The altars of the Greeks and Romans had sometimes horns also, to which animals were fastened, and to which those who fled thither for protection used to cling. It was an act of impiety to force such persons away. This belief in the sanctity of places was adopted by the Roman Catholic church, which, in the season of its temporal power, largely bestowed the privilege of sanctuary upon favourite churches and convents. [See ASYLUM.]

A sort of natural religion seems to have pointed out the tops of hills, and groves, as the fittest spots for altars. The pagan nations which surrounded the Jews were especially addicted to worshipping in high places; and it was hardly possible to prevent the Jews themselves from falling into this habit. 'They also built them high places, and images, and groves, on every high hill, and under every green tree.' 1 *Kings* xiv. 23. Passages of the same import occur continually in the Jewish Chronicles. The northern nations of ancient Europe worshipped in the thickest shade of their forests. The ancient Persians, as Herodotus tells us (I. 131.) made no temples, nor statues, nor altars, but worshipped the deity on the tops of the mountains.

The altars of the Greeks were of three sorts: those dedicated to the heavenly gods, (*βωμοί*,) were often structures of considerable height; those of demi-gods and heroes were low and near the ground (*ἐσχάρα*); and those of the infernal deities (if such may be called altars) were trenches sunk in the ground (*βόθρος, λάκκοι*). They may again be divided into three classes, those for burnt-offerings (*ἔμπυροι*): those on which no fire was used, which were (*ἄπυροι*), meant for offerings of fruit, meal-cakes, &c.; and those on which fire might be used to consume vegetable productions, but no blood was spilled (*ἀνάιμακτοι*), the altar: when dedicated to either of the latter classes, it was often nothing more than a raised hearth or step. Each temple usually had two altars, one in the open air before it, for burnt-offerings; another before the statue of the god to whom the building was sacred. Altars were often erected where there was no temple. The Greek altars were usually square, sometimes circular, or triangular. They were often made of marble, and elegantly sculptured.

The Roman altars and rites of worship much resemble the Greek. We must distinguish between *altare* and *ara*. The former, as is indicated by the syllable *alt*, signifying high, was an elevated structure, used only for burnt-offerings, and dedicated to none but the heavenly gods: the latter might belong either to the heavenly, or infernal gods, or to heroes. The Romans, however, like the Greeks, dug trenches (*scrobes*), into which they poured libations to the infernal gods. *Ara* seems to be the general term, and is used by Virgil as including *altare;*

En quatuor aras,
Ecce duo tibi Daphni, duoque altaria Phœbo. *Ecl.* v. 65.

From *altare* comes the English word altar, which by the Roman Catholic church is used in its proper sense, to denote an erection on which sacrifice is offered, it being their doctrine that the mass is a sacrifice. Applied to the communion-table of an English Protestant church, the word is used metaphorically, or rather, is misplaced; for the English church teaches the sacrament of the Lord's Supper to be no sacrifice, but merely a symbol.

ALTDORF, or **ALTORF**, (Old Village,) is the capital of the Canton of Uri in Switzerland. It stands at a short distance from the lake of the Four Cantons, in a valley surrounded by lofty mountains, and on the right bank of the Reuss, which flows into the lake. It is about twenty miles S.E. of Luzern, and in 46° 52′ N. lat., 8° 45′ E. long.: the elevation of the town above the lake is given differently by different authorities: the lake itself is about 1400 feet above the level of the sea. Altorf being at the foot of a lofty mountain would be in danger of suffering from avalanches, but for the pine forests on the slopes, which serve as a rampart against the falling masses. It was burnt in 1799, and rebuilt in better style. The town-house, a handsome parish church, and a school, are among the chief buildings: the population is about 1700. Altorf stands at the Swiss termination of the pass over Mount St. Gothard, and supplies horses and carriages for crossing the mountains to Bellinzona in Italy. It is also a kind of entrepôt for goods passing into or from Italy by the St. Gothard pass. An old tower at Altorf is said to mark the spot from which Tell shot the apple from his son's head; and a fountain now occupies the place of the linden tree under which the boy stood.

ALTENBURG, the capital of the duchy of Saxe-Altenburg, is situated about two miles west of the left bank of the Pleisse, a tributary to the Elster, 50° 50′ N. lat. 12° 27′ E. long. The town stands on uneven ground, and consists of a main part and several suburbs: it is in parts well built. It contains eight churches, a gymnasium founded in 1703, with a considerable library, an hospital and house of correction; also a foundation for noble ladies, a society of naturalists, a theatre, &c. The chief branches of industry are manufactures of linen, ribands, gloves, vinegar, starch, coaches, &c. There is also a considerable trade in cattle and corn. The population in 1822 was 10,604; in 1832, 12,629.

The castle of Altenburg stands on a rock, and is known in German history as the place for which the young princes Ernest and Albert, the founders of the two chief lines of the Saxon house, were carried off by Kunz von Kauffungen, A.D. 1455. Altenburg was once an imperial city, and the capital of a district called Pleissen. After 1172 we find it mentioned as a place where the emperors sometimes resided and held diets. (See SAXE-ALTENBURG, for an account of the duchy and its political changes.)

ALTERATIVES, a word signifying 'things that produce a change.' Under this head are comprehended those medicines which do not produce any immediate or very perceptible effect, but which gradually bring the body from a diseased to a more healthy state. They seem to act in removing unhealthy conditions of the system, much in the same way that a drop of water hollows a stone, not by its violence, but by frequently falling. They are generally given in small and frequent doses, and, even when given in large doses, they are often repeated. The former mode of administering them is employed when they are powerful medicines, the latter when less active. Out of almost every class of medicines some one may be used as an alterative—its claim to be so regarded depending less upon its natural powers, than upon the manner in which these are modified, so as to effect a particular purpose. Thus by diminishing the dose, or combining them with other medicines, some of the most powerful drugs we possess are capable of being employed as alteratives, and made to produce effects exactly opposite to what they do when given alone or in large doses. Ten grains of ipecacuanha, for example, taken with some fluid into the stomach, will speedily cause a feeling of sickness, followed by vomiting—three or four grains will cause a feeling of sickness and loss of appetite, though not actual vomiting—while one-quarter or one-half a grain taken about an hour before each meal for several days in succession, will be found greatly to increase the appetite, and improve the digestion. Yet even ten grains of ipecacuan, if taken along with two of opium, will not produce any obvious effect on the stomach, but, if the patient be kept warm in bed, will cause a profuse flow of perspiration.

Many of the forms or preparations of mercury, even the most active and poisonous, when given in very small doses, neither prove purgative nor destructive to life, but, on the contrary, often produce signal benefit, relieving the patient from many complaints which rendered his days miserable, or even threatened to shorten them. Nor is the most dreaded of the mineral poisons—arsenic itself—incapable of contributing to the restoration of health, since we see it now make the shivering ague cease, and at another time cause the agonizing headache to depart.

Others which are less active may be given in very large doses, as sarsaparilla, and similar articles.

The variety of agents which may be used as alteratives must convince us that they cannot all act in the same way, and that their beneficial effects cannot be attributed to the same cause. Most of them appear to act upon the secretions and excretions—either by increasing their quantity or altering their quality. In many parts of the body, but particularly along the course of the alimentary canal, are situated glands, the duty of which is to elaborate from the blood certain fluids containing salts and other principles, which are primarily useful in keeping moist the surfaces over which they flow, and often secondarily useful in effecting changes in the matters with which they come in contact, as the saliva with the food, as soon as it is received into the mouth, and the bile with the chyle, upon its passage out of the stomach. These, then, are secretions. The kidneys and skin are organs by which fluids are separated from the blood, serving as vehicles for the removal from the system of salts and other principles no longer useful, the retention and accumulation of which would soon prove hurtful, and ultimately fatal. These are termed excretions:—that of the kidneys being of no primary or secondary use, while that of the skin keeps this covering moist and pliant,—states necessary for its answering the objects of its existence.

The preservation of a due proportion in the quality and quantity of these secretions and excretions is essential to the maintenance of that equilibrium, that fair and equal, or harmonizing play of all the organs of the body, when, feeling no weight or oppression in any part, a man readily says he *is well*. The disturbance of this balance gives rise to various degrees of uneasiness and ill-health: states to which the French apply the expressive term—*malaise*.

The functions of secretion and excretion being rather vital than chemical processes, they are greatly dependant upon the state of the nervous system. This, again, is only perfect when the blood is of a proper quality; and this last is beholden for its excellence to the thorough performance of digestion, for which a due supply of nervous energy is required.

As all these functions act and react upon each other, it matters but little which of them is the first to fail in contributing its part to the general welfare, as all in time suffer; but the functions of secretion and excretion, perhaps, soonest show a falling off, and soonest attract the attention of the patient. He awakes with a dry tongue, and observes that the secretion from the kidneys is less in quantity and more highly coloured than natural, or excessive in quantity and pale, or he perceives that the skin is dry and harsh, or bloated.

To remedy these states alteratives are often employed. Small doses of some mercurial, alone, at night, or with rhubarb and soda during the day, or small quantities of ipecacuanha, will often relieve the dryness of the mouth. A little common salt taken immediately on waking will also remove it. With this view a little bacon has often been recommended at breakfast—the benefit being due to the salt, not the bacon.

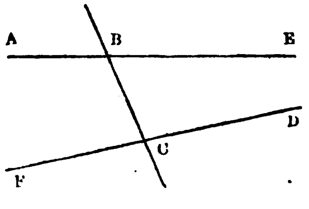
The removal of the depraved and unhealthy secretions from the intestinal canal, where they are apt to linger, causing uneasiness to the patient, and by the unpleasantness of his breath rendering his presence disagreeable to others, is best effected by a course of gentle purgatives. The frequent repetition of too powerful purgatives is to be reprobated, as often occasioning disease of the inner coats of the alimentary canal. After these, some strengthening medicine, as bark or iron, will generally be useful, especially if the nervous system be out of order, owing to much mental exertion, or protracted night-watching. At this stage of the treatment, exercise and travelling, change of scene and pursuit, are of much service; or a visit to some watering-place; for the mineral springs, having the saline ingredients very minutely divided, may be considered as nature's alteratives.

Where the skin is much affected, exercise of a regulated kind, such as that practised by trainers, may prove useful, as the diet is at the same time strictly attended to. Indeed, a partial or complete change of diet is often the most effectual alterative we can employ.

But neither medicines nor a strict plan of diet should be begun or continued without the advice of a competent judge. It is in such cases that persons are most apt to undertake the cure of their own complaints, and, either by using inefficient means allow them to get rooted in the system—or, by employing the *nostrums* and secret, but often dangerous, combinations of *quacks*, become a prey in their purses and persons to ignorance and fraud.

The explanation of the functions of the system, and the action of remedies, already given and hereafter to be given in this work, are by no means intended to enable the patient to dispense with the assistance of his medical attendant, but to enable him to receive the full benefit of that assistance, by enabling him to understand something of the principles on which his treatment is conducted, and thereby to teach him how he may co-operate with his physician in rendering it effectual.

ALTE'RNATE. In geometry, angles are said to be alternate which are made by two lines with a third, on opposite sides of it, as ABC and BCD, or EBC and BCF. If two lines be parallel, the alternate angles made by a third line with them are equal.



In algebra, those terms of a proportion are said to be alternate which are separated from one another by another term; thus, in the proportion

2 is to 4 as 8 is to 16,

2 and 8 are alternate terms, as also 4 and 16. If alternate terms be rendered consecutive, and consecutive terms alternate, the proportion still continues; thus,

2 is to 8 as 4 is to 16.

This proposition is the sixteenth of the fifth book of Euclid, and is referred to by the Latin word *alternando*, or by the English words 'by alternation,' or 'alternately.'

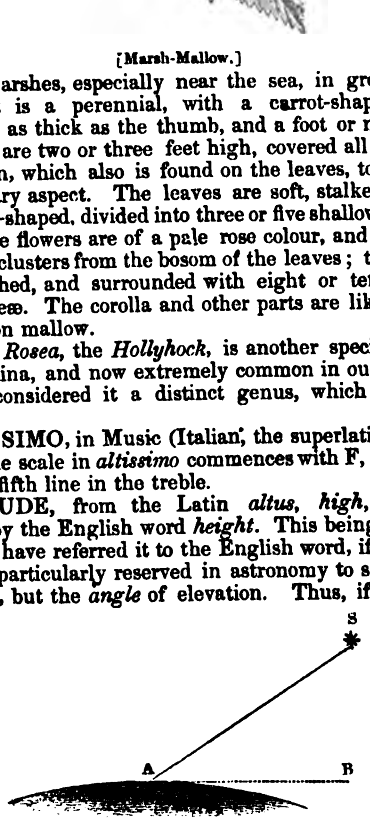
ALTHÆA OFFICINA'LIS, or MARSH-MALLOW, is a plant the use of whose mucilaginous roots and leaves in all cases in which emollient or demulcent substances are required, is of great antiquity. It is a common European plant, belonging to the natural order *Malvaceæ*, and is often found in marshes, especially near the sea, in great abundance. It is a perennial, with a carrot-shaped white fleshy root, as thick as the thumb, and a foot or more long. The stems are two or three feet high, covered all over with a soft down, which also is found on the leaves, to which it gives a hoary aspect. The leaves are soft, stalked, often a little heart-shaped, divided into three or five shallow serrated lobes. The flowers are of a pale rose colour, and appear in very short clusters from the bosom of the leaves; their calyx is five-toothed, and surrounded with eight or ten, or even more bracteæ. The corolla and other parts are like those of the common mallow.

[Marsh-Mallow.]

Althæa Rosea, the *Hollyhock*, is another species, found wild in China, and now extremely common in our gardens. Linnæus considered it a distinct genus, which he called *Alcea*.

ALTI'SSIMO, in Music (Italian, the superlative of *alto*, high). The scale in *altissimo* commences with F, the octave above the fifth line in the treble.

ALTITUDE, from the Latin *altus*, *high*, may be rendered by the English word *height*. This being the case we should have referred it to the English word, if the term were not particularly reserved in astronomy to signify, not the *length*, but the *angle* of elevation. Thus, if A be the position of a spectator on the earth, and A B the line on the horizon, which is drawn towards the point directly under the star S, the angle B A S is the altitude of the star. For other less common applications of the term, see HEIGHTS.



The altitude of the pole is the geographical latitude of the place of observation, and remains the same throughout the twenty-four hours: the altitudes of the stars and sun change with the diurnal motion; being nothing when they rise and set, and greatest when they are on the meridian.

The altitude of a star is directly observed at sea with the SEXTANT; and the uses which are made of such observations may be seen in the following mathematical propositions, into the proofs of which we cannot enter here.

1. When the latitude of the place is known, the time of day may be found from one observation of the altitude of the sun or a star; or conversely, if the time of day be known, the latitude may be found from the observation.

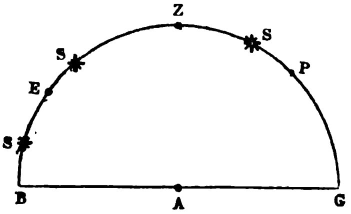
2. When neither the time nor the latitude is known, both may be found by observing any two altitudes of the sun or a

star, and noting the time which elapses between the observations; but it is most convenient to observe one altitude first, before a star comes to the meridian, and then wait for the time when the same star comes to the same altitude on the other side of the meridian. Or if the latitude be very nearly known, a more accurate approximation may be simply made by the above method.

3. If the star be one of those which never sets, the latitude of the place is the half sum of its greatest and least altitudes.

In all that precedes, it is supposed that the star is *known*,—that is, that its right ascension and declination are known; and certain corrections must be applied to the observed altitude, for which see Refraction, Parallax, Dip.

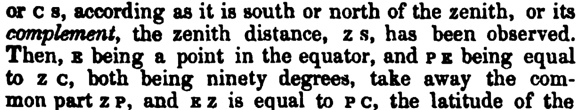
In fixed observatories on land, the altitude of stars, or rather their zenith distances, which are what the altitudes want of ninety degrees, are observed with the mural or the transit circle (see Circle, Mural; Circle, Transit); but only when the stars are on the meridian. Let A be the place of the observer, C and B the north and south points of his horizon, P the north pole, Z the zenith, C P Z B the meridian, arcs of which may be made to represent angles at A, and S the star on the meridian, whose altitude, B S, or C S, according as it is south or north of the zenith, or its *complement*, the zenith distance, Z S, has been observed. Then, E being a point in the equator, and P E being equal to Z C, both being ninety degrees, take away the common part Z P, and E Z is equal to P C, the latitude of the place. And E S, or the star's declination, is E Z diminished by Z S, if the star passes the meridian above E, or Z S diminished by E Z, if the star passes below E. If the star passes between the zenith and the pole, the declination E S is the sum of E Z and Z S. That is, the declination of a star is the difference between its observed zenith distance and the latitude of the place, if the star passes south of the zenith, or the sum of the same quantities, if it passes between the zenith and the pole. In the first case the declination is *north*, if the latitude be greater than the zenith distance; *south*, if the zenith distance be greater than the latitude: in the second case, it is always north.



In this way, with a number of minute precautions for the sake of accuracy, catalogues of the declinations of stars are formed, by observation of their altitudes, or, which amounts to the same thing, of their zenith distances.

For the altitude of the Nonagesimal, see Nonagesimal.

ALTO, in Music (Italian, ***high***), the highest natural adult male voice, or countertenor, the usual compass of which is, from F the fourth line in the base, to C the third space on the treble, *e. g.*—



Alto, Italian, the instrument called in England the Tenor, and by the Italians, the Viola.

ALTO CLEF, in Music, a name of the C clef, when placed on the third line; more commonly, in England, called the countertenor clef. See Clef.

ALTO-RILIEVO (high relief), a term which designates that kind of sculpture which is executed on a flat surface, but projects considerably above the ground or plane. The degree of projection given to alto-rilievo depends on the will of the sculptor; more than three-fourths of the figure are frequently shown, and figures in basso-rilievo (low relief) are sometimes added, to express gradations of distance. The attempt to give a picturesque air to sculpture has usually a barbarous effect, but the temptation afforded to that species of practice by alto-rilievo has seduced many artists, and those of no mean powers, into the experiment. The largest performance ever executed in alto-rilievo is the stupendous work by Algardi, in St. Peter's at Rome, representing the Repulse of Attila by St. Peter and St. Paul. The gigantic figures in front of this composition project nearly in the full rotundity of nature, and the middle and distant groups subside through all the degrees of projection into the lowest basso-rilievo. However erroneous the style, it is impossible to refuse admiration to the powers displayed in this work. The alto-rilievos by Donatelli at Florence are among the most perfect examples of this art. There are specimens by various practitioners in Westminster Abbey, which exhibit all the eccentricities of bad taste. The most legitimate use of alto-rilievo is where it is introduced in alternate or occasional compartments to give relief by the boldness of its projections to the uniformity of a large surface. Such are the Metopes among the Elgin Marbles, which, alternately with the triglyphs, ornamented the frieze of the entablature which surmounted the exterior colonnade of the Parthenon. Fifteen of these original Metopes, with one cast, are in the British Museum; they are of unequal execution, but several of them may be referred to as the finest examples extant of alto-rilievo. [See *Elgin Marbles*, published by the Society for the Diffusion of Knowledge.]

ALTON, a market town in Hampshire, on the road to Winchester, forty-seven miles south-west of London, near the source of the river Wey. It is a well-built place, with three principal streets, partially paved by subscription and lighted. Some bombazeens and serges were made, but this manufacture seems to have decayed, nor is the town at present noted for any particular branch of industry. There are hop plantations in this neighbourhood; and two breweries in the town. The living is a vicarage in the gift of the Bishop of Winchester. The church is neat, and there are two or three meeting-houses for the Dissenters. Alton has a national school.

The market is on Saturday; and there are two fairs in the year. The population in 1831, was 2742.

During the civil wars, the royalist troops, under Lord Hopton, were surprised at Alton by the Parliamentarians under Sir William Waller.

A'LTONA, or **ALTENA**, a considerable city belonging to the Crown of Denmark, situated in the Lordship of Pinneberg, which is an appendage to the duchy of Holstein. Next to Copenhagen, Altona is the most important town in the Danish dominions, although at the time when Pinneberg was united with Denmark, in 1640, it was only an inconsiderable village. In 1664, it obtained the rights and privileges of a city.

Altona stands on the north bank of the Elbe, in 53° 34′ N. lat., and 9° 55′ E. long., about seventy-five miles from the mouth of the river, and about two miles below, and to the west of Hamburg; the suburbs of which city are in fact only separated from the Danish city by a wall.

The manufactures employ about 2200 hands. They consist of silk, woollen, and cotton goods, tobacco, soap, candles, and leathern articles, together with glass-houses, distilleries, breweries, and sugar-refineries, besides some establishments of minor importance. Ship-building also has long been carried on, and several vessels belonging to the port are employed annually in the herring and whale fisheries, and in trading to the Mediterranean.

The trade of the port bears only a small proportion to that carried on in the neighbouring City of Hamburg, which presents the constant appearance of commercial activity, while the streets of Altona are comparatively deserted. The marine of Altona consists of little else than a line of gun-boats to guard against smuggling; but the docks and canals of the free city are crowded with merchantmen from all parts of the world.

Altona was burnt by the Swedes in 1713, but has been rebuilt with greater regularity; many of the houses are spacious and elegant, a circumstance which, added to its greater quietness, is, probably, the reason why several merchants whose counting-houses are in Hamburg have their residences in Altona.

The town contains a public school or college, founded by Christian VII., a library, and an orphan house. It has also six churches and two synagogues for German and Portuguese Jews, who are very numerous. The native inhabitants are principally Lutherans; the remainder Calvinists, with a few Roman Catholics. The population in 1831 was 26,500. (Semple's *Observations on a Journey from Hamburg to Berlin.* Cannabich, *Diction. Geograph.*)

ALTRINGHAM, or ALTRINCHAM, a small town in the parish of Bowdon and county of Chester, near the Duke of Bridgewater's canal from Manchester to Runcorn: it is about 8 miles south-west of Manchester, and nearly 180 north-west from London. The neighbourhood supplies Manchester with fruit and vegetables; and the salubrity of the air makes it a place of some resort for invalids. It is a neat and clean town, with a population in 1831 of 2708. The chief manufactures are of cotton and worsted. There is a corporation, but the mayor has no jurisdiction. Besides a chapel for the members of the Established Church, there are two Methodist and one Unitarian meeting-house. The market is on Tuesday, and there are three fairs in the year.

ALUM, an earthy salt, which occurs in a native state only in small quantities, but it has been long artificially made, and extensively employed in various chemical manufactures. Its basis is sulphate of alumina, combined usually with sulphate of potash, but sometimes with sulphate of soda or sulphate of ammonia: when the first alkaline salt enters into its composition, the product is *common* or *potash alum*, the second forms *soda alum*, and the third *ammonia alum*. Alum appears to have been known from the earliest ages; it occurs in a native state in Carinthia, and also at Miseno, and other places in Italy. *Alumen*, with its mode of preparation, uses, &c., is described by *Pliny* (xxxv. 15); and the best is said to have been obtained from Egypt (see *Herod.* ii. 180, *στυπτηρίη*) and the island of Melos: it was made, however, in several other places. In the middle ages, alum was manufactured in Rochha, the Turkish name of the government which comprehends Edessa (Niebuhr, *Reisebeschreibung*, ii. p. 409), whence comes the name Roch alum, still in use. It was also made near Smyrna and Constantinople. About the middle of the fifteenth century alum was manufactured at La Tolfa, and other places in Italy, and Pope Pius II. prohibited the use of oriental alum. The alum-stone of La Tolfa contains all the ingredients of alum mixed with silica: to procure alum from the stone, it is broken into pieces, roasted, exposed to air and moisture, and the soluble parts being dissolved in water, crystals of alum are obtained as the solution cools.

In the reign of Elizabeth the alum-works of Whitby were established; which, with those since formed near Glasgow, supply the market with a large quantity of alum. The alum is procured from alum-slate, the stratum of which is nearly thirty miles in length: this alum-slate has not been accurately analyzed, but it does not appear to contain any potash salt, and this is therefore added. The method of manufacturing, is to mix the broken alum-slate with fuel, and set it on fire; when the combustion is over, the residual matter, consisting of earth, oxide of iron, and sulphate of alumina, is lixiviated with water; a solution of the earthy salt being obtained, potash salts are added to it, and crystals of alum are formed. It requires about 130 tons of calcined alum-slate to produce one ton of alum. Near Glasgow alum is manufactured from *slaty clay;* which is obtained from old coal pits; the slate contains also iron pyrites, and both its constituents combining with oxygen, sulphate of iron is formed, with excess of sulphuric acid, which acting upon and combining with the clay or alumina of the slate, forms a double sulphate of iron and alumina, which crystallizes in small filaments, of a greenish-white colour.

When the slate containing this double salt is put into water, it is dissolved; by evaporation, crystals of sulphate of iron are obtained, and to the solution, which is principally sulphate of alumina, potash salts are added, and crystals of alum are formed; these are purified by redissolving them in water and crystallization. By exposing to air and moisture the slate which remains after the solution of the sulphate of iron and alumina, a further portion of the pyrites is acted upon, and more sulphate of iron and alumina are obtained, which are dissolved, as before, in water.

Alum is also sometimes prepared by directly combining sulphuric acid and alumina, with the addition of potash salts; in general, however, this method is much less economical than those already detailed. By whatever process alum is prepared, its properties are the following: it is colourless, inodorous, has an astringent taste, and crystallizes generally in regular octahedrons; but by the addition of alumina, and particular management, it may be made to crystallize in cubes. It is brittle, and easily reduced to powder; its specific gravity is about 1·731; water, at 60° Fahrenheit, dissolves about one-eighteenth of its weight of alum, and boiling water about three-fourths of its weight. The solution reddens vegetable blue colours strongly; when exposed to dry air, alum effloresces slightly on the surface, but it remains long without undergoing any change internally. When moderately heated, alum dissolves in its water of crystallization; if more strongly heated, the water is evaporated, and when exposed to a very high temperature, sulphuric acid is expelled, and there remains a mixture of alumina and sulphate of potash.

Alum has been frequently analyzed, and the later results of chemists differ but little. According to Dr. Thomson it consists of

Four atoms of sulphuric acid .	40 × 4	=	160	or	32·85
Three atoms of alumina .	18 × 3	=	54	„	11·08
One atom of potash . . .		=	48	„	9·85
Twenty-five atoms of water .	9 ×25	=	225	„	46·22
			487		100·00

The same chemist considers its atomic constitution to be

Three atoms of sulphate of alumina	58 × 3	=	174	or	35·73
One atom of sulphate of potash		=	88	„	18·07
Twenty-five atoms of water .	9 ×25	=	225	„	46·20
Weight of its atom .		=	487		100·00

The analysis of Berzelius agrees very closely with that of Dr. Thomson; the greatest difference is in the proportion of sulphuric acid, which the former states to be 34·23 per cent., being 1·38 greater than the quantity found by Dr. Thomson.

Soda alum is not met with in commerce. It may be prepared by adding sulphate of soda to a solution of sulphate of alumina; by evaporation crystals are obtained, which, when pure, have the following properties: their taste is astringent, and their form the octahedron, like that of potash alum; they are more brittle and more soluble in water than the crystals of common alum; their specific gravity is about 1·6. When soda alum is heated nearly to redness, it loses its water; and when more strongly heated, sulphuric acid is expelled. Its other properties are similar to those of common alum. It appears to consist of

Three atoms of sulphate of alumina	58 × 3	=	. 4	or	36·94
One atom of sulphate of soda		=	72	„	15·28
Twenty-five atoms of water .	9 ×25	=	225	„	47·78
Weight of its atom .		=	471		100·00

According to Dr. Thomson, soda alum occurs in a native state at St. Juan, near the city of Mendoza in South America. It is found in small nodules, and differs from the crystallized salt in containing only twenty atoms of water.

Ammonia Alum may be prepared by adding sulphate of ammonia to sulphate of alumina in solution. By evaporation octahedral crystals are obtained, similar in appearance and in many properties to those of the preceding alums. It is more soluble in water than potash alum, but less so than soda alum; in taste, and in action upon vegetable blue colours, it resembles them.

When moderately heated it swells, fuses, and loses its water of crystallization; and if the heat be much increased, the whole both of the sulphate of ammonia and sulphuric acid is expelled, and pure alumina remains. This alum is not prepared for use in England, but it is said to be manufactured in France. It is readily distinguished from the other alums, by the evolution of ammonia, which takes place on the addition of potash or soda in sufficient quantity.

According to Dr. Thomson, ammonia alum is composed of

Three atoms of sulphate of alumina	58 × 3	=	174	or	38·15
One atom of sulphate of ammonia		=	57	„	12·50
Twenty-five atoms of water .	9 ×25	=	225	„	49·35
Weignt of its atom .		=	456		100·00

We have already mentioned that alum is decomposed by heat; and the same effect is produced by numerous chemical re-agents: thus the alkalis, potash, soda, and ammonia, when added to it in solution, combine with the sulphuric acid and precipitate alumina. It is decomposed by the alkaline earths, lime, barytes, and strontia; and acetate of lead, muriate of lime, &c. &c., decompose it by double decomposition.

Alum sometimes contains sulphate of iron, which is extremely injurious in certain applications of alum. It is readily detected by the addition of a solution of ferrocyanate of potash, which precipitates Prussian blue when oxide of iron is present.

Alum is employed for a vast number of purposes. It is used in lake colours, dyeing, calico printing, leather dressing; and by candle-makers to harden the tallow and render it white. It is an ingredient in making pyrophorus, as will be hereafter described; and in medicine it is employed as an astringent.

ALUM SLATE, a rock from which, as its name implies, alum is prepared. It is found in Germany, Sweden, &c., and in Yorkshire a stratum occurs, which, according to Mr. Winter, (Nicholson's *Journal*, No. 25, p. 241,) is twenty-eight miles in length, extending from ten miles to the southward of Whitby, to eighteen miles to the northward; the cliffs are in general precipitous, and their height is from 100 to 750 feet. The colour of this slate is bluish-grey: its hardness varies; at the top part of the stratum, it may be crumbled between the fingers; whereas at a considerable depth, it is as hard as roofing slate. The specific gravity is about 2·48. By exposure to the air it effloresces, and acquires the taste of alum. Alum slate has not been accurately analyzed; it contains silica, alumina, and, before efflorescence, probably pyrites or bisulphuret of iron.

At Hurlett near Paisley, and Campsie near Glasgow, alum is manufactured from what appears to be *slate clay*, impregnated with bisulphuret of iron; it is obtained from old coal-pits, and having been long exposed to air and moisture, sulphate of iron and sulphate of alumina are formed, and crystallize so as completely to destroy the texture of the slate.

This double sulphate of iron and alumina occurs in the form of soft delicate fibres, easily separable from each other; it is nearly colourless, of a silky lustre, and resembles asbestos in appearance. It is readily soluble in water, the solution yields crystals of sulphate of iron, and when potash salts are added to the remaining solution of sulphate of alumina, crystals of alum are immediately formed, and this is the process of alum-making already noticed. According to the analysis of Phillips, (*Annals of Philosophy*, 21—426,) this double sulphate or ferro-sulphate of alumina consists of

Sulphuric acid . . .	30·9
Protoxide of iron . .	20·7
Alumina	5·2
Leaving for water . .	43·2
	100·0

When this double salt has been dissolved, the remaining slate is exposed in heaps to air and moisture, and by their action upon the pyrites, further quantities of the salt are obtained.

ALUM STONE, a mineral which occurs in a secondary rock at La Tolfa in Italy, and is there used in the preparation of alum; it is found in small masses and veins, and according to Cordier it exists in most burning volcanoes. It is said to be met with also in Tuscany and Hungary.

This mineral is either massive or crystallized; the former is usually greyish-white, and sometimes red. It is translucent, easily frangible, scratches calcareous spar, but is scratched by fluor spar. When heated by the blowpipe it decrepitates, and by continuing the heat emits a sulphureous smell.

The crystals are generally situated in the cavities of the massive substance; they are small, shining, sometimes externally brownish; their form is an obtuse rhomboid, variously modified.

Both varieties have been analyzed, the massive by Vauquelin, and the crystallized by Cordier; the results are,

Massive.		Crystallized.	
Sulphuric acid . .	25·00	Sulphuric acid . .	35·495
Alumina	43·92	Alumina	39·654
Potash	3·08	Potash	10·021
Silica	24·00	Water, a trace of oxide of iron and loss .	14·830
Water	4·00		
	100·00		100·000

ALU'MINA. The earthy oxide of aluminum, sometimes called argil or the argillaceous earth; it constitutes the larger portion of all clays, and their plastic property is owing to it. The name of alumina is derived from *alumen*, the Latin for alum, the salt from which it is generally obtained in a pure state, by means which will presently be mentioned. Alumina is widely diffused throughout the earth; the adamantine spar or corundum, the ruby and sapphire, are alumina nearly pure and crystallized; these substances have not, however, any of the more obvious properties of common clay, for instead of being amorphous, soft, and diffusible through water, they are crystallized, are among the hardest substances in nature, and will not mix with water. The diaspore is a crystallized mineral, which consists almost entirely of alumina and water; and in North America another hydrate of alumina has been found, and called gibbsite.

The following is the process recommended by Berzelius (*Traité de Chimie*, ii. 369) for procuring pure alumina: dissolve and crystallize alum repeatedly to deprive it of the peroxide of iron which it usually contains; when thus rendered pure, a portion of the alum dissolved in water and added to a solution of potash in excess, gives a precipitate at first, which is afterwards completely re-dissolved. To a boiling solution of the purified alum, add one of carbonate of potash, as long as precipitation takes place; then a slight excess of the carbonate being used, digest with a gentle heat to decompose the subsulphate of alumina formed. Wash this carefully on a filter, and re-dissolve it in muriatic acid; precipitate the clear solution with ammonia or the carbonate, and wash the precipitate, which, when dried with a gentle heat, is hydrate of alumina, and when heated to redness, becomes pure alumina, by losing its water.

If intended for the purpose of solution in acids, it is better to keep the alumina in the state of hydrate, for the heat requisite to deprive it of water, occasions its particles to cohere so firmly, that acids act upon it slowly and with great difficulty.

According to Gay Lussac, pure alumina may be obtained by heating ammonia alum to redness in a platina crucible; thus prepared it is insoluble in acids. (*Ann. de Ch. et de Phys.*, v. 101.)

The properties of alumina are, that it is white, powdery, and light; it has neither taste nor smell, and it adheres to the tongue. Berzelius considers alumina to be composed of 53.3 aluminum and 46.7 oxygen out of 100 parts; hydrogen being reckoned unity, he regards its constitution to be two atoms of aluminum, 13.716 × 2=27.432, with 3 atoms of oxygen, 8.013×3=24.039; its atomic weight is consequently 51.471. Dr. Thomson states its constitution to be 1 atom of aluminum =10, with one atom of oxygen =8, giving 18 as its atomic weight.

Alumina is insoluble in water, but considerable affinity exists between them, as is shown by the high temperature required to decompose the hydrate. Berzelius (*An. de Ch.* lxxxii. 17) found that 100 parts of anhydrous alumina gained 15.5 of water from a dry atmosphere, and 33 from a humid one; which, on removal to a dry place, were reduced to 15.5.

Alumina shrinks considerably by heat; and Mr. Wedgwood, supposing that the degree of contraction would determine that of the heat producing it, invented a pyrometer on this principle, but it is now ascertained that its indications are fallacious. When alumina is exposed to the heat obtained by a jet of oxygen gas directed on a spirit lamp, it fuses slowly into a clear colourless glass.

Alumina produces no change in vegetable blues or yellows, and consequently shows neither acid nor alkaline properties. When in a finely divided state, and especially when recently precipitated and moist, alumina combines readily with most acids, except the carbonic; but when it has been strongly heated, it is rendered insoluble in them; it dissolves easily in the solutions of potash and soda, and even those of barytes and strontia, but ammonia takes it up very sparingly.

Nitric and muriatic acids form salts with alumina, which dissolve in water in large quantity, but afford no crystals by evaporation: these acids are applied to no use. Acetic acid unites with alumina, and the resulting acetate is largely employed in calico printing as a mordant: it is generally prepared from alum by double decomposition, either with acetate of lead or of lime. Sulphate of alumina is unimportant, except when considered as entering into the composition of alum.

It is evident from what has been stated with respect to alumina, that it is an exceedingly important substance, whether regarded as a constituent of soils or with respect to its extensive employment in the operations of the dyer.

calico-printer, or colour-maker. It is a necessary ingredient in all kinds of porcelain, earthenware, bricks, and tiles.

ALU'MINUM. The base of alumina, and generally regarded as a metal. Davy reduced alumina by voltaic electricity, and by the action of potassium in vapour upon alumina heated to redness. Further attempts were made by Œrsted and Berzelius, but it was first obtained in a perfectly separate state by Wöhler in 1827, who procured it by acting with heat upon chloride of aluminum with potassium; the chlorine combining with the potassium, the chloride so formed was dissolved by water, and the aluminum was left. Aluminum thus obtained is a grey powder, resembling platina in appearance; when burnished it has the lustre of tin; it does not fuse at the temperature of melting cast-iron, and it is a non-conductor of electricity, which is also the case with iron in a finely divided state. When heated to redness in the air, it burns with great vividness, and is converted by the acquisition of oxygen into alumina: in pure oxygen it burns with so great splendor, that the eye can scarcely support it; but in order to produce this effect it must be previously heated to redness; the heat evolved is sufficiently great to fuse the alumina partially, and it is then as hard as corundum.

Aluminum does not decompose water until it is heated to ebullition, and then decomposition is slowly effected. Neither sulphuric, muriatic, nor nitric acid dissolve aluminum when cold, but when heated they act upon it quickly. It dissolves very readily even in a weak solution of potash, with the evolution of hydrogen gas. Solution of ammonia also dissolves it. With oxygen, as already noticed, aluminum forms alumina; combined with chlorine, the result is a deliquescent chloride. Sulphuret of aluminum may be procured by dropping sulphur upon heated aluminum; it is a black powder, which decomposes by exposure to the air, and which, when put into water, deposits alumina and evolves sulphuretted hydrogen.

ALURED, ALRED, or ALFRED, of Beverley, an English historian, who lived in the twelfth century. He is the author of an Epitome of British History, from the time of the fabulous Brutus to the twenty-ninth year of the reign of Henry I., which Thomas Hearne published at Oxford in 1716, under the title of *The Annals of Alured of Beverley*. It is written in a Latin style remarkable for its correctness, considering the age in which the author lived; and more attention appears to be paid in it to the dates of the events recorded than in most of our antient chronicles. It exhibits, however, in many places so strong a resemblance to the similar work which bears the name of Geoffrey of Monmouth, that Leland, and others after him, have considered it to be merely an abridgment of Geoffrey's work. On the other hand, it would rather seem that Alured's history was really published before that of Geoffrey, so that where they agree in expression, the plagiarism or copying ought probably to be charged upon the latter. Geoffrey's work has always been regarded as principally a translation from a British or Armoric original; and he and Alured may have drawn their information, to a considerable extent, from the same sources. Of the personal history of Alured the little that has been handed down rests entirely on the worthless authority of Bale, in his *Illustrium Magnæ Britanniæ Scriptorum Catalogus, a Japheto, per* 3620 *Annos*. He is said to have been born in the town of Beverley, in Yorkshire; to have received his education at Cambridge, where he became distinguished for his skill in divinity, as well as in various branches of profane learning; and, having afterwards turned secular priest, to have been made one of the canons and treasurer of the church of St. John in his native town. His death is conjectured to have taken place in 1129, the year in which his annals terminate. Bale makes him the author of many other works; but the catalogue appears to be manufactured by the process of representing each of the books of his Annals as a distinct treatise. Among the works that have been attributed to Alured is a history of St. John of Beverley; which the writer of his life in the *Biographia Britannica* considers to be a collection of charters and other records respecting that ecclesiastical foundation still preserved among the Cottonian manuscripts in the British Museum. But for the opinion that this collection is the history said to have been written by Alured, there do not appear to be sufficient grounds.

ALUTA, or ALT, a tributary of the Danube, which rises in Transylvania, in the eastern Carpathian mountains, about 46° 40′ N. lat. Its course is at first due south for about 60 miles, when it makes a turn and runs nearly due north for about 20 miles. Its general course is then S.W., S.S.W., and S., till it reaches the Carpathian mountains, through which it makes its way. This pass, called the Pass of the Red Tower, is about 18 miles S.S.E. of Hermanstadt. From the mountains the Alt takes a general south course through Wallachia, forming one of the chief rivers of that province: it joins the Danube nearly opposite the town of Nikopolis, in about 43° 46′ N. lat., 24° 52′ E. long. The whole length of its course is not less than 250 miles, and may be considerably more. The navigation of the river is said to be dangerous. It brings down particles of gold from the auriferous sands in the neighbourhood of the mountains.

ALVA, DUKE OF. [See Alba.]

ALVAR, a principality in the centre of Upper Hindostan, twenty-five miles south-west of Delhi, north-west of Agra, and between 27° and 28° of north latitude. Alvar is a well-wooded, hilly country, abounding with jungle and with natural fastnesses, of which advantage has been taken by some of the inhabitants to carry on a system of predatory incursions into the neighbouring districts. These people are described as having been formerly exceedingly brutal in their habits; and for this reason it was once customary with some of the native chiefs, when at war, to engage their services, in order the more effectually to ravage the country of their enemies. The principality is now under the dominion of the Rajah of Macherry, whose sway extends over about 3000 square miles. The chief towns in his dominions are Alvar, Macherry, and Rajghur: although Macherry gives the title to the chief, Alvar is the capital.

In 1803, during the war with Scindiah and the Rajah of Berar, Lord Lake concluded a treaty with the Macherry Rajah, who then placed himself under the protection of the British government. Two years after that time, he received a considerable accession of territory at the expense of the Rajah of Bhurtpoor, who, contrary to his engagements, had assisted Holkar in his hostility to the Company's government.

If the inhabitants of this principality were not originally incited to their lawless courses by the oppression of the neighbouring chiefs, there is little doubt that they must have been confirmed in their bad habits by the harsh and cruel measures adopted towards them. Among other restrictions, they were prohibited from cultivating the land in any situation where adequate returns could be expected; their implements of husbandry in such cases were seized and destroyed, and themselves subjected to the most brutal punishments. They were frequently put to a lingering death by being enclosed within four walls. So far were these measures of cruelty from having produced any reformation in the people, that the commission of outrages was continually on the increase; whereas, since the interference of the English government, and the consequent adoption of conciliatory measures, outrages are now of rare occurrence, which were before so frequent that no one could venture to travel from one part of the country to another without a military escort. (Rennell's *Memoir of a Map of Hindostan*, Hamilton's *East India Gazetteer*, and *Parliamentary Reports*.)

ALVAR, a large and strongly-fortified town, situated at the base of a steep hill, in 27° 44′ north lat., and 76° 32′ east long., seventy-five miles S.S.W. from Delhi. This town is in the principality of the same name, and forms at once the capital and the principal residence of the Macherry Rajah. On the summit of the hill at the foot of which Alvar is built, there is a strong fort, 1200 feet above the level of the town.

ALVAREZ, (FRANCISCO,) a Portuguese traveller, was born in the latter part of the fifteenth century, at the town of Coimbra. King Emanuel made him his chaplain. About the year 1512, David, the Emperor of Abyssinia, sent a certain Armenian, by name Matheo, to India, with the view of establishing an alliance with Portugal. Matheo was kindly received by Affonso de Alboquerque, who was then governor of the settlements in India. He was sent to Portugal, and at first considered as an impostor, and treated as such by those who conducted him. On his arrival at Lisbon, King Emanuel rendered him ample justice; and in 1515, he sent Edward Galvaõ on an extraordinary embassy to the Emperor David, and Alvarez was appointed his secretary. After a long voyage, they arrived at the Isle of Camaran, in the Red Sea, where Galvaõ died not long after his arrival.

While Lope Suarez was governor of India, this mission was delayed; but Diego Lopez de Segueira, who succeeded him in the government, perfected what his predecessor had left incomplete. He appointed Rodrigo de Lima ambassador, and confirmed Alvarez in the office of secretary. He told Rodrigo before all the men, 'I send Alvarez with you, and not you with Alvarez; do nothing without first asking his advice, and follow it exactly.'

The expedition landed at Arkeeko on the Abyssinian coast, on the 7th of April, 1520; here they met with a Moor and a Christian. The latter informed them that the country was inhabited by Christians, but that they were subject to the depredations of the Mohammedans. The Christian governor of the country came afterwards with a fine retinue to meet them. The monks of the monastery of Bisam also visited the travellers, and received them kindly in their house. Proceeding on their journey with much fatigue and privation, occasioned partly by the loss of their guide and interpreter, Matheo, who died shortly after entering the Abyssinian territory, they arrived at the emperor's residence in Amhara, after passing through the countries of Tigre and Angot. After some years' residence in that city and country, Alvarez returned to Lisbon on 24th July, 1527. The king rewarded him with a handsome benefice, and ordered him to publish an account of his travels. Alvarez published his work at Lisbon, in one volume folio, with the following title: '*Descripçam das Terras do Preste Joam, segundo vio e escreveo o Padre Francisco Alvarez, capellão del Rey nosso senhor, agora novamente, impresso por mandad do dito senhor em casa de Luis Rodriguez, libreiro de sua Alteza. Lisboa*, 1540. A copy of this volume is in the British Museum.

Alvarez says in his dedication to the king, that he went to Paris purposely to purchase the type for the printing of his manuscript.

In his relation, the traveller speaks more of the country than of himself. The simplicity and frankness with which it is written are admirable. It bears the stamp of truth in every page. It is unfortunate that the writer gives no exact notions of the relative position of places, or of distances, particularly as he traversed and visited the now almost unknown countries of Angot, Amhara, and Efat. Peter Covilham, [see Abyssinia, p. 58,] who was in Abyssinia at the time of Alvarez' arrival, informed him that the Nile (Bahr el Azrek) rose in the kingdom of Gojam, and that he (Covilham) had been sent there on a mission by the Queen Elena. The narrative of Alvarez is generally clear, and he is apparently an honest and trustworthy writer. A French translation appeared of it in 1558, at Antwerp, under the title of *Description Historique de l'Ethiopie*, by Bellère. There is also another in Spanish, by Fray Tomas de Padilla, (Antwerp, 1557,) and Ramusio published it in Italian, in his collection of Travels. We have not seen the latter of these translations; but of the two former, the Spanish is by far preferable to the French. It is surprising that a book of such merit should not have been translated into English. A copy of the original, as well as of the Spanish and French translations, are in the library of the British Museum.

Alvarez died in 1540. He was not a man of very superior talents, but he was undoubtedly an accurate, and, above all, an honest traveller. (See Nicolao Antonio. Mariana, book xxx. ch. 23—25.)

ALVERSTOKE. [See Gosport.]

ALYA'TTES, a king of Lydia, the father of Crœsus; he died about B.C. 562, after a reign of fifty-seven years. Near the Lake Gygæa, which is a few miles north of Sardis (now Sart) in Asia Minor, we still see the immense mound of earth which was raised to his memory. Herodotus, who gives the first account of it (i. 93.) says, that the circuit round the base was 3800 Greek feet, and the width (of the base?) 2600 feet. The height is not given. The lower part of it was a substruction of stone, which is now covered by the earth that has fallen down; but the mound still retains its conical form, and rises up like a natural hill. Its dimensions are much greater than those of any similar monuments in Great Britain. The circuit of Silbury Hill, which forms so striking an object on the Bath road, is inconsiderable when compared with the mound of Alyattes. Other mounds of various sizes are found near the large one, and probably were raised in memory of the antient kings of Lydia. (See Chandler's *Travels in Asia Minor.*)

In the reign of Alyattes a great eclipse took place while the Lydian and Median armies were fighting (Herod. i. 74): the place where the eclipse was seen is not mentioned by Herodotus; but we may fairly conjecture it was in the upper latitudes of Asia Minor, and between the Halys and the higher waters of the Euphrates. This eclipse was predicted by Thales of Miletus, but we cannot infer from the words of Herodotus that he predicted the *day*: all that the words of the historian can be made to signify is, that he predicted the year. But Herodotus knew so little of physical science that we must not interpret his words too strictly. Scaliger says this eclipse took place October 1, 583 B.C.: Volney, February 3, 626: Mayer, May, 603. Costard, *Phil. Trans.* 1753, showed, by allowing for the moon's acceleration, that Mayer's eclipse was not seen at all in Asia Minor.

Baily has calculated (*Phil. Transac.* 1811) all the eclipses from B.C. 650 to B.C. 580, and has found only one that was total in or near any part of Asia Minor, viz. 30 Sept. 610. The centre of the moon's shadow passed in the forenoon in a right line over the north-eastern part of Asia Minor, through Armenia into Persia. It passed over the mouth of the river Halys. If the eclipse mentioned by Diodorus to have taken place during the voyage of Agathocles, B.C. 310, be rightly given, a correction becomes necessary for the moon's distance from her node, which being allowed for, *no* eclipse between B.C. 650 and 580 was central or total at or near any part of Asia Minor. Therefore either the date of the eclipse of Agathocles or of Thales is false.

ALYTH, a town in Perthshire, in an extensive parish, which stretches into Forfarshire, includes the Mountains of King's Seat (1238 feet high) and Mount Blair, and the forest of Alyth, and affords a supply of game and fuel. Some parts of the parish are fitted for pasturage of black cattle and sheep. The town is pleasantly situated on a rivulet, running into the Isla, a tributary of the Tay, and at the foot of a hill. It has a well-supplied market, and some manufactures, of linen and yarn. There are several fairs in the year. The church is an ancient Gothic building, in good condition; and besides the usual parochial school, there is one at Drumfork in the parish, established by the Society for Promoting Christian Knowledge. Alyth was constituted a royal burgh in the fifteenth century, but never sent members to parliament. It is 12 miles W. by S. from Forfar. The population of the parish in 1831 was 2888. There are the vestiges of a fortification on a hill near the town.

A'MADEUS I. was the son of Adelaide, Marchioness of Susa, and of Humbert I., Count of Maurienne, in Savoy, called the 'White-handed;' some say he was the son of Oddo, Humbert's son. After his father's death, he governed conjointly with his mother the states of Susa and Maurienne. This made him master of the great pass over the Alps into Italy, by Mont Cenis, from which circumstance much of the subsequent importance of his family was derived. He married a daughter of Gerald, Count of Burgundy. Amadeus, as a feudatory of the empire, was attending the Emperor Henry III. at Verona, when one day he asked admission to the imperial chamber, followed, as was his custom, by a numerous retinue of young noblemen and squires. Henry ordered him to be admitted, but 'without his tail, meaning his retinue. Upon this, Amadeus refused to enter without his friends. The emperor was not displeased at his boldness, and allowed the whole to come in with their lord. From this circumstance Amadeus was styled *Caudatus*. Amadeus was mainly instrumental in bringing about a reconciliation between Henry IV. and Pope Gregory VII., and thus putting an end to the disastrous contest between the church and the empire. He died soon after, in 1078, and was buried in the cathedral of St. Jean de Maurienne.

AMADEUS II., styled by some III., as they suppose another Amadeus, either before or after Amadeus I., of whom, however, they give us no account. This has occasioned some confusion in the early genealogy of the House of Savoy. He succeeded his father Humbert II., Count of Maurienne, in 1103. He accompanied Henry V. to Rome, where the latter was crowned emperor. As a reward for his fidelity, Henry gave him the title of Count of Savoy, and vicar perpetual of the empire. Amadeus also took the title of Marquis of Turin; and married the daughter of the Count or Dauphin, as he was called, of Vienne, on the Rhone. His differences with Louis VII., King of France, who was Amadeus' cousin by his mother's side, were settled by the mediation of St. Bernard, the famous Abbot of Clairvaux, who persuaded Amadeus to take the cross, and accompany the king to the Holy Land, which expedition, however, turned out unsuccessful. Amadeus distinguished himself at the siege of Damascus, and relieved Acre, which was besieged by the Turks. On his return from Syria, he landed in the island of Cyprus, where he died at Nicosia, of a fever, in 1148. The celebrated Abbey of Hautecombe, where are the sepulchres of the House of Savoy, was founded by him in 1125.

AMADEUS III. succeeded, in 1233, his father Thomas, as Count of Savoy, and his brother inherited Piedmont. Amadeus obliged the Count of Genevois to acknowledge himself his vassal: he also conquered the Chablais and the Lower Valais; and sent troops over the Little St. Bernard into the valley of Aosta, and subjugated that country. The Emperor Frederick II., on his passage through Turin, was sumptuously entertained by Amadeus, to whose titles he added on this occasion those of Duke of Chablais and of Aosta. Amadeus died in 1246.

AMADEUS IV., called 'the Great,' succeeded his uncle Philip in 1285. By his marriage with Sybilla, Countess of Bugey and Bresse, these districts of ancient Burgundy were united to his states. He interfered in the disputes between the Counts of Genevois and the Bishop of Geneva, and protected the city from the encroachments of the Counts. The town and district of Ivrea gave itself up to him by common consent of the citizens. He inherited the barony of Faucigny by the will of Beatrix, the last of her family, but he had to defend his claims by arms against the Dauphin of Vienne. This was the origin of long wars between the two states. Amadeus afterwards embarked for the East, where he assisted in the defence of Rhodes against the Turks in 1315. It was on this occasion that he assumed the white cross on his arms and banner, which has ever since remained the ensign of Savoy. He died in 1323 at Avignon, where he had gone for the purpose of urging Pope John XXII. to proclaim a new crusade.

AMADEUS V. succeeded his brother Edward in 1329, continued the war against the Dauphin of Vienne, and died in 1342. He has been called Aymon by the same historians who have anticipated one number in the list of the former Amadeuses. They all agree in calling the following, Amadeus VI. The names of Aymon and Amadeus were frequently confounded in the countries of ancient Burgundy.

AMADEUS VI., son and successor of the preceding, was called 'the Green Count,' from the colour of the dress in which he appeared, when only fourteen years of age, at a great tournament given at Chambery, where he won the prize. In 1349 Humbert, last Dauphin of Vienne, disgusted with the world in consequence of the death of an only son, gave up his title and principality to Charles, grandson of Philip of Valois, and retired into a Dominican convent.

From that epoch the eldest son of the King of France has been called Dauphin, and the province Dauphiny. Amadeus VI. was not pleased at this cession, which gave him a much more formidable neighbour than he had before; and a war ensued, in which Amadeus defeated the French in 1354. A treaty was concluded at Paris the following year, by which the Count of Savoy gave up to France the districts he possessed in Dauphiny beyond the rivers Rhone and Guier; and he, on his part, was acknowledged undisputed sovereign of Faucigny and the country of Gex, as well as suzerain lord over the Counts of Genevois, all which titles had been till then subjects of contention between the Counts of Savoy and the Dauphins of Vienne. Amadeus was next engaged in a war against the two brothers, Barnabas and Galeazzo Visconti, who had attacked the Marquis of Montferrat. He marched to the assistance of the latter, and drove away the forces of the Visconti. He also obliged the Marquis of Saluzzo to pay him homage. He thus extended his dominion on the Italian side of the Alps. Amadeus's alliance was courted by the principal sovereigns of his time. John Palæologus, Emperor of Constantinople, and Amadeus's cousin by his mother's side, being threatened by the Bulgarians and the Turks, who had taken Adrianople, implored the assistance of the western princes. The pope proclaimed a crusade, but the Count of Savoy alone answered the call. At his own expense he assembled a number of galleys in the port of Venice, where he embarked with a chosen band of his own knights, and a considerable number of archers and other infantry, all dressed in green. He arrived at Coron in the Morea, in July 1366, and from thence he proceeded to Gallipoli, where Sultan Amurath had placed a garrison. The town was taken, and the white cross of Savoy hoisted on its ramparts. From Gallipoli he proceeded to Constantinople, where he found the people in great confusion, the Emperor Palæologus being a prisoner in the hands of the Bulgarians. Amadeus sailed again for the Black Sea, landed on the Bulgarian coast, took Mesembria by storm, and attacked Varna. The Bulgarians now sued for peace, and as a first condition delivered Palæologus, who returned to Constantinople with Amadeus. The latter, however, soon after quarrelled with the Greek emperor, whom he was endeavouring, but in vain, to restore to the bosom of the Roman or Western church. An interesting account of this expedition from the original MSS. was lately published by Pietro Datta, of Turin. On his return to Italy, Amadeus found that the Visconti had availed themselves of his absence to invade again Montferrat and Piedmont, although Galeazzo Visconti had married Blanche, Amadeus's sister. Amadeus soon obliged them to retire and to raise the siege of Asti. The Emperor Charles IV., on his passage through Chambery, was splendidly entertained by Amadeus, who did homage as Duke of Aosta and Chablais, Marquis of Susa, and imperial Vicar, according to feudal usage, by throwing the banners of those jurisdictions to the ground before the emperor; 'but when the sixth banner came forth, which was that of the white cross, the Count of Savoy entreated the emperor not to allow it to be lowered, saying that it had never been lowered yet to the ground, and never should, so please God.' (Paradino, *Chronique de Savoie.*) Amadeus had now risen to great power and influence, and was looked upon as the arbiter of Italy. The Venetians and the Genoese had long quarrelled about the possession of the Island of Tenedos, in the Ægean Sea; but at last agreed to give it in full possession to the Count of Savoy. Amadeus in his old age was still thinking of another expedition against the Turks, but the Pope Clemens VII. persuaded him first to accompany Louis Duke of Anjou in his expedition to Naples, to which kingdom he was called by the adoption of Queen Joanna I. Amadeus went in 1382, and shared in the first successes of Louis, who conquered the Abruzzi and Apulia. A contagious disease, however, spread through the army, and the Count of Savoy was one of its earliest victims. He died at Santo Stefano in Apulia, in 1383. He was the founder of the Order of the Annonciade.

AMADEUS VII., called 'the Red Count,' succeeded his father, Amadeus VI. He made the important acquisition of the county of Nice, by the unanimous wish of the citizens, in 1388, and the act was solemnly registered as a public document. He was killed by a fall from his horse while hunting in the forest of Lornes, near Thonon, in 1391.

AMADEUS VIII., son and successor of the preceding, was created first Duke of Savoy, in 1416, by the Emperor Sigismund, who declared the court of the dutchy to be independent of the imperial chamber. Amadeus waged war against Philip Maria Visconti, Duke of Milan, and took Vercelli, which he united to his dominions. He also annexed to them the county of Genevois, having purchased the rights of the various claimants after the extinction of the male line. Thus the whole of Savoy was finally united under one sovereign. He was also Prince of Piedmont, Baron of Vaud, Lord of Nizza, Mondovi, and Valenza, Duke of Aosta, &c. Amadeus gave his subjects a code of laws called *Statuta Sabaudiæ.* Under him Savoy enjoyed profound peace, whilst the countries around were a prey to foreign and civil wars. After forty-three years' reign, and having lost his wife, Maria Beatrix of Burgundy, he retired, in 1434, to the hermitage of Ripaille, a delightful spot on the Lake of Geneva, with six of his nobles, whom he created Knights of St. Maurice. He entrusted the administration of his states to his son Louis. For five years he lived at Ripaille, where he was consulted in matters of importance by his son as well as other sovereigns; and here he mediated the peace of Arras between France and England. The council assembled at Basle, having deposed Eugenius IV. in 1439, called Amadeus to the Papal chair. Amadeus at first refused, but being persuaded by the Cardinal of Arles, he assumed the pontifical dignity with the name of Felix V. At the same time he definitively abdicated his temporal sovereignty to his son Louis. In June, 1440, the new pope proceeded to Basle, where he was solemnly crowned. France, England, Spain, Germany, and Lombardy, acknowledged him as pope, whilst the rest of Italy and the Venetians supported Eugenius, who continued to reside at Rome. The schism lasted nine years, but Eugenius having died, the Cardinals who were at Rome elected Nicholas V., when Felix himself proposed to renounce his rights to Nicholas, and thus terminate the scandal of the church. This arrangement was effected in 1449, and Felix having solemnly deposed the tiara, and having received the title of Cardinal Legate, retired again to his favourite Ripaille, where he met his six old companions, and appeared as forgetful of the pomps and cares of the papacy as he had been of those of his temporal sovereignty. He died in January, 1451, at Geneva.

AMADEUS IX., Duke of Savoy, succeeded his father Louis in 1465. He was called 'the Pious,' from his goodness and charity to the poor. He married Yolande of France, sister of Louis XI. He reigned only eight years, and died at Vercelli in 1472. A few hours before his death he assembled his council and recommended them 'to administer impartial justice, and to love the poor.' He was succeeded by his son Philibert. Louis, Amadeus' brother, was for a while king of Cyprus, but his title to that kingdom was disputed. As heirs of Louis, however, the kings of Sardinia still assume the title of Kings of Cyprus.

A'MADIS DE GAULA, the hero of an old romance of chivalry, written in Spanish prose by Vasco Lobeira, towards the end of the twelfth century. It was afterwards corrected and edited in more modern Spanish by Garcia Ordoñez of Montalvo, about the beginning of the sixteenth century, and became a very popular book in Italy and France; it was translated into French by D'Herberay, and printed in 1555, with many additions, under the mis-translated title of *Amadis des Gaules*, meaning France. In the original Spanish romance, Gaula is Wales; and the subject, characters, and localities, are British. The story alludes to fabulous feats between the Welsh and the English, previous to those of Arthur and the Knights of the Round Table; the Romans and Saxons are united against the Prince of Gaula or Wales, and the Saxons are represented as faithless and treacherous. It is probable that Vasco Lobeira took the groundwork of his story from some older British or Welsh legend. The *Amadis* is considered as one of the most interesting works in the whole library of chivalry and romance. There are also several other Spanish romances concerning Amadis and his family, which are, however, deservedly forgotten. Bernardo Tasso, the father of Torquato, wrote a poem on the subject of the Amadis de Gaula, which he called *Amadigi di Francia*, copying the mistake of the French translator, and adding other actions and episodes to the original story. This poem has never been held in great esteem in Italy. See Warton's *History of English Poetry*, where he treats of Amadis.

AMADO'U, the name of an inflammable substance which is frequently used as tinder. It is prepared from the dried plant of the *Boletus igniarius*, steeped in a strong solution of saltpetre, and cut into thin slices. This plant grows horizontally from the sides of the cherry, the ash, and other trees; when it first makes its appearance it is a little round wart-like body, the size of a pea, of a yellow colour, and of a soft yielding substance; it gradually increases in size and hardness till it becomes of a darkish brown, and is as large as an apple. It afterwards takes a horizontal direction, forms a border and becomes covered with numerous closely-packed tubes on its under surface, which are exceedingly minute. When the plant is full grown the tubes are of a reddish-brown colour, and of a hard woody texture; and the upper surface is of various colours disposed in grey, brown, or clouded concentric elevated circles. The plant is perennial, and increases yearly in size

[Boletus igniarius.]

AMAGER, or **AMAK**, a small island in the Baltic, lying opposite to Copenhagen, with which it is connected by two bridges. It is about nine miles long, and on an average three broad; quite level, and without wood or good water. The soil is fertile, and the island supplies Copenhagen with garden vegetables, milk, butter, and cheese. A Dutch colony from the Water-land in North Holland was invited here in 1516 by Christian II. Of the two parishes, that on the east side of the island, called Hollanderbye, is the proper settlement of the Dutch colony. The language of the people is a mixture of Dutch, German, and Danish. The inhabitants, in summer, send their cattle to pasture on the adjacent low island of Saltholm.

A part of Copenhagen, called Christianshafen, is on the island of Amager. (See COPENHAGEN.)

AMALARIC, the last Visigoth king of Spain, was the son of Alaric II. and grandson of Theodoric II. At the death of his father, A.D. 506, he was only five years of age; and Gensaleic, a bastard son of Alaric, was elected king of the Goths in Spain. Theodoric, who was then in Italy, sent his general Theudis with a powerful army to protect the rights of his grandson. Gensaleic was defeated, and Theudis was entrusted with the guardianship of the child and the government of Spain. When Amalaric became of age he was acknowledged king of the Goths both in Spain and in Gothic Gaul. In order to secure his French possessions he solicited and obtained the hand of Clotilda, daughter of Clovis, king of the Franks. But this marriage proved in the end an unfortunate one. Amalaric was a violent Arian, and Clotilda a zealous Catholic. At first each attempted to convert the other, but all their mutual endeavours having failed, Amalaric tried to obtain his object by violent means. He so ill-treated his unfortunate queen, that at last she was compelled to apply to her brothers for protection against her cruel husband. The French historians say, that she was so barbarously treated, that the violence offered to her by her husband frequently occasioned her blood to flow, and that she sent her brothers a handkerchief steeped in it as a testimony of her sufferings. But this statement is not confirmed by the contemporary writers. Her brother Childebert, or Childibert, king of Paris, mustered a large army and marched against his brother-in-law. The two armies met, according to some authors, in Gothic Gaul, and according to others in Catalonia. Both French and Spaniards fought with equal valour and obstinacy. At last the Spaniards were defeated, and Amalaric took refuge in a church, where he was killed, in the year 531. The conqueror, after having plundered the Arian churches, returned to France with his sister.

Amalaric was the last of the Visigoth kings, and the first who established the court at Seville. On his death, Theudis, an Ostrogoth or eastern Goth, was elected king. [See Mariana, book v. ch. 7. Procopius, *De Bello Gothorum*, lib. i.]

AMALEKITES, a nation who dwelt south-west of Palestine, between Edom and Egypt (Gen. xiv. 7; Exod. xvii. 8-16; 1 Sam. xv. 7). According to Josephus, *Antiquities*, iii. 2, those who dwelt in Gobolitis and Petra were called Amalekites, and were the most warlike among the surrounding nations. The Gobolitis of Josephus is the Gebala or Gabala of Stephanus Byzantinus, and the Gabalene of Eusebius. Its inhabitants are called Gabalitæ and Gebaleni. According to Burckhardt, the country between the Dead Sea and Wady Mousa is still called *Jebâl* or *mountain*. Gobolitis means the *high-land*, especially the mountainous country near Petra. The following passage (Jos. *Ant*. II. 1. § 2.) will illustrate our statement. 'Aliphaz had five legitimate sons, Theman, Omer, Ophus, Jotham, and Okanaz, for *Amalek* was illegitimate, being born of a concubine whose name was Thamna. These inhabited that part of Idumea which is called *Gobolitis*, and that which, after Amalek, was called Amalekitis.' Josephus calls their country *Amalekitis*, and describes it as a part of *Idumæa*. (*Ant*. ii. 1.) Josephus also calls the country of Madian Amalekitis, and says, that it was situated between Pelusium, on the borders of Egypt, and the Red Sea. (*Ant*. vi. 7: § 3, and ch. 8.) It appears also that they occupied several places in Palestine among the Canaanites, just as some Sclavonic Wendish settlements are found among the Saxons in Germany. In the land of Ephraim we find a mountain of the Amalekites where Abdon, the son of Hillel, was buried in Pirathon. There dwelt also many Kenites among the Amalekites, whom Josephus names Σικιμίται. (1 Sam. xv. 6; *Ant.* vi. 8; Judges xii. 15; compare v. 14.)

We read in Gen. xiv. 7, that Amraphel, king of Shinar, Arioch, king of Ellassar, Chedorlaomer, king of Elam, and Tidal, king of nations, came to Enmishpat (*Fountain of Judgment*), which is *Kadesh*, and smote all the country of the Amalekites. Kadesh is placed, in Asheton's *Historical Map of Palestine*, in 34° 58′ E. long. and three minutes N.N.E. of Enmishpat; but Moses informs us, that *Enmishpat* is *Kadesh*. According to Rabbi Sh'lomo Ben Jarchi, 'the country of the Amalekites' means, in Gen. xiv. 7, the country which was *afterwards* inhabited by the Amalekites; as we might say that Cæsar went into *France*, because Gaul was afterwards occupied by the Franks, or as Jacob set his face to mount *Gilead*, although this name of Gilead is of a later date. This opinion has been generally adopted; for Amalek, one of the dukes, that came of Eliphaz, the son of Esau, in the land of Edom was considered the progenitor of the Amalekites, and therefore they could not exist in the days of Abraham. Gen. xxxvi. 1, 12, 16. But the name of Amalek was, perhaps, given to two different nations. The Arabians mention *Imlik*, *Amalik*, or *Amaleka* among the aborigines of Arabia, the remains of which were mingled with the descendants of Joctan and Adnan, and became Mostarabs or Mocarabes, that is, Arabians mixed with foreigners; and they give these names also to the Canaanites and Philistines, which nations were probably related to each other. According to Arabian writers, the inhabitants of North Africa were descended from the Amalekites, who were expelled by Joshua. This assertion has probably some reference to the Carthaginians being a Phœnician colony. (D'Herbelot, *Bibl. Or.*, art. *Amlac;* Abulfeda in Pococke's *Spec. Hist. Arabum*, ed. White, pp. 464, 465.)

Some Arabians make Amalek a descendant of Ham, and father of Aad; but Abulfeda (*Historia Anteislamica, ed. Fleischer*, p. 16) makes him descend from Shem. Ebn Arabshah (in *Vita Timuri*, ed. Manger., ii. 780) calls Amalek *the great*, on account of his descent from the giant race of Ham. (Comp. Relandi *Palæstina*, p. 78-82; J. D. Michaelis, *Spicilegium Geographiæ Heb. Externæ*, t. i. p. 170-177; Alb. Schultens' *Monum. Ant. Hist. Arabum;* Gesenius in *Ersch und Gruber*.)

The Amalekites were the first who opposed the Israelites on their march from Egypt. (Exod. xvii. 8-13; Jos. *Ant.* iii. 2.) They suffered great loss, but were afterwards assisted by the Canaanites, and obtained a great victory. (Num. xiv. 39-45.) During the time of the Judges, the Israelites were frequently oppressed by the Amalekites, Ammonites, and Midianites. (Judges iii. 13; vi. 3; Joseph. v. 7.) Saul gathered 200,000 footmen and 10,000 men of Judah, and came to the city of Amalek, (the name of which is unknown,) and laid waste the valley, and said unto the Kenites, 'Go, depart, get you down from among the Amalekites, lest I destroy you with them; for ye showed kindness to all the children of Israel, when they came up out of Egypt;' or, as Josephus says, he spared them because they were related to Reguel, the father-in-law of Moses. So the Kenites departed from the Amalekites; and Saul smote the Amalekites from Havilah to Shur, that is over against Egypt. Saul took their king Agag alive, who was cut to pieces by the prophet Samuel. Saul was rejected from being king because he had spared Agag and the best cattle of the Amalekites. (1 Sam. xv.; Jos. *Ant.* vi. 8.) David warred against them (1 Sam. xxvii. 8.); and therefore the Amalekites plundered the town of Ziklag and set it on fire, but David overtook them in the wilderness, and recovered all that they had carried away. (1 Sam. xxx. 18; *Ant.* vi. 15.)

At a later period, David dedicated silver and gold unto the Lord, which he had taken from Amalek and other subdued nations. (2 Sam. viii. 12.) The Amalekites were finally extirpated by the Shimeonites, who occupied their country during the reign of Hezekiah. (1 Chron. iv. 43.) Thus, according to the direction of Moses, the remembrance of Amalek was blotted out from under heaven, because they slew the hindmost of the Israelites who fainted in the wilderness. (Deut. xxv. 17, 19) But it seems that some of them escaped to neighbouring countries, where they continued to hate the Israelites, for we find that Haman, the *Agagite*, being, probably, a descendant of Agag, king of the Amalekites, endeavoured to destroy Israel in the empire of Ahasuerus. (Esther iii. 1.)

The name עמלק has been derived from לקק, or ילק, and explained to be a people which *licks up* or *taketh away* everything, like יֶלֶק, *the locust;* or, from לקה, *a people which beats down;* or, more probably, from מלק, for מלך, *a people which reigns, a royal nation, a nation of the king, a set of royalists.* The name of the Amalekites may be descriptive of their prowess; and Balaam's saying, (Num. xxiv. 20,) 'Amalek was the first of the nations,' seems to express dignity rather than antiquity, *the most eminent of the nations.*

AMALFI, a town in the kingdom of Naples, built on the steep declivity of a mountain overlooking the Gulf of Salerno, 40° 37′ N. lat., 14° 35′ E. long. In the early part of the middle ages, Amalfi was a republic, with a scanty territory, but renowned for its trade with Egypt and the East. It took part in the crusades, and its citizens founded in Palestine the hospital of St. John of Jerusalem, from which the celebrated military order took its name. Amalfi was taken about the end of the eleventh century by Robert Guiscard, the Norman Conqueror, at the same time as Salerno, and was erected into a duchy. William of Apulia, the poet historian, describes Amalfi at that time as the great mart for eastern goods, frequented 'by Arabs, Indians, Africans, and Sicilians.' In the subsequent wars between the Normans and Pope Innocent II., who was supported by the Emperor Lotharius, Amalfi was taken, in 1137, by the Pisan fleet, who were auxiliaries of the emperor. It was on this occasion that a solitary copy of the Pandects of Justinian, a work long lost to the world, is said to have been found by the Pisan conquerors amidst other plunder within the walls of Amalfi, and from that epoch the study of the Roman law was revived in Europe. Flavio Gioia, a citizen of Amalfi, found out the mariner's compass about the beginning of the fourteenth century; he probably derived the first idea of it from some eastern trader, it having been used in a rude form in the Indian seas long before. The present town of Amalfi, though much fallen from its former splendour, still retains some remains of trade, and its inhabitants are reckoned good mariners. It has a very antient cathedral, and stands in a romantic position, thirteen miles W.S.W. of Salerno.

AMALGAM, a compound of two or more metals, of which one is always mercury; and this circumstance distinguishes an *amalgam* from a mere *alloy*. Nature presents us with only one amalgam, which is of silver, and is termed by mineralogists *native amalgam:* it occurs in Hungary, Sweden, &c., and is met with either semifluid, massive, or crystallized in rhombic dodecahedrons. Klaproth found it to consist of 64 parts of mercury and 36 of silver, out of 100 parts. Most metals may be amalgamated with mercury, and the combination appears to depend on chemical affinity. When the cohesion of a metal is slight, as in the cases of potassium and sodium; or when its affinity for mercury is considerable, as in the instances of gold and silver, amalgamation takes place readily by mere contact. When, on the other hand, the cohesion of a metal is strong, or its affinity for mercury is weak, heat, or intermediate action, or both, are requisite to effect amalgamation.

There are several circumstances which show that amalgamation is the result of chemical affinity; the crystalline form of the native amalgam is strongly indicative of it, and it is confirmed by analysis: for if the quantities of mercury and silver were 64 of the former and 35·2 of the latter metal, instead of 36, as abovementioned, they would be in the proportions of 200 to 110, or 1 atom of each.

The phenomena also, which accompany the action of mercury upon other metals, evince its chemical nature: if 44 parts of mercury be mixed with 1 part of potassium, combination occurs with the evolution of much heat, and when the resulting amalgam is cold, it is hard, and has the appearance of silver when the quantity of mercury exceeds 100 parts to 1 part of potassium, the compound is liquid; and an amalgam containing only 1·5 per cent. of potassium is susceptible of crystallizing. The density of an amalgam exceeds that of the mean of the metals; this and the tendency exhibited by one or both metals to oxidize, are additional indications of chemical combination. If mercury and lead be shaken together in a bottle containing atmospheric air, its oxygen is absorbed, and a black powder is formed which contains an oxide of one metal or of both of them.

There are some metals, it has been already observed, which require heat in order to amalgamate them; of this, antimony offers an example. In order to effect combination, it must be melted, and while liquid mixed with hot mercury. Mere heat, however, causes scarcely any action between iron and mercury. It has been stated, that they may be amalgamated by mixing the filings of the metal with powdered alum, and rubbing them together in a mortar with a little water: after trituration the alum may be washed out. By the intervention of tin or zinc, iron may be combined with mercury, and a double amalgam is formed. Platina also unites with mercury by the intervention of the amalgam of potassium; but not by direct action.

Having stated some examples of the different modes in which amalgams may be formed, we shall notice their general properties. Amalgams are either liquid, soft, or hard; their form being dependent, in some cases, upon the quantity of mercury employed; and, in others, upon the nature of the metal amalgamated: thus an amalgam consisting of 80 parts of mercury and 1 part of sodium is solid, whilst a compound of 15 parts of mercury and 1 part of tin is liquid. The liquid amalgams resemble mercury in appearance, except that the greater part of them flow less readily: solid amalgams are brittle. In general, amalgams are white; they are all crystallizable, and then form compounds of definite proportions. To prove this, it is only requisite to dissolve a proper quantity of a metal in mercury with heat, and to allow the amalgam to cool; it then separates into two portions, one of which is liquid and the other is solid and crystallized; the fluid portion may, however, be regarded as a solution of the definite compound in an indefinite excess of mercury. The amalgams of the more oxidable metals, as of potassium and sodium, are decomposed by exposure to the air and absorbing oxygen, and they decompose water with the evolution of hydrogen gas; the double amalgam of iron and zinc does not rapidly undergo any change, and is not attracted by the magnet. All amalgams are decomposed by a red heat, the mercury being distilled, and the more fixed metals remaining. The process of amalgamation and decomposition is employed to separate gold and silver from their ores; the mercury obtained by decomposing the amalgams is distilled and repeatedly used for the same purpose, with comparatively little loss. The amalgams of gold and silver are employed in the processes of gilding and plating. The amalgam of tin is largely used in what is termed silvering mirrors, and various amalgams of tin and zinc are employed for exciting electricity in the machine. These compounds, as well as other amalgams, will be treated of under each particular metal. Some curious effects result from the action of amalgams upon each other: if mercury be added to the liquid amalgam of potassium and sodium, an instant solidification ensues, and heat enough to inflame the latter metals is evolved. When, on the other hand, a solid amalgam of bismuth is put in contact with one of lead, they become fluid, and the thermometer sinks during their action. There is a curious compound called an amalgam of ammonia, the real nature of which has not been satisfactorily explained. When mercury is negatively electrified in a solution of ammonia, or an amalgam of mercury and potassium is placed upon moistened muriate of ammonia, the metal increases in volume and becomes of the consistence of butter; this appearance has been supposed to be owing to the combination of a metal, which Berzelius calls *ammonium*, with mercury. When thrown into water it effervesces copiously, hydrogen gas is given off, and ammonia remains in solution. Gay-Lussac and Thenard have maintained the opinion that the amalgam consists of mercury united to azote and hydrogen; the latter being in larger proportion than in ammonia.

AMALIA, wife of the Duke of Saxe Weimar, lost her husband when she was hardly twenty years of age, and found herself at the head of the government in troubled times, during the wars between the two great German powers, Austria and Frederic of Prussia. The Duchess of Weimar, however, contrived to direct in safety the affairs of her little state, and after the restoration of peace she turned all her thoughts to the internal improvement of her country. The city of Weimar became the resort of the most distinguished literary men of Germany, whom the Duchess encouraged by her liberal patronage to come and reside at her court. Wieland, Herder, Schiller, and Goethe, formed a constellation of genius of which any city might be proud. Wieland was appointed tutor to the two sons of the Duchess. Goethe was also induced to settle at Weimar, where he resided ever after, and filled a distinguished place in the ducal council. Herder was appointed court chaplain, consistorial councillor, and inspector of the schools. The Duchess Amalia withdrew from public life in 1775, having given up the sovereign authority to her eldest son, then of age: she retired to her delightful country residence of Tieffurth, where she continued to surround herself with men of talent and learning. She travelled into Italy in 1788, and returned from that country with an increased taste for the arts, especially for music. The Duchess was a sincere patroness of genius, which she delighted in discovering and raising from obscurity and poverty. She died in 1807, regretted by all who knew her.

AMAND LES EAUX, St., a town in France in the department of Nord, on the river Scarpe, and on the road from Lille to Valenciennes, about seven miles N.W. of the latter. The population amounts to about 9000; and the inhabitants carry on a considerable trade in oil, and in thread made of the flax grown in the neighbourhood. There are manufactures of porcelain, of lace, and of leather. There are some mineral waters and baths about half a league from the town, in a marshy plain, and nearly surrounded by the wood of St. Amand. The town was ceded to France by treaty in 1714, and previous to the French Revolution it contained an abbey with a considerable ecclesiastical establishment. The abbey church is much admired for its architecture.

Another town of the same name usually distinguished as St. Amand Mont Rond, is in the department of the Cher, and on a tributary of the river Cher, not far from its junction. It has a population of 6000 persons, who are chiefly occupied in trade; it is one of the most commercial towns in the department, and is the mart of the grain, wine, chestnuts, ship-timber, and cattle of the district: in the season a considerable quantity of mushrooms is gathered. There are some iron works here. It is 25 miles south of Bourges, and 156 south of Paris.

This town was built in the year 1410, on the ruins of a place called Orval, which the English had burned. It is the capital of an arrondissement.

There are several other small places of this name in different parts of France.

AMA'NUS, a chain of lofty mountains separating Cilicia from Syria. [See Taurus.] The name Amanus was given by the Greek and Roman geographers, and is also sometimes applied by modern geographers to the range which, beginning at the mountain of Cape Hynzyr on the Gulf of Scanderoon, runs in a north-eastern direction into the interior.

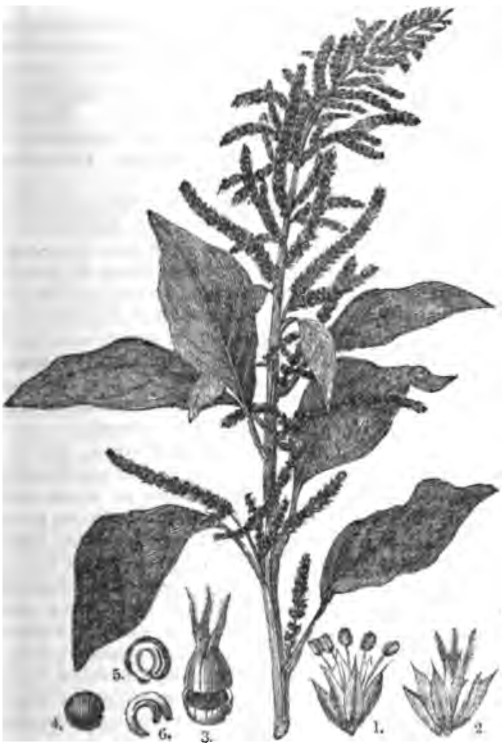
AMARA, or AMARASINHA, an antient Hindu grammarian, and author of one of the oldest and most esteemed original vocabularies of Sanskrit nouns, called after his name *Amara Kosha*, i. e. the Thesaurus of Amara, but sometimes quoted under the title of *Trikanda*, i. e. the Tripartite. Owing to the almost total want of records on the internal history of India, the æra at which Amara lived can only be ascertained by conjecture. Numerous authorities assert that he was a contemporary of King Vikramaditya; and his name is included in a memorial verse among the Nine Gems, or nine distinguished poets and scholars who adorned the court of that prince. The exact date of this Vikramaditya's reign is, however, still subject to discussion, as in Indian history several kings of that name occur. Tradition places Amara and the Nine Gems generally under the first Vikramaditya, 56 years before our æra. Mr. Bentley (*Asiatic Researches*, vol. vii. p. 242-244) supposes the Vikramaditya under whose reign Amara lived, to be the successor of Raja Bhoja-deva, as sovereign of Dhara in Malwa, who reigned during the latter part of the eleventh century. Mr. Colebrooke, (*Algebra from the Sanskrit*, *Introd.* pp. 45-51,) from astronomical data in the work of Varahamihira, (another of the Nine Gems,) has assumed the close of the fifth century, or about the year 472, as the probable epoch when that astronomer wrote, and Vikramaditya and the Nine Gems lived. This opinion, with regard to Amara, is supported by the frequent reference made to his Dictionary as to an antient and classical work of standard authority, by numerous writers, to many of whom an antiquity of several centuries at least can be confidently attributed.

Of Amara's life little is known. He embraced the tenets of the Bauddhas, a heterodox sect; and all his compositions, with the exception of his Dictionary, perished in the persecutions raised by the Brahmans against the persons and writings of the Bauddhas, which began in the third century, and reached their height during the fifth and sixth.

Like other original Sanskrit vocabularies, that of Amara is in metre, to aid the memory. The whole is divided into three books. In the first two words relating to kindred objects are collected in one or more verses, and placed in chapters. Thus the first book commences with words for heaven; next follow the names and attributes of the several deities; then come terms for space, the cardinal points of the compass, &c. The third book is supplementary: it contains epithets, a list of homonymous words, (arranged alphabetically like many Arabic Dictionaries, according to the final consonants,) particles, and adverbs, (considered as indeclinable nouns by the Hindu grammarians,) and remarks on the gender of substantives. The Sanskrit Dictionaries or *Koshas*, do not include the verbs of the language, the stems or roots being arranged and explained in separate lists. The Amara Kosha contains only about 10,000 different words. In a language so copious as the Sanskrit, this number appears small: but in consequence of the great regularity and consistency with which, in this language, compound nouns and derivatives are formed, very few of these require to be inserted and explained in a Dictionary. Real deficiencies in the list of Amara are supplied partly by commentaries on it, and partly by more recent Dictionaries, one of which, the *Trikandasesha*, by Purushottamadeva, is, what its title implies, purposely compiled as a supplement to the tripartite work of Amara.

An excellent edition of the *Amarakosha*, with marginal explanations and notes in English, and an alphabetic index, was published by Mr. H. T. Colebrooke at Serampore, 1808, 4to.; reprinted, 1829, 8vo. An edition of the mere Sanskrit text, and table of contents likewise in Sanskrit, appeared at Calcutta in 1813, in a volume with three other original Sanskrit vocabularies. (*Asiat. Res.* vii. p. 214, seq. Wilson's *Sanskrit Dictionary, Preface*, p. 5. seq. *first edit.*)

AMARANTA'CEÆ, a natural order of apetalous dicotyledonous plants, remarkable for the dry coloured scales of which all their bracteæ and floral envelopes are composed; a character by which they are principally known from Chenopodeæ. Their essential distinction is briefly this: calyx, dry, coloured, not falling away; petals, wanting; stamens, five or more; ovarium, quite simple, superior; fruit, an utricle, containing a single seed, which has an embryo curved round a central farinaceous albumen; leaves, destitute of stipulæ.



[Amaranthus polygamus.]
1. A calyx and bractea with stamens. 2. The same with the pistillum.
3. The pistillum opening. 4. A seed.
5. A seed cut down, showing the embryo. 6. The embryo—all magnified.

The species are found chiefly in tropical countries, where they are often troublesome weeds. The cock's-comb, the globe-amaranth, the prince's-feather, the love-lies-bleeding of our gardens belong to the order; which does not contain a single species in which any deleterious property has been found.

AMARAPURA, a city in the Burman empire, six miles east of Ava, in 21° 55′ N. lat., and 96° 7′ E. long. This city was founded in 1783, by the monarch then on the Burmese throne, and was declared the capital of the empire. The seat of government has since been removed, or rather has returned, to Ava.

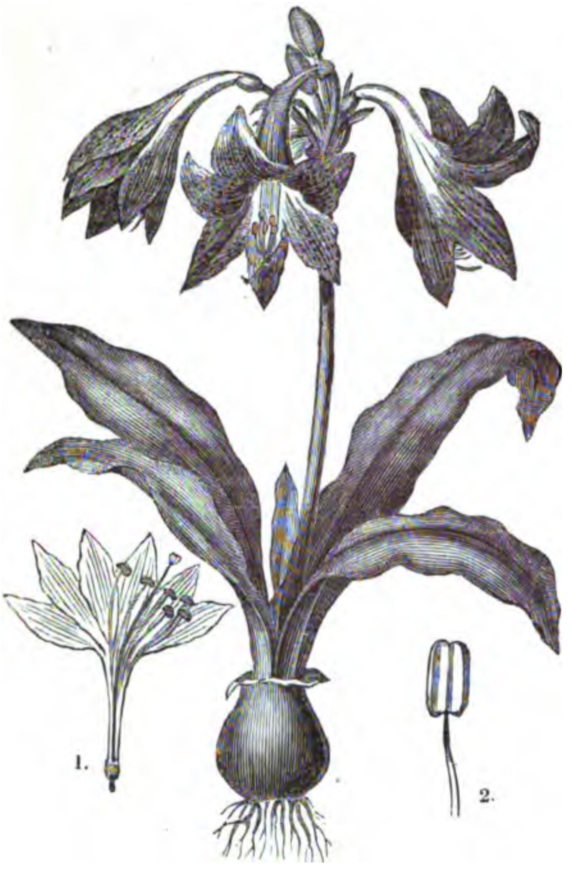
Amarapura stands near the east bank of the Irawaddy, and at a short distance from a branch of the same river, which is to the east of Amarapura, and joins the main stream immediately below Ava. With very few exceptions, the houses are built of wood: many of the public buildings have a very striking appearance, owing to the splendour of the gilding with which their roofs are covered, both within and on the outside. From the nature of the material employed in building, there is great risk of accidents from fire. To guard against these, the better kind of houses are surrounded by enclosures, and all are covered with tiles; besides which, pots filled with water are placed on the ridge of the roof, to be in readiness if a fire should break out. Notwithstanding these precautions, nearly the whole of the city, consisting of 20,000 to 25,000 houses, was burnt to the ground, in March, 1810. The population at that time was estimated at more than 170,000; but owing partly to the calamity just mentioned, and partly also to the removal of the seat of government in 1819, the present estimate of its population does not go beyond 30,000 persons.

The fortifications of Amarapura are equal in strength to most of the native fortresses in India. The fort is a square building with walls twenty feet high, which are faced with brick, and strongly built. Each angle of the fort contains a large square projecting bastion, and each side has a principal gate, besides two smaller ones between it and the bastions, so that there are in all twelve gates. Each side of the fort is somewhat more than 7000 feet long, and the whole is surrounded by a broad ditch, faced with brick. The fort is built on the northern bank of the lake, the waters of which wash its walls whenever the lake is swelled during the rainy season.

The manufacture of jewellery was formerly carried on extensively in this city, an entire street having been filled with the houses of goldsmiths; most of these shops have now disappeared. The fort contains a royal library, the books composing which are contained in about one hundred large, well-filled wooden chests. The river Irawaddy offers the advantage of water-carriage to and from the city, which is situated near a fertile district, where abundance of wheat is raised of a good quality. (Captain Cox's *Notes on the Burman Empire.*—See also Berghaus' *Asia*, and his *Atlas.*)

AMARYLLI'DEÆ, or the narcissus tribe of plants, is a group of monocotyledonous genera, to which the daffodil, the belladonna and Guernsey lilies, and the showy Brunsvigias and blood-flowers (*hæmanthus*) of the Cape of Good Hope belong. They are characterized by having six stamens, a highly-coloured flower, and an inferior ovarium. The beauty of their blossoms serves as a cloak to their poisonous properties, and shows how little the external appearances of plants are to be trusted in judging of their virtues. To form an opinion only from their aspect, these would be pronounced the most harmless of plants, while in fact their bulbs are dangerous poisons; the juice of that of *hæmanthus toxicarius* is inspissated by the Hottentots, who smear their arrow-heads with it; other kinds are not less fatal, and even the common daffodil contains within its bulbs an acrid irritating principle which renders it a powerful emetic. Like many other poisonous families, this occasionally secretes a kind of fœcula, or flour, which, when separated from the juice that is naturally mixed with it, becomes a wholesome article of food; the arrow-root of Chili is yielded by an *alströmeria*, which belongs to amaryllideæ.

The species, which are chiefly scattered over Brazil, Africa, and tropical Asia, are nearly all bulbous; a few only acquire a high degree of development and lose their bulbous character, as the doryanthes of New Holland. No tribe is more admired by cultivators, in consequence of the universal beauty of its flowers.



[Amaryllis reticulata, diminished in size.]
1. The flower cut open. 2. A stamen the natural size.

AMASIEH or **AMASIA**, a sanjak of Anatolia, and also the name of the principal town of the province, which is in 40° 28′ N. lat., 36° 26′ E. long. Amasieh was the birthplace of the Greek geographer Strabo, whose description of its situation corresponds, as far as we can understand it, with the modern appearance of the place. Its antient name of Amasia or Amaseia can scarcely be said to have undergone any change at all. 'My city,' says Strabo (*Casaub.*, p. 561), 'stands in a deep and extensive gorge, through which the Iris (now the Jeshil-Ermak) flows. It is surprisingly favoured both by nature and art, being at once both a town and a garrison: a rock, lofty and precipitous, all round, descends with rapid slope to the river; one part has a wall close on the bank of the stream, where it joins on to the city; and in another part the wall runs up on each side of the hill to the summits, of which there are two, connected with one another and exceedingly well fortified. Within the enclosure made by the wall are the palace and the tombs of the kings. The summits are united by a very narrow neck, the ascent to which is five or six stadia on each side from the bank of the river and from the suburbs; and from the neck to the two summits is about another stadium of steep ascent, which is altogether impregnable. * * * On the tops also water is carried up under the rock; two narrow galleries (pipes, channels, σύριγγες) being cut, one from the neck to the river, and the other from the summits to the neck. * * * There are two bridges on the river, one from the city to the suburbs, and another from the suburbs to the country; at this latter bridge terminates the mountain which overhangs the rock.' The town was of course on both sides of the river: the castle with part of the surrounding walls still exists on the opposite side of the river to the town. The description of Strabo is not altogether intelligible without a better plan of the place than we can find. A view of the mountain with the two tops may be seen in Jackson's *Journey from India* (London, 1799, p. 212.) Jackson describes some of the mountains round the town as being almost half a mile in perpendicular height. They are all calcareous stone, susceptible of a polish. Otter (ii. p. 334) also describes a long road cut with infinite pains in the rock, to bring, as he says, water from the mountains to Amasia; but this is not Strabo's channel. This city is now large and populous: the houses are chiefly of wood, but many are of stone, and are all covered with tiles. There is a large stone mosque, built by Sultan Bayazid, with two lofty minarets, also of stone; the dome of the mosque is covered with lead.

This town can only be approached by two narrow passes, one on the north, the other on the south, both of which can be defended by a small force. The river, which runs in a deep, narrow channel, both above and below the town, is not suitable for navigation. The inhabitants procure from it their chief supply of water, which is raised by wheels furnished with buckets, and driven by the stream. Fontannier calls the river of Amasia the *Tocatlu-sou*, or river of Tocat, and gives the name of Jeshil-Ermak to the lower course of the stream. In the numerous gardens about the town many fine fruits are grown, especially grapes of which a strong wine resembling sherry is made. Silk forms the chief part of the commerce of Amasieh. There is also a great trade in the fur of the marten, which is caught in the Janik mountains, that extend from Amasieh to Trebisond. Many of the inhabitants are Christians, but the population is not known. Amasieh has an Armenian archbishop. Fontannier, a late traveller, states the number of houses at 10,000.

The antiquities of Amasieh are often spoken of, but no satisfactory account of its remains is yet published. Jackson describes some holes in one of the hills cut in the solid rock (see his plate) similar to a Hindoo pagoda, which can only be approached by narrow passes cut through the rock. (Compare Morier, *Journey through Persia*, &c., p. 349.) The ruins of a temple also are mentioned by Fontannier.

We are not able fully to understand the passage from Strabo placed within asterisks; it either means that there was a communication under the surface, between the river and the castle, and the two summits, for the purpose of securing a supply of water from the river, or that the channels conveyed water from a spring on the summit to the town: but it is impossible to say what is the precise meaning of Strabo. The two existing canals, which Fontannier speaks of as the canals or pipes (σύριγγες) of Strabo, are certainly not those described by the Greek geographer. No modern traveller has yet given any such account as will at all explain this obscure passage of Strabo. The name is written Amasseia on the earlier coins, and Amasia on those struck under the early Roman emperors. (See Rasche, *Lexicon Rei Numariæ*.)

AMA'SIS, or **AMO'SIS**, the eighth king, according to Africanus, of the twenty-sixth dynasty of Egyptian kings, reigned from B.C. 569 to B.C. 525. Amasis was a native of Siouph, in the nomos (district) of Sais, in the Delta. Being sent by Apries (the Pharaoh Hophra of Scripture, Jerem. xliv. 30.) to stop a mutiny in the Egyptian army, he was proclaimed king by the rebels, and returning at the head of this army, he defeated his master, who was supported by a force of 30,000 Carians and Ionian Greeks. After the battle, Amasis became king of Egypt, and Apries, being surrendered to the Egyptians, was put to death.

Amasis married a Greek wife from Cyrene, and further prepared the way for great changes in the social condition of Egypt, by allowing Greek merchants to settle at Naucratis, and to build temples and bazaars. Solon is said to have visited Egypt in his reign. Amasis decorated Sais, the chief city of the nomos, in which he was born, with numerous great works of Egyptian art: these were, magnificent propylæa to the temple of Athenæa; enormous colossi; and large androsphinxes. But his great architectural achievement was a monolith (one-stone) temple which he brought from the granite quarries of Syene, down the river, a distance of about 600 miles. The exterior dimensions of this stone were 31½ Greek feet long, 21 broad, and 12 high: a chamber was cut out in the interior, the dimensions of which were 28¼ feet long, 18 broad, and 7½ high. (See *British Museum. Egypt.*) Sais, the royal residence of Amasis, where so many wonders of Egyptian art were collected, is now a mass of rubbish called Sa el Hajar, or Sa, *the Rock*; exhibiting only mounds of rubbish and pottery, and sun-dried bricks. Many remains of antiquity might probably be discovered by digging.

Amasis also made a colossus 75 Greek feet long, flanked by two smaller figures 30 feet high, which he placed in front of the great temple of Hephæstus (Phtha) at Memphis. He placed another at Sais, of the same size. He was succeeded by his son Psammenitus, who was conquered by Cambyses the Persian, B.C. 525. (See *Description de l'Egypte. Antiq.*, vol. v. Herod., book ii. chaps. 162—182.)

AMATHO'NTE, a small village of Cyprus, on the south coast of the island, near the sea, said to be on or near the site of the Greek city of Amathus, and a few miles from the modern Limassol. Amathus was a city of great antiquity, and possibly of remote Phœnician origin, though afterwards inhabited chiefly by Greeks. Adonis was worshipped there in a temple of great antiquity. [See ADONIS.] In the neighbourhood were mines of metal. Near Limassol there are still considerable remains, supposed to belong to the old town. (See Mannert, *Syrien*, p. 447.)

AMA'TI, HIERO'NYMUS, the name of a celebrated maker of violins, a native of Cremona in Italy, who lived about the year 1600. His son, Anthony, and his grandson, Nicholas, (son of the latter,) were also excellent makers.

AMA'TO, or AMATUS, (JOANNES RODERICUS) often called Amatus Lusitanus, a very eminent physician of the sixteenth century. Most of the particulars that are known of his personal history are in his writings, from which they have been carefully collected by Astruc, in his treatise *De Morbis Venereis*. (See vol. ii. pp. 735—740, 2nd edit. 4to., Paris, 1740.) Succeeding biographers have copied the statements in Astruc's notice, but not in all respects with accuracy. Amato was of a Jewish family, and was born at Castel-Branco, in the province of Beira, in Portugal, in 1511. Like many of his nation, concealing his religious faith, he was educated at Salamanca; after leaving which, he travelled in France, the Netherlands, Germany, and Italy. He remained for some time both at Venice and Ferrara, giving lectures on the medical art; and, as Astruc adds, putting the statement in Italics, he superintended the dissection of twelve bodies in the year 1457. But it is evident that this date is a mistake, and that the year should probably be 1547, a correction which may perhaps make the circumstance recorded not quite so remarkable. Before 1549, Amato had removed to Ancona, where he resided and practised his profession till 1555. While here, he had the honour of being several times called to Rome to attend the Pope, Julius III. Dread of the Inquisition, however, whose notice had been attracted to him as a concealed Jew, induced him, in 1555, to withdraw to Pesaro. It appears that on this occasion he found an enemy in the new pope, Paul IV., and that in his precipitate flight he left behind him all his property, and lost the manuscript of an unfinished commentary on *Avicenna*, which he was preparing for the press. From Pesaro he some time after retired to Ragusa, and from thence, in 1559, to Thessalonica (Saloniki), where he made open profession of the religion of his forefathers. He is ascertained to have been alive in 1561, but no notice of him occurs after that date, and it is not known when he died. Amato is the author of two works, both of which long ranked among the most esteemed medical treatises of modern times. The one is entitled, in the first edition, printed in 4to. at Antwerp, in 1536, *Exegemata in Priores duos Dioscoridis de Materia Medica Libros*; and in subsequent editions, *Enarrationes in Dioscoridem*. It was printed with this title in 4to. at Strasburg, in 1551, and in 8vo. at Venice, in 1553, at Strasburg in 1554, and at Lyons in 1557 and 1558; the last two editions have notes by Robert Constantine. Amato's other work is his *Curationum Medicinalium Centuriæ Septem*. Of this work, the first part or century, written at Ancona, in 1549, was published in 8vo. at Florence, in 1551; the second, written at Rome, in 1551, was published in 12mo. at Venice, in 1552; the third and fourth, written at Ancona, in 1552 and 1553, were, probably after having been printed separately in Italy, published together, and accompanied by the preceding two, in folio, at Basil, in 1556: the fifth, written at Pesaro and Ragusa, in 1556 and 1557, the sixth, written at Ragusa, in 1558, and the seventh, written at Thessalonica, in 1561, were published together at Venice, in 1566. The author intended to complete the work by the addition of three other centuries, in which, and not, as has been commonly said, in a complete edition of Dioscorides, he proposed to make his reply to an attack that had been directed against him by Peter Andrew Mathiolus, in a treatise entitled *Apologia adversus Amatum*, published in folio at Venice, in 1557. This design, however, he appears not to have lived to accomplish. Besides other reprints of portions of the work, the collected Centuries of Amatus appeared in 12mo. at Lyons, in 1580; in 4to. at Paris in 1613, and in 1620; in 4to. at Bordeaux, in 1620; and in folio at Frankfort, in 1646. In both these works, the author is said to show an intimate acquaintance with the writings of the Greek and Arabic physicians; and they are also stated to contain many curious notices both in medicine and in natural history. Some of his biographers mention a translation into Spanish by Amato of the *Roman History* of Eutropius.

AMAURO'SIS, from *ἀμαυρόω*, (to darken or to make obscure,) dimness of sight, blindness. [See GUTTA SERENA.]

AMAZI'AH, or AMAZIAHU, means literally, *one strengthened by Jehovah*, and is the name of the ninth King of Judah, who began to reign when he was twenty-five years old, about the year 838 B.C., after his father Joash had been murdered in the house of Millo by his own servants Jozachar and Jehozabat. (2 Kings xiv.) Amaziah reigned twenty-five years in Jerusalem; his mother's name was Jehoaddan of Jerusalem. He did what was right in the sight of the Lord, yet not with a perfect heart, and not like David; he did according to all things as Joash his father did. The people in his reign still sacrificed, and burnt incense on the high places. He slew his servants who had slain the king his father, but the children of the murderers he spared. Having resolved to attack the Amalekites, Idumæans, and Gablitans, he collected an army of 300,000 men in the tribes of Judah and Benjamin, and paid 100 talents of silver to 100,000 auxiliaries of the kingdom of Israel, but according to the advice of a prophet, he dismissed the auxiliaries before the war commenced. The disbanded Israelites upon this ravaged the cities of Judah, slew 3000 men, and took much spoil. With his own troops, Amaziah slew 10,000 of the Edomites in the Valley of Salt, and the children of Judah brought other 10,000 of the Edomites to the top of a rock, and cast them all down. Amaziah also took *Selah* and called it *Joktheel*. The name of Selah is translated *Petra, rock*, by the Greeks. The remains at this place in Arabia Petræa, between the *Dead Sea* and the Elanitic Gulph, are described by Irby and Mangles (*Travels*, p. 336, &c.)

Amaziah, flushed with the victory over Edom, set the gods of Seir up to be his gods, burned incense unto them, and declared war against Jehoash, the King of Israel. But Judah was worsted before Israel, and they fled every man to their tents. Jehoash took Amaziah captive at Beth-shemesh, and broke down of the wall of Jerusalem, from the gate of Ephraim unto the Corner-gate, four hundred cubits. He also took all the vessels that were found in the house of the Lord, and in the treasures of the king's house, and hostages, and returned to Samaria. It appears that Amaziah obtained his liberty, for we know that he reigned after the death of Jehoash fifteen years, until they made a conspiracy against him in Jerusalem; and he fled to Lachish; but they sent after him and slew him there, and brought him on horses, and buried him in Jerusalem with his fathers in the City of David. And the people of Judah took *Azariah*, (*Help of Jehovah*,) or *Uzziah*, (*Power of Jehovah*,) who was sixteen years old, and made him king instead of his father Amaziah, 2 Kings xiv.; 2 Chron. xxv.; Compare Jos. *Ant.* ix. 9, 10. The Septuagint wrote for *Amaziah*, Αμεσσίας, Josephus, *Αμασίας*, and the Vulgate *Amasias*.

A'MAZON, or MARAÑON, or ORELLA'NA, is the name given to a river which traverses the equatorial regions of South America nearly in its whole extent, running chiefly from west to east, and having its embouchure almost under the equator. It is the largest river on the globe, not only for the length of its course, but also for the extent of country which is watered by this noble stream, and its great tributaries.

Geographers do not agree as to the true sources of this river, though they agree in placing them in the highest ranges of the Cordilleras. Some think that they are found in an alpine lake, a little to the south of the tenth parallel, called the lake of *Lauricoche*. From this lake a river issues which is called the *Upper Marañon*, or *Tunguragua*, and runs north-north-west in a longitudinal valley of the Cordilleras, up to about 5° of southern lat., or 350 miles. The direction of its course is then changed to the north-east for about 50 or 60 miles, and in this part of its course the river descends from the high valley of the mountains to the plains that are situated to the east of them, by the *Pongo de Manseriche*, which name is given to a long rapid of the river, full of eddies and small cataracts, extending between the town of *St. Jaen de Brancamoros*, and the village of *Chuchunga*, for about twenty-four miles. The river above the Pongo runs down the mountain channel, forming rapids and cataracts, but increased to the width of 250 fathoms; below St. Jaen de Brancamoros it suddenly contracts to 25 fathoms, and rushes through a rent or crevice between mountains of tremendous height. This Pongo cannot be descended in boats, because they would be broken to pieces by the shocks which they experience when dashed against the rocks. Balsas, therefore, are used, a kind of rafts, made of a very light wood or rather cane, similar to the bamboo, the single pieces of which are fastened together by rushes in such a manner that they yield to every shock of moderate violence, and consequently are not subject to be separated even by the strongest. The rafts used in the surf of Coromandel in the East Indies, and called there catamorans, are constructed on the same principle. At some distance from the Pongo, the Tunguragua leaves the mountains and enters the plain. Here it receives first from the right the *Huallaga* or *Guallaga*, a river whose sources are somewhat to the south of the principal stream, and which, traversing another but lower longitudinal valley of the Cordilleras, runs almost parallel to the Tunguragua, nearly due north, for about 350 miles.

Advancing farther to the east, between the 4th and 5th degree of southern lat., the waters of the river are increased by two great tributaries from the left, the rivers *Pastaza* and *Tigre*, both of which rise in the Cordilleras, between 1° and 2° of southern latitude, and descend in a south-eastern course to the Tunguragua. The course of the former is stated to be about 350, that of the latter nearly 400 miles.

Thus increased by the waters of three large rivers, the Tunguragua meets at *St. Joaquin de Omaguas*, its rival, the *Ucayali*, which is considered as the true source of the Marañon by all those who think that the stream which rises farthest from the mouth has the best claim to the honour of being thought its source. Yet the sources of the Ucayali are not known. It was formerly conjectured that the principal source of this river was the *Beni* or *Paro*, which was supposed to be formed by the waters descending from the Cordilleras about the 18th southern parallel, and somewhat to the north of it. But Lieutenant Mawe, in his *Journal of a Passage from the Pacific to the Atlantic, &c.*, has translated a few notices respecting the sources of the Ucayali, which were published at the time of his stay in Peru, according to which, the river *Parobeni* rises not far from the town of Cuzco, probably near the 14th southern parallel. This agrees very well with the statement of Mr. Pentland, who ascertained that the high snow-topped range, which borders on the east the valley of the lake of *Titicaca*, extends much farther to the east, and occupies the site where our maps place the sources of the Beni or Paro. It seems, therefore, very probable, that the waters descending from that range run directly to the *Mamoré*, a tributary of the Madeira. The Parobeni then would not be the most southern source of the Ucayali, but we must look for it in the *Apurimac*, which rises to the north-west of the lake of Titicaca, between the 15th and 16th parallel, and runs in a longitudinal valley north and north-north-east for more than 3° of lat., till at about the 12th southern parallel it meets the river *Jaura*, descending from the north in the same longitudinal valley. After its junction with this river, the Apurimac turns to the east, and enters the plain, where it mingles its waters with those of the *Pangoa*, descending from the Cordilleras on the east, and takes the name of *Tambo*. At 10° 31′ of southern lat., the Tambo unites with the Parobeni, whose course has been nearly due north through nearly 4° of lat., and the river formed by their conjunction is called Ucayali. The Ucayali continues its course in the direction of north-north-east for 6½° of lat. till it reaches St. Joaquin de Omaguas, and joins the Tunguragua. Both rivers unite, and are called afterwards *Amazon*, or *Marañon*.

From the town of St. Joaquin de Omaguas, the Amazon traverses 22° of longitude, running nearly in an eastern direction. In all this extent it traverses only 4° of latitude, from the 4th parallel to the equator; and two of them it traverses near its embouchure, where it runs nearly north-east. In this part of its course it receives a great number of tributaries, some of them of such magnitude, as to surpass the largest rivers in Europe in their extent and the volume of their water.

From the north, there fall into the Amazon, the *Napo*, the *Putumayo*, the *Yapura*, and the *Rio Negro*. All these four rivers rise in the eastern declivity of the Cordilleras, within a space not exceeding 3° of long. (between 75° and 78°) and 3° of lat. (from 1° of southern lat. to 2° of northern), but as they meet the Amazon river at great distances from one another, the courses of those which join the main stream farthest to the east, are the longest. The Napo, the most westerly and shortest of them, has its source at the foot of the volcano *Cotopaxi*, and runs first nearly due east, afterwards east-south-east till it reaches the Amazon river, after a course of between 700 and 800 miles. The Putumayo, which is also called *Ica*, rises on the eastern declivity of the snowy mountains, which inclose the high valley of Pasto on the east, about one degree to the north of the equator, and runs parallel to the Napo; but towards its mouth its course, for a considerable space, is directed towards the east, parallel to the Amazon river itself. The whole course of this river is reckoned to amount to upwards of 800 miles. The Yapura, or *Caqueta*, rises where (between 1° and 2° of northern lat.) the chain of the Cordilleras divides into three great branches, not far from the sources of the *Magdalena river*, and runs parallel to the Putumayo, but reaches the Amazon much more to the east, after a course of about 900 miles. The Rio Negro is by far the largest of the northern tributaries of the Amazon river. Its unknown source lies about the 2nd parallel of northern latitude, and the 75th meridian west from Greenwich. Its upper course, for 7° of long., (from 75° to 68°) is nearly due east, up to the place where the *Cassiquiari* branches off to the north-north-east, to form a connexion between the Rio Negro and the Orinoco. At this point the Rio Negro changes its course to the south, and continues in this direction for 2° of latitude, till it has passed the equator, where it unites with the *Guapes*, a river which likewise descends from the eastern declivity of the Cordilleras, and at its junction with the Rio Negro has already run upwards of 500 miles. This river forces the Rio Negro to resume its eastern direction, in which it continues for 5° more of longitude, at a distance of about 20′ to the south of the equator. It then gradually begins to approach the Amazon river by an east-south-eastern course, and here it receives another great tributary, the *Rio Branco*. This river rises in the mountains called *Pacarayma*, a ridge of the mountain-mass called by Humboldt *Parime*, and not far from the sources of the *Paragua*, a tributary of the *Caroni*, which falls into the Orinoco, running to the north. The upper part of the course of the Rio Branco is nearly parallel to the ridge, from west to east, for upwards of a hundred miles, till it suddenly turns to the south, and reaches the Rio Negro by a south-south-western course. Its whole course probably amounts to at least 500 miles. After this junction, the Rio Negro declines entirely to the south-east, and reaches the Amazon river at about the 60th meridian. The whole course of the Rio Negro cannot be less than 1400 miles, and this tributary of the Amazon river may well be compared with the Mississippi before its junction with the Missouri.

To the east of the Rio Negro, a few other rivers fall into the Amazon on the north side. They rise in the mountains of French Guiana, but have a comparatively short course, and as none of them have acquired any political importance, we omit them here, and turn to the streams which bring their tribute from the south to this king of rivers.

After the junction of the Ucayali with the Tunguragua, the Amazon receives from the south the following tributaries, the *Yavari*, the *Yutai*, the *Yurua*, the *Tefe*, the *Purus*, the *Madeira*, the *Topayos*, and the *Xingu*. The Yavari is comparatively a small river, for its whole course, as it seems, does not extend over more than 4° of lat. in a north-eastern direction, so that it can hardly exceed 360 miles; but it is mentioned for its political importance, as forming the boundaries between Brazil and the republic of Peru. The rivers Yutai, Yurua, Tefe, and Purus, are thought to have their sources much farther to the south, about the parallel of the town of Cuzco, and the two former, or, according to some maps, three of them, are said to issue from a vast lake, called *Roguaguado*, but these statements depend on the accounts collected by some missionaries from the information of the natives. The course of these rivers lies through the least known part of South America, as they have never been ascended nor descended by any European, as far as we know, and the statements of the natives are not much to be relied on when they refer to such great distances. All the country between the rivers *Parobeni* and *Purus* may be considered as unknown.

The *Madeira*, however, the largest of the tributaries of the Amazon river, is pretty well known, because it has been ascended even in its upper branches. Two large rivers are considered as its sources, the *Mamoré* and the *Guaporé*, but they descend from different places; the former is the channel for the waters that run down to the east from the high ground between the 14th and 20th degrees of latitude; the latter collects chiefly those that descend from the Campos Pareceis in Brasil. The most southern source of the Mamoré is on the south of the mountain mass near *Santa Cruz de la Serra*, a branch or offset of the Cordilleras projecting some distance to the east. Here the river formed by the waters descending from the north and west, is called *Condorillo*, and runs for above three degrees of longitude to the east-south-east along the foot of the mountains: before it reaches the plain of *Chiquitos*, which separates the Cordilleras from the Campos Pareceis, and turns to the north, the name of Condorillo is changed to that of *Rio Grande* or *Guapihi*. Running in the plain it surrounds the western extremity of the *Sierra de Santa Cruz*, returning from the 64th meridian to the 66th. It then takes the name of *Mamoré*, and runs to the north and north-east till it reaches the *Guaporé*, or *Itenez*, the other branch of the Madeira. The Guaporé, which has its source more to the east, and in about 16° S. lat., is increased by many considerable rivers, especially the *Ubay*, which joins it from the south-east. Its general course lies to the north-north-west, and only where it approaches the Mamoré, it runs nearly due north-west. At about the 12th degree of lat., both rivers uniting, take the name of Madeira (the Portuguese name for wood), because its banks are covered with high forest-trees. Between 12° and 9° of southern lat. the Madeira runs nearly due north, but then declines considerably to the east, till it reaches the Amazon river at 3° 24′ 18″ of southern latitude, and about 59° west from Greenwich. Though the course of this river is obstructed by some rapids and falls, it is navigable almost in its whole extent. The whole course of the Madeira from the sources of the Condorillo amounts to upwards of 1800 miles.

The Topayos or Topayoso, its neighbour to the east, rises in about 14° of southern lat., and runs generally to the north-east, till it reaches the Amazon between 1° and 2° of southern lat. and 54° and 55° of western long. Its tributaries are numerous, especially in the upper part of its course, but not considerable. Its whole length may amount to 900 miles. The last great tributary of the Marañon is the Xingu, which rises in the interior mountainous parts of Brasil, about 15° of southern lat., and runs for a great part of its course to the north-north-west, approaching the Topayos; it then runs parallel to it, but at some distance before its junction with the main stream it makes a great bend to the south-east, and then joins, with a north-north-eastern course, the Amazon. Its whole course amounts to about 1000 miles.

Towards its embouchure the Amazon divides into two branches, of which the northern is by far the broadest, and retains its name. The southern, called *Tagypura*, runs south of the island called by the Portuguese *Ilha dos Ioanes*, or *Ilha do Marajò*, and joins on the eastern side of the island the river Tocantins, which after this junction is called the river *Para*. The width of the channel between the island and the continent is about eighteen miles, but towards its mouth it widens to thirty miles.

The *width* of the Amazon river is, of course, various. In the upper parts of its course it averages from one to two miles; but lower down it grows much wider, and after its junction with the Xingu it is hardly possible to discover its opposite banks.

From the sea to the mouth of the Rio Negro the depth of the main channel is nowhere less than thirty fathoms; higher up it varies from ten to twelve; and up to the basin of Omaguas, near the junction of the Tunguragua with the Ucayali, there is depth of water for vessels of almost every description. Higher up, only vessels can proceed with safety which do not draw more than five or six feet water. Such vessels may enter the Tunguragua and proceed up to the Pongo of Manseriche. The Guallaga and Ucayali too are navigable for such vessels to a considerable distance from their junction with the main stream.

The shoals of the river are very numerous; and the navigable channels in many places narrow, winding, and subject to continual changes. The banks of the river being low are subject to be under water, owing to the freshets and great swellings in the rainy season: when they happen, the country is inundated for many miles on each side of the river, the whole of the numerous islands are covered with water, and often either change their situation, or new ones are formed. In the lower part of its course, the navigation is rendered somewhat difficult by the floating trees, which descend from the Madeira, as into the Mississippi from the Missouri.

The islands formed by this river are almost innumerable, and of all sizes; many are twelve or fifteen miles in circumference, and some thirty or thirty-six. The most remarkable are the islands of *Tupinambas*, of dos Ioanes, and of *Caviana*. The first is properly formed by the two branches by which the Madeira joins the Amazon; that to the east, running parallel to the main land, is named *Manes*, and separates the island of Tupinambas from the Amazon. The island itself extends over two degrees and a half of longitude according to the statement of Lieut. Maw, but it seems to be very narrow. The Ilha dos Ioanes, or Ilha do Marajò, which, as we have already noticed, is enclosed by the two branches of the Amazon and the river Para, extends from east to west about 130 miles, and not much less from north to south: its circumference is stated to be from 500 to 600 miles. The island of Caviana, which lies where the river meets the Atlantic Ocean, is about 40 miles in length, and nearly 25 in breadth; it is said to be very fertile.

The rapidity of the stream is very great; according to Lieut. Maw, its common rate is about four miles per hour, in some places more, and in some less. That, however, is only the case in the rainy season, between April and October; in the dry season its rapidity is diminished. The tide which enters the river may be observed as far as the town of Obidos, 400 miles from its mouth. When the tide begins to ebb, and the sea-water receding liberates the imprisoned current of the river, the Amazon pours out with increased force and velocity into the ocean, and as it here meets, at no great distance from the land, the current which from cape *St. Roque* runs along the north-eastern coast of Brasil, it gives rise to that phenomenon which is called by the Indians *Pororoca*. The river and the current, having both great rapidity, and meeting nearly at right angles, come into contact with great violence, and raise a mountain of water to the height of 180 feet, as it is, perhaps rather extravagantly, estimated. The shock of these two bodies of water is so dreadful, that it makes all the neighbouring islands tremble, and fishermen and navigators fly from it in the utmost terror. It may be said, that the river and the ocean contend for the empire of the waves. But they seem to come to a compromise: for the sea-current continues its way along the coast of Guyana to the island of Trinidad, and the current of the river is still observable in the ocean at a distance of 500 sea-miles from its mouth, according to the statement of Sir James Yeo. (See Major Rennell's *Investigation of the Currents of the Atlantic Ocean.*)

According to the calculation of Baron Humboldt, the whole course of the Amazon river amounts to 720 German geographical miles, (at 15 to a degree,) or upwards of 3300 English statute miles; but he considers the Lake of Lauricoche and the river Tunguragua as the true sources of the river. If the Apurimac is taken as the main stream instead of the Tunguragua, the course of it will be increased by 300 or 400 miles.

The last-mentioned traveller discovered and navigated the natural canal by which the river-system of the Amazon is united to that of the Orinoco. Some vague information of the existence of such a connexion had already before his time reached Europe, but it was strongly combated by geographers, and rejected. Now, however, it is no longer doubtful that a river, called the Cassiquiari, forms between the 2° and the 3° of northern latitude a navigable connexion between the Rio Negro and the Orinoco, running about a hundred miles and upwards in a north-eastern direction. The country on its banks is nearly uninhabited.

Humboldt considers the country on the banks of the Amazon and between the lower courses of its tributaries as a plain, but it does not deserve such a name, when compared with the Llanos of the Orinoco and the Pampas of the Rio de la Plata. The country immediately on the banks of the Amazon, and also to a distance of many miles on each side, is very low, and therefore subject to be inundated, but farther from the banks it rises and is much diversified with low hills covered with tall trees. The full growth of these trees, the hardness of their wood, which often defies the attacks of iron and even the finest steel, and their vigour of vegetation, give unequivocal testimony to the richness of the soil on which they grow, and would, perhaps, a hundredfold repay the labour bestowed on it, if it was cultivated. But it is almost entirely without culture, and, except a few spots where the Spaniards and Portuguese have settled, it is only inhabited by the native savages, who roam about in the immense forests and live by hunting. Very few articles are brought thence to the markets of the world, and those are only gathered from the wild trees and plants, as cacao, sarsaparilla, copaiba-gum, and caoutchouc. Doubtless these immense forests with their vigorous vegetation conceal many valuable treasures; but until our times access to them was shut up from political motives, and the time which has elapsed since has not been sufficient to examine such a vast field with any degree of attention and success.

The fish of the Amazon river itself are not much better known. Turtles of different kinds are in great abundance; alligators are frequently met with, but the most extraordinary animal is the manatee (*Trichecus Manati*), which is also called the sea-cow, though according to Baron Humboldt it is never met with in salt-water. It is found also in the Essequibo. [See MANATEE.]

It is observed as a very curious fact, that between San Francesco de Borja (4° 28′ S. lat. and 76° 24′ W. long.) and the mouth of the Rio Negro, a stone or a pebble is almost as rare as a diamond.

The first European who descended this river was *Francisco Orellana*, a Spaniard, and to preserve the memory of his bold enterprise, the river is called by many Spaniards *Orellana*. This adventurer narrated, that its banks were inhabited by warlike nations; and that in some parts the women themselves went into battle, which gave rise to the name of *Amazon*, in reference to the ancient fable of the Amazons. It is uncertain whence the name of *Marañon* is derived. The most probable conjecture is, that a nation of this name inhabited a part of its banks.

Both the Spaniards and the Portuguese have erected some settlements on its banks, but they are of little importance. St. Jaen de Brancomoros on the Tunguragua is the most important settlement of the Spaniards, containing about 4000 inhabitants; St. Francisco de Borja, at the confluence of the Amazon and Pastaza, is much smaller. The most remarkable settlements of the Portuguese are Obidos, where an excellent sort of cacao is gathered, and Santarem, at the mouth of the Topayos. Both contain only a few thousand inhabitants.

The effects of civilization cannot be better shown than by a reference to the state of navigation on the Amazon and its rival rivers the Mississippi and Yantse-Kiang. Though the country traversed by the river-system of the Amazon is more extensive than those which belong to the two latter, and perhaps not inferior in fertility, the number of vessels that navigate the Amazon river all the year round is certainly less than those that pass in one month along the Mississippi, and probably not greater than the number of those which every day ascend and descend the Yantse-Kiang. (See *Travels* of La Condamine, of Baron Alexander von Humboldt, and of Lieut. Maw; Southey's *History of Brasil;* the Atlas to Humboldt's *Travels;* Arrowsmith's *Map of America;* and *Journ. of Lond. Geog. Soc.*, vol. ii. p. 650.)

AMAZONS, a fabulous nation of female warriors. Still it is remarkable, that, wild and almost impossible as the stories relating to them for the most part are, the historians and geographers of antiquity bear strong testimony to the general belief that such a nation existed. All appear to agree in assigning them a Scythian origin. Two Scythian princes, according to Justin, wandering from their own country, reached the river Thermodon in Cappadocia with their followers, and settled there. The new comers in time provoked the anger of their neighbours, and, in a war which ensued, their male population was almost exterminated. The women then took up arms, and with so much better success, that in future they resolved to live without men, and put the remaining males to death. They elected two queens, who in turn commanded their armies in the field, and kept order at home. They are said to have extended their conquests far and near, and to have founded many cities in Asia Minor, as Ephesus, Smyrna, Cumæ, and others. and indeed they are placed by different authors in so many different parts of Asia Minor, that nothing certain can be made out respecting them. Their chief seat, however, was Themiscyra, on the river Thermodon, near the southern coast of the Euxine sea. Diodorus places a tribe of Amazons in Libya; far more ancient, he says, than those settled on the Thermodon. The names of Antiope, Hippolyta, (whose tomb was shown at Megara in the time of Pausanias,) Penthesilea, Thalestris, will be familiar to the student of Greek and Latin poetry. The Amazons are said to have been warred on by Heracles (Hercules) and by Dionysus (Bacchus); to have invaded Attica in the time of Theseus, under the command of Hippolyta; and the battle between the Amazons and Athenians was painted at Athens in the celebrated portico called Pœcile (the painted). Priam fought for the Trojans against the Amazons after the death of Hector; yet the Amazons came to the assistance of the Trojans against the Greeks under the command of Penthesilea, who was slain by Achilles, (Virgil, *Æn.* i. 491.) Though they rejected the fellowship of men, they did not neglect the care of continuing their race: but they only brought up female children, whom they educated in all the arts of war, searing the right breast, that it might not interfere with the free use of the arm. They are usually figured, in medallic and other representations, with a short mantle, reaching to the knee, the left breast bare. By the orator Lysias, they are said to have been the first who fought on horseback, and to have had iron weapons, which were not in use among their neighbours. This may, perhaps, have arisen from the geographical position assigned to them, near the country of the Chalybes, or workers in iron. Their weapons were a semicircular, or crescent-shaped shield, bows and arrows, and the double-edged battle-axe, which was their peculiar and distinguishing weapon. Even in times of ascertained and credible history, we still find rumours concerning these singular beings; for it is asserted by Diodorus and Curtius, that Thalestris, Queen of the Amazons, paid a visit to Alexander in Hyrcania; and by Plutarch, that certain Amazons fought with the Albanians against Pompey. The story of the Amazons visiting Alexander is discussed by Arrian, (vii. 13,) with his usual judgment, and exploded: Arrian believes, however, that there was once a race of Amazons. We may here mention that the Amazons are placed by Strabo in the mountains of Albania, on the banks of the Caspian Sea. Of their name two derivations are given: one that they are so called from ἅμα ζώσας, 'females living together;' the other as being ἄνευ μάζου, 'without a breast.' It is more likely to have been originally a foreign word, which the Greeks, according to their custom, transmuted into a Greek form, and then proceeded to invent a fitting etymology. There are, it is said, figures in India, consisting of half a male, and half a female body, vertically united: and it has been suggested, that something of this kind may have given rise to the story of the Amazons.

The story of a race of Amazons is not confined to Asia. Alvarez, who visited Abyssinia in 1520, speaks of a race of Amazons south of Damot, who were warlike, and fought with bows and arrows, mounted on bullocks. They destroy the left breast when young. They live with their husbands, but are governed only by a queen: the men have nothing to do with war. Pierre Petit has written a long book, (*Traité Historique sur les Amazons,*) to prove that there were Amazons, in which all or most that is reported about them will be found collected. (See also Herod. iv. 110-116. Strabo, Diodorus. Justin.) The figure of an Amazon is a common type on antient coins. (Rasche, *Lexic. Rei Num.*)

AMBASSADOR is the term most commonly used by writers on public law, to designate every kind of diplomatic minister or agent, and may, in this sense, be defined to be a person sent by one sovereign power to another to treat upon affairs of state. The necessity of employing such means of communication between independent communities is so obvious, that there is hardly an instance on record of a people in so rude a state of society, as to be ignorant of the functions of an ambassador, and of the respect which is due to his office. The right of communicating in this manner, the right of embassy as it is called belongs by the law of nations to the person or persons in whom the sovereignty of an independent state is lodged. In the republics of ancient Greece, and of ancient and modern Italy, ambassadors were often appointed directly by the legislative assemblies: in modern states, however, whatever may be the form of their government, ambassadors are for the most part, named by the person intrusted with the supreme executive power. In the United States of North America, the President names an ambassador, but the appointment must be confirmed by the Senate. Sometimes, like other matters within the province of the executive sovereignty, the power of appointing and sending ambassadors has been delegated to a subordinate executive officer, as it was to the viceroy of Naples, the Governor of Milan, and the Spanish Governor-General of the Netherlands. It belongs to every power which has the right of making war and peace, and accordingly is possessed by the East India Company. Embassies were antiently sent only on particular occasions, with authority to transact some specific business; as for instance, to negotiate a treaty of peace or alliance, or to complain of wrongs and demand redress. But great necessary changes were gradually introduced, occasioned by the political condition of Europe and modification of society. The several states which had previously risen to importance, although independent of one another, were yet bound together by numerous ties, and with the progress of commerce and civilization, the intercourse between them became so great, and their interests so complicated, that it was found expedient for them to keep up a more regular communication; and with this view it became customary for one power to have its ambassador residing constantly at the court of another.

Among the ordinary functions of an ambassador, the following are the most important; 1st, to conduct negotiations on behalf of his country;—the extent of his authority in this respect is marked and limited by the power which he has received from home; he has, however, by the modern law of nations no authority to conclude any engagement definitively, the treaty which he has negotiated having no binding power, till it has been formally ratified by his government; 2ndly, to watch over the accomplishment of all existing engagements; and 3dly, to take care generally that nothing is done within the territories of the state, nor any treaty entered into with other powers, by which the honour or interests of his country can be affected, without informing his government of such measures.

Besides these more public functions, an ambassador has certain duties to perform towards private individuals of his own nation: such as, to provide them with passports; to present them at court, if they produce the requisite testimonials; to protect them from violence and injustice; and if any manifest wrong has been done, or if justice has been refused them, to exert himself to obtain redress, and to secure for them the full benefit of the laws; and, lastly, to assist them in maintaining their rights in courts of justice, as well by certifying what is the law of his country upon the point in dispute, as by the authentication of private documents, which is usually confined in practice to such as have been previously authenticated at the foreign-office of his own government, and thence transmitted to him.

The right which exists in every sovereign power, of communicating by means of ambassadors, implies on the part of the state to which such communications are made, certain corresponding duties. [See Grotius *on the Law of War and Peace*, Book ii. c. 18.]

The first of which is that of receiving the ambassadors sent to it. This is a duty, however, which exists only between nations at peace with each other; for, in time of war, a hostile power cannot claim to have its ambassadors received, unless they are provided with a safe-conduct or passport; and the granting of these is merely a matter of discretion. And in order to claim the performance of this duty, it is, in all cases, requisite that the ambassador should be provided with the proofs of his authority; these are contained in an instrument, called his Letters of Credence, or Credentials, delivered to him by his own government, and addressed to that of the state to which he is sent. [See CREDENTIALS.] A refusal to receive an ambassador properly accredited, if made without sufficient cause, is considered a gross insult to the power that he represents. But if one of several competitors for the sovereign power in any country, or if a province which has revolted and asserts its independence, claims to send an ambassador, a government, so far from being bound to receive the person so sent, cannot do so without thereby taking upon itself the responsibility of recognizing the competitor in the one case to be actually the sovereign, and the revolted province in the other to be actually independent. Though this may be the general principle, the practice is somewhat different. In such cases, consuls are generally first sent; and when a *de facto* power has been established for some time, governments think themselves justified in following up these consuls by ministers, even though the mother country, to which the revolted states belong, may not have recognised their independence. This was done by the British government and others in the case of the South American States, whose independence Spain has not yet recognised.

It is said that a government will be justified in refusing to receive an ambassador, if he is personally disagreeable to the state, or of a notoriously bad character. But it is now generally the practice, in order to avoid such a refusal, to inform the court beforehand of the person intended to be sent. Every government, it is also said, has a right to make general rules respecting the class of persons whom it chooses to admit; but every court would think itself aggrieved and insulted by the refusal of the ambassador it has appointed, except on specific and satisfactory grounds. There is nothing, for instance, in the general law of nations to prevent a man's being accredited by a foreign power to the government of his own country; and in this case he is clothed, as far as his character as an ambassador is concerned, with precisely the same rights as if he was a member of the state by which he is employed. But any government may, by a general regulation, refuse to admit, as France and Sweden have in fact done, any of its own subjects as the representative of an independent state.

The next great duty of a state, with respect to ambassadors sent to it, is to protect them from every thing which may in any degree interfere with the due performance of their functions. This duty commences even before the ambassador has delivered his credentials, as soon as his appointment has been notified to the court. This is the principle on which are founded what may be called the essential privileges of an ambassador.

The first of which is that of perfect security; for as he is necessarily placed among those who have always the power, and from the nature of his duties, not unfrequently the will, to molest him, it is requisite that he should be in the fullest manner protected from every kind of violence whatever, either to his person or his property. The breach of this privilege has, from the earliest ages, been considered a high offence against the rights of nations; whether proceeding from the sovereign power itself, or from the unauthorized acts of individuals.

The Porte used to violate this right, by confining the ministers of any power it went to war with, in the Seven Towers, under the pretence of protecting them from popular outrage. The last minister shut up in the ' Seven Towers was M. Ruffin, the envoy of the French republic. Since that time, partly from some improvement in the Turks, but more from their weakness and fears, the practice has dropped, and is not likely to be renewed.

The second essential privilege of an ambassador is, that no legal process can affect him, in his person or his property; so much of his property, at least, as is connected with his official character, such as his furniture, equipages, &c. [See *Bynkerschoek de foro Legatorum*.] This privilege is analogous, and in some degree subsidiary to the former; for it would be of little avail to protect an ambassador from open outrage, if he were liable to be harassed by legal proceedings, which, if instituted (as it is always possible they should be) without foundation, would be only a cloak to violence, and even if well founded would interfere with the discharge of his public functions. Ambassadors are, therefore, deemed not to be amenable for their conduct before any criminal tribunal of the country they reside in.

It must not, however, be supposed that they are at liberty to misconduct themselves with impunity. They are bound to respect the laws and customs of the country they are in; and if they commit any offence, the sovereign may complain of it to the government they represent; or, if the case is of a more serious nature, he may demand that they be recalled, or may even dismiss them peremptorily, and in either case require that they be brought to trial in their own country. And if an ambassador is guilty of an offence which threatens the immediate safety of the state, not even the privilege of personal security will protect him from any degree of force which may be necessary to defeat his intentions: thus, if he engages in a conspiracy against the government, he may, if the circumstances require it, be put under arrest, in order to be sent home, and if he is found in arms joining in a rebellion, there is no doubt but that the principle of self-defence will justify his being treated as an enemy.

The same principle also extends to civil suits, and no claim can be enforced against an ambassador by any compulsory process whatever.

These privileges are not confined to the ambassador alone, but are extended to all his suite—his companions as they are sometimes called,—including not only the persons employed by him in diplomatic services, but his wife, chaplain, household, &c. The law of nations in this respect is fully recognized by the law of England. By the statute of 7 Anne, c. 12, all legal process against the person or goods of an ambassador, or of his domestic, or domestic servants, is declared to be void. The benefit of this Act may be claimed by any one who is actually in the domestic service of the ambassador, whether he is a British subject or a foreigner, provided he is not a merchant or trader within the bankrupt law; and it is not necessary that he should be resident in the ambassador's house. But if he takes a house, and uses it for any other purpose besides that of residence—as if he lets part of it in lodgings, he so far loses his privilege, and his goods are liable to be distrained for parochial-rates.

Whoever sues out or executes any process contrary to the provisions of the act, is punishable at the discretion of the Lord Chancellor and the two chief justices, or any two of them, as a violator of the law of nations, and disturber of the public repose;—with this exception, however, that no one can be punished for arresting an ambassador's servant, unless the name of such servant be registered with the secretary of state, and by him transmitted to the sheriffs of London and Middlesex.

The third essential privilege of an ambassador is, that his residence enjoys a security similar to that of his person and property: it is not only protected from open outrage, but it is likewise exempted from being searched or visited, whether by the police, by revenue officers, or under colour of legal process of any description whatever.

This privilege has sometimes been construed to extend so far, as to make the ambassador's residence an asylum to which any offender might flee and be out of the reach of the law; but the government has, in such a case, a right to demand that the offender be given up, and if he is an offender against the state, it is held that in case of a refusal on the part of the ambassador, it may even be justifiable, if the circumstances require it, to seize him by force.

This privilege of asylum, as it is called, was formerly granted in some cities to the whole quarter in which the ambassador resided; such was the case at Madrid, till in the year 1684 it was confined to the residence itself. Such, also, was the case at Rome to a much later period; and even at the present day some vestiges of this immunity still remain, but since 1815 it has been confined to cases of correctional police.

There are some other privileges which, though not essential to the character of ambassadors, are yet very generally admitted. Ambassadors are, for instance, in all civilized countries allowed the free exercise of their religion; they are in general exempted from direct taxation; and they are usually allowed to import their goods without paying any custom-house duties: this last privilege, however, being extremely liable to abuse, has sometimes been limited. At Madrid since the year 1814, and at St. Petersburgh since 1817, ambassadors are allowed six months to import their goods free of customs, and after that time their exemption ceases. At Berlin, they are only allowed to import goods until the duties payable amount to a certain sum.

If any violence has been offered to an ambassador, or any of his privileges have been infringed, although he may himself, if he chooses it, prosecute the offender, it is more usual for him to demand satisfaction of the government, and it is their duty to bring the offender to punishment.

The title of ambassador, in the more limited sense of the word, as it is used in the public law of the present age, is confined to diplomatic ministers of the highest order. Ambassadors, in this sense of the word, hold an office of very exalted rank; their credentials are addressed immediately from their own sovereign to the sovereign to whom they are sent; with whom they thereby are entitled to treat personally, without the intervention of his ministers, in the same manner as their master would if he were present. This is a right, however, which, at least in free states, where the ministers alone are responsible for the acts of the government, exists rather in name than in reality. The ambassadors, properly so called, are deemed to represent, not only the interests, but likewise the person and dignity of their master; but this representative character, as it is called, amounts in reality to little more than the enjoyment of certain marks of distinction; the principal of which are, that an ambassador is always styled 'Your Excellence,' which was formerly the mode of addressing a sovereign prince; 2. That he takes precedence next after Princes of the blood royal, &c.

Ambassadors are of two kinds—1. Those who reside regularly at the court at which they are accredited, to perform the usual duties of their office; 2. Those who are sent on special occasions, either on missions of important business, as the negotiation of a treaty; or more frequently on some errand of state ceremony—such as to be present at a coronation or a marriage; in which case the representative character, from the dignity with which it clothes them, is of peculiar importance. The designation of Ambassador Extraordinary was originally appropriated to those of the second kind (such as belonged to the first being styled Ordinary Ambassadors); but the title of Extraordinary, being considered more exalted, is now usually bestowed even on those who are regularly resident. To the highest order of minister belong also the Legates and Nuncios of the Pope. [See LEGATE, NUNCIO.]

The rank and pomp annexed to the office of ambassador being attended with considerable expense, and having frequently occasioned embarrassments and disputes, it was found expedient to employ ministers under other denominations, who, though inferior in point of dignity, should be invested with equal powers. The chief difference by which all the lower orders of diplomatic agents are distinguished from ambassadors, properly so called, is, that they are the representatives, not of the personal dignity of their sovereign, but only of his affairs and interests, in the same manner as an ordinary agent is the representative of his principal. Diplomatic ministers of the second order receive their credentials (like ambassadors) immediately from their own sovereign. To this order belong envoys, ordinary and extraordinary, ministers plenipotentiary, the internuncios of the pope, and the Austrian minister at Constantinople, who is styled internuncio and minister plenipotentiary. The distinction of ministers into those of the first and those of the second order began to prevail towards the end of the fifteenth century, and is said to have been originally introduced by Louis XI. of France. [See ENVOY.]

There is likewise a third order of diplomatic agents, which does not appear to have been recognised till towards the beginning of the eighteenth century. Those who belong to it are known by the title of Chargé d'Affaires (which is said to have been given by a sovereign, for the first time, to the Swedish minister at Constantinople, in 1748,) Resident, or Minister. Their credentials are given them by the ministers of state in their own country, and are addressed to the ministers of the country they are sent to; except in the case of the diplomatic agents of the Hanseatic towns, whose credentials are addressed to the sovereign. In this order may also be included the ministers, whom an ambassador or envoy, by virtue of an authority from his sovereign, appoints (usually under the title of Chargé d'Affaires) to conduct in his absence the affairs of his mission. [See CHARGE' D'AFFAIRES.]

The third order may now be considered to be subdivided into two; for at the Congress of Aix la Chapelle, in 1818, it was agreed between Austria, France, Great Britain, Prussia, and Russia, that their *Resident Ministers* at one another's courts should form, in respect of rank, an intermediate class between ministers of the second order and chargés d'affaires.

Consuls are not in general reckoned among diplomatic ministers; in some particular cases, however, (such as that of the consuls-general sent to the semi-barbarous nations along some parts of the Mediterranean coast) having diplomatic duties to perform, they are accredited and treated as ministers. [See CONSUL.]

It was long a disputed question, whether the smaller powers had a right to communicate by means of ministers of the highest order. It is now settled that this right belongs only to states enjoying royal honours,—with the exception, however, that the smaller states are permitted to send ministers of the highest order to one another if they like it. But according to the practice of the present day it is only in the intercourse between the greater powers that such ministers are employed. The courts with which the British government interchanges ambassadors, are those of Paris, Vienna, St. Petersburgh, Spain, Portugal, and Holland as it stood before the French revolution;—we also interchanged ambassadors with the kingdom of the Netherlands as long as it existed; and we are in the habit of sending ambassadors to Constantinople, but the sultan has no regular diplomatic minister resident in this country.

The rules relating to the ceremonial due to diplomatic ministers are laid down at great length by writers on the subject. The first thing to be done by a minister is to announce his arrival to the minister for foreign affairs. He is then entitled to an audience of the sovereign, either public or *private*. The *right* of demanding at all times, during his stay, a *private* audience, is the *distinction* and important privilege of an ambassador. Should his only chance of carrying a measure depend on his having a private audience of the sovereign to whom he is sent, it is evident that this might be thwarted by the sovereign's ministers, who would of right be present at the audience of any minister below the rank of ambassador. A minister plenipotentiary as well as an ambassador can claim a public audience. He there presents his credentials to the sovereign, and hands them over to the minister for foreign affairs. Ministers and envoys also present their credentials to the sovereign in person. After he has been presented to the sovereign, a minister visits all the diplomatic body. But a minister of the highest order pays *his respects in person only to those of the same rank*—with ministers of a lower order he merely *leaves his card*. When an ambassador arrives at a court, all the diplomatists there, who are not of his own rank, call on him first.

Disputes have frequently arisen among ministers of the same rank about precedence. The rules by which it has at various times been endeavoured to settle the respective rank of the representatives of each state, being founded on no solid principle, and not sanctioned by general acquiescence, it is unnecessary to mention. A rule which has long been partially adopted, may now be considered fully established: for at the congress of Vienna, in 1815, it was agreed by the eight powers which signed the treaty of Paris, that ministers in each class shall take precedence among themselves, according to the date of their official announcement at court. If the reader is curious to know wherein this precedence chiefly consists,—in what manner ministers are required to arrange themselves when they are standing up; in what, when they sit round a table: what order it behoves them to observe when they are placed in a row; what, when they walk in a line: how their rank is marked when their numbers are even; how, when their numbers are odd—we must refer him to the *Manuel Diplomatique* of the Baron Charles De Martens, chap. vi.

For further information on the subject of ambassador, he may consult Wicquefort, *de l'Ambassadeur*, *Les Causes célèbres du droit des Gens*, by C. De Martens, and the writers on the law of nations, particularly Vattel and G. F. Martens; and likewise the *Cours de droit public par* Pinheiro-Ferreira.

AMBER, a carbonaceous mineral which occurs in beds of lignite, in Greenland, Prussia, France, Switzerland, and some other countries. The greater portion of it comes from the southern coasts of the Baltic Sea, where it is thrown up between Königsberg and Memel. (Berzelius, *Traité de Chimie*, vi. 589.)

It is also stated (*An. de Chimie*, xvi. 215) that it is obtained by mining at a distance of 200 feet from the sea, and at a depth of about 100 feet, and is found in small cavities. It is occasionally met with (Aikin's *Dict. of Chemistry*, i. 57) in the gravel beds near London, in which case it is merely an alluvial product. Amber occurs generally in small pieces, which are sometimes colourless, frequently light-yellow, or deep-brown, and very commonly translucent; two large masses have, however, been found, one of them weighing upwards of thirteen pounds, and the other more than eighteen.

Amber is rather harder than common resins, which it resembles in several properties: it is susceptible of a good polish, and when rubbed becomes electrical; indeed the word *electricity* is derived from ἤλεκτρον, the Greek name for amber. Its density varies from 1·065 to 1·070: when bruised it exhales a slight aromatic odour; and when heated to 448° Fahrenheit it melts, then inflames and burns with a bright flame, and emits a smell which is not disagreeable.

The subject of the origin of amber is one which has been much discussed. According to Berzelius (*Chimie*, vi. 589), it was originally a resin dissolved in a volatile oil or natural balsam; the proofs of this opinion are, he conceives, numerous; it has often the impression of the branches and bark upon which it has flowed and solidified; it often contains insects, some of which are so delicately formed, that they could not have occurred except in a very fluid mass. Dr. Brewster (*Edinburgh Phil. Journal*, iv. 332) concludes, from an examination of the optical properties of amber, that it is an indurated vegetable juice.

Amber consists of a mixture of several substances, which are, a volatile oil, two resins soluble in alcohol and in ether, succinic acid, and a bituminous body that resists the action of all solvents, and which is the principal part of amber.

Water does not act upon this substance; it does not even dissolve any of the succinic acid. Alcohol takes up a soft, yellow, limpid resin. Cold concentrated sulphuric acid dissolves amber; the solution has a brown colour, and when water is added to it, the greater part of the amber is precipitated. Nitric acid converts it into a resinous substance, and dissolves it totally.

When amber, in the state of fine powder, is boiled in a solution of potash or of the carbonate, a great quantity of succinic acid is dissolved.

According to Drapiez, the composition of amber is as follows:—

Carbon	80·59
Hydrogen	7·31
Oxygen	6·73
Ashes	3·27
Loss	2·10
	100·00

The ashes consist of lime, silica, and alumina.

This analysis can only be considered as an approximation.

Amber is employed for ornamental purposes in the manufacture of necklaces, &c. It is used also for preparing amber varnish, for obtaining a peculiar oil used in medicine, and it yields succinic acid employed in chemical investigations.

AMBERG, which derives its name from *Stadt am Berge*, or Town on the Mountain, is the capital of the circle of the Regen in Bavaria. It is a well-built and agreeable town, divided into two equal parts by the river Vils. Its public edifices consist of the handsome church of St. Martin, which is adorned with several fine monuments, a college once belonging to the Jesuits, an arsenal, guildhall, house of correction, court of appeal, lyceum, high school, seminary for the education of teachers, library, and cabinet of natural history. It has an extensive manufactory of arms, besides manufactures of earthenware, woollen cloths, tobacco, &c., and is the seat of a royal mint. There are considerable iron mines in the neighbouring 'Iron-mountains,' which produce nearly 1400 tons of iron annually; and Amberg has some trade also in salt. It lies about forty miles east of Nuremberg; 11° 48′ E. long. 49° 27′ N. lat. The number of inhabitants is nearly 8000; in 1825 it was 7680.

AMBERGRIS, a substance of animal origin, found principally in warm climates, floating on the sea, or thrown on the coasts. The best comes from Madagascar, Surinam, and Java. It has been found in the intestinal canal of the *physeter macrocephalus*, mixed with the remains of several marine animals which have served it for food; on this account it has been supposed to be a morbid product, analogous to biliary calculi.

Ambergris of good quality is solid, opaque, of a bright grey colour, which is darkest externally, and intermixed with yellow or reddish striæ. When it is heated or rubbed, it exhales an odour which is agreeable to most persons. It is sufficiently soft to be flattened between the fingers. Its fracture is fine-grained, with traces of lamellar structure. The heat of the hand is sufficient to soften it. Its specific gravity varies from 0·908 to 0·920.

When ambergris is heated with boiling alcohol of specific gravity 0·833, until it is saturated, a peculiar substance, called *ambrein*, is obtained as the solution cools, grouped in mammillated, small, colourless crystals. The solution, by evaporation, yields a further portion of ambrein, which may be rendered pure, by being redissolved in alcohol, and then crystallized.

Ambrein, thus obtained, is brilliant, white, and insipid;

it has an agreeable odour, which appears, however, to be adventitious, because it is diminished by repeated crystallizations; by fusion or a long-continued gentle heat it acquires a resinous odour.

Chemists do not agree as to its fusibility. Pelletier and Caventou found that it softened at 77° Fahrenheit, and melted at 86°; according to John it melts at about 100°, and at 112° flows like oil. When heated upon platina foil it fuses, smokes, and is volatilized, leaving scarcely any residue; by dry distillation it becomes brown, leaves a little charcoal, but is collected in the receiver, without having suffered any other material change. It is very soluble in strong alcohol, either hot or cold, in ether, and in oils, both fixed and volatile. Nitric acid converts it into a peculiar acid, called *ambreic acid;* the caustic alkalies do not form soap with it.

According to Juch and Bouillon-Lagrange, benzoic acid exists in distilled ambergris; by the analysis of John, ambergris appears to be composed of ambrein 0·85, an extractive matter soluble in alcohol, and probably containing benzoic acid, 0·025; watery extract with benzoic acid and common salt 0·015; with 0·11 not accounted for.

Ambergris is used as a perfume; and as the alcoholic solution is the most odorous preparation of it, it is generally employed in that form.

AMBERT, a town in France, in the department of Puy de Dôme, on the river Dore, a feeder of the Allier. It is a place of considerable trade; the best cheeses of the province of Auvergne are exported from it, and it has considerable manufactures of woollen stuffs, playing-cards, and especially of paper, which is considered to be among the best in France. The houses are built and the streets paved with the granite procured from the mountains to the east of the town. The population amounts to about 7000. The distance from Clermont, the capital of the department, is differently given, but it is probably about 31 or 32 miles.

It is the capital of an arrondissement containing a population of above 80,000, and comprehending 486 square miles.

AMBHEER, a town in the principality of Jeypoor, in the Rajpoot states, in 26° 57′ N. lat., and 75° 40′ E. long. This town was formerly the capital of the principality, but on the building of Jeypoor, by Mirza Raja Jeysingh, five miles south of Ambheer, the seat of government was removed to the new city, which gave its name to the principality.

Ambheer is built on the margin of a small lake, and is surrounded on all sides by mountains, which give a considerable degree of romantic beauty to the spot. A palace built on the edge of a precipice overhanging the lake, and formerly inhabited by the Rajahs, is in good preservation. It was furnished with fountains, balconies, and terraces, and contained numerous apartments of all dimensions, some of which are still exceedingly beautiful. It is remarkable that a good deal of stained glass has been used by way of ornament. This palace is now employed as a state prison.

A small island in the lake is cultivated as a royal garden. A great part of what were once magnificent buildings within the city, are in a ruinous state, and Ambheer is now nearly depopulated. Enough, however, remains to show that it must once have been a splendid place. (Hamilton's *East India Gazetteer.*)

AMBOISE, a town in France, in the department of Indre et Loire, on the south or left bank of the Loire, between Blois and Tours. It is connected with many historical recollections. In the castle of Amboise, built by Charles VII., Louis XI. instituted, in 1469, the order of St. Michael. Charles VIII., his successor, was born and died in the same edifice; and to Amboise, in 1560, the Duke of Guise removed Francis II., and defeated the plot which the Prince of Condé and the leading Huguenots had formed. Part of this castle remains; it is on a steep rock, washed by the Loire, which is here parted into two streams by a small island. From the top of one of the towers a view is obtained of the neighbouring country, called from its richness the Garden of France. The town is surrounded by vineyards. It is ill-built, but has a good bridge over the Loire, finished in 1822. The inhabitants amount to between five and six thousand, and carry on some manufactures, particularly of steel and files: the latter are in great repute.

Amboise is 22 miles W.S.W. of Blois, 15 E. of Tours, and 127 S.W. of Paris.

AMBOISE, (CARDINAL GEORGES D',) an eminent French ecclesiastic and statesman. He was born in 1460 at the château of Chaumont on the Loire, the seat of his family, which was one of the most illustrious in France. Being a younger son he was educated for the church, and was made Bishop of Montauban by the time he had attained the age of fourteen. His first preferment at court was given him by Louis XI., who made him his almoner. After the death of this prince, however, in 1483, having connected himself with the Duke of Orleans, who unsuccessfully disputed the regency with Anne of Beaujeu, he shared the misfortunes of his party, and was along with the duke himself put into confinement, from which he was not released till six or seven years after, when the new king, Charles VIII., attained his majority. Soon after being restored to liberty he was promoted to the archbishopric of Narbonne, which, in 1493, he exchanged for that of Rouen. Here, besides presiding over his diocese, he acted as the deputy of his friend the Duke of Orleans, who held the office of governor of Normandy, and in that capacity introduced several valuable reforms into the administration of the province. In 1498 the duke became king by the title of Louis XII., and from this time D'Amboise may be considered as prime minister of France. The memorable events of the reign of Louis XII. are connected with the assertion of his rights to the duchy of Milan, and the protracted wars which he carried on in Italy to maintain that claim. In this part of his conduct it is probable that Louis acted rather according to his own views than by the advice of his minister; but he seems to have intrusted to the latter almost the entire management of the domestic affairs of his kingdom. In this department D'Amboise displayed equal ability and disinterestedness. By the financial reforms which he effected he was enabled both considerably to reduce the customary imposts, and to supply the heavy demands of the war without any increase of taxation. He exerted himself also, with considerable success, to rectify the existing corruptions both in the law and the church, introducing various regulations, with a view to diminish the length of processes in the former, and by his example as well as by his authority discountenancing the scandalous rapacity of the higher order of ecclesiastics. He would never accept any other benefice in addition to his archbishopric; and even the greater part of his episcopal revenue he distributed among the poor, or devoted to other pious purposes. With all this moderation, however, in regard to the more common objects of human desire, he was far from being without ambition. Very soon after the accession of Louis XII. he had obtained a cardinal's hat, and subsequently the pope appointed him to the high office of legate. But on the death of the infamous Alexander VI., in 1503, it appeared that the chair of St. Peter itself was the place which he aspired to occupy. He failed, however, in this object through a piece of mismanagement, which made him at the time very much laughed at, though it was only discreditable to him as a politician. A large military force of the king his master occupied Rome, by placing which in an imposing attitude he might easily have controlled the election; but the Cardinal de la Rovère having suggested to him that such a mode of securing his object would both have a bad look, and was moreover quite unnecessary, inasmuch as he would most certainly be elected for his own merits, if he left the matter to the free voices of the conclave, he followed this crafty advice, and withdrew the troops. The result was that in a few weeks the Cardinal de la Rovère was pope himself, with the title of Julius II. No other vacancy in the ecclesiastical throne occurred during the life of D'Amboise, who died in the convent of the Celestines at Lyons, on the 25th of May, 1510. It is said that, on his death-bed, he expressed his sense of the vanity of those worldly honours which he had sought so anxiously during his life—exclaiming, as he named the monk who attended him, 'Brother John! ah, why have I not all my life been brother John?' He was buried in the cathedral of Rouen, where his mausoleum is still to be seen. Notwithstanding some faults and weaknesses, D'Amboise was undoubtedly a great benefactor to France. This his countrymen themselves so strongly felt, that they used affectionately to call him *the people's father*. Most of the accounts of his life that have appeared in France are written in the most panegyrical style. One, by an author who calls himself the Sieur des Montagnes, printed in 12mo. at Paris in 1631, commences with the most honest avowal of a partial intention which we recollect to have met with in any historian; 'My design,' says this writer, 'is no other than, according to my custom, to take up the cause of the king, to defend his ministers, and throughout to p spect to those to whom we are naturally bound by their rank and dignity, in conformity with the commandment of God to revere the superior powers.' There is another work, entitled *A History of the Administration of the Cardinal D'Amboise,* by the Sieur Michel Baudier, historiographer to his majesty, published in 4to. at Paris, in 1634, the character of which may be likewise judged of from its first sentence: 'Beloved country,' exclaims the learned historiographer royal, 'mother of kingdoms, companion of the empire, vast and precious heritage of the greatest kings of the earth; beloved France, all who have ever spoken of you, inspired by the truth, have preferred your glory to that of the monarchies which surround you, and have raised your praises as far above theirs as the height of the lofty pines surpasses the lowliness of the little shrubs.' M. Baudier then proceeds to characterise the inhabitants of France as the first of nations—and finally enters upon the proper subject of his book, by describing the cardinal as the first of Frenchmen. The letters of Louis XII. and the Cardinal D'Amboise were published at Brussels in four volumes 8vo., by Jean Godefroy, in 1712.

AMBOOR, a neat and regularly built town of the Carnatic province, in the south of India, situated in 12° 49′ N. lat., and 78° 46′ E. long. It stands within a range of hills of moderate elevation. The river Palaur, or Milk river, passes within three miles to the southward of the town, and falls into the bay of Bengal, about 50 miles S.W. of Madras.

Amboor was formerly a place of considerable strength, having a lofty isolated mountain at its side on which a fort was built, so difficult of approach as to be considered almost impregnable. Since 1801, when Amboor came into the possession of the East India Company, the works of this fort have been partially destroyed; the part which remains is now used as a place of confinement for criminals.

The neighbouring territory is very productive. It is watered by numerous small streams which run from the river Palaur along the heights, and are employed for irrigating rice-fields, and tobacco-plantations. A great number of date trees are cultivated which yield a considerable quantity of coarse sugar. Many of the inhabitants are employed in the preparation of castor-oil, which is exported in considerable quantity. Amboor is 108 miles W.S.W. from Madras. (*Asiatic Researches.*—Hamilton's *East India Gazetteer.*)

AMBOYNA is one of the Molucca, or Spice Islands, in the eastern seas, lying off the south-west coast of the larger island of Ceram. The length of Amboyna is about thirty-two miles, and its average breadth ten miles. Its south-west coast is indented by a bay so deep, that the island is nearly divided by it into two unequal limbs, which are connected at the head of the bay by a narrow isthmus. The two peninsulas, into which the island is thus divided, are called Hitoe and Leytimor; the former lies to the north-west, and comprises full two-thirds of the surface of the island. In 1683 the Dutch governor attempted to cut through the isthmus, which is called the pass of Baguewala, in order to open a more direct communication with the small islands of Saparoua, Oma, and Harocha. Vessels which trade between the town of Amboyna and these islands are now obliged to pass down the bay of Amboyna and round one or other of the peninsulas. The construction of the necessary canal would have been much facilitated by the existence of a little river called Matta Passo, or the Eye of the Pass, and considerable progress had been made towards its completion, when it was stopped through the superstitious fears of the natives. The Bay of Amboyna is five leagues long from its entrance: its breadth varies considerably; in some parts it is not more than a Dutch mile across.

Amboyna is a mountainous place, abundantly furnished with trees and underwood. The variety of trees growing on the island is so considerable, that the great naturalist Rumphius is said to have possessed a cabinet inlaid with specimens of 400 different kinds. Notwithstanding this, the quantity of building timber is so small, that importations are constantly made from Java. Lingoa wood, commonly known as Amboyna wood, is principally procured from Ceram. The soil is for the most part a reddish clay; in the valleys it is of a darker colour, and mixed with sand. Sulphur is produced among the hills, some of which are encrusted with a copious efflorescence of that mineral. The island is considered healthy, notwithstanding the great heat of the climate. It is remarkable that to the eastward of the 120th degree of longitude, the monsoons are directly the reverse of what are experienced to the westward of that line, so that the weather is fine and dry on the east-coast of Celebes, in the Moluccas and the adjacent islands, when the contrary state prevails at Sumbhawa, Lombok, Java, and Borneo. On the other hand, it is dry in these islands, while the Moluccas are deluged with rain, which at those seasons is so heavy in Amboyna, that the merest rivulets are swoln into mighty torrents, which overflow their channels, and bear down every thing that opposes their progress. It is only at such seasons that Amboyna can be said to have any rivers: at other times the streams are not deserving of the name. Four of them, Way Tome, Way Alla, Way Nito, and Bato Gadja, or Elephant's River, which rise in the mountains of Leytimor and discharge themselves into the sea near the town, are not more than from two to three feet deep during the dry season.

The earliest visit made to Amboyna by any Europeans was in 1511, when the Portuguese viceroy, Albuquerque, despatched a squadron from Malacca, which returned with a lading of spices, having been received with kindness by the natives. Ten years afterwards a squadron of Portuguese ships was sent to take formal possession of the Spice Islands, in the name of the King of Portugal. The commander established himself in the Island of Ternate as his head-quarters, and the dominion of the Portuguese over the Moluccas continued for sixty years, during which time the natives endured from them every species of tyranny and cruelty

At the commencement of the seventeenth century, these islands were taken from the Portuguese by the Dutch, their conquest being facilitated by the anxiety of the natives to be rid of their first European oppressors. Unhappily, the change of masters brought with it no change for the better in the condition of the people, who were subjected to every kind of injustice which the cupidity of their Dutch rulers could suggest. As a consequence of this treatment, the inhabitants of Amboyna were continually in arms, and the country became the constant scene of strife and desolation.

At a very early period after its first formation, the English East India Company endeavoured to appropriate to itself a share in the spice trade. In 1604, the Company sent out a second expedition, consisting of four ships, under the command of Sir Henry Middleton, one of which ships obtained a lading of cloves at Amboyna. In 1612, the Company formed a settlement at Cambello in this island, from which the settlers were forced to retire in June, 1614. An attempt was made to accommodate the dispute between the English Company and the Dutch, relative to the right of trading with the Spice Islands, and a treaty for this purpose was concluded in London, in July, 1619. But so many disputes occurred in executing the provisions of this treaty, that the grounds of contention appear to have been multiplied rather than reduced, and at length reached such a point, that under the accusation of conspiring to surprize the garrison, and expel the Dutch from the island, Captain Towerson and nine Englishmen, with nine Japanese, and a Portuguese sailor, were seized at Amboyna, tried, pronounced guilty, and executed. This event, known as 'the massacre of Amboyna,' excited the greatest indignation in England, and became the subject of the most formal remonstrances on the part of the British government.

During the war with Holland, in 1796, Amboyna was captured by a British force under Admiral Rainier. It was restored at the peace in 1801, was taken again by the English in 1810, and was again given up to Holland at the treaty of Paris in 1814. While the English retained possession of the island, the East India Company was not unmindful of the moral improvement of the natives. It furnished the means for establishing upwards of forty schools on the Lancasterian system, and granted the sum of 10,000 rupees to assist in publishing a version of the Bible in the Malay language.

The main object of the different European powers, who endeavoured to possess themselves of Amboyna, was to monopolize the trade in cloves, the cultivation of which spice forms the principal object of industry with the natives. With the desire of keeping the cultivation of the clove-tree completely within their power, the Dutch caused it to be extirpated from every island with the exception of Amboyna, where they provided for a sufficient production of the spice, by obliging every native family to rear a certain number of clove-trees. In the prosecution of their plans, the island was divided into 4000 allotments, each one of which was expected to support 125 trees, and a law was passed in 1720 rendering it compulsory upon the natives to make up the full complement. The number of trees upon the island accordingly amounted to 500,000, the average produce of which exceeded one million of pounds of cloves annually.

The cajuputi-tree, whence the medicinal oil of that name is procured, grows in Amboyna, which also produces all the vegetables and fruits commonly found in that quarter of the globe. The woods contain great numbers of deer and wild hogs, the flesh of which forms a principal article of food with the natives. Buffaloes, cows, horses, sheep, and goats, have been introduced by the Portuguese and Dutch from Java and Celebes. The Bay of Amboyna formerly abounded with fish of all the kinds usually found in the eastern seas; but it is said that since the earthquake which occurred at Amboyna in 1754, their number has been very greatly diminished.

Amboyna is inhabited by four different races of people, the Aborigines, the Amboynese, Chinese, and Europeans. The first of these races, called Horaforas, are, according to some accounts, a wild and savage race, possessing a great deal of muscular strength, and every disposition to use it to the annoyance of the other inhabitants. Their numbers are now much reduced. The Amboynese are the descendants of Malays, and were found on the island when the Portuguese first landed there. At present the Amboynese are an indolent effeminate race: the greater part of them profess the religion of Mohammed; a few have been converted to the Catholic faith by the Portuguese, or to Lutheranism by the Dutch. The Chinese settled at Amboyna are not numerous; but they are very industrious and enterprising traders. Still fewer are the European race of inhabitants. They are principally Dutch, and the descendants of Dutchmen, many of them being the offspring of Amboynese mothers.

The town of Amboyna, which is in 3° 40′ S. lat., and 128° 15′ E. long., is built within the bay, in the peninsula of Leytimor. It is clean, neat, and built with regularity. The houses are of wood, only one story high, and the roofs are covered with interlaced branches and leaves of palm trees. The town contains an hospital, a town-house, and two churches, in one of which service is performed in the Malay language. The western quarter of the town is inhabited by Chinese, and the Europeans occupy the south end, near which is the burial-place of Rumphius. Fort Victoria in the front of the town is, in form, an irregular hexagon, with a ditch and covered way on the land-side, and a hornwork towards the sea. (Crawfurd's *History of the Indian Archipelago;* Mill's *History of British India;* Porter's *Tropical Agriculturist; and Reports of the House of Commons on the Affairs of India.* Wilcock's *Translation of* Stavorinus's *Voyages.* For the rest of the islands of this groupe, see Moluccas.)

AMBROSE (SAINT) was born, some of his biographers state, in the year 333, but more probably about 340. His family had long been one of distinction in Rome; and his father, whose name was also Ambrosius, held the high office of prefect of Gaul. In this province Ambrose was born, and probably in the town of Trier or Treves, then called Augusta Treverorum, which was the principal seat of the prefecture. He was educated at Rome under the ablest masters; after which, he and his brother Satyrus proceeded, with the view of following the legal profession, to Milan, then the residence of the court, and as such considered the capital of the western empire. Ambrose soon acquired distinction at the bar; and this, with the interest of his family, introduced him to civil honours. While yet a young man he was appointed governor of Liguria, the province to which the city of Milan then belonged. In this office he conducted himself in such a manner, as to secure at once the approbation of the emperor, and the general esteem and attachment of the people. Thus situated, he had reached his thirty-fourth year, when an incident happened which suddenly changed the entire course of his life. In A.D. 374, died Auxentius, the Archbishop of Milan, on which, a violent contest immediately arose, as to the appointment of his successor, between the two great parties which then distracted the church—the Orthodox and the Arians. On the day when the election was to take place, the ferment was so violent, that Ambrose was induced to try what could be done to allay it by his influence with the people; and having accordingly presented himself before them, he addressed them in a speech, recommending the observance of greater order and decorum. His speech was well received, for Ambrose excelled in the art of popular persuasion; and as soon as he had concluded, a little boy in a distant part of the crowd, called aloud, *Ambrosius Episcopus!* (Ambrose Bishop.) In that age, and especially in such a state of excitement, these words were deemed a direct intimation from heaven; and, being instantly taken up by a thousand other voices, the assembly came to a unanimous resolution that Ambrose should be placed in the vacant office. From the subsequent conduct of Ambrose, some suspicion arises that the whole was partly a scheme of his own. He professed the utmost reluctance to accept the episcopal dignity, and some of the expedients to which he resorted, as related on the unexceptionable authority of his secretary Paulinus, with the view of making it appear that he wished the people to alter their choice, were not a little extraordinary. He even ran away from Milan, till, as is said, having walked for some hours, he found to his surprise that he had only got back again to one of the city gates. He was, however, at last prevailed upon, by the express command of the emperor, to mount the archiepiscopal throne. Although he had been educated in the Christian religion, his baptism had never yet taken place; and he was actually consecrated on the eighth day after undergoing that rite.

The extraordinary piety and zeal of the new archbishop soon rendered him the wonder of the church. Females, in particular, we are told, actuated by the fanaticism of the age, used to come in great numbers from every quarter of the Christian world to receive the veil from his hands. But, in addition to his pastoral and other sacred labours, Ambrose acted a distinguished part in the political affairs of his time. For a tolerably full, and, upon the whole, not an unfair account of this part of his career, the reader may consult the twenty-seventh and twenty-eighth chapters of Gibbon. While he lived, he was consulted on all great emergencies, both by Theodosius, the emperor of the East, by Valentinian II., the western emperor, and even by the mother of the latter, the empress Justina, notwithstanding her attachment to the Arian heresy, of which Ambrose was the most determined opponent. The empress was particularly anxious that Ambrose should resign two, or at least one, of the Milan churches to the use of the Arians; but this demand the bishop pertinaciously resisted; and as he was supported in his opposition by the people, whose violence, he remarked, he had not excited, but God alone could quell, Justina was soon glad to give up the contest. It was, according to one account, upon obtaining this triumph, that St. Ambrose composed the celebrated hymn of thanksgiving, the *Te Deum Laudamus*, which has long formed a remarkable part of the service of the Roman church, and has also been retained in the church of England liturgy. But it is now allowed by the Roman Catholic critics themselves, that the *Te Deum Laudamus* is of an age considerably later than that of Ambrose.

Ambrose went twice, at the instance of Justina, on an embassy to the rebel Maximus, who disputed the empire with the sons of Valentinian; the first time, soon after the murder of Gratian at Lyons, on the 23d of August, 383, when, after remaining at Treves for above a year, he prevailed upon Maximus to forego his intention of invading Italy. The second attempt of the same kind, made some years later, was not attended with the same success; but the career of Maximus was soon after terminated by the victorious arms of Theodosius. This celebrated emperor of the East, attached as he was to the orthodox faith, was one of the most revering admirers of the Archbishop of Milan: but when in 390 Theodosius, carried away by a blind passion, barbarously gave orders for a general massacre of the inhabitants of Thessalonica, by way of punishment for an outrage committed by a few individuals, Ambrose expressed in severe terms to the imperial criminal his abhorrence of an act so inhuman; nor would he again admit him to the communion of the faithful, until he had been subjected to an exclusion of eight months' duration, and had publicly performed penance, in the guise and attitude of a suppliant, in the great church of Milan. Ambrose died at Milan on the 3d of April, 397; and the great church, from its being made the depositary of his body, received the name of the *Basilica Ambrosiana.* This celebrated prelate is one of the most remarkable of those individuals who, in different ages, and in all professions, have gained an extraordinary ascendancy over their fellow men, and by that means have contrived to direct or powerfully influence the affairs of the time. To a knowledge and skill in the practice of the arts by which the common mind is won, such characters have invariably united great energy, unfaltering devotion to their objects, and very frequently not much scrupulousness as to the means of attaining them. Of this last-mentioned qualification, as well as of the others, Ambrose possessed far from an inconsiderable share,—as might be easily shown by a more minute examination of his life than it has here been possible to attempt. Persons of this description, however, being usually distinguished by greater vigour of the active than of the speculative faculties, have seldom left much behind them, or exercised, otherwise than by their example, any enduring influence over the opinions and conduct of mankind. And so it was with the subject of the present article. 'Ambrose,' says Gibbon, 'could act better than he could write. His compositions are destitute of taste or genius; without the spirit of Tertullian, the copious elegance of Lactantius, the lively wit of Jerom, or the grave energy of Augustin.' The best edition of the works of St. Ambrose is that published in two volumes folio, Paris, 1686 and 1690, by the Benedictine monks; the brothers J. Du Frische and N. Le Nourri were the editors. The first piece in this collection is a treatise in six books, entitled *Hexaemeron*, being an account of the creation. It is said to be in the greater part translated or pilfered from a work of St. Basil's on the same subject,—though it also contains many things from Pliny and other sources, and some that are either the author's own, or have been taken from older works that are now lost. It is rather a curious production, considered as illustrative of the state of natural knowledge in the fourth century. One of the ablest of Ambrose's literary performances is reputed to be his treatise in three books, *De Officiis Ministrorum*. Of his other treatises many are written in recommendation of his favourite moral virtue, celibacy. Upon this topic the Benedictine collection contains three books *De Virginibus*, one *De Viduis*, one *De Virginitate*, one *De Institutione Virginis*, one entitled *Exhortatio Virginitatis*, and one *De Lapsu Virginis Consecratæ*. Many of Ambrose's letters have also been preserved; and these form the best sources for his biography. His *Offices* and several of his other pieces have been translated into English, and there are also French translations of some of them. Besides his life by Paulinus, already mentioned, and another memoir of him in Greek, which appears to be mostly copied from the ecclesiastical history of Theodoret, the Benedictine editors have given at the end of their edition an ample biography of the saint, collected principally from his own writings. Upon this subject also a large body of information is to be found in the *Mémoires pour servir à l'Histoire Ecclésiastique des Six Premiers Siècles*, par M. Le Nain de Tillemont; tom. x., pp. 78—306, and 729—770. 4to., Paris, 1705. See also *Cave, Scriptorum Ecclesiasticorum Historia Literaria;* folio, Colon. Allobrog. 1720: pp. 165—169. Ambrose, according to St. Augustin, was the first who introduced the singing of psalms into the western church. The practice had prevailed before in that of the east.

AMBROSIAN LIBRARY at Milan. The Ambrosian Library owes its existence to the munificence of Cardinal Frederick Borromeo, archbishop of Milan. He laid the foundation of it in 1602, and it was opened to the public in 1609. Its name was given in memory of St. Ambrose, archbishop and patron saint of Milan. Frederick Borromeo not only placed his own collection of books in this library, but sent his librarian, Anthony Oggiati, into different countries to purchase additions. Montfaucon assures us that numerous manuscripts were obtained for it from Thessaly, Chios, Corcyra, and Magna Græcia: the founder added to these some very valuable accessions from the monastery of Bobbio (anciently Bobium), in the northernmost Apennines, together with a considerable assemblage of manuscripts from the Pinelli collection: the latter cost no less than three thousand four hundred ducats. It was the founder's original intention to join to the endowment of his library a college of sixteen learned men; but the want of funds reduced the number to four: of these, one translated Greek, a second taught Hebrew, a third Arabic, and a fourth was to make collections of whatever was valuable in authors. The Ambrosian Library now contains about forty thousand printed volumes, with rather more than fifteen thousand manuscripts; and annexed to it is a gallery of pictures, statues, antiques of various kinds, and medals, all containing numerous articles of rarity and reputation. Many of its curiosities of every description were carried to France during Bonaparte's campaign in Italy, and with them a manuscript collection of the works of Leonardo da Vinci, accompanied with drawings and designs, which a citizen of Milan, of the name of Galeas Arconati, refusing every lucrative offer from private persons, had given to the Ambrosian Library. One volume of this collection was returned to the library after the Peace of Paris in 1814, but the remaining volumes, having been sent to the library of the Institute and not to the Bibliothèque du Roi, it was not at the time of the reclamation known were they were, and it is believed they are yet retained in Paris. Another rarity belonging to the Ambrosian collection is a manuscript of *Virgil*, the margins of which are interspersed with notes in the hand-writing of Petrarch: the *Palimpsesti*, or rescript manuscripts, edited between 1814 and 1816 by Angelo Maio, were discovered in the Bobian portion of the Ambrosian collection. Oggiati, Muratori, and Maio, have been the three most eminent librarians of this library. Maio is now the librarian of the Vatican. The hall of the Ambrosian Library is well proportioned, though not so large as might be expected for a collection of books and manuscripts so considerable. The ceiling is adorned with paintings, and the space between the book-cases and the cornice filled up by the portraits of the most eminent authors, whose writings are deposited below. For further information on the Ambrosian Library we refer to Boscha *de Origine et Statu Bibliothecæ Ambrosianæ Hemidecas*, 4to. Milan, 1672; Saxius *de Studiis Literariis Mediolanensium Prodromus*, 8vo. Milan, 1729, p. 147; and Montfaucon's *Diarium Italicum*.

AMBUSC'ADE, a military term, derived from the Italian *imboscata*, something hidden in a wood. The older English word *ambush*, is the same word, the analogy of which would be more clearly seen if the word began with *i*, *imbush*, as in *impound*, *immerse*, *impress*, &c. It signifies an attempt to lie in wait for and attack an enemy, without his perceiving the intention until he is attacked. In antient times before the art of war was as complicated as at present, this mode of secret attack was common and frequently successful, and is so still among savage nations; in modern times it does not appear to be thought much of, for we do not find any particular stress laid upon it in works upon the military art.

We do not include in this word an attack which, though unexpected and sudden, is made while the other party is aware of an enemy somewhere in the neighbourhood; or an unexpected attack made upon the enemy in his position, which is called a surprise.

AMBULANCE (from *ambulare*, to walk or march), a French word applied to the moving hospitals, which are attached to every French army or division of an army, for the purpose of rendering immediate assistance to sick or wounded soldiers. In every European army surgical and medical aid has long been provided with more or less care, but it is chiefly due to the skill and humanity of the French surgeons, (especially the celebrated Larrey,) during the wars of Napoleon, that great improvements have been generally introduced into this important department; and that the wounded and exhausted, instead of being neglected or left to chance relief, are sought out with the utmost promptitude, and carefully removed to the *ambulance*, which is placed out of the reach of the enemy's fire.

AMBULATORY, in a substantive sense, a place to walk in. With reference to buildings, this term may be applied to the space enclosed by a colonnade or an arcade. In the peripteral temple of the Greeks, the lateral or flanking porticos are properly termed ambulatories; the cloister of a monastery is surrounded by an ambulatory or ambulatories. Of the former, or external colonnaded ambulatory, the porticos of the *Bourse* or Exchange at Paris afford a good modern exemplification; and of the latter, or internal arcaded ambulatory, there can be no better than that afforded by the Royal Exchange in London. The aisles (see AISLE) of the antient Basilica, and those of its representative in later architectural works, the cathedral, or other large church, are sometimes called ambulatories.

In an adjective sense, ambulatory may be applied to anything, the functions of which require it to move from place to place. Formerly the Parliament and the Court of King's Bench in this country were termed ambulatory courts, because they were held sometimes in one place, and sometimes in another; indeed, wherever the king happened to be.

Ambulatory is formed from the Latin word signifying *to walk*.

AMED, or **KARA AMID**, (Black Amid,) a town of Mesopotamia, called Diarbekr by the Arabs.

AMELAND, a small island belonging to the Dutch province of Friesland: it lies in 53° 27′ N. lat. and is about twelve miles long. It contains some good pasture land; some of the inhabitants make lime of the sea-shells found on the coast, and many of them are fishermen. The population is about 3000.

Ameland is one of that series of islands which extends along the coast from the extreme point of North Holland, and once formed a part of the main land from which they have been detached by the violence of the sea. (See Zuider-zee.) The passage between Ameland and the Frisian coast is dangerous from its shoals. The channel is called a *watte* or ford.

AMELOT DE LA HOUSSAYE, (ABRAHAM NICOLAS,) a political writer, was born at Orléans, in 1634. He accompanied the President of St. André, appointed ambassador of France at Venice, in 1669, as secretary. A stay of several years in that city having enabled him to become acquainted with its history and politics, probably induced him to translate Velferus's *History of the Government of Venice*, and to add historical and political notes, which, at the same time that they threw a great light on the Venetian government, gave such offence, that, it is said, a formal complaint was made to Louis XIV., who sent Amelot to the Bastille. No other particulars of Amelot's life are recorded; all that is known is that he was extremely poor, and subsisted on the bounties of an Abbé. He died at Paris in 1706.

He left the following works:—Sarpi's *History of the Council of Trent*, translated from Newton's Latin version—*The Courtier*, translated from the Spanish—*The Prince*, translated from Machiavelli; he endeavoured also to vindicate the author, by maintaining that he had only described what princes do, and not what they ought to do—a translation of *Tacitus*, with historical and political notes: he did not complete this work; the six last volumes are by François Bruys—*Memoirs, Historical, Political, Critical, and Literary:* this work is also incomplete; it is arranged alphabetically, but does not go beyond half the letters. There are also some other works of no great interest, of which a list is given in *Mémoires de Miéron*, vol. xxxv.

AMEN, a Hebrew word, properly signifying 'firmness,' and hence 'truth,' which has been adopted without alteration in various languages.

Its most frequent use is at the conclusion of prayers, thanksgivings, and denunciations, where it is understood to express belief, assent, and concurrence in what has been expressed. Examples of its use in all these cases are numerous in the Bible. When the priest has declared to the woman suspected of adultery the effect of the water of jealousy, 'the woman shall answer, Amen, amen.'—Numb. v. 22. When curses are pronounced against the wicked in Deut. xxvii. 15, all the people are ordered to repeat amen.

The word amen concludes all the gospels, and almost all the epistles; it is repeated at the end of four of the five sections of the Psalms according to the division of the Jews; namely, the 41st, the 72nd, the 89th, and the 106th Psalms: in this last Psalm it is followed by hallelujah, which word concludes the last section.

In many churches in England, the word amen is pronounced aloud by the people: this was the antient practice of the Christian world, and St. Jerom relates, that when the congregated people at Rome pronounced amen, the sound was like that of a clap of thunder. They possibly attributed great efficacy to the loudness of their voices, after the example of the Jews, who imagined that this word, shouted forth with great force, had power to open the gates of heaven.

Amen is often used by our Saviour at the beginning of a discourse, as an impressive particle, which in our version is rendered 'verily.' In the Gospel of St. John the word is always repeated.

In one instance this word is used as an adjective, meaning certain, fixed. 'For all the promises of God in him are yea, and in him Amen,' 2 Cor. i. 20. In one other instance the word denotes our Saviour. 'These things saith the Amen,' Rev. iii. 14.

AMENDE HONORABLE. Amende in French is a penalty, so called from being regarded as a compensation for, or rectification and amendment of, the offence According to the old laws of France, persons guilty of crimes coming under the head of public scandals, such as sedition, sacrilege, fraudulent bankruptcy, &c., used often to be condemned, sometimes as their whole punishment, and sometimes as only part of it, to make a public confession of their guilt. This was called making the *amende honorable*, which was either simple, or *in figuris*, in which last case the culprit was conducted by the public executioner into open court in his shirt, with a rope about his neck, and a lighted torch in his hand, and in that state made his confession on his knees. The amende honorable was accounted an infamous punishment, and appears to have been so called as consisting altogether in the disgrace, and not in any fine or other actual suffering. It was considered a mere *honorary* penalty, and called in Latin *mulcta honoraria*. The courts, however, were also sometimes wont to order a person by whom the reputation or honour of another had been injured to make a public acknowledgment of the wrong; and such a sentence carried no infamy with it. It is from this latter custom that the modern and popular use of the expression has been borrowed, according to which we say that a person makes the amende honorable when he publicly admits any wrong which he feels that he has done to another person.

AMENDMENT, in Law, signifies the correction of mistakes in the written records of judicial proceedings. In early periods of the history of English law, the pleadings between the parties were conducted orally, or *ore tenus*, as it was technically called, at the bar of the court by their respective advocates. If, therefore, any mistake occurred in the pleadings of either party, it was corrected at once upon a suggestion made to the court. Subsequently, when pleading *ore tenus* was superseded by the present practice of delivering written pleadings from one contending party or his attorney to the other, it was considered reasonable to continue the same indulgence as to amendments. Hence it has been usual at all times for the courts, upon application made by either party, to amend the interlocutory proceedings in a cause; and at the present day, the courts will always amend mistakes in the pleadings, whilst they continue in paper, upon proper and equitable terms. But in antient times, after the proceedings were once entered on record, the judges of the different courts always considered that they had no authority by the common law to alter them in any respect; either for the purpose of correcting false Latin, of supplying a word, syllable, or letter accidentally omitted, or of removing any other clerical error. The consequence of which was, that after a suit was decided in favour of a party, it frequently happened that his adversary discovered some blunder made by the officer of the court on making up the record; and by bringing a writ of error, he deprived the successful party of all benefit from the judgment which he had obtained. This inconvenient rule appears to have arisen out of a rigid observance of the words of an ordinance of Edward I., which directs the judges to record the pleas pleaded before them, but forbids them 'to make their records a warrant for their own misdoings, or to erase or *amend* them, or to record anything against their previous enrolments.' (*Britton*, p. 2.) These words obviously imply nothing more than a reasonable restriction upon the alteration of the records of courts of justice clandestinely and for sinister purposes, and certainly do not justify the absurdly strict interpretation afterwards applied to them. To the rule, however, thus established there were several exceptions:—1. All errors in records might be amended during the same term in which they were made, because it was said, that in contemplation of law the record is in the breast of the judges during the term, and not on the roll. 2. In an essoign, or excuse by a defendant for not appearing to a writ in proper time, if the plaintiff's name were mistaken, the mistake might be amended, because it was inconsistent with the writ, and, if enrolled in its erroneous form, it would be a record against a previous enrolment, and for that reason a breach of the ordinance of Edward I. 3. For the same reason, a continuance, which is an entry on the record showing the continuation of a cause from one term to another, might be amended so as to make it correspond to the proceedings previously recorded.

It is plain that these ingenious exceptions must have afforded but little relief from the oppressive strictness of the rule; and in cases which did not fall directly within them, the judges always held that they were bound by the ordinance of Edward I., and refused to rectify the most palpable errors after the expiration of the term to which the record belonged. It is probable that the judges may have adhered thus closely to their interpretation of the ordinance from a reasonable regard to their own safety; for in the seventeenth year of the reign of Edward I., (1289,) we find that king instituting a prosecution of enormous severity against the judges, and imposing upon them fines amounting altogether to upwards of 100,000 marks or near 70,000*l.* for imputed offences, connected for the most part with the erasure and alteration of the records. With the fear of this formidable infliction before their eyes, which it might be very convenient to a monarch engaged in expensive wars to repeat for the purpose of replenishing his coffers, the judges of those days were perfectly justified in erring on the side of caution, by adhering to the strict letter of the ordinance.

But this rigid abstinence of the judges from all alteration of their records was necessarily a great inconvenience in the administration of justice, and led in course of time to a series of legislative enactments, called statutes of Amendment and statutes of *Jeofails*, (*jeo fail* or *j'ai faillé*,) by the former of which, express authority was given to amend certain specified errors in the records; and by the latter the judges were empowered to proceed to judgment notwithstanding such errors. The first statute of amendment was the 14th Edw. III. c. 6, (1340,) which enacted that no *process* should be annulled by a clerical mistake in 'writing one *syllable* or *letter* too much or too little; but that as soon as the thing was perceived by the objection of the party, or in other manner, it should be hastily amended in due form, without giving any advantage to the party who objected to the mistake.' Still the judges exhibited great reluctance to depart from the letter of the statute, and much doubt and discussion arose in the courts, whether the statute, though it authorized the amendment of a *letter* or *syllable*, extended to the case of a *total omission* of a word. In a case in which this point was raised some years after the statute had been passed, the judges resolved to incur no personal danger by deciding it, but formally consulted the law-makers upon the meaning of the act. 'I went,' says Chief Justice Thorpe, who describes this conference in a case in the Year Book, (40 Edw. III. c. 34,) 'together with Sir Hugh Green, to the parliament, and there were twenty-four of the bishops and earls; and we demanded of them who made the statute, if the record might be amended; and the archbishop or metropolitan said, that it was a nice demand and a vain question of them, if it might be amended or not; for he said that it might as well be amended in this case as if it were but one letter, for if a letter or syllable fail in a word, it is no word; wherefore, if all the word fail, it may be amended as well as if it failed but of a letter or a syllable; for there is no more difference in the one case than in the other.' Upon this sensible advice and reproof of the archbishop, the judges admitted the amendment of a word.

In consequence of the indisposition of the judges to give this statute a liberal interpretation, of which the above black-letter anecdote is an instance, it proved in a great measure ineffectual; for though the terms of it appear to extend to every part of civil or criminal proceedings in which a clerical mistake has been made, they construed the word 'process' in the act of parliament strictly, and confined amendments to civil suits, and in them to errors in the entry of the processes for the defendant's appearance and for summoning the jury. If, therefore, a mistake occurred in the entry of the process which was wholly immaterial, it was amended; but if a mistake of a word, syllable, or even a letter, was made by the clerk in drawing up the plea-roll or body of the record, the whole proceedings might be annulled by a writ of error. To remove this gross absurdity, and to enlarge the power of judges in amendments, the statutes 8 Henry VI. c. 12 and c. 15 (1430) were made, by which the judges were authorized, 'in any record, process, word, plea, warrant of attorney, writ, pannel, or return, to amend all that which to them seemed to be the misprision of the clerk;' and also the 'misprisions of sheriffs, coroners, bailiffs of franchises, or other officers in their returns.' Appeals, indictments of treason and felony, and outlawries for treason and felony, were, however, expressly excepted from the operation of the statutes of Henry VI.

But these latter enactments, which were, properly speaking, the only statutes of *amendment* in ancient times—those which followed being statutes of *Jeofails*—though they considerably enlarged the power of the judges in making amendments, proved but an insufficient relief to suitors; for they extended only to the amendment of what the judges should interpret to be the misprision of their clerks, and upon this point subtle doubts and nice distinctions were suggested by the acuteness of legal criticism, and multiplied to an enormous extent in the course of the ensuing century; in consequence of which, just and lawful judgments were continually overthrown by formal objections, founded on errors which the courts did not consider to be strictly *clerical* misprisions.

The next legislative provision upon this subject was a statute of Jeofails which was passed in 1540, (32 Henry VIII. c. 30,) by which it was enacted, that 'where the jury have given their verdict for either party in any court of record, and a jeofail or mistake is afterwards discovered, the judgment of the court shall stand according to the verdict without reversal.' This was followed by the statute 18 Eliz. c. 14, (1572,) which declares, 'that after verdict given in any court of record, judgment shall not be stayed or reversed for false Latin or other faults in form in original and judicial writs, counts, &c., or for want of any writ, or by reason of the imperfect return of any sheriff, or for want of any warrant of attorney.' The 21st Jac. I. c. 13, (1623,) specifies several other formal defects not mentioned in the previous statutes, and declares, that on account of such defects, when discovered after verdict, no judgment shall be stayed or reversed. The next statute of Jeofails, in chronological order, was the 16th and 17th Car. II. c. 8, (1665,) called by Mr. Justice Twisden 'the Omnipotent Act,' which was intended to remove doubts arising upon former laws as to the distinction between matters of form and matters of substance, and also specified a great variety of minute technical defects, which after verdict were not to arrest or stay the judgment of the court. The statutes which have been above mentioned, were calculated almost exclusively to aid imperfections in form after the verdict of a jury had passed upon the facts. This limitation was extremely unreasonable and prejudicial, as it enabled a party who made no defence, and had no substantial defence to make, to defeat a just action, by taking formal objections to the record in arrest of judgment, or upon a writ of error, of which he could not have availed himself after a verdict. To remedy this inconsistency, the celebrated statute for the amendment of the law, introduced by Lord Somers, after his retirement from the office of chancellor in 1705, (4 Anne, c. 16,) extended the operation of the statutes of Jeofails to all cases of judgment by confession or default.

From this summary view of the older statutes of Amendment and Jeofails, it appears that since the time of Henry VI. the legislature discontinued the more direct and convenient mode of obviating the evil by allowing the judges to amend formal errors in their records where justice required it, and adopted a more circuitous and uncertain course, by specifically enumerating certain errors and mistakes which were not to deprive the successful party of his judgment. Perhaps the extreme caution of the judges in former times, in adhering rigidly to the letter of the power delegated to them, may have suggested to the legislature this variation from their original course; but, however this may have been, there can be no doubt that the authority to amend under certain restrictions was the more efficient remedy. The statutes of Jeofails have only given imperfect relief to suitors; for professional ingenuity has never failed to discover new errors not specified in them, and to draw subtle distinctions in cases where the words of the statutes were to a common understanding distinctly applicable.

In modern times a disposition has been manifested to proceed upon the ancient course, by increasing the authority of judges to amend the records of their courts in certain cases. Thus, a most important improvement was introduced into the administration of justice by the statute of 9 Geo. IV. c. 15; which enabled 'any court of record in civil actions, any judge at *Nisi Prius*, and any court of Oyer and Terminer, and gaol delivery, if such court or judge should see fit so to do, to amend the record upon the appearance of a variance between any matter in writing or in print produced in evidence, and the recital thereof upon the record.' So also in criminal cases, the statute 7 Geo. IV. c. 64, s. 19, authorizes the court, upon a dilatory plea by the defendant of misnomer, or of a want of addition, or of a wrong addition, to amend the indictment or information according to the truth, and then to proceed with the trial upon the merits of the case, as if no such dilatory plea had been pleaded.

It has been noticed above, that in one of the early statutes of Amendment (8 Henry VI. c. 12) indictments and criminal prosecutions are expressly excepted from its operation; and though there is no such exception in the other statutes of Amendment, or in the statutes of Jeofails, it was fully established by the general current of authorities, that notwithstanding those statutes, criminal pleadings stand upon the same principles with respect to amendment, as those to which all pleadings were subject at common law. With respect to indictments, it was formerly considered that, as they are found upon the oath of a jury, there would be a manifest impropriety in making any alteration without their consent; hence it became a common practice, which is continued to the present day, from very ancient times, to ask the grand jury formally, at the time of their returning their bills into court, whether they consent that the court shall amend matters of form in the bills they have found, altering no matter of substance without their privity. But it is believed that instances of such amendments are extremely rare, and are almost unknown in modern practice. It is now decided law, that criminal informations, which do not depend upon the oath of a jury, may be amended by the court at any time before trial; though this was considered, even so late as the time of Lord Holt, to be a very questionable point. A frequent failure of justice by means of minute objections was the consequence of this exclusion of criminal cases from the beneficial operation of the statutes, and became a great reproach to the administration of the criminal law: to remove this evil, a kind of general statute of Jeofails, applicable to criminal pleadings, was introduced in 1826, in order, as the preamble states, 'that the punishment of offenders might be less frequently intercepted in consequence of technical niceties.' This statute (7 Geo. IV. c. 64, s. 20) provides that no judgment upon any indictment or information, for any felony or misdemeanor, whether after verdict or outlawry, or by confession, default, or otherwise, shall be stayed or reversed for want of the averment of any matter unnecessary to be proved.' It then proceeds to specify a variety of defects, both of omission and imperfect statement, and enacts that an objection founded on the appearance of such defects upon the record shall not have the effect of staying or reversing the judgment of the court.

AMENDMENT, in parliamentary proceedings, is an alteration proposed to be made in the draught of any bill, or in the terms of any motion, under discussion. Although no member (except when the House is in committee) is allowed to speak more than once upon the same question, he may speak again upon the amendment, which is considered to be a new question. Sometimes an amendment is moved, the effect of which is entirely to reverse the sense of the original motion; but when this is the object, it is more usual to move a negative. It not unfrequently happens, however, that the amendment proposes to leave out all the words of the original motion except the word 'That,' with which it commenced, and to substitute others in their place. When a motion for the adjournment of the House is made, it is always in the words 'That the House do now adjourn;' and, if the motion be carried, the House will adjourn to the next sitting-day, unless a resolution shall have been come to in a previous part of the evening that at its rising it will adjourn to some other particular day. It is not competent, therefore, upon the motion for adjournment to move an amendment specifying any day to which the House shall adjourn. It was long a matter of dispute whether, when an amendment was proposed to a motion after the previous question had been also proposed, it was necessary to withdraw the previous question before the amendment could be put; but it was decided, by a vote of the House of Commons on the 16th March, 1778, that it was necessary first to withdraw the motion for the previous question. An amendment may be proposed upon an amendment, as well as upon an original motion. It is commonly said that the rule is, when an amendment has been proposed, that the amendment is first put to the vote and then the main question; but this, although the mode commonly observed at public meetings, is not exactly the practice of Parliament. There the general rule is, that the motion which has been first put and seconded, shall always be the first put from the chair; and, accordingly, when an amendment has been proposed, instead of the question that it shall be adopted being directly put, a vote is taken upon the question, 'That the words proposed to be left out stand part of the question.' If this motion is carried in the affirmative, the main question, which is really the same thing, is next put, and, of course, agreed to. But if the motion, 'That the words proposed to be left out stand part of the question,' is negatived, the words that were proposed in the amendment are substituted, as of course, and the main question thus altered is then put. So that, in point of fact, the amendment separately is never put at all.

When amendments are made in either House upon a bill which has passed the other, the bill, as amended, must be sent back to the other House. The rules of proceeding between the Houses in the case of such amendments, according to Mr. Hatsell, are as follows:—'1st. Either House disagreeing to amendments made by the other should assign reasons, and all reasons must be delivered at a conference; 2dly. If the reasons for disagreeing are held to be sufficient by the other House, that House answers by message that they do not insist; 3dly. If held insufficient, the House at a conference say, that they insist, or adhere, and give reasons for so doing.' It may be added, that the almost uniform practice in both Houses, when it is intended not to insist upon the amendments, has been to move affirmatively 'to insist,' and then to negative that question. (See Hatsell's *Precedents*, edit. 1818, vol. ii., pp. 106-135, and 186-207; and vol. iv., pp. 5-14, 44-47, and 242.)

AMENTA'CEÆ, a name sometimes given to a number of forest trees found chiefly in the north of Europe, Asia, and America; the flowers of which are arranged in a dense cylindrical deciduous spike, called by botanists an amentum. Such are the poplar, the birch, the hazel, the willow, the oak, and many others. But as their genera are in fact constructed in very different manners, amentaceæ are more correctly separated, by modern botanists, into several different orders, for which see CUPULIFERÆ, SALICINEÆ, BETULINEÆ, and PLATANEÆ. The term amentaceæ is, therefore, either to be considered abolished, or as a collective name of all these.

AMERCEMENT. Where courts of justice impose a pecuniary punishment on offenders, the sum awarded to be paid is termed a *fine*, or an *amercement*, according to the nature of the offence and the authority of the court. The difference between these is not merely nominal, though perhaps at the present day it is not of much practical importance. The remedy for the recovery of the amercement is by action, or by distress on the personal property of the offender; but for a fine, the law has provided a process for securing payment, by arresting the person of the delinquent.

Where the offence amounts to a breach of the peace, or to a contempt of the king's courts, or other similar misdemeanour, a fine is the ordinary punishment, the amount of which is in the sole discretion of the judge: where the offence is of a lighter character, or is the subject of a proceeding in certain inferior courts, the party is punished by being amerced, and is said to be *in misericordiâ*, or 'at the mercy' of the court. In the latter case, the court has no further authority than to adjudge that *some* amercement shall be inflicted on the party; the *amount* of it is left to be assessed (or, in technical language, *affeered*) by persons whose character is analogous to that of a jury.

The following examples may be selected to illustrate this subject:—

The sum of money ordered by the superior judges to be paid by way of penalty for the commission of any criminal acts, of which an offender has been found guilty, is a *fine*, and is sometimes also called a *ransom*, because it is imposed in lieu of corporal punishment.

So where the defendant in a civil action had a verdict against him for the commission of a trespass, or any other civil injury accompanied by force or violence, the court usually awarded that he should pay a fine to the king over and above the damages which he was liable to pay to the injured party. But where there was a verdict in an action against the defendant for a breach of contract, or other similar injury wholly independent of any imaginable force or breach of the peace, the court awarded, and still awards, that he shall be *amerced*, (in addition to the usual judgments of damages, &c. payable to the plaintiff,) and the proper person to assess the amount is the coroner of the county in which the action is laid.

In all actions in which the plaintiff fails in establishing his right, a similar amercement is imposed on him as the penalty of his false claim; and this is in addition to the costs which he has to pay to the successful party.

It should be observed, however, that although the records of our legal proceedings still carry on their face the formal evidence of these antient usages, and the defeated plaintiff is to this day nominally amerced for his failure, and the unsuccessful defendant is still liable in many instances to be fined or amerced for his obstinate resistance to the plaintiff's just demand, yet in civil actions, neither fine nor amercement is ever in fact levied. In some cases, the legislature has abolished the practice; in others it has been effectually abrogated by desuetude, so that scarcely any other penal fines or amercements are now known in our courts, except those which are imposed in the execution of criminal justice.

The subject of amercements was formerly of sufficient importance to obtain a place in the provisions of the Great Charter, which enacts that they shall be equitably proportioned to the magnitude of the offence, and shall in no case be so excessive as to deprive the offender of the means of livelihood. It is by analogy to the case of amercement that fines, although not expressly named in Magna Charta, are deemed to be constitutionally within its spirit, so as to restrain within moderate and reasonable limits the discretion of the judges in imposing them. (See the *Bill of Rights*, 1 William and Mary; Bacon's *Abridgment, tit. Fines and Amercements;* Blackstone's *Com.*, book iv., chap. 29.)

AMERICA. The general description of this continent will be given under the following heads.—

I. Discovery.
II. Short notices of what coasts have been surveyed.
III. Its Physical Geography. *a.* North America; *b.* South America.
IV. Man.
V. Zoology of America.
VI. Botany of America.
VII. Chief Political Divisions and Foreign Settlements.

I. During the latter part of the fifteenth century there was an ardent spirit of discovery in Europe, the principal object of which was to find a passage by sea to the East Indies. The Cape de Verde Islands, the Azores, much of the Western coast of Africa, and the Cape of Good Hope, were successively discovered by the Portuguese, and the probability of reaching India by sea was gradually becoming stronger. The states of Venice and Genoa concentrated the commerce of Italy, but the overland trade with India was engrossed by Venice. In this state of things a project was formed by Christopher Colomb, or Columbus, a citizen of the rival state of Genoa, to sail westward to the Indies,—an idea which shows Columbus's knowledge of the figure of the earth to have been superior to the general notions of his age. He offered his services for this purpose to the governments of Genoa, France, England, and Portugal, by whom the proposal was successively rejected; but after eight years, his offer was accepted by Ferdinand and Isabella, king and queen of the united kingdoms of Castile and Aragon. The expenses of the expedition were defrayed by the crown of Castile, the property of Isabella, and it was to the influence of this princess that the furtherance of Columbus's views appears to have been mainly owing. The expedition, consisting of three vessels, sailed from Spain on the 3d of August, 1492; and on Friday, the 12th October following, an island was descried, upon which Columbus landed on the same day. The island was named by him San Salvador, and is now otherwise known as Guanahani, one of the Bahama islands. Columbus then visited other adjacent islands, and proceeded to Cuba and Hayti, to which latter he gave the name of Española. Here he left a few of his companions as the groundwork of a colony, and returned to Spain to procure reinforcements. The court was then at Barcelona, and the entrance of Columbus, with some of the natives, and the gold, the arms, and utensils, of the discovered islands, was a triumph at once more striking and more truly glorious than that of any conqueror. In this voyage he had acquired a general knowledge of the islands in the sea between North and South America, but he had no notion that there was an ocean between them and China; they were considered as part of India, from whence arose the appellation of West Indies, as well as that of Indians, which has ever since been given to the original inhabitants of the whole continent of America. The success of Columbus now rendered the court of Spain eager to forward his designs, and he sailed, on his second voyage for Española, with a fleet of seventeen sail, accompanied by several persons of rank and fortune. In this voyage the principal discovery was the island of Jamaica. Columbus was soon called back to Spain to answer accusations which had been made against him by his enemies. A third expedition followed, in which the island of Trinidad was found, and the admiral visited the mouth of the river Orinoco and landed on the coasts of South America which now form part of Columbia, before reaching Española. After having thus discovered the continent of America, and made settlements in the islands, it was the hard fate of Columbus to be sent home in irons and treated with indignity, owing to the machinations of his enemies. He, notwithstanding, undertook a fourth voyage, and returning to Spain, died at Valladolid in 1506, having had the glory of making one-half of the world known to the other—a glory untainted by cruelty or rapacity on his part, though the search of gold was pursued by the Spaniards with most unscrupulous avidity.

The success of Columbus soon gave encouragement to private adventurers to the new world, one of the first of whom was Alonzo de Ojeda, who, in 1499, followed the course of Columbus to the coast of Paria, and, standing to the west, ranged along a considerable extent of coast beyond that on which Columbus had touched, and thus ascertained that this country was part of the continent. Amerigo Vespucci, a Florentine gentleman, accompanied Ojeda in this voyage, and having had a chief share in the direction of it, and having published an account of it on his return, the country of which he was supposed to be the discoverer came gradually to be called by his name, and by universal usage the name of *America* has been bestowed on this new division of the globe. It is now too late to redress the injustice which has received the sanction of time.

The finding of a new world in the west was an event at once extraordinary and unexpected; it was accidental, because the object of Columbus was a western passage to India; nor are there any reasons for believing that the inhabitants of the old world had, at any previous time, the slightest approach to a knowledge of the western continent, unless the alleged discovery of Greenland, by the Norwegians, in the ninth century, be so considered. They had gradually reached the Shetland and Feroe Islands, and advanced to Iceland, in all which they had planted colonies, and they certainly arrived either at Greenland, or some other part of the high latitudes of the North American continent, and made settlements there also: but it does not appear that this gave the Europeans any notion or suspicion of the existence of a new continent stretching so far from north to south, and this Norwegian discovery is a very different thing from discovery in the southern latitudes. Part of Asia, Europe, and Africa constituted the earth known to the antients; to this world alone all antient traditions and writings have reference: and to it were confined all enterprises of gain or ambition, and all philosophical speculations. The discovery of America, therefore, was the opening of a new field to wealth, glory, and knowledge. Its influence upon the old world has been, perhaps, scarcely less important than that of the old world upon the new, and the memory of the immortal Columbus will be held in perpetual honour alike by the old continent which gave him birth, and by the new one, which ought to have borne his name. (See Robertson's *America*, and Washington Irving's *Columbus.*)

Although the island of St. Salvador was discovered, as already stated, in 1492, the existence of the continent of South America was not ascertained by Columbus until 30th May, 1498. Now, almost a year before, viz., on 24th June, 1497, the coast of North America had been reached by an English vessel, commanded by Giovanni Gaboto, or Cabot, a Venetian, settled in Bristol, who undertook an expedition in company with his son Sebastian, and explored a long line of the North American coast. (For the discoveries of the two Cabots, and as to their comparative agency, see the article Cabot.) In 1498, Sebastian Cabot, in another expedition, visited Newfoundland. In 1500, Gaspar Cortereal, a Portuguese, touched at Labrador; and Brazil was accidentally discovered by a Portuguese fleet under Cabral, which had been fitted out for purposes of trade and conquest in the East, in consequence of the success of Vasco de Gama, who had recently accomplished the passage to the East Indies by the Cape of Good Hope. (See Africa, Gama.) The coast of the province of Tierra Firma, from

Cape de Vela to the Gulf of Darien, was first visited by Bastidas, a Spaniard, in 1501. Yucatan was discovered by Diaz de Solis and Pinzon in 1508, and Florida by Ponce de Leon in 1512. In the same year, Sebastian Cabot reached the bay, since called Hudson's Bay. The Pacific, or Southern Ocean, was first seen from the mountain tops near Panama, by Balboa, in 1513; and, two years after, a landing was effected on the south-east coast of South America, about the mouth of the Rio de la Plata, by De Solis, who, as well as several of his crew, was killed, roasted, and eaten by the natives. The Spanish government, which had been foremost in discovery, was the first also to make conquests in America, early in the sixteenth century. Fernando Cortez was dispatched to subdue Mexico, the most powerful state in the new continent, and very rich and extensive. Notwithstanding the efforts of its chief, Montezuma, it soon fell under the dominion of Spain, and this conquest was followed by another almost equally valuable—that of Peru, whose subjugation to the Spanish yoke was effected by Pizarro. The French now began to participate in the zeal for adventure, and in 1524, an expedition was dispatched by Francis I., under Giovanni Verazzano, a Florentine, who surveyed a line of coast of seven hundred leagues, comprising the United States and part of British America. But in 1508 Aubert, a Frenchman, had already discovered the St. Lawrence river. Jacques Cartier, also a Frenchman, in 1534, nearly circumnavigated Newfoundland, and entered the Gulf of St. Lawrence. In his second voyage, the next year, Cartier sailed up the St. Lawrence, to the habitation of Hochelagen, near the site of Montreal, and brought away a native king to France. The coast of California, on the west side of the northern division of the continent, was discovered by Ximenes, a pilot, who had murdered Mendoza, a captain, dispatched by Cortez on a voyage of discovery; the gulf of California, or sea of Cortez, was first entered by Francisco de Ulloa, another captain sent out by Cortez, in 1539. The Spaniards subsequently undertook several unsuccessful voyages, but they did not abandon their hopes, and at the close of the sixteenth century, Sebastian Viscaino advanced along the coast of New Albion as far as the Columbia River. During the reign of Henry VIII., attempts were made by the English to find the north-west passage to India, without success; and in the next reign, Sir Henry Willoughby failed in search of a north-east passage. Three successive voyages in search of the north-west passage were made in the next reign, by Martin Frobisher, who, in 1576, and the two following years, explored Labrador and Greenland, but without any further result. Among our early north-west voyages of discovery, may be mentioned those of Davis, in 1585; of Weymouth, in 1602; of Knight, in 1606; of Hudson, in 1610 (from whom is named the great inland sea called Hudson's Bay and the river of New York); of Button, in 1612; and of Bylot and Baffin, in 1615, from the latter of whom Baffin's Bay has been named. After this year, there seems a pause in the progress of northern discovery; but, in the mean time, colonization in North America had been begun by England. Sir Humphry Gilbert was the first to attempt it, though he merely took formal possession of Newfoundland, in 1583; his half-brother, the celebrated Sir Walter Raleigh, in 1584, dispatched an expedition which discovered the country then called Virginia, and he made several attempts to colonize it, without effect. The colonies of Virginia and New England were respectively planted in 1607 and 1620, under James I., and it is not a little remarkable that one hundred and six years elapsed after North America was first visited by Cabot, before a single Englishman had effectually settled in the country.

For the progress of discovery on the north-west shores of America, the English accounts of Cooke, Clarke, Meares, and Vancouver, and the narratives of the Russians, Behring and Tshirikow, may be referred to. The journey of Samuel Hearne, to the Copper-mine River, from Hudson's Bay to the Northern Ocean, in latitude 72°, which terminated in 1772, was important in showing the fallacy of the supposition that was entertained of the extension of the continent in an unbroken mass towards the Pole, Hearne having been the first to reach the shore of the Arctic Ocean. In 1793, Alexander Mackenzie reached the Arctic Ocean, latitude 69°, and in another expedition crossed to the Pacific by land, being the first person who had penetrated from sea to sea across the mass of the continent. After this, there was another pause in the annals of discovery, until, in 1818, the British government dispatched Captain Ross in search of the north-west passage, who entered Lancaster Sound, and reached latitude 78° north, but returned under circumstances of disappointment. In 1819, the Admiralty dispatched Lieutenant Parry in the same direction, and his success was so brilliant that he reached 30° of west longitude beyond any former navigator, discovered the North Georgian islands, and numerous new lands and bays, and completely established the fact of the existence of the Polar Sea. Captains Parry and Lyon undertook another voyage in 1821, and wintered in Melville Island, without further success. Captain Parry made a third expedition in 1824, wintering at Prince Regent's Inlet, but lost one of his ships, and was, upon the whole, unsuccessful. The land expedition of Lieutenant Franklin and Dr. Richardson, in 1820, to the Arctic Sea, and the second expedition in 1825, to the mouth of Mackenzie River, and thence by sea towards the north-west extremity of the continent, made some addition to our knowledge of the coast of this Polar Sea, and also extended our information as to the climate and productions of these Arctic regions. The object of Captain Beechey's voyage to Behring's Straits, in 1825, was to meet the expedition of Franklin, which was not effected; he returned without further discovery than the addition by survey of a new and extensive line of coast to the geography of the Polar Regions. It only remains to refer to the Polar voyages, particularly those of Scoresby, between 1806 and 1822, and that of Captain Parry in 1827, who reached the latitude of 82° 40″ north. The private expedition of Captain Ross left England in 1829, and has not been heard of since. All the discoveries, either in the Polar regions or towards the north-west, have been arrested in their progress by either fixed or moveable ice, and the question of the existence of the north-west passage is still unsettled. There is an account of a pretended voyage round the northern extremities, written by L. Ferrer Maldonado, and alleged to have been performed by himself in 1588, but it is considered unworthy of credit; the fact at present is that no one has ever sailed round America on the north, nor, if the passage were discovered, could it be of any commercial utility.

For an account of discoveries made by the Danes on the east coast of Greenland in 1829, see *Journal of the Royal Geographical Society*, for 1830-31.

II. The following are the parts of the American coast that have been surveyed.

The river and gulf of St. Lawrence are now in the course of being surveyed in a very elaborate manner by Captain Bayfield.

Newfoundland was surveyed by Cook, and the east side has since been accurately laid down by Captain Bullock.

Nova Scotia has been surveyed by Mr. Des Barres and Mr. Lockwood.

The West Indies are now in course of being surveyed by Captain R. Owen.

There has been no complete survey of the coast of the United States.

The survey of the coast of Brazil has been ably executed by Admiral Roussin.

The Rio de la Plata has been surveyed by sundry English officers, Heywood, Foster, &c.

The coast to the south of that river is now undergoing a survey by Captain Fitzroy.

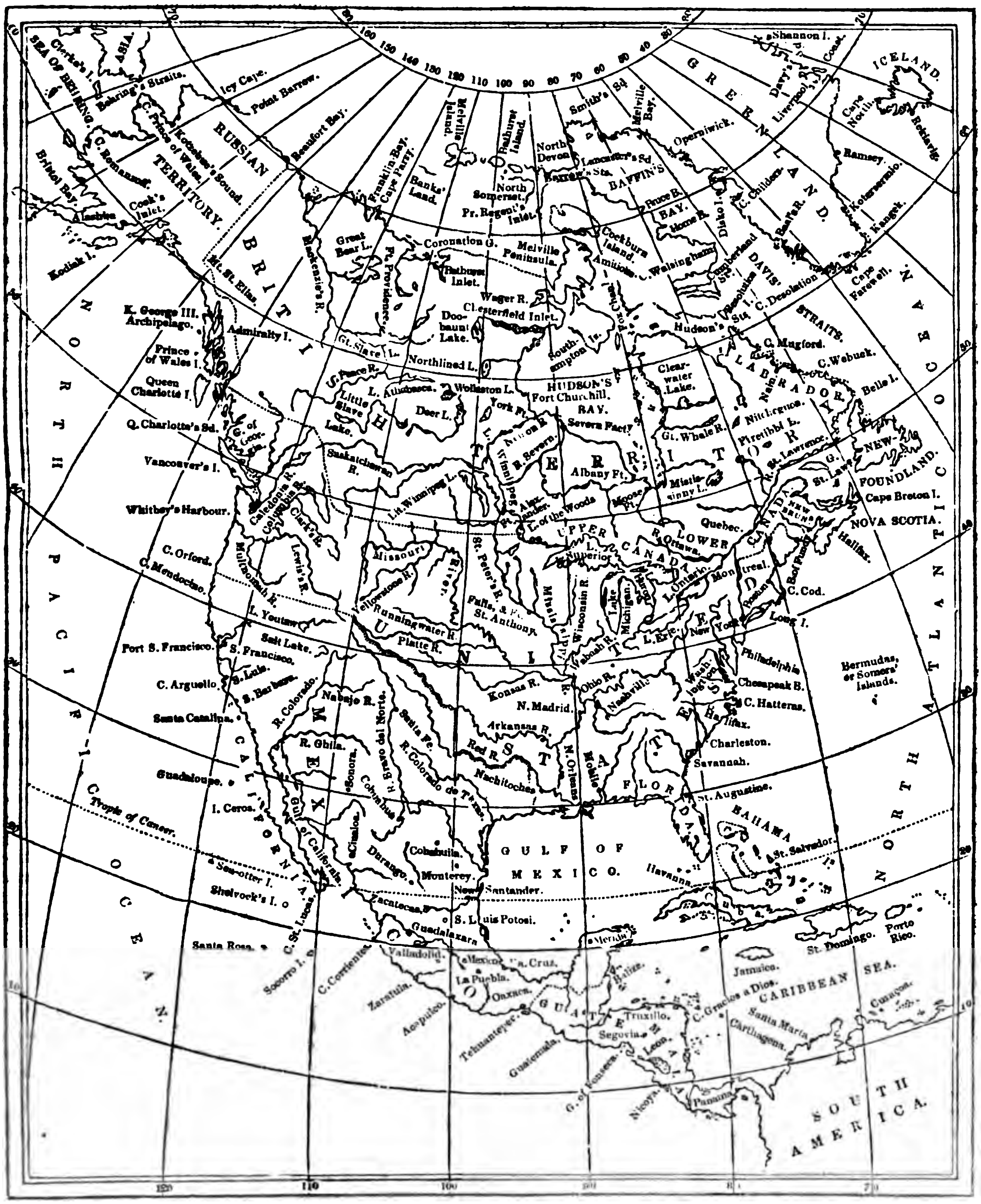
The coasts of the Tierra del Fuego, the Strait of Magalhaens, and the coasts of the continent north of the strait, on the east side as far as to about 50° S. lat., and on the west nearly up to 48° S., have been lately surveyed by Captain Philip Parker King.

The west coast, from the part opposite to the north of Mexico downwards, was all long ago surveyed by the Spaniards, but wants re-examining. Cook, in his third voyage, surveyed from Cape Gregory in 44° N. lat. to the Icy Cape, which he placed in 70° 44′ N. lat.; and Vancouver afterwards surveyed from 38° 15′ N. lat. to 45° 46′ N. lat.

The portion of Behring's Straits from 65° 50′ N. lat. to 67° 5′ N. lat., including Kotzebue's Sound, was surveyed by Kotzebue; and Captain Beechey has since executed a more extensive survey of the same coast, beginning at Point Rodney in 64° 35′ N. lat., and terminating with Point Barrow (the farthest point seen) in 71° 25′ N. lat. and 156° 10′ W. long.

III. The external form of America presents, in many respects, a contrast to that of the old continent. Viewed as an entire region, it has a lengthened figure, of which the greater diameter is inclined to the equator: the whole continent is the longest continuous mass of land that the globe presents, stretching from the northern icy ocean into the cold regions of the south. This continent is composed of two great peninsulas united by a long isthmus, which, whether we consider its form, or the primitive rocks of which it is composed, bears no resemblance to the isthmus between Africa and Asia. The expression 'New Continent,' which is often applied to America, does not refer to the comparative ages of the two continents, or the time of their supposed appearance above the ocean, but to the chronological order of our knowledge.

The northern extremities of America, as already stated, have been but partially ascertained, and when we reflect on the nature of the Icy Sea, it is difficult to believe that navigators can ever explore its full extent. On the east, America is washed by the Atlantic, and on the west by the Pacific ocean. Its length from the northern latitude of 70° to 56° south latitude, may be considered as exceeding 9000 miles, though it cannot be accurately stated; its breadth upon an average is about 2000 miles; its widest part extends from about the 55th to the 168th degree of west longitude from Greenwich. The extent of surface has been variously stated. Hassel has given it at 17,303,000, and Balbi at 14,622,000 square miles, but in every estimate allowance must be made for the uncertainty of the northern limits, and our still imperfect acquaintance with the form and position of some coasts. Berghaus makes the area about 14,219,967 square miles, not reckoning the islands, to which he assigns an area of about 98,660 square miles, which is certainly too little. The most southern point is Cape Horn, near the island of Tierra del Fuego. The two great portions which are called North and South America are divided by the great mediterranean sea sometimes called the Columbian Archipelago, and united in 9° N. lat. by the isthmus of Panama, which in the narrowest place is not more than thirty miles wide. North America comprehends all that part of the New World which lies north of the isthmus of



Panama, and extends to the Polar Regions. Its eastern extremity on the coast of Labrador is in 55°, and its western, on Behring's Straits, in about 168° W. longitude.

a. The form of North America has sometimes been compared to that of a triangle, with the vertex terminating at the isthmus of Panama, and the base determined by the shores of the Frozen Ocean. It may be more to the purpose to remark that, as a general law, the breadth of the continent diminishes southwards to the isthmus of Panama from the latitude of 50° north. The extent of coast is very great, owing to its form: the length of coast from Hudson's Straits to the Florida Channel is about 4800 miles; and measured from the Florida Channel along the inland sea to Panama, about 4500. The whole length on the Pacific side to Behring's Straits (including the Gulf of California) has been roughly given at 10,500 miles. The extreme north and north-eastern coasts we do not attempt to give. The area of North America is stated to be rather greater than that of South America.

The coast of North America is more indented by seas and large inlets on the eastern than on the western side. On the east side proceeding from north to south, we have Baffin's Bay and Hudson's Bay; the latter, a kind of inland sea larger than the Baltic, runs far into the mass of the land, and tends to break the continuity of the immense breadth of the continent. Davis' Straits and Baffin's Bay, with the Icy Ocean, may be considered as separating Greenland and the Polar lands from the American continent, to which Greenland can scarcely be considered as belonging. The Bay of St. Lawrence, and the great river itself, with the chain of enormous fresh-water lakes running far into the interior, form one of the most striking features of this continent, and one which exercises a most powerful influence on its climate and its capabilities as an habitation for man. Hudson's Bay with the Atlantic and Gulf of St. Lawrence bound on three sides the extensive and inhospitable peninsula of Labrador. The most southern point of the peninsula of Nova Scotia, with Cape Cod, the termination of the most eastern projection of the State of Massachusetts, may be considered as marking the opening and the limits of a great gulf, of which the Bay of Fundy is the funnel-formed termination. The coast of America, between the Bay of Fundy and the Gulf of Mexico, is not marked by any very considerable indentation, except the Chesapeake Bay, which runs from south to north about 180 miles, with an average breadth of about thirteen miles. Cape Hatteras in North Carolina may be considered, in connection with Cape Florida to the south, and Cape Cod and the southern point of Nova Scotia, as dividing the Atlantic coast south of the St. Lawrence into three great divisions. The more particular description of the Atlantic coast south of the Bay of Fundy belongs to the article UNITED STATES.

If the islands that in an irregular line lie stretched in front of the Gulf of Mexico and the Caribbean Sea were united with one another and with the main land—a state of things that we have no difficulty in imagining to have once existed—we should have a large internal sea analogous to the Mediterranean. If it be doubted if this sea was ever closed like the Mediterranean, we cannot doubt that the islands which now line its eastern limits have been hacked and broken into smaller pieces by the action of the ocean. Between the tenth degree of north latitude, which is near the island of Trinidad, and the twenty-fifth of north latitude, (the southern extremity of Florida,) we find the eastern limits of this great inland sea; but as we advance into it towards the west we find it scooped out into various basins, each of which, with their winds and currents, will require a separate description. The Gulf of MEXICO is on the N.W.; and on the south, the Gulf of HONDURAS, and what is sometimes called the Caribbean Gulf or Sea, comprehending the Bay of Darien and the deep indentations of the northern coast of South America. The Archipelago, which the great inland sea of the Americas presents, is one of the most extensive and interesting in the world. The Gulf of Mexico, hemmed in by the peninsulas of Florida and Yucatan, and by the western side of the island of Cuba, is the most important part of this inland sea.

The western coast of North America presents no very deep and extensive indentations of the coast as we advance northwards from the Bay of Panama, till we come to the immense Gulf of California, about 800 miles in length, and from sixty to eighty miles in average width, formed by the main land and the long narrow peninsula of California. Between the latitudes of 47° and 60°, the west coast of North America is exceedingly irregular, presenting a great number of islands, some of considerable extent, and forming with the main land numerous bays and creeks. Farther north we find between Cook's Inlet and Prince William's Sound an extensive peninsula running about 200 miles from north-east to south-west; and west of this the still more remarkable long narrow peninsula of Alashka, or Alyaska, running in a similar direction for about double the distance. Both these peninsulas have steep rocky coasts lined with islands and rocks. The straits which take their name from the navigator Behring separate Asia from America by a comparatively narrow channel of about 48 miles in width.

Though the great mountain-chain which runs from the extremity of North to the extremity of South America, experiences two depressions or breaks at the isthmus of Panama, we cannot consider the two continental masses as separate in their character. They form one mass with many striking characteristics in common. South America has the form of an irregular triangle, of which we may name as the three points, the isthmus of Panama, Cape St. Roque (not strictly the most eastern point), 5° 28′ S. lat., 35° 40′ W. long., and the island of Cape Horn, 56° S. lat., 67° 20′ W. long.

The great extent of its sea-coast is determined by its peninsular form, and in this, as well as in the absence of all very great indentations of the ocean, it presents some resemblance to Africa; but it also presents the striking contrast of more continuous and elevated mountain-chains, and a more complete developement of its water system. The extent of coast that it offers to the inland sea and the Atlantic, is roughly estimated at about 10,000 miles: the coast washed by the Pacific is about 5800 miles. The extreme southern points of South America, and the southern coast on the Pacific, bear some analogy to the north-west coast of North America in their irregular outline, and the number of islands that line it. Tierra del Fuego, though separated from the mainland by a narrow and most irregular arm of the sea, must be considered, with its appendages of barren islands and rocks, as the real termination of the continent. From this point advancing northwards along the coast of the Pacific, we find it studded with almost innumerable islands, some of considerable extent, separated by countless channels. (See *Charts of Capt. King's late Surveys.*) This island coast extends as far north as the Chiloe Archipelago, 42° S. lat. South of the lat. of 40°, it is remarked that the mountains press close on the shore, instead of leaving a space between their base and the ocean, as is the case in the parallels north of 40°. The sea thus insinuates itself within the mountains, detaches island masses, and makes many deep creeks, somewhat resembling the *fjords* on the coast of Norway. The rest of the coast of South America presents no indentations that require a notice in this general sketch, except the great bend that takes place about the latitude of the lake Titicaca, corresponding to a change in the direction of the Andes; with the Gulf of Guayaquil and the Bay of Panama.

The mountain system of the Americas is remarkable for presenting the longest line of elevated surface in the world. The Andes which may be traced from the extreme rocky islands, forming part of the system of Tierra del Fuego, run along the western side of the continent at a comparatively short distance from the coast. [See ANDES.] Though this chain experiences two depressions, as we have stated, in the isthmus of Panama, another chain, perhaps a continuation, immediately rises again, and continues its course between the inland sea and the Pacific, spreading out in Mexico into extensive table-lands crowned by elevated volcanic peaks, (Orizaba and Popocatepetl are above 16,000 feet high,) and continuing in its main line a general course N.N.W., at a much greater distance from the Pacific than the Andes of South America. The part of this range when it is within the limits of the United State, is known by the name of the Rocky mountains, and in the north-west territory is sometimes called the Chippewayan range. The termination of this range is at the Frozen Ocean on the west side of the Mackenzie River; after the fiftieth parallel of latitude the elevation is not considerable. The whole length is not less than 8700 miles. The chain which extends from the table land of Mexico does not run northward in a line so regular as the Andes of the southern continent. About the lat. of 22° N. it divides into several branches. The most easterly branch, which is but of inconsiderable elevation, is in its northern course broken through by the Rio del Norte; it then takes a north-eastern direction, forming the northern part of the province of Texas: in this part of its course, it acts as the water-shed between the Sabine with other small rivers that enter the Gulf of Mexico, and the minor affluents of the Rio Roxo, (Red River,) a tributary to the Mississippi. This is the range of hills which crosses the Arkansas, and appears in the state of Missouri under the name of the Ozark mountains, running towards the confluence of the Missouri and Mississippi; and probably continued beyond them at a slight elevation towards lake Superior. The general direction of the Ozark corresponds to that of the Appalachian chain.

The main mass called the Sierra Madre, running north from the plateau of Guanaxuato to the high table-lands of New Mexico, spreads out to a great extent east and west, and contains several parallel chains of mountains, forming longitudinal valleys like that in which the Rio del Norte runs. This mountain system, in its further course, separates the basin of the great Missouri and its affluents from the waters that flow into the Gulf of California and the Pacific. Of these western streams, the almost unknown Rio Colorado, which enters the Bay of California, and the Oregon, or great Columbia River, are the chief. From the level of the Mississippi River, as we advance westward towards the great dividing line, the country rises in irregular terraces, and in planes of small inclinations, so that the main mass of the Rocky Mountains does not present to the spectator any remarkable features of grandeur, at least none corresponding to its actual elevation. But between 36° and 42°, there are several points of the Rocky Mountains always covered with snow, and the mean temperature of these elevated regions within the territory of the United States is very low. The Big Horn, Spanish Peak, and James' Peak are estimated to be about 11,000 feet above the level of the sea.

Of the connexion and character of the mountain-masses in North America, which lie west of the main mass, we have but very imperfect information. A western branch, sometimes called the Cordillera of Sonora, stretches from the plateau of Guanaxuato towards the northern point of the Gulf of California, about 33° N. lat. The long narrow peninsula of California has also a chain of hills or mountains, running through it in a north-west direction, and supposed to be attached to some point of the Sierra Madre. Some are of opinion that the mountains of the Sierra Madre terminate about latitude 33°, (though it is certain that even north of that point there is a high table-land,) and that the Rocky Mountains, in which the Oregon has its rise, are to be considered as a continuation of the Californian range. But it is, perhaps, more probable, that the range which is traversed by the Columbia River in the lower part of its course, is the continuation of the mountains of California. From the northern extremity of the Gulf of California to the termination of the coast at the Icy Sea, we are only imperfectly acquainted with these high lands that are often seen at no great distance from the shore, and sometimes rising up from it like Alpine masses. There is, probably, a continuous range from the mountains of California following the windings of the coast into the peninsula of Alyaska; which, in a proper point of view, will admit of a better comparison with the Andes than the chain of the Rocky Mountains. In some part of the north-west coast these Ocean Alps rise to the height of between 14,000 and 16,000 feet. Mount Fairweather and Mount Elias, near the parallel of 60° north, rise respectively to the height of 13,824 and 16,938 feet.

The mountain system of the eastern side of the North American continent, called the Appalachian, stretches from about the 34° of latitude northwards to the banks of the St. Lawrence. As far north as the Hudson, its direction is pretty nearly from S.W. to N.E. In its southern parts, in the states of Alabama and Tennessee, it is at its greatest distance from the Atlantic, but continually approaches nearer as it runs north, till it is traversed by the Hudson River, where it is also reached by the tide-water. Here it takes a turn more to the north through Vermont and New Hampshire; in which latter state it acquires its greatest elevation. In the White mountains of the state of New Hampshire, Mount Washington, about N. lat. 44° 15′, is 6200 feet high, though it does not appear to belong to the main branch, but looks rather like a detached group.

The Appalachian system, considered in its full extent, does not consist of a single chain, but we frequently find several chains running parallel to one another, and forming extensive longitudinal valleys such as that of Shenandoah in Virginia. [See APPALACHIAN MOUNTAINS.] This mountain system, which is about 1200 miles long, forms the most striking characteristic of the Atlantic portion of the United States, containing the sources of numerous rivers, which on the one side contribute their waters to the Mississippi, and on the other find their way to the Atlantic, sometimes breaking through the most eastern chains of the Appalachian system, by passages apparently rent in the mountains. Though the height of the range south of the Hudson is inconsiderable, rarely exceeding the elevation of 3000 feet, yet, from its continuity, and the surface which it covers, this mountain system is a most important element in the climatology of the United States. For a more detailed view of this portion of the continent, see APPALACHIAN MOUNTAINS and UNITED STATES.

The great valley of the Mississippi drains a surface perhaps inferior to that of no river on the globe. The sources of the main stream, the Missouri, are ascertained to be in the Rocky Mountains, about 44° N. lat.: but the Yellowstone, which is really the main branch of the Missouri, rises in 42° N. lat. The sources of the Mississippi, though an inferior stream, have not been ascertained till lately. Mr. Schoolcraft, in the year 1832, found that the Mississippi originates in a lake, at the elevation of about 1500 feet above the Atlantic, and computed to be 3160 miles from the ocean, following the windings of the stream. We are not able to state the latitude and longitude of the source.

To form a correct view of the character of the vast continent of North America, we must consider the chain of the Rocky Mountains as its chief axis. Sloping down from this range to the Pacific (at least within the limits of the United States), we find an extensive region drained by rivers that run into the great ocean. East of the Rocky Mountains lies the great central valley of the Mississippi, perhaps the largest and certainly the most interesting valley in the world; its eastern boundary is the Appalachian mountain system, its southern boundary is the Gulf of Mexico, and its northern limit is the level of the great lakes. From the Rocky Mountains to the bed of the Mississippi we have a slope, which, as to length, bears a similar proportion to the height of the Rocky Mountains that the shorter slope from the Alleghany system to the Mississippi bears to the height of its mountains. The slope from the Appalachian to the Atlantic is, according to the same law, shorter than that from the Rocky Mountains to the Pacific. Thus we have three great water systems south of the line of the Canadian lakes.

On the Pacific, the chief rivers are the—	Length in Miles.
Oregon, with numerous large branches	1000
The Rio Colorado	unknown

In the great central valley we have the great Missouri, with its affluent the Mississippi, and numerous other streams of great length:—

	Miles.
Missouri to its confluence with the Mississippi	3000
Mississippi to its confluence with Missouri	1200
Mississippi from the confluence of the Missouri to its mouth	1265
Entering on the west side—	
The Arkansas	2000
Rio Roxo (Red River)	1500
On the east—	
Ohio to the junction of the Mississippi	980
Missouri to the outlet in the Gulf of Mexico	4265

These lengths are given according to Darby. It will be observed that the length of the Mississippi, as here given, falls very far short of what is stated above.

Such are a few of the mighty rivers that water this extensive valley, which presents perhaps one of the most striking features on the face of the earth. From north to south its length is not less than 1200 miles, stretching from regions of almost perpetual cold to the tropical warmth of Louisiana. We see from an American paper that the Missouri has been navigated this year (1833) by a steam-boat engaged in the north-western trade, from the mouth of the Yellow-stone River to St. Louis.

When America was discovered, one continuous forest spread from west to east, from the shores of the Atlantic over the Appalachian system, and descended into the valley of the Mississippi. From the Gulf of St. Lawrence and the region of the great lakes, this uninterrupted mass of vegetation reached to the shores of the Gulf of Mexico, and extended even west of the main stream of the Mississippi. 'This ocean of woods, still in the far greater part existing, may be considered as about 2000 miles in length, with a mean breadth of 1000, and comprising 2,000,000 of square miles, and limited either by the Atlantic Ocean, the Gulf of Mexico, or by naked interior plains.' (Darby's *View of the United States*, p. 357.) These naked interior plains are found west of the Mississippi on the high lands as we advance westward. Here we come to extensive steppes devoid of trees, parched in summer by scorching heat, and over which in winter the winds from the Rocky Mountains sweep with an intensity of cold almost beyond belief. The spacious and dry plains of the Texas and the upper regions of Arkansas present a character analogous to the high plateaus of the Asiatic continent, and here the white man adopts those pastoral habits which are the only mode of life suited to the regions which he occupies. Stretched along the base of the Rocky Mountains, with an average width of five or six hundred miles, we find a country, which is emphatically called the desert; a country lying between the Ozark Mountains, and the Rocky Mountains, as far north as 41° at least. The lower parts of the Mississippi valley with a portion towards the north, are still covered with a dense forest, spread interminably like an ocean.

The prairies of the Mississippi valley are found both on the east and west side of the channel of the river; prairies exist also in the State of Alabama. They are extensive, elevated, and generally irregular tracts, without trees, though sometimes capable of producing them, covered in the spring with countless flowers and long grass, and often possessing a deep rich soil. Sometimes on the west side of the Mississippi they exhibit on their surface a salt efflorescence; incrustations of pure salt, covering the ground like ice, are seen in the upper valley of the Canadian river, one of the tributaries of the great Arkansas.

The rivers that enter the Atlantic along the eastern slope of the Appalachian, though in themselves of great importance, are inconsiderable when compared with the great rivers of the Pacific slope, and those of the Mississippi valley. They will be found particularly described under their several heads.

The basin of the Mississippi which has been described as extending from the Gulf of Mexico to the neighbourhood of Lake Superior, has no mountain barrier on the north. But here we find a most striking phenomenon. From the western extremity of Lake Superior, (about 92° W. long.) one of whose tributaries interlocks its sources with a branch of the Mississippi, we have a series of enormous fresh-water lakes, Superior, Huron, Michigan, Erie, and Ontario, collectively covering a surface of about 73,000 square miles, a space equal to the area of Great Britain. These lakes have the outer margin of the basins in which they lie at no very great distance from their shores, as we may infer from the inconsiderable courses of the streams which they receive. Lake Superior is the highest of these inland seas, being 641 feet above the level of the Atlantic: Lakes Huron and Michigan form a separate and somewhat lower basin; Erie a third; and 333 feet below Erie lies Ontario, doubtless once at a much higher level than it now is. The great falls of Niagara in the narrow channel that connects lakes Erie and Ontario, show at once the great difference between the level of these two lakes. The course of the St. Lawrence, it has been remarked, from the eastern extremity of Ontario, has a singular conformity to that of the opposite Atlantic coast, having a general north-east direction. After its exit from Ontario it receives near Montreal the great river Uttawas from the north-west, and, increased by numerous smaller streams, enters the Atlantic by a wide bay. This river of lakes, which in many respects is the most interesting in the world, will require a separate notice. [See St. Lawrence.]

The upper branches of the Mississippi proper and the St. Lawrence lakes are on a high level, but not in a region of mountains. North of the basin of the Canadian seas we find that the cold regions of the north-west territory have also their great rivers. The Portage de la Prairie, about 150 feet above the level of lakes Winnipeg and Superior, is a swampy district, which, at this point, forms the dividing line between the waters that flow to the St. Lawrence basin, and those that belong to the basin of Winnipeg, the receptacle of numerous streams. The southern branch of the Saskatchevan rises in the Rocky Mountains near the sources of a branch of the Columbia river and the Missouri, traverses 15° of longitude, and falls into the great lake Winnipeg, in 53° north lat.: this lake is connected with Hudson's Bay by the Severn and Port Nelson rivers. The course of the Saskatchevan, as far as Winnipeg, is at least 900 miles. In 56° 41′ N. lat. and 109° 52′ W. long. is Methy Portage, forming part of a range running southwest which separates the rivers flowing north from those that flow south or east. On the north side is a valley 1000 feet deep, and a water passage is open, with some interruptions, to the great lake Athabasca. The basin of the Mackenzie lies north of the Methy Portage. The Mackenzie is one of the large rivers of our globe; but such is the complicated water system of this region, with its endless lakes communicating with one another, that it is almost impossible to say what should be considered as the source of this river. If we consider the Athabasca river as its remote branch, the Mackenzie flows through about 16° of latitude into the Icy Ocean. The sources of the Peace river are much farther to the north; but if we follow this stream through the Slave Lake into the Mackenzie, we shall find the whole course of the stream as long as if we traced it from the more southern branch. East of the Mackenzie, and flowing into the Arctic Ocean, are the Copper-mine and Fish rivers. It is impossible not to recognize a curious resemblance in the water system of the southern and northern parts of North America. The elevated table-land in which the Mississippi and the affluents of Lake Superior rise, divides the continent east of the Rocky Mountains into two parts. The basin of Winnipeg may be considered as a continuation of that of St. Lawrence, or as part of one high plateau, divided into two portions. Down the southern slope, the Mississippi flows to the warm regions of the Gulf of Mexico; and down the northern, the rival river Mackenzie runs into the Icy Ocean. The St. Lawrence and the large streams that enter the west side of Hudson's Bay are the great channels that carry off the collected waters of this elevated region of lakes into the Atlantic. But the peculiar nature of this north-west territory, and infinite assemblage of fresh-water basins, will be the subject of a separate discussion. It may be well to observe, that, independent of geographical position and the consequent difference of climate, the numerous lakes that belong to the northern portion of this continent and to the system of the St. Lawrence give it a peculiar character.

As it is our intention to devote a special article to the Canadian Seas, the N.W. Territory, and the United States, it is the less necessary here to enter into more minute details. Nor do we propose to discuss the subject of the climate of this continent further at present than by a few general remarks, and by referring to page 445 of this article, on the Botany of America.

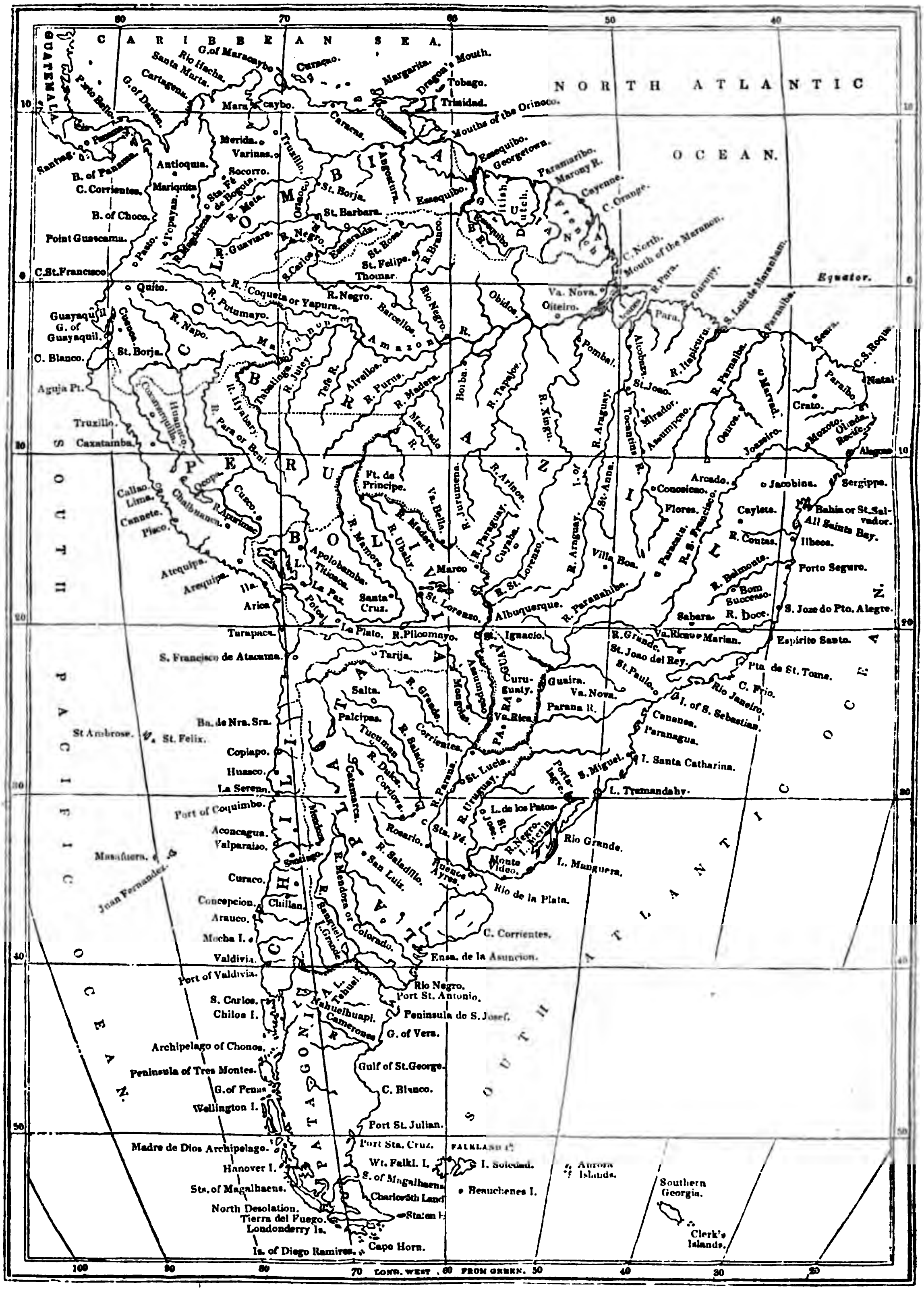
It is a fact, well ascertained, that the average temperature on the west coast of North America is higher than on the eastern. In the Oregon valley it is said to be higher than in corresponding latitudes on the Atlantic coast, by an amount equivalent to five or six degrees of latitude; and the winters are also much moister. The general nature of the climate of the American continent may be best understood by what is now known of the United States and the Canadas. The North-West territory, east of the Rocky Mountains, is a cold and inhospitable region, not adapted for the residence of agriculturists. On the eastern part of the continent agriculture has not advanced farther than the latitude of 51° or 52°. But the limit of successful cultivation, at the present day, must not be taken as the limit which cannot be passed. The cold within the United States increases as we advance westward on the same parallel, and this is independent of elevation, as we see from comparing the temperature of corresponding points on the Mississippi and the Atlantic, and as we infer from vegetable productions succeeding in a higher latitude on the Atlantic coast than in the basin of the Mississippi. The ponds of New Orleans have been frozen so as to allow half-grown boys to skate or play on them; a phænomenon that never occurred in the same latitude on the Atlantic coast. The discussion of the climate of the United States, which comprehends so large a portion of the habitable northern part of the New World, will be sufficient to show the general character of the climate of North America. We therefore refer to the article United States of North America, and to Darby's excellent work, entitled *a View of the United States*, &c., Philadelphia, 1828.

a. 1. Since the acquisition of Louisiana by the United States in 1803, the government have sent out several expeditions to explore part of the extensive regions between the Mississippi and the Ocean. The first was that at the head of which was Captain Meriwether Lewis, with Captain Clarke. The party entered the Missouri at St. Louis, where it joins the Mississippi, on the 14th of May, 1804, and by the 1st of November reached the Mandan towns, above 1600 miles from St. Louis, in latitude 47° 21′ 47″ N., and longitude 99° 24′ 45″ W. from Greenwich. Here they remained till the 7th of April, and during their stay completed, from the information of the Indians, a map of the country between the Mississippi and the Pacific from about latitude 34° to 54° N. They then continued the ascent of the Missouri, till, on the 18th of August, 1805, they reached its extreme navigable point, about 2500 miles from its junction with the Mississippi. Here, leaving the river, they made their way on horseback across the mountains, when they reached a navigable stream, which led them into Lewis river, from which they were carried into the main branch, the Columbia, and proceeded down it till, on the 15th November, they reached the Pacific. They remained on this coast till the 27th March, 1806, when they set out on their return, and reached St. Louis on the 23d of September. Meanwhile, in the latter part of 1804, Mr. Dunbar, of Natchez, accompanied by Dr. Hunter, had sailed up the Washita River, which flows from the N.W. into the Red River, a few miles above its junction with the Mississippi, as far as to the hot-springs in its vicinity, in latitude 34° 31′ 4″ N., longitude 92° 50′ 45″ W. A considerable portion of the Red River itself had been before this explored by Dr. Sibley, of Natchitoches. In 1805, Lieutenant, afterwards General, Zebulon Montgomery Pike was despatched by the government on an expedition to explore the upper portion of the Mississippi. He sailed from Port St. Louis on the 9th of August, and after making his way to what were then considered the sources of the river, returned to the same place on the 30th of April, 1806. Soon after his return, Pike was despatched on a second expedition, to explore the country to the south of the Missouri. He left St. Louis on the 15th of July, 1806, and having proceeded up the Missouri till he came to its junction with the Great Osage River, he entered the latter, and explored it nearly to its source. The course of the Great Osage had been before this very imperfectly known. He then crossed the country to the Arkansas, which he explored from about latitude 35° to its source in latitude 42° N., a portion of which no account had been previously given. The lower part of the Arkansas was, at the same time, explored by a detachment from the main party, conducted by Lieutenant Wilkinson. After leaving the Arkansas, Pike continued his progress to the westward till he came upon the Rio del Norte, in New Mexico, where he was taken prisoner by the Spaniards, and detained for some months. He was, however, at length released, and effected his return to St. Louis by the 1st of July, 1807. In the course of this expedition, besides the results we have already mentioned, the sources of the River Platte, which falls into the Missouri, were discovered, a part of the River Kansas and the Platte was explored, and the general course of the Rio del Norte was ascertained.

In 1819, another expedition was sent out in the same direction, under the conduct of Major Long. This gentleman and his party left Pittsburgh, in Pennsylvania, on the 5th of May, and sailing down the Ohio to its junction with the Mississippi, ascended the latter river as far as St. Louis. They then proceeded along the north side of the valley of the Missouri to Council Bluffs, a position on the Missouri, above the junction of the Platte; here they established their head-quarters, and examined a considerable part of the surrounding country. A detachment was also sent across to Fort Osage and the Konzas village, farther to the south. Another detachment having returned down the Missouri to St. Louis, then ascended the Mississippi as far as to the Des Moines, or De Moyen Rapids, in lat. 40° 20′ N.

Meanwhile the main body, proceeding to the west, reached the Pawnee villages on the Loup Fork, a branch of the Platte, from whence directing their route to the south they came upon the Platte, and followed it westward till their further progress was stopped by the Rocky Mountains (about long. 104 W.) from whence it issues. They then took their way in a southerly direction along the base of the mountains, only occasionally ascending the peaks, till they came to the Arkansas. A detachment being sent up that river, ascended it for about thirty miles, to the spot where it leaves the mountains; while another party descended it to the Mississippi. The main body, meanwhile, directed their way across the country to the south, till, after having travelled about 150 miles, they came to a river, along the valley of which they proceeded for 200 miles, when they were told by some Indians that it was the Red River. But having continued their course for some hundred miles farther in the same direction, they learned that this information was wrong, and that the river was the Canadian, which falls into the Arkansas. Upon this, without making any further attempt to reach the Red River, they directed their steps to Belle Point, on the Arkansas, the place where it had been arranged that their companions who had undertaken the descent of that river should wait for them. They arrived there on the 13th of September, four days after the other party had made their appearance. The whole then set out for Cape Girardeau, on the Mississippi, a short distance to the north of the junction of that river with the Ohio, where they arrived on the 10th of October. In 1823 Major Long, accompanied by Messrs. Say, Keating, and Calhoun, was dispatched by the government on an expedition to the St. Peter's River, which, flowing from the north-west, enters the Mississippi a few miles below the Falls of St. Anthony, in 45° N. lat. Setting out from Washington, the party proceeded by Wheeling, Columbus, and the southern extremity of Lake Michigan to the Mississippi, which they came upon at Fort Crawford, about 43° N. lat. 91° W. long. From this point they pursued the course of the stream upwards along its right bank to the mouth of the St. Peter's River, which latter they then followed to its source in a small lake called Polecat Lake, in 45° 40′ N. lat. 96° 36′ W. long.; the distance from the Mississippi by the route taken being about 500 miles, though only 275 miles in a straight line. Very near the Polecat Lake is Lake Travers, the source of the Red River, which the travellers followed down to Lake Winnepeg, into which it flows. Fort Alexander on this lake, in 50° 46′ N. lat. 96° 25′ W. long., was the ultimate limit to which their journey extended. From this point they returned by the Lake of the Woods and Rainy Lake to Fort William on Lake Superior—thence round by the northern border of that lake to its junction with Lake Huron—across the Huron to its south-eastern extremity—and finally, round the west end and along the south-eastern coast of Lake Erie to the Falls of Niagara. The extent of the whole region traversed, or respecting which information was obtained, might be about 1300 miles from E.S.E. to W.N.W., and its average breadth about 450 miles. (See *Discoveries made in exploring the Missouri, Red River, and Washita*, by Captains Lewis and Clarke, Doctor Sibley, and William Dunbar, Esq., 8vo., Natchez, 1806; *Travels to the Source of the Missouri, in* 1804, 1805, *and* 1806, by Captains Lewis and Clarke, 4to., Lond., 1814; *Exploratory Travels through the Western Territories of North America; comprising a Voyage from St. Louis on the Mississippi to the Source of the River, and a Journey through the interior of Louisiana and the North-Eastern Provinces of New Spain, performed in* 1805, 1806, *and* 1807, by order of the Government, by Zebulon Montgomery Pike, Major, 4to., Lond., 1811; *Major S. H. Long's Expedition from Pittsburgh to the Rocky Mountains, in* 1819 *and* 1820, by Edwin James, 3 vols. 8vo., Lond., 1823; and *Narrative of an Expedition to the Source of St. Peter's River, Lake Winnepeck, &c., compiled from the Notes of Major Long*, by W. H. Keating, 2 vols. 8vo. Lond. 1825.)

To these successive expeditions sent out by the government of the United States to the more remote parts of its extensive territory, is to be added that in which Captain Back is at present engaged for the exploration of part of the northern extremity of the continent. The latest intelligence that has been received of this expedition is, that on the 10th of July Captain Back and his party were found by Mr. Simpson, the governor of the Hudson's Bay Company, in excellent health and spirits, at Fort Alexander, a trading station of the Company, on Lake Ouinipigue, (or Winnipeg,) not far from the Red River settlement on the Asseniboin. Here he had been waiting from the 6th for Mr. Simpson, who furnished him with an order on the Company's establishments along the whole line of communication to the Great Slave Lake, for whatever he might want during three years.



[South America.]

b. The Andes, as we have already remarked, is the great mountain-system of South America, presenting the longest unbroken range of lofty summits on the globe. Its description will be found under the article ANDES. There is a certain analogy between North and South America as to its mountain-chains. The axis of the two continents, in each case, approaches the western shore much more closely than the eastern, though, as already observed, the Rocky Mountains, which are the true axis of the North American continent, are far removed from the Pacific, compared with the chain of the Andes. The consequence of this is, that North America possesses an extensive water-system on the Pacific slope, including the great Colorado, the Colombia, and other large rivers; but no considerable stream from the Andes enters the western ocean.

The Rio de la Plata flows in a great central valley, running from north to south, which may be compared with the valley of the Mississippi, while the Amazon is the great drain of the low lands that stretch from the Andes to the Atlantic, and may be compared with the St. Lawrence of

North America. Besides the offsets that shoot out from the Andes, we find in South America several distinct mountain-systems. That which runs along the coast of Venezuela is, however, an offset from the eastern Cordillera of Cundinamarca, which runs down to the Caribbean Sea along the east side of the Lake of Maracaibo. From this system the Venezuela chain strikes off at right angles, in two parallel chains, running due east, of which the northern keeps close to the sea, and may be traced into the Island of Trinidad over the strait called the Dragon's Mouth. The highest point of this chain is the Silla de Caracas, which has an elevation of about 8000 feet. Besides this northern chain, which runs along the Island of Trinidad, terminating in Point Galera on the north-east shore, we find a chain parallel to it running along the southern shore of this singularly formed island; both these chains are undoubted prolongations of the Venezuela system. In consequence of this conformation of the northern coast, no great river enters the Atlantic, between the mouth of the Magdalena and that of the Orinoco. The Magdalena rises in the Andes at the point where the mountains divide into three branches, and like its affluent, the Cauca, runs in a longitudinal valley through at least 9° of latitude into the Caribbean Sea. Its course and outlet have a strong analogy to that of the Mackenzie River in North America. The high land of Guiana, or Parima, lies between the lower waters of the Orinoco and the Amazon, and forms, with the high lands of Venezuela and the Andes, the boundary of that immense plain which is drained by the Orinoco. This mountain-system of Parima runs from east to west, perhaps for 600 miles: it consists apparently of several parallel chains, some of which, in British Guiana, are said to rise to the height of 4000 feet. Numerous streams descend from these mountains to the ocean, one of which, the Essequibo, might be considered a large river in any other part of the world. Its numerous tributaries, which descend from remote parts of Guiana, run through almost impervious tropical forests, and, uniting in one main channel, enter the sea in about 7° N. lat. The high lands of Brazil lie on the east side of the continent, between the Amazon River and the Rio de la Plata. In their position, and their relation to the great basins of the continent, they present a most striking analogy to the Appalachian system of Northern America. Between the Andes and the high lands of Brazil lies the extensive plain drained by the Plata; and between the mountains of Guiana and those of Brazil, lies spread the immense level that belongs to the lower course of the Amazon.

The main mountain-mass of the Brazilian system lies between 18° and 28° S. lat., and consists of several parallel chains with a length of about 700, and a breadth of 400 miles. The *Sierra* nearest the sea is called the *Sierra do Mar;* next to this, and joining on to the Sierra do Mar in about 22° 30′ S. lat., we find the central chain, which, running as far north as about 16° S. lat., contains the highest points of the Brazilian system; some of these have probably an elevation of 5000 feet. This chain is continued at a smaller elevation up to 10° S. lat. The western chain, which is of small elevation, separates the affluents of the Parana and Francesco from those of the Araguay and Tocantin, which unite to form the Para. It does not appear that any mountain-system stretches across, and connects these high lands of Brazil with the Andes, and consequently the waters of the Paraguay are separated from the southern tributaries of the great Amazon by a water-shed of no great elevation. In no part of the world do we find three such basins as those of the Orinoco, Amazon, and La Plata, separated by such slight elevations. The mountains of Guiana, indeed, hardly can be said to separate the Amazon and Orinoco: they form an almost insulated mass, and only fill up the space between the lower courses of the two rivers, while the small difference between the levels of the upper parts of these streams is shown by the Cassiquiari channel which connects the Rio Negro, one of the large affluents of the Amazon, with the Orinoco. From the basin of the Amazon to that of the La Plata, it is not probable that the ascent is greater than from the upper waters of the Mississippi to the level of the Canadian sea.

Between the Amazon and the Plata, we find no rivers entering the Atlantic of any very considerable size, except the Paruaiba and Francesco. The Francesco runs in a longitudinal valley parallel to the mountains and the sea, for the greatest part of its course: it then turns to the E. and S. E., and enters the Atlantic. The rest of the Brazilian streams that flow to the Atlantic present, in their course and magnitude, a striking resemblance to the Atlantic waters of the Appalachian system.

The Orinoco is navigable upwards from its mouth, with only one interruption of rapids, for about 1000 miles, the Amazon is navigable for above 2000 miles; and the Paraguay, which is navigable through 19° of latitude, (from its confluence with the Jauru, 16° 20′ S. lat., to Buenos Ayres, where the name of Plata prevails,) is said to be separated from the Guapore (a feeder of the Madeira, which is a branch of the great Amazon) by a portage of only three miles, on a level whose height, it is said, does not exceed 2500 feet, and we are inclined to conjecture may be less. Such a natural system of water-communication, capable of being turned to the benefit of man, certainly exists nowhere else in the world, except, perhaps, in the northern division of the continent.

The Amazon River, said to be the largest in the world, and the Plata, which is scarcely inferior in the area that it drains and the magnitude of its affluents, will be found described under their several heads: the following statement, as to their supposed lengths, may be useful:—

	Miles.
The length of the Amazon	3300
Its tributaries, viz.,	
Ucayali	1350
Yutai	750
Jaura	750
Madeira	1800
Topayos	1000
Xingu	1080
Napo	800
Rio Negro	1400
The Parana, or Rio de la Plata, the second in magnitude	2130
Its tributaries, viz.,	
Paraguay	1200
Pilcomay } tributaries of the preceding	1020
Vermejoo } tributaries of the preceding	660
Salado	750
Uraguay	660
The Magdalena, discharging itself into the Caribbean Sea	750
The Orinoco	1440
The Essequibo	400
The Tocantin, or river of Gran Para .	1500
The Parnaiba	700
The San Francesco	1275
The Cusu Levon, or Negro	540
The Moyale Levon, or Colorado . . .	1080

The South American lakes are not numerous; and being, in many cases, caused by the overflowing of the immense rivers, they appear in the rainy season, and are dry in the summer. The Lake of Maracaibo, into which the waters of the Gulf of Venezuela enter at high tides, is 120 miles long, and 90 wide. The Lake of Titicaca, situated high in the Andes of Peru, receives the waters of numerous streams, but has no visible outlet. Salt lakes and salt streams are occasionally found; as for instance, on the route from Buenos Ayres through the great plain to Mendoza. (See Caldcleugh's *South America*, vol. i. p. 279.) There are also many lakes of no very great dimensions in Chili, and parts of the Andes system.

South America presents the most striking contrasts of lofty mountains and extensive plains in the whole world. It exhibits also a no less remarkable variety of climate from the summit of its snow-clad mountains to the low burning level of its interminable plains; from the woodless plateaus of Quito and Potosi, where the moderate temperature and even the cold of a northern climate are felt at elevations ranging from 8000 to 12,000 feet above the level of the sea, to the low flats of the Orinoco, the Essequibo, and the Amazon, covered with forests which almost exclude the light of day, adorned with all the magnificent foliage of a tropical climate, and swarming with almost endless forms of animal life!

The great plains, called in the native language *Pampas*, and by the Spaniards *Llanos* (levels), may be, in some respects, compared with the prairies of the northern continent and the high levels of the Arkansas. The immense plain which stretches N. W. of the town of Buenos Ayres, and runs south into the unexplored regions of Patagonia, appears to the eye like one dead level, without wood, without a stone, almost without water, in parts covered, during summer, with thistles taller than a man, in other parts clothed with rich grass, which furnishes food for innumerable herds of wild cattle. The enormous pampas of Patagonia, Buenos Ayres, and the more northern province of Tucuman, have been stated, at a guess, to be four times the area of France; and, perhaps, the estimate is not excessive. From the mouth of the Rio de la Plata, the continent of America narrows southward through 20° of latitude, the greater part of it being a country yet little known to Europeans. From about 40° of S. latitude, the country called Patagonia commences on the east coast: though not without some rivers, it appears to have none that run far into the interior; and it is hardly probable that it will offer many inducements for the white man to attempt to establish himself among a warlike race, whose climate and whose soil afford no great encouragement to European settlement. This mighty peninsula of South America, whose northern limits are warmed by the perpetual heats of the tropics, terminates, like the northern portion of the continent, though in a much lower latitude, in a region generally represented as cold and barren. In summer, however, when the north winds blow, the temperature of the island of Tierra del Fuego is moderate; and in some parts of the Straits of Magalhaens vegetation is very active. The Fuchsia and Veronica were found growing in the straits, in the lat. 54° south, 'and in full flower within a very short distance of the base of a mountain, covered for two-thirds down with snow, and with the temperature at 36°.' (Captain King.) But the winds from the south sometimes bring cold even in summer, and the highest mountains, though not more than four or five thousand feet above the sea-level, are covered with snow in summer. A race of men inhabits the islands of Tierra del Fuego, different from those of the higher continent, whose place in the scale of intellectual power is somewhat analogous to the ungenial nature of the southern parts of their islands.

It appears from Captain King's brief remarks on the geography of the Patagonian regions, (*Journal Lond. Geog. Soc.*,) that the immense pampas of Buenos Ayres probably extend south to the eastern banks of the Ancon sin Salida, and the northern shores of the Otway and Skyring waters. For *east* of the Ancon sin Salida, and *north* of the Skyring and Otway waters, no hills are seen; the general nature of the Patagonian coast, from the Rio de la Plata to the entrance of Magalhaen's Strait, is comparatively low, and, as far as we know, it bears the general character of the pampas. It is then probable, that from the wide levels of the Orinoco to the Otway water, a man might travel without crossing a single *mountain*.

The phenomenon of earthquakes is now exhibited in South America with more activity than in any other quarter of the world; nor is North America free from them, though their sphere of action appears to be, perhaps, more limited, and their effects less terrible. The great earthquake which, on March 26, 1812, laid Caracas and La Guayra in ruins, was felt near New Madrid on the Mississippi, where its effects were only less disastrous because the place was less populous. The forest near New Madrid presented, for some years afterwards, 'a singular scene of confusion; the trees standing inclined in every direction, and many having their trunks and branches broken.' (Long's *Exped. to the Rocky Mountains*, iii., p. 184.) These concussions, which are very common about New Madrid, are felt, it is said, from New Orleans to the mouth of the Missouri, and from the settlements on the Red River and the Washita to the Falls of Ohio. They are felt also in the Appalachian system and on the Atlantic slope, though we know of no instance in which any damage has been done. But in South America, earthquakes are matters of ordinary occurrence, though, we believe, they are always within the more immediate sphere of the greater Cordilleras and the detached branch along the northern coast of Venezuela. On the eastern coast of America they seldom occur. It is asserted, that where thunder and lightning are common in South America, as at Potosi, earthquakes are unknown; while at Lima, where thunder and lightning seldom occur, earthquakes are an ordinary occurrence. Whether this generalization is really a safe one may perhaps be doubted, till it is confirmed by further observation.

The climate of South America necessarily varies with the extent of latitude which the continent traverses. The latitude, however, is only one of the causes of the variations of temperature. The extensive and lofty mountain-chain, the highest peaks of which are covered with eternal snow, and the great height of the plateaus, added to the steep descents and great depths of the valleys that belong to the system of the Andes, necessarily produce a great variety of temperature within small distances. The Andes have a curious effect on the distribution of rain in South America. The wide plains on the east are deluged, within the tropics, by the heavy periodical rains from November to May, but the narrow margin between the Cordilleras and the Pacific is almost entirely without rain, at least within the tropics. It is said, however, that this phenomenon is confined to those parts where the mountains come near to the Ocean. In Chili, the north-west winds bring abundance of rain. As to temperature, that of Caracas is in winter, maximum of Fahrenheit 76°, minimum 52°; in summer, maximum 85°, minimum 69°. Chili, also, though bordering upon the torrid zone, never feels the extremity of heat. At Lima, the thermometer varies from 61° to 84°. On the eastern parts of the continent, viz., Buenos Ayres and Monte Video, the weather is wetter, and in the winter months is often boisterous and the air cool, whilst in summer the heat is very great and the thunder-storms often tremendous. The mean temperature of Tierra del Fuego, for the autumnal period of February, March, and April, is 47°; and for the three following months, the winter period, it is 34°. The extensive pampas produce in the dry season an effect not unlike that of the kamsin in the arid regions of Africa and the Arabian desert. In St. Jago del Estero, in the province of the same name, a hot wind has been felt in the summer month of December, which blisters the skin and face, scorches the leaves, and shrivels the bark of trees. (See Temple's *Travels in Peru*, ii., p. 484.)

b. 1. Much new information respecting parts both of the western coast and of the interior of South America, was obtained about the middle of the last century, from the expeditions sent out thither by France and Spain to measure an arc of the meridian. The French expedition was put under the command of Godin, Bouguer, and De la Condamine; and the Spanish, which was to co-operate with it, under that of Don Jorge Juan, and Don Antonio de Ulloa. Both left Europe in the spring of 1735, and the two parties met, as had been arranged, at Carthagena in the course of the summer. It was nearly ten years before their return home; soon after which, ample accounts of their operations and of all they had seen and learned were published in Spanish by Ulloa, and in French both by Bouguer and De la Condamine. Ulloa's book has been translated into English, and the third edition was published at London in 2 vols., 8vo., in 1772, with additions by Mr. John Adams of Waltham Abbey, who had resided many years in South America. It was by far the fullest account of the Province of Quito and the neighbouring districts which had then appeared. Ulloa and his companions had visited in person nearly every part of that province; and they had, besides, been exceedingly industrious in collecting information from all who had any to give. Ulloa, besides crossing the isthmus of Panama, and exploring the greater part of the coast from Panama down to Conception, in Chili, had repeatedly made the journey from Guayaquil to Quito, and had traversed in various directions a great part of the country to the south and north-east of that town.

De la Condamine published the account of the adventures of himself and his associates, first under the title of *Relation Abrégée d'un Voyage fait dans l'Intérieur de l'Amérique Méridionale*, 8vo., Paris, 1745, being the report read before the Academy of Sciences; and afterwards more at length under the title of *Journal du Voyage fait par Ordre du Roi à l'Equateur*, 4to., Paris, 1751. Prefixed to the last-mentioned work is a map of Quito on a large scale, drawn by D'Anville under the direction of the author. In addition to much information respecting the interior of the province of Quito, the French academicians brought home the first complete account that had been given of the course of the Amazons, which they had descended from Quebrada de Chuchunga to its mouth, a distance of a thousand leagues. They ascertained in particular that this river was connected with the Orinoco by the Rio Negro, one of its large northern affluents, a fact which, till then, had been doubted or denied.

But the geography of the upper regions of these two rivers has been recently more completely elucidated by Humboldt and Bonpland, whose examination of this part of South America began in 1799, and did not terminate till 1804. In these five years, after having examined the coast from Cumana to Caraccas, and made various excursions in the neighbourhood of both towns, they penetrated across the great plains to the Rio Apure, down which they sailed to its junction with the Orinoco. They then ascended the Orinoco by its principal branch till they reached the village of San Fernando de Atabipo, at its confluence with the Atabipo and the Guaviare, near lat. 4° N. From this point they sailed up the Atabipo to the mouth of the Rio Temi, which latter they ascended as far as to its junction with the Tuamini, and then to the village of San Antonio de Javita. Here they were detained for some days till their boat was carried across the land to the Pimichin, a tributary of the Rio Negro. Entering the Pimichin, they descended it till it brought them into the Rio Negro, down which they sailed till they reached the mission of San Carlos, a short distance below the mouth of the Cassiquiari channel, by which the Orinoco communicates with the Rio Negro, and through that, as has just been mentioned, with the Amazons. They afterwards returned up the river to the mouth of the Cassiquiari, along which they proceeded to the point of its junction with the Orinoco at Esmeralda, having for the first time completely traced the connexion between the Amazons and the latter. From Esmeralda they sailed down the Orinoco to Angostura, thus retracing part of their former voyage, but also following the river over a much larger portion of its course. From Angostura they proceeded across the country to New Barcelona on the coast. After a visit to Cuba they again returned to the continent, and having landed at the town of Carthagena, proceeded to the Rio Magdalena, which they ascended as far as it was navigable. On leaving the Magdalena they pursued their route to Popayan and Quito, and penetrated southwards as far as Lima, in the course of their journey crossing the Cordillera of the Andes no fewer than five times, and obtaining much new information respecting the upper portions of the river of the Amazons, a part of one of the branches of which they descended, having entered it at a point considerably higher than that where De la Condamine had begun his voyage. From Lima they went by sea to Guayaquil, and thence in the same manner to Acapulco in New Spain. The examination of the town and vicinity of Mexico and the other parts of that interesting region concluded their researches in America, in the course of which, besides large and important accessions to natural history, antiquities, and various other branches of knowledge, the geographical positions that had been determined amounted to nearly seven hundred.

Still further additions to the geography of South America may soon be expected from M. Bonpland, who, having gone out to Buenos Ayres in 1818, two years after undertook a journey to Paraguay, where he was seized and detained by orders of Francia, who had acquired an absolute authority in the province. He has recently, however, obtained his liberty, and is said to have now returned to France. From the opportunities of observation which he has had, we may expect a large addition to our knowledge of the hydrography of the Rio de la Plata, and the natural history of this portion of South America.

In 1817, when the Archduchess of Austria was married to Don Pedro, then Crown Prince of Brazil, Dr. Joh. Bapt. Von Spix, and Dr. C. F. Phil. Von Martius, were sent out in the train of the princess by the King of Bavaria, with instructions to explore some portion of that region of South America. Having landed at Rio de Janeiro, these travellers, after some time, proceeded to the city of San Paulo in the interior, from which they directed their course northwards to Villa Rica, having visited on the way the royal iron-foundries at San João de Ypanema. From Villa Rica they made an excursion to the Coroados Indians on the Rio Xipotó, and also ascended the mountain of Itacolumi in the neighbourhood of the town. They then, after some other excursions, went to the island of St. Louis, and there putting on board ship, arrived after a voyage of six days at Para, near the mouth of the Amazons. From this point they travelled along the bank of the river as far as to Pauxis, five hundred miles up the country, from whence pursuing their route in the same direction, they at length reached the mouth of the Rio Negro. Martius then proceeded up the Japura, till he reached the base of the mountain Arascoara; while Spix, following the main stream, crossed successively the Jurua, the Juratry, and the Iça, and penetrated to Tabatiaga, the last Portuguese settlement, at the mouth of the Jupary. On meeting again, the two returned together down the Amazons to Para. Their explorations, therefore, may be shortly described as having extended in one direction from the 24th degree of south latitude to the equator, and in the other from the mouth of the Amazons to the frontiers of Peru. Spix and Martius brought home extensive and valuable collections in natural history, which have been deposited in a building at Munich, called the Brasilian Museum, erected expressly for their reception.

A great part of the precious metals used in the world are brought from America, and, with the exception of the Mexican mines, almost all from the southern continent. Gold is found in New Granada, Peru, Chili, La Plata, and Brazil, and in North Carolina; and diamonds have been for some time a part of the Brazilian exports. The silver mines in Peru are very rich, and in Chili there are mines of silver, lead, and sulphur; those of copper are still more abundant. There are mines of iron, sulphur, antimony, tin, lead, copper, and quicksilver, in Brazil, but the pursuit of the precious metals appears to have diverted attention from other mining speculations. America also sends to Europe pearls and other precious stones. (See Maltebrun's *Geography*; Humboldt's *Travels*, &c.)

The following statement, from a parliamentary paper, exhibits a remarkable decrease in the supply of the precious metals drawn from America.

Gold and Silver Mines.—Statement of the value sterling of gold and silver raised in each of the several mining countries of America and Russia, in the two periods of twenty years from 1790 to 1809 inclusive, and from 1810 to 1829 inclusive; derived from the returns of British consular agents.

General Abstract, from 1790 *to* 1809

	Gold.	Silver.	Total.
	£.	£.	£.
Mexico . .	4,523,378	94,429,304	98,952,681
Panama . . .	223,518	——	223,518
Chili . . .	863,974	944,736	1,808,710
Buenos Ayres .	1,862,955	19,286,831	21,149,786
Total of America	7,473,825	114,660,870	122,134,695

From 1810 *to* 1829.

	Gold.	Silver.	Total.
	£.	£.	£.
Mexico . .	1,913,075	45,388,729	47,301,804
Panama . . .	23,603	——	23,603
Chili . . .	1,904,514	878,188	2,782,702
Buenos Ayres .	2,161,940	7,895,842	10,057,782
Total of America	6,003,132	54,162,759	60,165,891
Russia . . .	3,703,743	1,502,981	5,206,724
	9,706,875	55,665,740	65,372,615

V. THE MAN OF AMERICA. The native Americans constitute, at the present day, by their physical characters, not less than by their languages, a race different from those known before the discovery of America. The following general description of them has been given. The natives of this part of the world are, in general, of a robust frame and a well-proportioned figure. Their complexion is of bronze, or reddish-copper hue—rusty-coloured, as it were, and not unlike cinnamon. Their hair is black, long, coarse, and shining, but not thickly set on the head. Their beard is thin, and grows in tufts. Their forehead is low, and their eyes are lengthened out, with the outer angles turned up towards the temples; the eyebrows high, the cheek-bones prominent; the nose a little flattened, but well marked; the lips extended, and their teeth closely set and pointed. In their mouth there is an expression of sweetness, which forms a contrast with the harsh character of their countenance. Their head is of a square shape, and their face is broad, without being flat, and tapers towards the chin. Their features, viewed in profile, are prominent, and deeply sculptured. They have a high chest, massy thighs, and arched legs, their feet are generally large, though some have been noticed to have small feet and hands, and their whole body is squat and thick-set. Though the shape of the forehead, and of the vertex, frequently depends on artificial means, yet, independently of the custom which prevails amongst them of disfiguring the heads of infants, there is no other people in the world in whom the frontal bone is so much flattened above; and, generally speaking, the skull is light. Such are said to be the general characteristics of all the nations of America, with the exception, perhaps, of those who occupy its two extremities. The northern Esquimaux, for instance, are below the middle stature; the Abipones, it is said, and still more especially the Patagonians, exceed the ordinary height. This muscular constitution, with a tall figure, is in some degree met with among the natives of Chili, as well as the Caribbeans on the banks of the Caroni, a tributary of the Orinoco, and amongst the Arkansas, who are esteemed the handsomest natives of this continent.

The copper or bronze hue of the skin is, with some slight exceptions, common to almost all the nations of America; upon which the climate, the situation, or the mode of living, appear not to exercise the slightest influence. Some of the tribes in Guiana are described as nearly black, though easily distinguished from the negro. The colour of the natives of Brazil and of California is deep, although the latter inhabit the temperate zone, and the former live near the tropic. The natives of New Spain are darker than the Indians of Quito and New Granada, who inhabit a precisely analogous climate. The nations dispersed to the north of the Rio Gola, are darker than those that border on the kingdom of Guatemala. The Indians who, in the torrid zone, inhabit the most elevated Table Land of the Cordilleras of the Andes, have a complexion as much copper-coloured as those who cultivate the banana under a burning sun, in the narrowest and deepest valleys of the equinoctial regions. The Indians who inhabit the mountains are clothed, and were so long before the conquest, while the Aborigines that wander on the plains of South America are perfectly or nearly naked, and consequently are always exposed to the vertical rays of the sun. These facts show that the colour of the American depends very little on the local situation which he actually occupies; and never, in the same individual, are those parts of the body that are constantly covered, of a fairer colour than those in contact with the air; the infants, moreover, are never white when they are born.

It was formerly supposed that the Americans were without beards, and certainly there are many among them who have neither beard nor hair on any part of their person, except the head. But the Indians who inhabit the torrid zone, and South America, have generally a small beard which becomes longer by shaving, and among the Patagonians there are many who have beards. A late traveller (Temple) asserts that the Chiriguano Indians of the province of Tarija are beardless, without stating any opinion as to this being natural or the effect of plucking out the hair. Almost all the Indians near Mexico, and some on the north-west coast, wear mustachios. An inference has been drawn that the Indians have a larger quantity of beard in proportion to their distance from the equator. The deficiency of beard does not exclusively belong to the Americans, nor is it by any means a certain sign of degeneracy, for some beardless races, such as the negroes of Congo, are very robust, and of colossal size.

These physiological characters, according to some opinions, appear to establish an affinity between the Americans and the Mongol race of Asia, as well as the Malays, and others; but the resemblance does not extend beyond mere colour, and cannot apply to the more essential parts—the cranium, the hair, and the profile. The great number of separate languages proves that a considerable portion of the American tribes have long existed in that savage solitude in which they are still plunged. Dr. Von Martius (*London Geographical Journal*, vol. ii.) has ascertained the names of more than two hundred and fifty tribes, some of them consisting of very small numbers, in the interior of Brazil: many of these numerous sub-divisions are, no doubt, closely related to one another, but the present splitting up of the Brazilian Indians is a curious phenomenon. The want of a common language among so many tribes may be the effect of some great political convulsion, and it is, at the same time, a cause of gradual decay and extinction of races. Traditions, monuments, manners, and customs, seem to indicate some affinity with Asia, but the communications, if any, must have been anterior to the developement of the state of things prevailing in the present day.

In regard to the origin of the Americans, numerous conjectures have been formed. It has been supposed by one writer, that America was peopled from the dispersion of the Israelites—by another, that the Egyptians were the ancestors of the Mexicans—by some, that the Carthaginians—and by others, that the antient Celts, made expeditions to America. Indeed, what theory is there, however absurd, that will not meet with supporters, as long as facts are few and doubtful? Grotius has derived the North American population from the Norwegians, and the theory of the purely Asiatic origin of the Americans has met with numerous supporters, among whom Vater of Berlin, in his discourse on the Languages of America, inserted in Adelung's *Mithridates*, book 3, says it is a demonstrable fact, 'that on the north-west parts of America, in Greenland, and on the coast of Labrador, as also to the west of it, in the vicinity of the Asiatic coast, there dwells a people which is one and the same race with the inhabitants of the north-east coast of Asia, and of the islands lying between the two hemispheres.' This is probable enough, but what does it prove as to the great mass of the American population? In fact, the state of our knowledge is not such as to warrant us in coming to any certain conclusion on the subject. What the real affinity of this race or races of men is to the rest of the great family of mankind, is a question involved in obscurity; and speculation on this subject without a larger collection of facts is not likely to forward the discovery of truth.

America presents, both in the northern and southern continents, traces of the labour of man, which perhaps belong to no race that inhabited the continent at the time of its European discovery. In the valley of the Ohio, and indeed in numerous other parts of the United States, are found mounds of earth, and fortifications undoubtedly of high antiquity. Some of these mounds are overgrown with antient trees, like a part of the primeval forest,—a fact indicating an antiquity of at least many hundred years. The pyramids of Mexico, the remains and the bas-reliefs of Guatemala near Palenque, on the Usumasinta river, and the works of the Peruvian Indians, are, according to some opinions, the work of races anterior to any now existing; but how a more civilized race was compelled to yield to one less advanced, so as to leave no traces but what we see, is a thing rather difficult to comprehend. If we have learnt nothing else from inquiries into the history of man in America, we have learnt at least to reject the unfounded hypothesis of the very recent peopling and formation of that continent. On comparing the most accurate descriptions of the existing natives of widely-separated parts of this continent, we find some most marked differences both in physical appearance, manners, language, and knowledge of the useful arts. Whatever general resemblance we may discover, we find also differences quite as striking. Yet theories and generalizations are formed of the most plausible character, all tending wonderfully to simplify the subject by systematic classifications and general assertions. One, with great self-composure, will reduce all the languages (including those of which we know nothing) to a few great classes; and another again, in two or three sentences, will either elevate to a high point of excellence, or characterize as brutes and unfeeling savages, all the inhabitants of a continent that stretches almost from pole to pole. Ignorance of facts is the only source of all these sweeping assertions. The love of hasty generalization is one of the strong obstacles to knowledge which we of the present day have to guard against; the rapid accumulation of facts within modern times makes every successive writer think he has attained all the elements for forming a complete system. A careful examination of facts, as they rapidly increase, should teach a different lesson.

It is only of late years that the study of the native races of America has been prosecuted in a manner likely to lead either to probable results, or to accurate knowledge of facts, which may perhaps prevent us from coming to any results at all. It is only when the white man has destroyed or debased a large portion of the inhabitants of the New World, that he begins to inquire with more eager interest into the character and history of his predecessors in the possession of the soil. Races of men have undoubtedly disappeared before the civilizing influence of the white man, even in

Europe, and the same process has taken place in the New World, and is now taking place in Van Diemen's land. The white man covets the fertile lands which the native only roams over in pursuit of prey, or partially cultivates; and the process of the occupation of the land when once begun by the European colonist, especially those of the Teutonic stock, is only limited by the nature of the soil and the climate. The native gradually recedes and disappears till the white man has reached the boundaries of agricultural occupation, or till climate arrests his progress. Thus in North America, where the exclusive habits of the white colonist are intolerant of all modes of life but that which he prescribes, the Indian and he are mutual enemies; and the disappearance of the aborigines has regularly continued, till, from the Atlantic to the Appalachian system, scarcely a vestige of the primitive races worth noticing is found; from the Appalachian to the borders of the lower Mississippi the same history is rapidly in progress, and the western limits of the white man's rule must be the rude plains which he cannot cultivate. The Indian has only been preserved in the two Americas where he has mingled with the white man, and partly adopted his habits; or where impenetrable unwholesome forests, or cold inhospitable regions, have protected, or where, as in the case of the Araucanos of Chili, his own courage has saved him from extermination. The islands of the Columbian Archipelago present the singular spectacle of a whole race of people that has disappeared within the limits of recent and authentic history: their place is occupied by the white man of Europe as the master, and the black man of Africa as the slave; and who can say what may be the future revolutions in the history of these new occupants?

The European settlers have been, in North America, principally the British, with a considerable number of French and Spaniards, some Dutch, Swedes, and, especially in the state of Pennsylvania, U. S., a considerable number of Germans; in South America, the Spaniards and Portuguese have been the chief settlers, with some Dutch and English. The particular accounts of the various settlements will be found under the heads of the countries to which they refer.

The population of the western hemisphere has been thus distributed:—

Whites	13,500,000
Indians	8,600,000
Negroes	6,500,000
Mixed races	6,500,000
	35,100,000

and by another computation according to languages, the division is as follows:—

Speaking the English language . .	11,647,000
Spanish	10,174,000
Portuguese	3,740,000
French	1,242,000
Dutch, German, Danish, Swedish, and Russian	216,000
Indian languages	7,543,000
	34,562,000

But these estimates are necessarily very loose, nor is it easy to distinguish exactly the possession of the native tribes. They predominate, in North America, in the territories west of the Mississippi, and possess the vast regions north of the United States, and west of the St. Lawrence: native tribes are also found in Mexico and Guatemala. In South America, they occupy chiefly Patagonia, Tierra del Fuego, the Guianas, Brazil, and many parts of the basins of the Orinoco, Amazon, and La Plata.

V. ZOOLOGY OF AMERICA. The southern portion of this vast continent contains an animal population which is, in a great measure, peculiar, and among its mammals particularly, offers a large variety of forms and characters to which we find no corresponding types among the productions of any other country. In North America, the case is different; a great portion of it is placed under the same parallels, and similar in soil and climate to the corresponding parts of Asia and Europe. It is not surprising, therefore, that it should likewise resemble these continents in its zoological characters; more especially when it is remembered that the opposite shores of Asia and America approach within a short distance of one another at Behring's Straits. All animals which are capable of enduring the rigour of these high latitudes, may probably pass from one continent to the other, either by means of the ice, or by swimming to the different islands interposed between the opposite shores. Thus the common bear, the wolf, the fox, the glutton, the badger, the sable, the ermine, the beaver, the elk, and the rein-deer, are found equally in Sweden, in Siberia, and in northern America; and if a few *species*, such as the bison and musk-ox, appear to be more confined in their geographical range, it is, most probably, owing to particular circumstances: at all events, there is not, perhaps, a single natural *genus* to be found north of the fortieth parallel in one continent which does not equally exist in the other two.

Out of 1346 mammals which have been described and indicated by zoologists, no fewer than 537 species are found in America, whilst Asia, the next richest portion of the earth in the variety of its mammals, contains only 422; Africa, 300; Europe, 180; and Australia, 80. The following table exhibits the peculiar characters of American mammalogy, the manner in which the different orders are distributed with relation to this continent, and the relative proportion which the number of American species bears to the whole number in each order. Indigenous animals alone have been included; the ox, horse, and other domestic quadrupeds, imported by the European colonists, do not properly belong to American zoology.

ORDERS.	Whole No. of known species.	Whole No. of American species.	No. of species peculiar to America.	No. of species common to America and other continents.
I. Quadrumana	186	82	82	0
II. Cheiroptera	192	82	82	0
III. Carnivora	320	140	106	34
IV. Marsupialia	67	18	18	0
V. Rodentia	295	133	126	7
VI. Edentata	23	20	20	0
VII. Pachydermata	30	6	6	0
VIII. Ruminantia	157	30	28	2
IX. Cetacea	76	26	12	4
Total	1346	537	480	57

The peculiar and appropriate characters of American mammalogy are distinctly shown by this Table. Of the 537 species contained in the second column, 57 only, or little more than 1 in 10, extend into Northern Asia and Europe; and if from these we deduct the 14 cetacea and 16 species of seals comprised among the carnivora, which all inhabit the Frozen Ocean, the common northern boundary of these two continents and of America, it will be found that the land animals common to all three are reduced to the comparatively trifling number of 27, not a single species of which extends to the south of the isthmus of Darien. The great majority of them, indeed, belong to the carnivorous furbearing quadrupeds, to the chase of which we are partly indebted for our geographical knowledge of the northern parts of Asia and America. They include the common brown and the Polar bears, the badger, and glutton, the dog, wolf, Arctic and common fox, and two or three other species or varieties, two or three feline animals of the lynx kind, the common weasel, the ermine, the pine martin, and the marine and river otters. The seven rodentia common to the old and new worlds are, the beaver, the common rat and mouse, the common squirrel, the varying or Polar hare, the zizel or souslic marmot, and the common water rat; the two ruminating quadrupeds are the elk and reindeer.

The mammalogy of the extensive continent of South America, at least as far as we are at present acquainted with it, is altogether peculiar. A very few species of *carnivora* and *marsupialia*, indeed, such as the couguar and opossum, extend into the southern parts of the United States; but the *quadrumana*, *edentata*, and *pachydermata*, without exception, and by far the greatest number of species belonging to the other orders, have never passed the isthmus of Darien, and are, consequently, confined exclusively to South America. On the other hand, few of the inhabitants of the northern continent extend into the southern; so that, in this respect, the two portions might almost be viewed as distinct continents. In other respects it is to be observed, and it is, perhaps, the most remarkable feature in American zoology, that, abstracting the *cetacea*, which are aquatic animals, three only out of the eight terrestrial orders have species common to this and other continents; whilst of the remaining five, the American species are exclusively confined to the southern hemisphere.

Among the Mexicans and Peruvians were found the very few domestic animals which existed in America previous to the arrival of Columbus; and even they possessed only the lama and vicunna, or pacos, (*Anchenia lacma* and *vicunna*,) and a small species of lap-dog which they called alco, and which is believed to have resembled the small naked variety at present found in Barbary and the Levant. The lama and pacos were used as beasts of burden, and the long and thick fleece of the latter furnished a rich fine wool, which was manufactured into cloth of a beautiful texture; the flesh of both species supplied an agreeable and wholesome food. The horse, the ass, the ox, the sheep, the goat, and the pig, are all strangers to the New World. Its inhabitants, therefore, in their progress to civilization, deprived of the assistance of these valuable domestics, had to contend with difficulties and to overcome impediments which were utterly unknown to the more fortunate Asiatic. Yet America is not destitute of herbivorous animals, which, in a domestic state, would have vastly contributed to increase the power and resources of the native tribes. Of the thirty ruminating animals, indeed, which are found in America, by far the greater number belong to the deer-kind, which are not well adapted for domestic purposes. Still the bison, (*Bos Americanus*,) the big-horned sheep, (*Ovis montana*,) and the Rocky Mountain goat (*Capra Americana*) would have been most valuable domestics, and have materially improved the condition of the natives. The companions of Cortez found these animals all preserved as curiosities, with the other indigenous animals of the country, in the menageries of Montezuma.

Since the planting of the European colonies and the introduction of the arts and agriculture of civilized life, the domestic animals of the Old World have increased prodigiously in every part of America. In many places they have even regained their pristine state of savage freedom; innumerable herds of wild oxen cover the rich Savannahs of Brazil, Buenos Ayres, and Colombia; and troops of horses, equally wild, are found in every part of the Pampas of South America, and likewise in the high plains of the Arkansas in North America. A nominal property in these wild herds is generally claimed by particular individuals, and they are assembled also at particular periods to be marked and counted; but, in all other respects, they are left to the unrestrained exercise of their natural freedom. The horned cattle are principally valuable for their hide and tallow, which are for the most part shipped to European ports, and constitute two of the staple commodities of South American exportation. From Buenos Ayres and Montevideo alone, as we are assured by Azara, upwards of 800,000 hides are exported annually. The custom of hunting cattle for this purpose is become, in South America, a particular trade, and a native is never considered properly educated till he can throw the lasso, or use the knife with skill and dexterity. For the purpose of procuring hides, it is necessary that a number of horsemen should unite. These arrange themselves in two lines, forming an angle; they then separate a small troop of cattle from the general herd, and press them in upon right and left, whilst the hunter who forms the apex of the angle, with a small semicircular adze which he carries for that purpose, houghs each beast in succession as he comes up with it, till the whole troop are disabled. During all this operation, the hunters are kept at a sharp round gallop, but as soon as they have thus secured a sufficient number of beasts, they return upon their steps, preceded by the same individual who formed the point of the angle before, and whose present duty it is to pith the animals, which he does in a most dexterous manner by a single stroke of a small dagger, whilst his companions who follow him are engaged in flaying the carcass and separating the tallow. When a single beast is wanted, however, for the purposes of the table, it is more usually procured by means of the lasso, which is nothing more than a noose at the end of a long coil of rope, but which, from the unerring certainty with which it is thrown, becomes a most formidable weapon in the hands of the South Americans. The other end of the rope is secured to the saddle, or girths, of the rider, and in this way he will gallop for miles, dragging a wild ox behind him.

In the immense Pampas of South America, there are numerous troops of wild horses, which, though of less importance than the horned cattle, are not without their uses to the inhabitants; in fact, they furnish the only means of crossing these extensive plains, and, consequently, of communicating with the neighbouring countries. The traveller and his guide set off on horseback, driving a wild troop of these animals at full gallop before them: when one beast is exhausted, another is secured by means of the lasso, the saddle is changed, the rider mounts and continues his journey, repeating the same operation as often as requisite till he arrives at his station for the night; here he obtains a fresh troop, and in this manner will travel for many days in succession, at the rate of 100 or 120 miles a-day. Much curious information concerning this mode of travelling, as well as on other subjects connected with South America, may be found in Captain Head's *Rough Notes of a Journey across the Pampas*, and also in Temple's *Peru*. Azara informs us, that the Indians of the Pampas are very partial to horse-flesh, and Mr. Ross Cox, in his late valuable account of the Colombia River, assures us that not the Indians alone, but likewise the European fur-traders who annually ascend that river, depend for their subsistence chiefly upon horse-flesh, and that to procure 'horses for the kettle,' they are often obliged to give an extravagant price, and sometimes even to sacrifice the animals which are necessary for the transport of their merchandise.

The ass, the sheep, the goat, and the hog were likewise introduced into America, both north and south, by the early European colonists; with the exception of the hog in the United States, they have not increased in the same proportion as the horse and ox. The ass is principally employed in the old Spanish and Portuguese settlements for the purpose of breeding mules, which are universally employed in transporting the precious metals, and possess all the wonderful sagacity in discovering and avoiding danger, and all the security of foot, which have, in all ages of the world, rendered this animal so valuable in mountainous countries.

Of wild indigenous animals, as has been already observed, America contains a prodigious variety, many of which are altogether peculiar, and others present types of organic structure to which we find no analogous forms in any other quarter of the world. Among these the quadrumanes, or American monkeys, are not the least singular. They are called monkeys, it is true, because the original discoverers of the country were ignorant of a more appropriate term by which to designate them, and because they bear a greater resemblance to the animals of the old world, properly so denominated, than to any other beings; but so entirely distinct are they from these animals in their zoological characters and functions, that they not only belong to different species, but even to different natural genera. Those of Africa and Asia have completely opposable thumbs on the fore-feet, as well as on the hind; they have universally ten molar-teeth in each jaw, as in man, and are generally provided with cheek-pouches and naked callosities: the American simia, on the contrary, are always destitute of the two latter organs; they have universally twelve molar-teeth in each jaw, and the thumbs of their fore-hands are, more properly speaking, versatile, or capable of occasional opposition, than habitually opposed to the other fingers. One extensive genus (*Ateles*) is absolutely destitute of thumb altogether, and the great majority of the species are provided with a prehensile power in the tail, which converts this organ into an actual fifth limb, and enables the animals to rest suspended from the branches, or swing from tree to tree with an ease and velocity which are truly surprising. Other species are destitute of this prehensile power in the tail, but exhibit all the other characters of the American quadrumanes in general.

Compared with the apes and monkeys of the Old World, the sapajous and sakis of America are certainly an inferior race of beings. In no instance do they exhibit the close proximity to man, which we observe in the orang-outang and chimpanzee; and their inferior links acquire the lengthened muzzle and slanting incisors, which approximate them to the lemurs and other inferior animals. All are remarkable for the gentleness of their disposition and the docility of their character, equally opposed to the ferocious nature of the baboons, and the restless petulance and ceaseless curiosity of the monkeys, properly so called. Their habitat is entirely confined to the tropical forests of South America, which resound at the rising and setting of the sun to the loud drum-like voice of the alwatas, or preaching monkeys, (*Mycetes*.) the hoarse-cry of the *Ateles*, and the shrill, piping voice of the sajous (*Ceous*). All these genera are remarkable for the prehensile power of their tails. Of those which are destitute of this faculty, the saïmiris (*Callithrix*) are distinguished by the smallness of their size, the elegance of their forms, the gracefulness and rapidity of their motions, and their gentle and playful disposition. The sakis (*Pithecia*) again join the general organization of the quadrumanes to the projecting snout and bushy tail of the fox, whilst the douroncouli (*Nocthores*) has the nocturnal manners and tardy pace of the slow lemurs (*Nycticebi*) of Asia, and appears to be the only representative of these animals in the western hemisphere. All these animals are sought after and eaten with avidity by the free Indians; and even Europeans, who have overcome their prejudices so far as to partake of the flesh, report it to be tender and agreeable.

Of the cheiroptera, winged mammals, or bats, peculiar to America, the most remarkable are the vampires, (*Phyllostoma*,) which are of a large size, and live upon blood, which they suck from men and animals while asleep, by the assistance of their long-projectile tongues and lips, furnished at the point and on the edges with a number of papillæ disposed for that purpose. As their bite is usually in the foot, and never creates pain sufficiently sharp to awaken the person attacked, it not unfrequently proves fatal from excessive hemorrhage: the vampires are, consequently, much dreaded by the inhabitants, and every precaution is used to guard against their attacks. Happily, they are by no means numerous, and are confined to the moist, tropical climates of Guiana, Colombia, and Brazil. No species of the roassettes (*Pteropus*) or frugivorous bats exists in America: in other respects the cheiroptera of this hemisphere differ in no essential characters from those of the Old World.

America is extremely rich in the variety of its carnivorous mammals. Of 320 species belonging to this order, America contains no fewer than 140, or seven-sixteenths of the whole, and of these the great majority, as has been already observed, are altogether peculiar to this continent. Those which are common to the northern latitudes of America, and the corresponding pars of Asia and Europe, have been already noticed. Of the others, the most remarkable are the grizly bear of the Rocky Mountains, (*Ursus ferox*,) the largest and most ferocious species of this genus. The spectacled bear, (*Ursus ornatus*,) a species but recently described, though it is mentioned by all the older writers on South America, inhabits the chain of the Andes, and is of a smaller size, and less carnivorous propensity. The common bear, (*Ursus arctos*,) the black bear, (*U. Americanus*,) with its variety the cinnamon bear of Hudson's Bay, and the white or Polar bear, (*U. maritimus*,) inhabit the northern parts of the continent, and are hunted by the fur traders for the sake of their pelt. The racoons, (*Procyon*,) the coatimondis, (*Nasua*,) and the kinkajou, (*Cercoleptes*,) are three small genera of carnivorous mammals peculiar to the southern states of the North American Union, and to the continent of South America; the latter is remarkable as being the only genus of carnivora provided with a prehensile tail; it is also found in Jamaica, and other West Indian islands. The mouffettes, (*Mephitis*,) are likewise a genus peculiar to the New World. Of the genus *canis*, or dog kind, America possesses eighteen or twenty different species, of which twelve or fourteen are peculiar. Besides the prairie wolf, (*Canis latrans*,) the Mexican wolf, (*C. Mexicanus*,) and the maned wolf, (*C. jubatus*,) these comprise many beautiful species and varieties of foxes, of which the fur is of great value in a commercial point of view. The species most valued on this account are the arctic fox, (*C. lagopus*,) with its blue variety, (*C. fuliginosus*,) the common American fox, (*C. fulvus*,) the cross fox, (*C. decussatus*,) the black, or silver fox, (*C. argentatus*,) and the kit fox, (*C. cinereo-argentatus*,) the smallest American species of this genus. The civets, paradoxures, ichneumons, suricats, and hyænas of the Old World, have no representatives in America. Of the cat kind, (*Felis*,) however, this continent contains numerous species, all equally remarkable, like their congeners of the Old World, for the beauty and diversity of their colours, and the treachery of their disposition. The jaguar (*F. onça*) nearly equals the Asiatic tiger in size and ferocity; it is confined to South America. The couguar, or puma, (*F. discolor*,) on the contrary, is occasionally met with in the southern states of the Union, and has even been known to stray as far north as Canada. This animal is often, though very improperly, called the American lion. The ocelot, (*F. pardalis*,) the margay, (*F. tigrina*,) and numerous other smaller species, are chiefly distinguished by the beauty and variety of their colours. The lynxes, distinguished from the other cats by their shorter tails and pencilled ears, are the only species of the whole genus which are valuable in a commercial point of view; and of these, the northern and western parts of America contain three or four distinct species, all of which furnish a long, thick, and valuable fur.

Though Australia appears to be the head-quarters of the marsupial mammals, one extensive genus, (*Didelphys*,) and a smaller one, (*Cheironectes*,) containing at present but a single species, are nevertheless peculiar to South America, and this coincidence in the zoology of two such distant continents, of which the productions of one, in particular, are at once so limited and so peculiar, is perhaps one of the most extraordinary circumstances in the whole geographical distribution of mammals. The distinguishing character of the marsupials, as such, consists in the abdominal pouch with which the females are provided, and in which the young are deposited at a period long prior to their complete developement. The opossums (*Didelphys*) and yapocks (*Cheironectes*) are further remarkable for their prehensile tails and opposable hind-thumbs. The first of these genera contains a great variety of species, which offer nothing remarkable; with the exception of the Virginian opossum, (*D. Virginiana*,) they are all confined to South America: the second genus, on the contrary, contains but a single species, the yapock, (*C. Palmata*,) one of the most singular and anomalous animals in existence: this little animal inhabits the rivers of Brazil and Guiana.

Among the rodentia, the continent of America is particularly rich in those tribes which have been found serviceable in the economy of human life. The beaver (*Castor*) is now almost exclusively confined to Canada and the north-west districts of America. Even here, however, their numbers are daily diminishing. In the year 1743, the imports of beaver skins into the ports of London and Rochelle exceeded 150,000; in the year 1827, the whole import, though from four times the extent of fur country known in 1743, only amounted to 50,000. The musquash, ondatra, (*Arvicola zibethicus*,) or musk beaver, as it is sometimes called, is a little animal resembling the beaver in its social habits, as well as in the fineness of its fur, which is equally used in the manufacture of hats. It inhabits all the rivers and streams of Canada, and, like the beaver, builds a hut to protect it from the severity of the winter. Between 400,000 and 500,000 skins of this animal are annually imported from Canada. The coypou (*Myopotamus*) is an animal closely resembling the beaver in size, quality of fur, and general organization, but its tail is round instead of flat, and it does not form the societies nor construct the residence for which the latter species is so well known. It seems, nevertheless, to represent this species in the rivers and lakes of South America, from whence its fur is brought under the improper name of Racoönda. The chinchilla is another animal of South America, remarkable for the beautiful, soft, and rich texture of its dark ash-coloured fur. It is a small species, about the size of a guinea-pig; inhabits Peru, Chili, and Buenos Ayres, and resides in deep burrows, which it constructs beneath the surface of the earth. Of the hare genus, (*Lepus*,) America contains five or six distinct species, one of which, recently discovered, (*L. Californica*,) is remarkable for the brilliant white colour of its long ears, and the rich ashy-brown of its fur. But the cavy family, comprising the agoutis, (*Chrysochloris*,) the pacas, (*Cœlogenys*,) the capybaras, (*Hydrochærus*,) and the cobayes, or guinea-pigs, (*Anæma*,) forms indisputably the most distinguishing and characteristic feature in this department of American zoology. These animals are peculiar to America, and for the most part, to the southern continent: the common agouti, however, extends into Carolina, and with the racoon and houtias, (*Capromys*,) constituted the largest mammals indigenous to St. Domingo, Jamaica, and the West Indian isles. The last-mentioned genus has been but lately discovered: it is composed of arboreal animals, as far as at present known, peculiar to the island of Cuba. The coendoos, or prehensile-tailed porcupines, (*Synetheres*,) are likewise peculiar to the American continent, and are not the least singular of its productions. The urson (*Hystrix dorsata*) inhabits the United States and Canada, and is the only species of porcupine, properly so called, which appears to have the power of climbing trees.

But of all other tribes of mammals, the edentata are those which are most especially characteristic of the zoology of America. Of twenty-three species, and seven genera, which compose this singular order of animals, no fewer than twenty species and five genera are exclusively confined to South America. These genera are the aï and sloths, (*Bradypus* and *Acheus*,) the armadillos, (*Dasypus*,) the chlamyphores, (*Chlamyphorus*,) and the ant-eaters, (*Myrmecophaga*.) Of the two remaining genera, the aardvark (*Orycteropus*) inhabits the Cape of Good Hope, and the pangolins (*Manis*) are distributed over the continents of Asia and Africa: the former contains but one, the latter two species. The genus *Chlamyphorus* contains but a single species, (*C. truncatus*,) which inhabits Chili, and lives almost entirely beneath the surface of the earth. The anteaters (*Myrmecophaga*) are entirely destitute of teeth, and, as their name imports, live exclusively upon ants, which they catch by means of their long, cylindrical tongues, covered with a glutinous saliva. The great ant-bear (*M. jubata*) is as large as a good-sized dog, and though destitute of teeth, and slow of foot, defends himself with courage and success, by means of his large and powerful claws, even from the attacks of the jaguar. The small species, (*M. didactyla*,) about the size of a rat, has a prehensile tail, and resides entirely in trees. There is also a third species of intermediate size, (*M. tamandua*,) which is likewise said to ascend trees, though it is without the prehensile power in the tail.

America is as remarkable for its poverty in pachydermatous mammals, as for its richness in edentata, and this is another most singular character in its zoological productions. The order *Pachydermata* contains nine existing genera, and thirty species; yet, of all these, only a single genus and four species are peculiar to America, for two of the six species mentioned in the table are doubtful, and rest upon very slender authority. The elephant, the hippopotamus, and the rhinoceros, have no existing representatives in this continent: of the tapirs, (*Tapirus*,) there are two American species, the common tapir, (*T. Americanus*,) and a new species recently discovered in the Andes, but not yet sufficiently known. We have already mentioned, that no species of the horse kind (*Equus*) is indigenous to America; the hogs, however, are represented by the closely-allied, though distinct genus of peccaries, (*Dicotyles*,) which contains two species, (*D. torquatus*, and *D. labiatus*,) both peculiar to this continent. These animals are gregarious, and inhabit the primeval forests of South America, living entirely upon vegetable substances, and uniting to defend themselves from the attacks of beasts of prey.

Out of 157 species of ruminating quadrupeds, thirty only are found in America; and of these, only five species belong to the hollow-horned family. Two of these, the bison and musk-ox, belong to the genus *Bos;* the big-horned sheep, (*O. montana*,) to the genus *Ovis;* the rocky mountain-goat, (*C. Americana*,) to the genus *Capra;* and the fifth, called cabree by the natives, has been generally referred to the antelopes, though it differs essentially, in many important characters, from all the other known species of that genus. The Rocky Mountain goat is remarkable for its long white hair, of a fine silky texture, finer even than that of the shawl-goat of Cashmere and Thibet, and which, if procured in sufficient quantity, would form a most valuable article of commerce and manufacture. All these species inhabit North America. The only ruminating animals which are found in the southern continent, exclusive of the lamas already mentioned, are various species of deer, which are remarkable only for replacing all other genera of ruminants in this extensive portion of the globe. North America likewise possesses many species of this genus, some of which, as the wapati, (*Cervus Canadensis*,) the elk, (*C. alces*,) and the rein-deer, (*C. tarandus*,) attain a very considerable size. The latter species is still found in numerous troops in the interior of Newfoundland, in the north-west territory, and as far north as Greenland, and the islands of the Frozen Ocean.

Of the cetacea, or whale kind, a great variety are found along the shores of America, particularly in high northern and southern latitudes. The most useful and remarkable are the common whale, (*Balæna mysticetus*,) the spermaceti whale, (*Physeter macrocephale*,) and the narwhale, (*Monodon monoceros*.) The *Manatee*, one of the two species of herbivorous cetacea of the genus *Lamantin*, which are found both in South America and Africa, is mentioned in our notice of the river Amazon.

Of American ornithology, we can undertake to give but a very limited account. We shall therefore confine our selves to those tribes which are most serviceable in an economical point of view, or most characteristic of the zoology of the country. Rapacious birds are here as numerous as in other parts of the earth, and of a great many different species, as well of vultures as of owls, hawks, and eagles. The condor of the Andes (*Vultur gryphus*) is the largest bird of prey known; and the king of the vultures (*V. papa*) is remarkable for the variety of its colours, and the bright tints of blue and vermilion which mark its naked head and neck. Among the incessores, the most characteristic of American zoology are the humming-birds, (*Trochilus*,) remarkable alike for their diminutive size, and the brilliant metallic lustre of their plumage. These singularly beautiful little animals, of which there are upwards of 150 different species, varying from the size of a common wren to that of an humble bee, are principally found in the tropical regions of Brazil and Guiana; but extend also into the United States, beyond 38° North, and were found by Captain King even in the latitude of 55° South, in the Straits of Magalhaens. (See *Lond. Geog. Journal*, vol. i. p. 169.) America abounds in birds of the order of scansores. Maccaws, parrots, and parroquets, swarm in all the forests; and the singular and beautiful genera of *Toucans* (*Rhamphastos*) and couroucous (*Trogon*) are peculiar to the tropical forests of this continent. Of rasores, or gallinaceous birds, it also contains an abundant supply, though of a family essentially different from that which inhabits the woods of India and China, which have supplied us with the common fowl, the peacock, and the pheasant. These useful and important genera have no representatives among the indigenous birds of America, but their place is well supplied by the turkeys, (*Meleagris*,) the courasous, (*Alector*,) and the guans, (*Penelope*,) all of which have been reduced to a state of domestication, and people the farm-yards of different parts of America. Except the common turkey, which we originally received from Virginia, and not from the Levant, as the name erroneously implies, all these species are confined to South America; the northern portion of the continent abounds more particularly in the grouse (*Tetrao*) and partridge (*Perdrix*) families. Vast flights of pigeons also migrate periodically to different parts of the northern continent, frequently extending for many miles on each side, darkening the entire atmosphere, and often requiring four or five days to pass over a particular place.

The American ostrich (*Struthio rhea*) is much smaller than the African species, from which it is further distinguished by having three toes completely developed on each foot. It is found principally on the pampas or plains of Buenos Ayres, and Patagonia, from the banks of the Amazon to the straits of Magalhaens. There are no bustards (*Otis*) in this part of the world, but the agami, or trumpet bird, (*Psophia*,) the cariama, (*Dicholophus*,) the jabiru, (*Mycteria*,) the jacauas, (*Parra*,) and the kamichi, (*Palamedea*,) are genera altogether peculiar to America, and are the most remarkable grallatores, or wading birds of the New World. The scarlet ibis (*Ibis ruber*) and the American flamingo (*Phœnicopterus Americanus*) are characterized by the uniform deep scarlet colour of their plumage. Of aquatic, or swimming birds, (*Anseres*,) this continent likewise contains an abundant supply, and possesses specimens of all the different genera which inhabit the Old World. There is, however, nothing peculiar in this part of American ornithology; and indeed, the order of anseres, from the peculiar nature of their organization, which enables them either to walk, swim, or fly, as the occasion may require, are more equally and universally distributed over every part of the earth, than any other group of animals.

The reptiles of America are numerous, and often important, even in an economical point of view, though like the generality of this class in other parts of the world, the great majority of them are absolutely useless, and some dangerous. Among the former, the principal is the turtle, (*Testudo mydas*.) This animal resorts yearly to the islands and shores of the Orinoco, and other large rivers of tropical America, and also to the shore of the islands in the Columbian Archipelago, to deposit its eggs, which it buries by thousands in the sand, and which are eagerly sought after by the Indians who annually resort to these haunts of the turtle for the purpose of procuring them. Three or four species of alligators likewise inhabit the rivers of the American continent, and the large islands of the West Indian group contain a species which is closely allied to the common crocodile of Egypt. The agamas supply in America the place of the chameleon, and the iguanas furnish a white and tender food. Brazil produces a species of reptile (*Bipes cariococca*) which is destitute of fore legs; and Mexico contains another (*cheirotes*) which is entirely deprived of the hind. Among the serpents, the genus boa is peculiar to America: the great serpents of India and Africa are erroneously classed amongst this genus. It contains many different species, the principal of which are the boa constrictor, the anaconda, (*Boa scytale*,) and the aboma, (*Boa cenchris*.) They chiefly inhabit the swamps and inundated fens of the tropical parts of South America. The rattle-snakes (*Crotalus*) are likewise a genus exclusively American, and particularly formidable on account of the deadly venom of their bite. There are also four or five different species of this genus, all of which reach the length of five or six feet: the common species of the United States is extremely numerous about the sources of the Columbia river. Among the frogs and toads, the most remarkable are the great bull-frog of North America, (*Rana mugiens*,) whose croaking may be heard at more than a mile's distance, and the *Rana pipa* of Surinam, which hatches its spawn in certain cells with which the skin of the back is provided for that purpose, and which are inhabited by the young during their tadpole state. Finally, the hellbender of the Americans, (*Salamandra gigantica*,) the *amphiuma*, the axolotl of the Mexicans, (*Siren pisciformis*,) and the sirens, properly so called, compose genera exclusively American, and unite by their structure and habits the frogs and reptiles with the eels and cartilaginous fish.

It is impossible for us to enter into any details concerning the ichthyology of this, or indeed any other continent. The species and varieties of fish are so numerous, and so similar in all quarters of the globe, that their geographical distribution is more uniform than that of most other classes. The various fresh-water species of Europe have their representatives in the rivers and lakes of the New World; and the marine tribes which frequent the coasts of America are little different from those of our own shores. The species, indeed, may be distinct, but the generic forms and characters are invariably the same, or differ only in trifling circumstances. The common cod is in every sense the most important and valuable fish that frequents the American shores. The great sand-banks off the islands of Newfoundland and Cape Breton annually attract myriads of this species to feed upon the worms which it produces; and hither, as is well known, the ships of England, France, and America resort yearly during the fishing season.

Of the insect tribes in America, the mosquitos, though of most diminutive size, are unquestionably the greatest scourge of the moist tropical countries, and even of many parts included in the temperate zone. So great an annoyance are these persevering torments in Venezuela and along the banks of the Orinoco, that the first question which acquaintances ask upon meeting of a morning is, generally, 'How were the flies last night?' and the missionaries who have the misfortune to be sent into the interior where these insects are particularly numerous, are locally said to be delivered up to the mosquitos. The chigoe is another insect which inhabits the same localities, and is scarcely less to be dreaded than the mosquito. Centipedes of various kinds likewise abound in America; and the white ants and termites are as troublesome and as destructive as their congeners of Africa and India.

VI. BOTANY OF AMERICA.—The climate and soil of this extensive continent are so varied by its extensive mountain-ranges, rivers, and forests, and by its diversified geographical position, that it would be in vain to attempt an account of its vegetable productions in any other way than by following them in their changes from the stunted flora of the north to the splendid scenery of the equatorial regions, and thence southwards as diminished temperature and its attendant circumstances again successively reduce the plants to a condition at the southern extremity in many respects analogous to that of the arctic circle.

If we contemplate the surface of this part of the world with reference to those circumstances which produce the greatest effect upon vegetation, by the diversity of climate that they occasion, we shall find that its mountain-ranges, those eternal and stupendous obstacles, by means of which Nature had cut off all communication between contiguous lands, until the hardihood and skill of man succeeded in overcoming them—called the Rocky Mountains in the north, and the Cordilleras in all those countries to the south which once owned the dominion of Spain, form what may not unaptly be called a back-bone to the whole continent, dividing it from Patagonia to the Mackenzie River into two portions of nearly equal length but very unequal breadth, the eastern being many times wider than the western, which is comparatively little more than a line of coast.

The vegetable productions of the two sides of this dividing line are so exceedingly different, that it will be indispensable to notice them separately.

The most northern station in which vegetation has been discovered, is Melville Island, 74° 50′ N. lat. Of this desolate region a very accurate account has been drawn up from the materials collected by the officers attending Captain Parry, and from it we learn, that although the mean temperature of the year is 1° to 2° below zero; and that of July, even on shipboard, where it may be supposed to be influenced materially by the fires that are constantly burning, but little more than 42°; yet that a considerable number of species are able to maintain an existence. These, however, are all of a very humble growth, the principal part consisting of saxifrages, grasses, cruciform plants, mosses, and lichens; not a tree or even a bush is able to rear its head, nor, indeed, is there a single plant of woody structure, except a little willow, (*Salix arctica*,) which rises six inches high. It is in these latitudes that the red snow-plant (*Protococcus nivalis*) that most simple of cryptogamic vegetables, exists in all its beauty, multiplying even among the snow itself, which it stains with crimson patches of considerable size.

In this part of the flora a decided similarity exists to the plants of the same latitudes in Europe and Asia; in many instances the species are distinct, but the general character of the vegetation is that of the Arctic Circle in the Old World. Even as we advance southward the features of the country are like those of Norway; vast forests of spruce firs, (*Abies alba* and *nigra*,) among which grow the reindeer moss and other lichens of Lapland, overspread the land. To these are added different kinds of wild currants, gooseberries, whortleberries, and a shrub extremely similar to the Gueldres rose of our own marshes (*Viburnum oxycoccus*), strawberries, and a variety of papilionaceous plants which abound in the open plains. With these are combined, as we continue to advance, the majestic poplars of Canada, (*Populus hudsonica*, and others,) birches, (*Betula papyracea*, and *populifolia*,) and many sorts of oaks and ashes, together with butter nuts (*Juglans cinerea*) and hickories (*Carya alba* and *amara*.)

It would be entering into a far more elaborate view of this subject than the limits of this work will admit, if we were to attempt to trace such changes with any kind of precision; all we can do is, having now pointed out the fact of a gradual change in the face of vegetation, to proceed to notice the great and distinctive features of other American districts, still confining ourselves to the eastern side of the continent.

We will suppose that we have arrived at the frontier of the British possessions in North America, where the sugar maple (*Acer saccharinum*) pours forth its saccharine juice at the first arrival of warm weather, even before the snows have had time to melt; the azalias add their gay and fragrant blossoms to the beauty of the opening summer; while the autumn is closed by the appearance of many kinds of asters, which stud the woods and meadows with their white or violet starry flower-heads. At this point wheat and other kinds of grain with maize are successfully cultivated, and even tobacco, such is the degree of summer-heat, is a common field-crop.

In the United States the great features of the North American flora are at length assumed. The forests consist of pines and larches unknown in Europe, of many kinds of oaks, of locust-trees, (*Robinia pseudo-acacia*,) black walnuts of enormous size, hickories, and ashes; among which the noble tulip-tree rears its towering head: in the swamps grow the deciduous cypress, (*Taxodium distichum*,) the white cedar, (*Cupressus thyoides*,) certain fir-trees, (*Pinus serotina* and *Abies pendula*,) the rhododendron, the glaucous kalmia, andromedas, sarracennias, and the glaucous magnolia; the sides of the mountains and hills are covered with the American arbor vitæ, magnolias, and hemlock spruces, among which spring up the arborescent azalea, the sorrel-tree, (*Andromeda arborea,*) and the beautiful mountain laurel (*Kalmia latifolia*); and, finally, the undergrowth of the woods and plains contains endless species of aster, several kinds of azalea and asclepias, dwarf pyrus, and various species of the exclusively American genera, liatris, phlox, gerardia, calycanthus, &c. Tobacco, maize, and wheat, are the staple objects of cultivation.

The approach to a tropical climate is first indicated by fields of cotton and rice, which on the Atlantic side commence at no point that can be definitely fixed, but *generally* may be said to begin south of Virginia. As we advance westward, towards the Mississippi, and cross that river, we experience a climate with a mean temperature, less than the parts on the Atlantic coast under the parallel. The line of tropical vegetation, therefore, does not advance so far to the north in the western parts, as on the Atlantic coast. (See Darby's *Geography of the United States.*) These southern countries, the climate of which is increased in heat and humidity far beyond that of corresponding latitudes in other parts of the world, present a complete mixture of the vegetable productions of Mexico and the northern states. Along with the principal part of the plants of Virginia and Kentucky, we have not only the cotton, the indigo, and the sugar-cane, as common articles of cultivation, but the planes and the deciduous cypress acquire gigantic dimensions. A solitary epidendrum inhabits the branches of the magnolia near Savannah. In the same neighbourhood is found the *Pinckneya*, a plant closely allied to the jesuit's bark of northern Peru; and the woods are filled throughout the Floridas, Carolinas, Alabama, and on the banks of the Mississippi, with dense masses of the tropical *Tillandsia usneoides*, which hangs from the branches of the trees like gigantic moss.

In southern Mexico we enter the tropics; and in all the valleys and plains where the temperature is not lowered by interrupting causes, the usual vegetation of such latitudes occurs. Palms, bananas, and plantains, and yams, yield the natives an abundant supply of food, which, produced without labour, and amply sufficient for their simple habits, oppose the greatest of all bars to the advancement of knowledge, or the excitement of industry among them. Habitually indolent, rendered still more so by the numerous holidays prescribed by his religion, and finding a few square yards of ground, which hardly requires tillage, capable of producing plantains and tobacco enough for his consumption, the Mexico-Spanish peasant is incapable of understanding the advantages of a life of industry, or the use of those active habits which alone are capable of raising him to the condition of truly civilized man. Besides these and the other common articles of cultivation by the inhabitant of the tropics, such as indigo, coffee, sugar-cane and maize, which here finds its native home, the cocoa-tree (*Theobroma cacao*), from whose seeds chocolate is prepared, is a most important species; the exportation of the seeds of this plant, which is found wild in the most burning districts, is valued at near 80,000*l.* sterling annually. Pine-apples are wild in the woods; the American aloe (*agave Americana*) yields, when wounded, an abundance of sweet fluid which is fermented into an intoxicating drink called *pulque*, and distilled into an ardent spirit known by the name of Vino Mercal; and great numbers of cacti occupy the dry and almost earthless situations, where little else will grow. In the low woods of Honduras are found those enormous forests which, since they have been wrested from the Spaniards, have been productive of such important commercial advantages to England from the abundance of mahogany and logwood-trees they contain. It is here also that the tamarind and the lignum vitæ (*Guaiacum officinale*) are found; the vanilla, whose pods are extensively used in Spain, Italy, and France, and the jalap convolvulus, which derives its name from the city of Xalapa, near which it principally abounds.

But in the highlands of Mexico, all this glorious vegetation disappears; the eatable-rooted nasturtium (*Tropæolum esculentum*) and the tuberous wood-sorrel (*Oxalis tuberosa*) supply the place of the yam; mahogany-trees give way to oaks, and to the singular hand-tree, (*Cheirostemon,*) the five united stamens of whose flowers are disposed like the talons of a bird of prey; while the pine tribe finds its most southern limits, and the herbage is composed of genera either resembling or identical with those of the more northern regions.

In the lower parts of these highlands the vegetation of course is more nearly the same as that of the plains, but in many places it exhibits a striking combination of the two, as, for example, near Xalapa, where the woods contain great numbers of oaks, the stems of which are covered with a host of orchideæ, peppers, and ferns.

In many respects the West Indies resemble the tropical parts of Mexico; the plants are either naturally the same, or have become so by importation from one shore to the other, or at least have a general resemblance, the principal difference being caused by the greater humidity of the atmosphere of the West India Islands in consequence of their insular position. Thus in the whole flora epiphytal orchideæ and ferns, especially of the arborescent kind, are more abundant; certain fruit trees are in many cases more luxuriant, and more generally cultivated, as the avocado pear (*Laurus persea*), the mango, the custard-apple (*anona squamosa*), and the guava (*psidium*); and it is said that the cabbage-palm attains the height of 200 feet. Coffee is an article of general and advantageous growth, and the tobacco of Cuba is only equalled by that of Persia and of some parts of the Burmese empire. Cloves are becoming generally cultivated; allspice (*Myrtus pimenta*) is a common tree on the hills; and in some of the islands, the nutmeg, imported from the East Indies, is thriving prodigiously, and latterly beginning to yield a crop. Aloe trees are cultivated in Jamaica and Barbadoes for the sake of their inspissated juice. [See ALOE.] Mandioc and yams are the common food of the negroes, along with plantains and rice; and a kind of arum (*Caladium esculentum*) is used at table as spinach is with us. Considering the number of degrees of latitude over which the West Indies extend, it is impossible to give any general account of their plants which will be true of all of them; it must therefore be borne in mind, that in general their flora agrees with that of the continent in the same latitude over against which they lie.

In all the remainder of eastern tropical America similar characters of vegetation are found. Where the air is dry and hot, the plants assume a parched and stunted character; but wherever, as is usually the case, there is a perfect combination of heat and moisture, the grandeur of the trees and the beauty of the flowers is beyond description. But the genera and species gradually change as we recede southward from the line. In those provinces to the north of the line, which, under the name of Cumana and the two Guianas, form a sort of crest to the equatorial region, the land beyond the limits of cultivation is overspread by impervious forests, which, in the language of an eye-witness and a botanist, are so completely choked up by huge twiners, spiny shrubs, and sharp-edged grasses, that a hatchet is necessary at every step to clear the way. It is here, however, that the quassia bitter, the fragrant tonga bean, which is so much employed for perfuming snuff, and the rose-wood, are produced. Cannon-ball trees (*Lecythis*) drop their monstrous fruits in these forests, and furnish the numerous monkeys with a ceaseless store of amusement; and arborescent species of the cinchona tribe (*Portlandia*, &c.) furnish medicinal barks scarcely inferior to that of Peru.

In Brazil the country is more open, and the scenery is consequently more diversified; besides which, it may be easily conceived that many most striking changes would occur in twenty-three degrees of latitude. A notion of its average state may be obtained from a consideration of the plants of the almost central province of Minas Geraes, an account of which, by M. Auguste de St. Hilaire, gives us many facts relating to the state of its vegetation before it became altered by the inroads of the Portuguese settlers.

The whole face of Brazil may be said to be divided into forests, deciduous stunted woods, and immense plains, to each of which a peculiar vegetation appertains.

When a European arrives in South America, there is nothing that produces so striking an impression upon him as the general resemblance that he perceives between the external aspect of the forests of the New World and those which he has left behind; a little more grandeur in the proportions, and a deeper green, together with a clear and brilliant sky, constitute the principal difference in the two scenes. To see the full beauty of an equinoctial forest, it is necessary for the traveller to bury himself in its deep recesses; and there, indeed, instead of the fatiguing monotony of our European oaks and firs, every tree has a character of its own, each has its peculiar foliage, and probably also a tint unlike that of the trees which surround it. Gigantic vegetables of the most different families intermix their branches; five-leaved bignonias grow by the side of bonduc-trees; cassias shed their yellow blossoms upon the rich fronds of arborescent ferns; myrtles and eugenias, with their thousand arms, contrast with the elegant simplicity of palms; and among the airy foliage of the mimosa, the cecropia elevates its giant leaves and heavy candelabra-shaped branches. Of some trees the trunk is perfectly smooth, of others it is defended by enormous spines, and the whole are often apparently sustained by the slanting stems of a huge wild fig-tree. With us, the oak, the chestnut, and the beech seem as if they bore no flowers, so small are they and so little distinguishable except by naturalists; but in the forests of South America it is often the most gigantic trees that produce the most brilliant flowers; cassias hang down their pendents of golden blossoms, Vochisias unfold their singular bunches; corollas, longer than those of our foxglove, sometimes yellow or sometimes purple, load the arborescent bignonias; while the chorisias are covered, as it were, with lilies, only their colours are richer and more varied; grasses also appear in the form of bamboos, as the most graceful of trees; bauhinias, bignonias, and aroideous plants cling round the trees like enormous cables; orchideous plants and bromelias overrun their limbs, or fasten themselves to them when prostrated by the storm, and make even their dead remains become verdant with leaves and flowers not their own. Such are the antient forests, flourishing in a damp and fertile soil, and clothed with perpetual green.

Far different are the deciduous stunted woods, called *catingas*, which are produced on a dry sandy soil, and are not dense enough to prevent the evaporation of their scanty earth; they periodically lose all their leaves in March and April, not recovering them till the month of August. When stripped of their leaves, they have a great similarity to the woods of Europe in their winter nakedness, bushes and small trees mixed here and there with individuals of a moderate size constituting their composition. Small acanthaceous plants, resembling our own labiatæ, fill up the intervals in these woods, and one might almost fancy one's self in a European wood, in a fine autumnal day, if it were not for the palms which here and there raise their heads above the other trees.

As for the plains, they consist for the most part of immense tracts, which have no more horizon than an ocean; destitute of even turf, they are covered not only with grasses of different kinds, but with undershrubs and small bushes of myrtles, melastomas, compositæ, and a multitude of other things. Among these, a few trees, here and there, collect into a cluster, and form a kind of oasis in a vegetable desert.

To the southward, all these things gradually fade away; vegetation becomes less and less tropical, never, however, assuming a European aspect, till at last in Patagonia and the adjacent islands, an antarctic imitation of northern vegetation makes its appearance. Beech-trees of new species, singular parasitical plants (*Misodendron*), Winter's bark, stunted berberries, evergreen arbutus, with a trailing habit, plants like buttercups, yet not buttercups, form the distinguishing features; and the traveller occasionally is astonished at seeing arborescent Fuchsias in flower, with humming-birds flitting among their branches in the midst of a snow-storm.

Of New South Shetland nothing can be said to be known, unless we admit the improbable statement adopted by Miers from the account of a navigator named Smith, that it is occupied by trees resembling our Norway spruce fir.

The western coast is far different, latitude for latitude, from the eastern; chilled by the unmitigated cold blasts from the south pole, destitute of large rivers and of all means of irrigation for a very considerable extent, it is a mere succession of fertile valleys and desert hilly plains. To the south, the sides of the mountains are covered with the Araucaria pine; in Chili, the peculiar forms of numerous species of Calceolaria, Schizanthus, Loasa, Adesmia, Azara, and Escallonia, form a flora of a totally different aspect from that of Buenos Ayres, while the sandy plains abound in numerous species of the purslane tribe (*Calandrinia*) and of salpiglossis. Numerous bushes of compositæ give an arid but glittering aspect to other parts; and in the spring, at the time of the melting of the snows, the sides of the mountains are enamelled with the beautiful flowers of the pica di loro (*chloræa*), leucocoryne, and other herbs.

Near the line, a new change comes over the face of nature. In the neighbourhood of Lima, towards the interior, epiphytal orchideous plants just begin to exist; plants which, as we advance to the southward, become the most singular feature of the flora, on account of their enormous numbers. In the mountains beyond the line in New Granada, between the level of the sea and eight or nine thousand feet above it, are found the forests that contain the rare cinchona trees, the rind of which, called the Jesuit's bark, is perhaps the most precious medicinal production of the New World. With these grow the Winter's bark-tree, gaily-marked flowers called Alstromerias, Fuchsias with enormous blossoms, and many kinds of oaks.

Of the remainder of the American coast to the north but little has been published; and what we have to state is chiefly collected from private sources of information. In all this part, as little similarity in the vegetation to that of the eastern side of the dividing ridge exists as in the southern hemisphere. Northern California approaches it the most, but even here the distinction is most obvious. Various species of calochortus, numerous currants with richly-coloured flowers, and especially great numbers of polemoniaceæ of unknown kinds, are characteristic forms; pines also, similar to those of Mexico, again appear on the hills, and perennial lupins begin to abound; the latter are so much increased in the north-west country, as to become a distinctive feature of the region; with these are mixed a remarkable plant called Clarkia pulchella, and many kinds of Pentstemon. The shrubs are berberries with pinnated leaves, *Gaultheria Shallon*, and more of the gay-flowered currants; and the trees number among them the broad-leaved sycamore (*Acer macrophyllum*), with firs and pines rising to a height exceeding two hundred feet. What is very remarkable, the species are more like those of Siberia than of the United States, and the most characteristic forms of the latter region are altogether wanting; no azaleas nor magnolias, few oaks, not a Kalmia, nor a walnut, nor a hickory have been observed; and even the asters themselves, which are the very weeds of the eastern side, are comparatively rare and of peculiar species. The spruce firs of the eastern side do not seem to exist on the western, but their place is occupied by the *Abies Douglasii*, which is found on the mountains at various elevations, dwindling at last to a mere bush. [See ABIES, p. 32.]

VII. POLITICAL DIVISIONS.—North America is politically divided into the republics of the UNITED STATES and MEXICO, the British possessions, and the countries still possessed by native tribes.

The more northern regions consist principally of the north-western coast discovered by the Russians, and called Russian America; the region continuous with Greenland called North Devon; the North Georgian Islands, and the countries west of Lancaster Sound in the Icy Sea; the country about Hudson's Bay, the east part of which is termed East Maine, and the western districts New North and South Wales; the north-east side called Labrador, or New Britain, inhabited by Esquimaux similar to the Greenlanders; and Greenland subject to Denmark. The population of these regions is not known with any sort of accuracy. The inhabitants neither of these, nor of the western and central regions, still occupied by aborigines, fall properly within the limits of a political description.

The provinces immediately under the British government in North America are bounded on the north by the Hudson's Bay regions, and on the south by the United States. They comprise the provinces of UPPER CANADA, and LOWER CANADA, NEW BRUNSWICK, NOVA SCOTIA, CAPE BRETON, PRINCE EDWARD'S ISLAND, NEWFOUNDLAND, with LABRADOR and the island of ANTICOSTI. Quebec is the residence of the captain-general of all British America. The extent of these possessions, in square miles, is about 2,360,000, and the present population may be computed at 1,350,000.

The republic of the UNITED STATES of America extends from the British possessions to the Gulf of Mexico, and from the Atlantic to the Great Pacific Ocean. Its southern boundary on the Pacific is the parallel of 42°, and its northern, according to American authorities, the parallel of 51°. It consists of twenty-four states, and three territories not enjoying the full rights of states. Washington, in the District of Columbia, is the seat of the federal government. Extent, about 2,257,300 square miles; population, above 13,000,000.

The present republic of MEXICO, extending from the sixteenth to the forty-second degree of north latitude, comprises about 1,639,000 square miles, and perhaps about 8,000,000 of inhabitants. It was formerly under the dominion of Spain, and comprehended the two Californias, and the intendencies of Mexico, Puebla, Vera Cruz, Oaxaca, Merida, Valladolid, Guadalaxara, Zacatecas Guanaxuato, San Luis Potosi, Durango, and Sonora, and the provinces of New Mexico, Cohahuila, and Texas. It now consists of nineteen states and four territories or provinces, and a federal district.

The republic of GUATEMALA, or Central America, formerly Spanish, situated to the South of Mexico, comprises 206,000 square miles. It consists of five states.

South America comprises the following states:—

The most northern part, lately COLOMBIA, but more recently divided into the three republics of NEW GRANADA, VENEZUELA, and ECUADOR. The territory of each is not exactly ascertained, but the extent of the three states may be taken at about 1,290,000 square miles, and the population about 3,000,000. They were formerly Spanish colonies.

To the south of these, extends, along the western coast, the republic of PERU, formerly Spanish. It contains about 600,000 square miles. Its chief city is Lima.

The republic of BOLIVIA, formerly Spanish, lies to the south of Peru. It contains perhaps about 320,000 square miles.

More to the southward is the republic of CHILI, formerly Spanish, covering 130,000 square miles.

The United Provinces of LA PLATA lie between the two last-mentioned states and the Atlantic Ocean. They perhaps contain 700,000 square miles. The chief town is Buenos Ayres.

The empire of BRAZIL, formerly a Portuguese possession, is the principal South American state washed by the Atlantic. It perhaps contains near 3,000,000 square miles. The metropolis is Rio Janeiro.

The republic of BANDA ORIENTAL, or Republica Oriental de l'Uruguay, lying immediately to the south of Brazil, with an extent of about 220,000 square miles.

PARAGUAY, watered by the Paraquay, and lying southwest of Brazil, comprises about 148,500 square miles.

It should be borne in mind by the reader, that all these estimates as to the areas of such extensive countries are very uncertain, and little reliance should be placed on them. Authorities often differ very much. The estimates of the population are still more vague, and in general are a mere guess.

GUIANA is a tract of country on the north-eastern coast, to the north of the river Amazon. It comprehends the British possessions of DEMERARA, ESSEQUIBO, and BERBICE, the French possession of CAYENNE, and the Dutch colony of SURINAM.

Patagonia is situated in the southern part of America, beyond the 46th degree of south latitude. The Straits of Magalhaens divide it from the island of Tierra del Fuego, which, like Patagonia, is inhabited by native tribes, and is very little known. The population of these countries, together with those of all the islands belonging to the southern extremity of the continent, is entirely unknown.

The islands often called the West Indies, in the Columbian Archipelago, situated in the Gulf between the two continents, are also included in America. They consist of the BAHAMA Islands, the Great ANTILLES, viz., Cuba, Jamaica, St. Domingo, or Haiti, and Porto Rico; the smaller ANTILLES, viz., Barbuda, Antigua, Guadaloupe, Dominica, Martinique, St. Lucie, Barbadoes, Granada, Tobago, St. Christopher's, St. Vincent's, and Trinidad, besides a number of smaller islands. The population of the islands is about as follows: viz., of the British islands, 800,000; of the French, 253,000; of the Spanish, 707,000; of the Danish, 46,700; of the Dutch, 26,000; and of the Swedish, 18,000. The republic of HAITI perhaps contains about 1,050,000. [See ANTILLES.] The BERMUDA or SOMERS Islands form a separate group.

AMERICANISM, a term used to express some peculiarity in the written or spoken language of the inhabitants of the United States of North America. Of all the colonies of Great Britain, in which her language has been planted, the United States are yet the only parts that have been separated from the mother country, and have attained political independence. In consequence of the rapid increase of their population, the diffusion of education, and the springing up of a numerous body of native writers, we see a new phenomenon in the history of the world of two great nations separated by a wide ocean using the same language. To preserve this language in its purity, as far as its essential character is concerned,—to introduce no new words but such as experience shows to be necessary,—to form them on true principles of analogy, and to give to them precise and definite meanings;—these are objects of equal importance to the two nations; for the preservation of a common language is a bond of unity and one of the great elements of civilization. The mother country may yet claim, and perhaps her claim will be allowed by some Americans, the privilege of a very rigid examination of American importations, before she allows them to be current coin of the realm; but to attempt to reject all new words that America produces would be both absurd and ineffectual. New wants and new circumstances are the parents of new terms, which, perhaps, increase quicker there than in an old country. The main differences between the spoken and written English language as it exists in America and Great Britain appear to be the following:—pronunciation; the use of words now obsolete in England, or used in different senses; the use of words in various parts of America as they are still used in various provinces of England; and new words.

In pronunciation, there is much greater uniformity in the United States than in Great Britain, and the general standard is certainly higher. In many parts of America, such, for example, as Philadelphia, the pronunciation is at least as good as in any part of the British dominions. But still there are differences very perceptible when we compare the natives of two remote parts; and if we take into account the wide spreading of the American nation, the great influx of foreigners, the entire absence of good education in some newly-settled parts, and the want of a metropolis to fix any thing like a standard of pronunciation, we think it will appear probable that the pronunciation may in time differ widely in different parts. The rapid communication from one part to another will help somewhat to check this tendency. The Americans generally sound the *h* more strongly than the English in such words as *house*, and also in such words as *neighbour*hood, and very rarely commit the fault so common in England, of *hasking* for *heggs*. Yet we know there is a small district, and there may be more, where the people retain this *shibboleth* which marks them as the descendants of a colony from the neighbourhood of London. The articulation of the Americans is generally slower than that of the English, and sometimes drawling, but certainly much more distinct.

As to the use of words now obsolete in England, they are mainly confined to conversation, for every one is aware that there is very little in the style of a good American writer, except perhaps a greater degree of ornament, by which we can distinguish it from that of a good English writer. But as the Americans write a great deal in public journals, and are the most prolific people in the world in producing inaugural speeches, orations, and all the various modes of addressing an audience, we should look at that part of their language in order to form a complete judgment of its whole condition, as well as at those specimens of composition which are of a less showy but more valuable and permanent nature.

The number of words now used in a different sense from that which they have in England is but small among writers of *good* authority; the list of those used in conversation would be somewhat larger. We have heard the word *shew* used as the past tense of the verb to *show;* the form is now obsolete in England, but may be found in our older writers. In some parts, (for we are aware that in so extensive a country scarcely any remark of this kind can be general,) the word *balance* in the spoken language is employed to express the *remainder* or *the rest:* thus people speak of 'the balance of the professors,' meaning 'the rest of the professors.' The word *mutton* is sometimes used, as it once was in England, to signify a sheep. Dr. Webster remarks, that this sense is obsolete or ludicrous; it is not either obsolete or ludicrous in the spoken language of some districts. The word *bug* is used (see Webster) in its original sense of a *fly;* and the old verb *prógress*, which the Americans use very often and pronounce *progréss*, is now beginning to be again adopted in its native country, though we think we could very well do without it. In judging how far words used in America in different significations from what they have in England, have been sanctioned by authority, and established in the written language, we cannot, perhaps, take a better guide than Dr. Webster's *Dictionary;* and we shall find the number by no means small. Cooper, in his '*Mohicans*,' speaks of a 'lake having *flowed* its usual banks.' Webster sanctions this usage under a transitive sense of the word *flow*, which he makes equivalent to *overflow*. (See Webster's *Dictionary*, under *flow;* and the example.) Against this usage we take the liberty of protesting. In the *National Intelligencer*, March 2, 1826, we find,—'for providing a jurisdiction *convenient* to the scene of almost all the shipwrecks:' this English-provincial and Irish use of *convenient* in the sense of *near*, is properly omitted by Webster. The verb *rent* has the double meaning in Webster of *granting on lease*, as a proprietor does, and *taking on lease* as a tenant does. *Nullification* is not in Webster, but has been defended on the ground of analogy, and by a reference to the use of *nullify* in Flavel. The usage of the word *locate* is familiar to all who read American papers or public documents: we say 'that a man *has located*, i. e. has selected, surveyed, and marked out—a hundred acres in Alabama.' The word *expect* is often used in a strange sense in some parts of America, but certainly nearly altogether in conversation, as in the following instance given by Webster: 'I expect it was.' The American lexicographer justly condemns this usage, which is of provincial English origin. The word *lengthy* some critics object to as being of American origin; we rather doubt if it is. Still it is a good word, well made, and well adapted to express the wearisomeness of listening to a long speech or discourse of any kind: we presume that in this, as in some other instances, the Americans did not call the word into use till they felt the absolute necessity of it. For other American usages which are somewhat peculiar, the reader may refer to the following words in Webster: to *wagon* (*waggon*); *studhorse; subserve; clever* (Webster's account of the English use of this word is incomplete); *notify; graduated*, &c. The American uses of *creek, girdle, section*, &c. may be seen in Webster. *Fivebar*, in Webster, for five-barred, is a mere vulgarism. Mr. Pickering, in a work published at Boston in 1816, has traced a great number of words and phrases which have been considered as Americanisms to the counties of the mother-country; we recollect one word at present, which we can only trace to Holland. In Virginia, *waffel-cakes* are often made; a similar cake with the same name, waffel, is very common in Holland.

As to new words, the number used in the written language is not great. The word *bindery*, meaning 'a place where books are bound,' is in Webster. We believe it is a new, but it certainly is not a bad word. In American advertisements we observe the word *book* is generally prefixed; thus we might say, a *book-bindery*. *Sparse* is, for any thing we know, a new word, and well applied; the Americans say a *sparse* instead of a *scattered* population; and we think the term has a more precise meaning than scattered, and is the proper correlative of *dense*. The danger of new words is, that the ignorant will use them without knowing their meaning, as we may observe in some of the inferior American newspapers. The number of new words that may be gradually creeping into the American spoken language, we suspect, is not inconsiderable; this arises in some measure from intermixture with foreigners, and must produce some effect though it may not be much. We have heard the German word *plunder* vulgarly applied to baggage or heavy commodities.

We suspect that many words of a moral import are beginning to vary considerably as to the signification attached to them in England and America. *High-minded*, a word not much used in Great Britain, rather implies something elevated or noble in *enduring:* in the conversation language, at least, of some parts of America, it is applied as a term of praise to *action*, often impetuous, and sometimes unjust. *Lady* and *Gentleman* are terms that come under the same predicament, as to difference of import.

The orthography of the English language is liable to more change in America than in England: the Americans, as a general rule, do not observe orthography so strictly as the English, of which any reader of American papers may convince himself. We refer to American newspapers, because they are, more than in England, used as a common medium for addressing the public on all subjects, and form a large part of the reading of the community.

We have said nothing of *style*, or the character of American writing as distinguished from English, as this lies yond the proper subject of the article. The main difference appears to us to arise from the superior value attached in America to oratorical display, and to the opinions there very commonly entertained about what is called fine writing and eloquence. [See STYLE, ELOQUENCE.]

AMERIGO VESPUCCIUS. [See VESPUCCI.]

AMERKOTE, a town near the eastern frontier of Sinde, and about eighty-five miles to the eastward of Hyderabad, in that province. It is in 25° 20′ north lat., and 69° 49′ east long. This town is celebrated as having been the birthplace of the Emperor Akbar, when, in 1541, his father Humayun was driven from Hindostan by Shere Khan, the regent of Bahar. Amerkote was once the capital of an independent district in the south-eastern quarter of Mooltan, under which latter name was formerly comprehended the whole of Sinde; in 1813 it was captured by the Ameers of Sinde. The country by which it is surrounded being barren, yields nothing to the public revenue, which is derived from duties on merchandise, and exactions from travellers who pass through. (Mill's *History of British India;* and Hamilton's *East India Gazetteer.*)

AMERSFOORT, a town in the province of Utrecht, twenty-five miles E. S. E. of Amsterdam, on the small navigable river Eem, which runs into the Zuider Zee. This town is situated at the foot of a small hill called Amersforderberg, in a very pleasant district. The extensive tobacco plantations around this place are much decreased, but the town has still some tobacco manufactures, cotton fabrics, and a glass-house. The population in Jan. 1, 1830, was 5585 males, and 6197 females. Amersfoort has three churches, one of which is a fine building. The Grand Pensionary Barneveldt, who was so unjustly executed at the Hague, in 1619, was a native of this town. Amersfoort was taken by the French in 1795.

In traversing the flat country from Utrecht to Amersfoort, and approaching the latter town, we observe a district of heath five or six miles long and as many broad, with some few trees on it, and dunes or hills of small elevation. These sandy hills contain fragments of quartz sometimes rounded, but for the most part angular, with pieces of rock of a schistose structure, containing a good deal of sand. The whole mass appears to have been brought down by the action of water from the upper course of the Rhine. These hills are sometimes called the Amersfoort Hills, and in their character are similar to the BELUWE or Welawe, a few miles farther to the east.

AMERSHAM or AGMONDESHAM, a borough town in Buckinghamshire, about twenty-six miles W.N.W. of London, on the road to Aylesbury and Buckingham, from which last it is distant thirty-three miles. It is in a valley between woody hills, near the river Coln, and consists of one main street, long and wide, not lighted but well paved, and crossed by a smaller one. The church stands near the point of intersection, and is a spacious building of brick covered with stucco: it consists of a nave with small aisles, transepts, chancel, monument room for the Drake family, in which are some handsome monuments, and a tower at the west-end. It is dedicated to St. Mary; and the living, a rectory in the gift of the Drake family, is accounted one of the best in England. The town-hall (the lower part of which is used for the market) is a brick building, near the centre of the town, raised upon pillars and surmounted by a lantern and clock: it was built by a Sir William Drake, who died in 1682. With these exceptions the town contains scarcely any building worthy of notice.

The manufactures are chiefly of black lace, cotton, straw-plait, and wooden chairs. The market is on Tuesday; there are two fairs, one on Whit-Monday, and another on the 19th September. The population of the borough and parish in 1831 was 2816, without reckoning (as it seems) the hamlet of Coleshill, which, though partly in this parish, is in the county of Herts.

Besides the parish church, there are two places of worship; one for Baptists, and one for Quakers. The grammar-school was founded by Dr. Robert Chaloner, rector of Amersham, and Canon of Windsor, who endowed it with 25*l.* per annum. Dr. Chaloner died in 1621. A writing school was endowed by Lord Newhaven (who died in 1728); and a Sunday-school, previously established by subscription, by the late William Drake, Jun., Esq. An almshouse for six poor widows was endowed by a Sir William Drake, Bart., who died in 1669.

Amersham was a parliamentary borough by prescription; out its right to send members was disused for four hundred years, till, in 1623, it was restored on petition. Edmund Waller, the poet, and Algernon Sidney were, members for this borough. It was disfranchised by the late Reform Bill.

Many of the inhabitants suffered as Lollards in the reign of Henry V., or as Protestants in that of Mary I.

AMES (JOSEPH) was the son of Mr. John Ames of Yarmouth, where he was born on the 23rd of January, 1689. His father appears to have afterwards settled in London, where he died when his son was in his twelfth year. At this time he was at a little school in Wapping. When fifteen, he was put apprentice to a plane-maker, either in King or Queen Street, (near Guildhall) in the city of London. Having served out his time, he then settled in Wapping, Horace Walpole says as a ship chandler; but according to other accounts, as an ironmonger. Whatever was his business, he seems to have pursued it with success, and to have attained by it, if not wealth, at least a competency. He also found time to supply the defects of his early education by reading; and this led at length to authorship. The study to which he was most attached was that of antiquities, and particularly those of his own country. He had formed an acquaintance with the Reverend John Lewis, the author of the *Antiquities of the Isle of Thanet*, and many other works, who lived for some time in Wapping; and it is this gentleman who is said to have first suggested to him, about the year 1730, the preparation of a history of English printing. Some circumstances prevented him from engaging in the project till two years after; but he then took it up in earnest, and its execution became the object of his life. The work, in a quarto volume of above 600 pages, appeared in 1749, under the title of *Typographical Antiquities; being an Historical Account of Printing in England, with some Memoirs of our Ancient Printers, and a Register of the Books printed by them, from the year* 1471 *to* 1600*; with an Appendix concerning Printing in Scotland and Ireland in the same time.*' This is Ames's principal work, and still, indeed, serves as the basis of the only elaborate history we have of English printing. It has probably preserved a good many title-pages, and other facts connected with its subject, that would have been lost, had the recording of them been longer deferred; and it is, upon the whole, creditable to the industry of its compiler. But the task, to be well performed, required much more learning than Ames possessed. The most valuable part of his book has been added to it by its subsequent editors, and especially by Mr. Herbert, whose edition, extended to three volumes quarto, appeared in 1785, 1786, and 1790. A still more augmented, and much more splendid edition has been since published by the Reverend Dr. Dibdin, in four vols. 4to., 1810-12. Ames's next most considerable work is that entitled *Parentalia, or Memoirs of the Family of Wren*, fol. 1750. The book bears to be ' by Stephen Wren, Esq.' (the grandson of Sir Christopher) ' with the care of Joseph Ames;' but Ames is understood to have been really the writer. He is also the author of a Catalogue of English heads, 8vo., 1748—of a Catalogue of English printers, in two leaves 4to., and of an Index to the catalogue of Lord Pembroke's coins, printed, but not published. Mr. Ames was a fellow of the Royal and Antiquarian Societies, and secretary to the latter from 1741 till his death. In the *Philosophical Transactions* for 1747, is an account of a case of Plica Polonica, or matted hair, communicated by him. (No. ccccIxxxiii. p. 556.) He died suddenly in the shop of a friend, an ironmonger, in St. Clement's Lane, on the 7th of October, 1759. He left a considerable collection both of books and of antiquities and other curiosities, which were sold by auction after his death; the sale occupied nine days. The above facts are taken from the *Life of Ames*, by the late Mr. Gough, first prefixed to Herbert's edition of the *Typographical Antiquities*, and since republished with additional notes in that of Dr. Dibdin.

AMESBURY, a market-town in Wiltshire, in a valley on the river Avon,* about seven or eight miles N. of Salisbury, and seventy-eight W.S.W. from London. Its population is small, the parish having only 944 inhabitants in 1831. The town has little trade, and is chiefly supported by travellers and posting. Even the market (which was on Friday) has been discontinued. There are three fairs. Amesbury consists of two streets, irregular and ill-built, neither paved nor lighted. The church, built of stone and flints, is of very early date, but some of its antient features have been defaced by alterations. It was probably attached to the nunnery which once existed here. The living is a perpetual curacy, in the gift of the Dean and Canons of Windsor. There is a Wesleyan chapel, and several schools, one of which is a national school.

Amesbury is a place of great antiquity. Under the Saxon king Edgar, it was of sufficient importance to be the seat of a synod; and Elfrida, the widow of that prince, founded here, in the latter part of the tenth century, a nunnery of the Benedictine order. An abbey had indeed existed at a much earlier period, founded, as some say, by Ambrosius, a British prince who lived at the time of the Saxon invasion, or by one Ambri a monk: this abbey appears to have been destroyed by the Danes about the time of Alfred. Elfrida's nunnery, notwithstanding some changes, lasted till the general dissolution of the religious houses. Its revenue at that time is estimated by Speed at 558*l.* 10*s.* 2*d.*, and by Dugdale at 495*l.* 15*s.* 2*d.* A mansion on its site, was, after the French Revolution, occupied by some nuns from Louvain, attracted it is said by the sanctity of the place: they subsequently removed into Dorsetshire. In its neighbourhood is STONEHENGE. To the west of the town are the traces of an antient encampment, which though popularly termed Vespasian's camp, is evidently not of Roman origin.

AMETHYST. This name has been applied to two precious stones of essentially different natures. The *oriental* amethyst is a rare variety of ADAMANTINE SPAR, or corundum, as already noticed; the *occidental*, or *common* amethyst, now to be described, is a variety of quartz or rock crystal, which is met with in many parts of the world, as India, Siberia, Sweden, Germany, Spain, &c. It occurs in various forms, as massive, in rounded pieces, and crystallized; the primary form of the crystal, like that of quartz, is a slightly obtuse rhomboid, but it is usually found in the secondary form of a six-sided prism, terminated at one or both ends by a six-sided pyramid; sometimes, though rarely, the prism is wanting, and the pyramids being then united base to base, the secondary crystal is a dodecahedron with triangular faces.

The amethyst is principally distinguished from common quartz by its colour, which is occasionally of every shade of violet, or rather purplish violet, and this in the perfect amethyst is pretty equal throughout the crystal; very commonly the summits only of the crystal are amethystine, the lower part being nearly colourless, or tinged with green. By long-continued heat the colour is destroyed, and the crystals become white and opalescent. Sometimes the crystals are aggregated or fasciculated; in the Palatinate they are found lining geodes of agate, and in Silesia capillary crystals occur mixed with micaceous iron ore.

The crystals of the amethyst vary from diaphanous to translucent, and they exhibit various degrees of splendour, both externally and internally. The fracture is commonly conchoidal, and the fragments are of indeterminate form. Like quartz, the amethyst is sufficiently hard to give fire with steel and to scratch glass; and has also been found, like it, with cavities containing water; it is infusible by the common blow-pipe. According to Rose, it consists of—

Silica	97·50
Alumina	·25
Oxide of iron and manganese	·50
	98·25

AMHARA, the name of one of the great divisions of the Abyssinian empire (see ABYSSINIA); but properly the name of a province. Beyond the information derived from the visits of the first Portuguese missionaries to this province, it has remained unknown. We find the first account of it in the *Journey* of Alvarez, who, in 1520, travelled from Arkeekoo, through Tigre and Angot, into Amhara. His description, though it gives no very exact account of the direction of his route or the distance of one place from another, contains a great deal of curious information. Soon after entering Amhara, Alvarez saw a lake three leagues long and one wide, with an island in the middle, on which was a monastery of St. Stephen. The monks gathered abundance of lemons, oranges, and citrons. The lake contained *gomaras*, or hippopotami. Alvarez mentions various other smaller lakes in Amhara. Numerous *sierras* traverse the country, some rising abruptly from the level plains, but well cultivated at the top, and sown with various kinds of grain. He describes many well-cultivated plains covered with maize, wheat, barley, and in some cases carefully irrigated. The country contained a great many Christian churches; indeed every district had its church. The people in some places went nearly naked.

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* There are two rivers of this name in Wiltshire. The one here mentioned passes by Salisbury.

The missionary describes some most singular and dangerous passes formed in the side of mountains: from many parts of the country to other parts there seems to be only one road, on which there were occasionally gates placed, which entirely commanded the passes; certain duties were levied at these gates.

At the period of Alvarez's visit, the emperor appears to have chiefly resided in Amhara. The great changes that have happened in Abyssinia since that time have, probably, rendered this province difficult of access. We find no information about it in the *Life and Adventures of N. Pearce* (London, 1831).

It will be observed that Alvarez mentions the orange and lemon as being in Abyssinia at the time of his visit. The received notion is, that the fruits of this class are indigenous in the eastern parts of Ava and the north of India; they may, possibly, be indigenous in Abyssinia also. Lobo says, that the Abyssinians have black grapes, peaches, some pomegranates, the sugar-cane, and the fig; but he says nothing about oranges and lemons. According to Bruce and Pearce, the orange and lemon are now in Abyssinia, but when introduced we do not know. [See ALVAREZ.]

AMHA'RIC LANGUAGE has its name from Amhara, where it is or was spoken in its greatest purity. Inferior dialects of the Amharic are spoken in the provinces of Gojam, Angot, Efat, Shoa, Bagemder, Samen, &c. The Amharic is supposed to be mentioned by Agatharchides, (*Hudson, Geogr. Min.*, t. i., p. 46,) about 120 years before Christ. Agatharchides calls the language of the Troglodytes of Ethiopia Καμάρα λέξις, a term which certainly bears some resemblance to *Amharic.* Agatharchides says that he was acquainted with the Kamara. The Amharic began to prevail in Abyssinia over the Geez language when Icon-Amlak, about the year 1300, having overcome the Zagæan dynasty, ascended the throne of his ancestors, and removed the residence of the royal court from Axum to Shoa, where he had lived in exile. Younger princes were usually confined in the mountain fortresses of Amhara, Goshen and Ambaçel. Icon-Amlak surrounded himself with officers and courtiers who spoke the Amharic, which was then generally adopted by the higher ranks in Abyssinia, who called it *Lesana negus*, the royal tongue. A knowledge of the Amharic enables a traveller to make himself understood in nearly every part of Abyssinia, although there are numerous dialects, of which no complete classification has yet been accomplished; of these the Tigré resembles much more the antient ecclesiastical Ethiopic or the Geez language, than the Amharic. The Arabian writer Makrizi counts fifty dialects. It will be probably quite as difficult to define the exact number of Ethiopian, as of Arabic, modern Greek, and English dialects, or the number of languages in general. The king of Abyssinia, his councillors, ecclesiastics, monks, and every well-educated Abyssinian, know the Geez language, in which documents and letters are usually composed. Therefore the *Geez* is called *lesana matzhaf*, or *metzhafeña*, that is, the language of letters or books. The foreign correspondence of the king is in Arabic. According to Bruce, there was a law, that whoever should dare to translate the Holy Scriptures from Geez into the Amharic should die; but this law has not been strictly observed.

The British and Foreign Bible Society have published a *Psalterium Davidis Amharice*, London, 1833, large 18mo., price 2*s.*; and *Novum Testamentum in Linguam Amharicam, vertit Abu Rumi Habessinus; edidit Thomas Pell Platt.* Londini, 1829, foolscap 4to., calf, 12*s.* The whole Bible is now preparing for the press under the superintendence of Mr. T. P. Platt, late Fellow of Trin. Coll., Cambridge. The New Testament and the Psalms have been circulated by Mr. Gobat and other missionaries in Abyssinia, and have been sometimes transcribed by the natives who could not be provided with printed copies. Mr. Gobat returned from Abyssinia in 1833.

The circumstances which enabled the British and Foreign Bible Society to obtain a translation of the whole Bible into the Amharic language are detailed in their reports, and in the *Christian Researches in the Mediterranean from* 1815 *to* 1820, *by the Rev. W. Jowett*, pp. 197-213.

The Amharic is said to be a degenerated Shemitic dialect, the grammatical structure of which has preserved its character, though its lexicographical contents are mingled with African words. It is likely that the Amharic and other dialects of the Ethiopic are derived from the old Arabic of the Himyarites in Yemen. The Amharic adds to the twenty-six characters of the Geez seven others, which are mere modifications in order to express some characteristic sounds. The vowels are expressed by variations in the shape of the letters, so that each character or letter is in fact a syllable, being a consonant followed by a vowel, thus: *lă, lé, lī, lā, lû, lĕ, lo.* The Amharic, with other Ethiopic dialects, is written from the left to the right hand, like our western languages.

Amharic literature is very scanty. Before the above publications of the British and Foreign Bible Society, there were in Abyssinia no Amharic books, except an Ethiopic-Amharic vocabulary, called *Sausau*, or the ladder. Ludolf's *Grammatica Amharica* contains a translation of Luke xi., 1-13, a confession of faith, some colloquial phrases, and a little poem in Amharic. The manuscript of Ludolph's translation of thirteen verses of St. Luke is preserved in the University library at Giessen. There is also a *Catechesis Christiana, Lingua Amharica*, by T. G. Ghbragzer, Romæ, after 1786. Ludolf was assisted by J. H. Michaëlis in the composition of his *Lexicon Amharicum* and his *Grammatica Amharica.* Ludolf derived his knowledge of Amharic chiefly from Abba Gregorius, a native unlearned Abyssinian, who merely drew up a rough Italian-Amharic vocabulary, which came afterwards into the library of Paris.

The French consul at Cairo, Asselin de Cherville, caused Abu Rumi, an old Abyssinian, who had been the instructor of Bruce and Sir William Jones, to translate the whole Bible into Amharic. This is the translation which is now in the possession of the British and Foreign Bible Society. M. Asselin was also engaged on an Amharic grammar and dictionary. (*Magasin Encyclopédique*, tome v. p. 197, &c.) M. Asselin devoted, during ten successive years, two days per week to the superintendence of Abu Rumi's translation.

No. XIV. of the Abyssinian manuscripts, in the library of the British and Foreign Bible Society, contains the Gospel of St. Mark in Amharic, by Pearce. Pearce, who is well-known from Salt's *Travels* and the recent publication of his life, was unacquainted with the Ethiopic characters; and has therefore expressed the sounds with which he was familiar in the common English handwriting and orthography. His attempts are sometimes a little amusing. Instances occur of as great deviations from the correct form, as if we should represent the French words, *il faut que*, by the combination *elfoker.* The reader will find some useful remarks on the subject of the Amharic translations, by T. P. Platt, Esq., in his work, intitled *A Catalogue of the Ethiopic Biblical Manuscripts in the Royal Library of Paris, and in the Library of the British and Foreign Bible Society; also some account of those in the Vatican Library at Rome. With remarks and extracts. To which are added Specimens of Versions of the New Testament into the modern Languages of Abyssinia: and a Grammatical Analysis of a Chapter in the Amharic Dialect: with fac-similes of an Ethiopic and an Amharic Manuscript.* By Thomas Pell Platt, B.A.: London, 1823. 4to. It appears that Pearce deviated from analogy in his orthography, frequently made grammatical errors, and violated the idiom of the language in attempting to render each word and particle of the English version from which he translated. In Pearce's Amharic version, there is scarcely a copulative or disjunctive particle in a whole chapter, not even the conjunction *and.* Abu Rumi's translation renders it likely that Pearce did not know certain forms of expression which should have been introduced. Perhaps in the rapidity of colloquial communication, many characteristics of particular inflexion may be lost, and so have been omitted by Pearce, whose translations, however, are valuable as expressing the native pronunciation. Pearce died at Alexandria.

Ludolf's Ethiopic types have been obtained from Germany for the use of the British and Foreign Bible Society; and the wish, repeatedly expressed by Ludolf, of promoting by linguistic studies the propagation of the Gospel, has been fulfilled after the lapse of more than a century. Various characters of Ludolf's types were altered under the direction of Professor Lee, to a nearer imitation of Ethiopic calligraphy.

Little collections of Amharic words have been made by

Salt in his *Travels*, and by Seetzen in his *Linguistischem Nachlasse*, Leipzig, 1816-18, p. 145, &c. Nine verses of the commencement of Solomon's Song, in five dialects, similar to the Amharic, may be seen in Bruce's Travels. (See the article *Amharische Sprache*, by Gesenius, in Ersch and Gruber's *Encyklopädie;* and see ETHIOPIAN LANGUAGES.)

AMHERST, a small town of Massachusetts, about seventy miles due west of Boston, and a few miles east of the Connecticut river. It has an incorporated college which opened in 1821. The latest accounts state that it had a president, ten instructors, 197 students, a library of 2380 volumes, and a student's library of 4515.

AMHERST, a town in the north-east angle of the Gulf of Martaban, in 16° 5′ N. lat., and 97° 25′ E. long.

This town was built by the British in 1826, on the termination of the Burmese war, in order to supply the place, as a military post, of the town of Martaban, which was restored to the Burmese under the provisions of the treaty. In this town an asylum was offered to such of the Burmese subjects as dreaded the resentment of their government for the part they had taken during the war. The place was named in honour of the Governor-General of India. It may afford some idea of the rapidity with which towns are raised in India, to state, that in the beginning of April, 1826, the spot selected as the site of this town was covered with jungle, and that in the following January it contained 1600 inhabitants.

The situation of Amherst appears to be well chosen for the purposes of commerce, it being easy of access to the Burmese, the Chinese, and the people of other countries beyond the Ganges. The run by sea between this place and Rangoon is short, and suited to the small vessels employed by the Burmese in their coasting trade. On the land side, there is a safe route to the interior of Ava, and to the country of the Shans, a people inhabiting the central region between Ava, Siam, and China. The practicability of this route for the introduction of merchandize into China was early established, by the transmission, in 1827, of several chests of opium.

The town is built on the south bank of the wide outlet, or æstuary of the Saluen river, which passes from China through the Shan country, and discharges itself into the gulf of Martaban. The channel of this stream is broad, but so shallow, and so much obstructed by shoals and rapids, that, except at its mouth, it is not navigable for vessels of any considerable burthen. Its course lies through an open and fertile country.

Amherst is a bar harbour with rather a dangerous entrance, but when this is passed, the anchorage is good in five fathoms water, within 100 yards of the shore. The bar has only one fathom at low water. The tide flows about six miles an hour, and its greatest rise is 19 feet. For two hours before, and the same time after high water, the harbour is so still, that the communication with the shore is perfectly easy.

Good water is found everywhere in the neighbourhood of the town, within six feet of the surface, and every circumstance connected with the station seems to promise that Amherst will become a place of considerable commercial and political importance. The military cantonments are situated about a mile and a half from the town, on a dry and elevated spot. (*Manuscripts of the India Board, quoted by Hamilton, and Reports of the House of Commons on the Affairs of India*, 1832.)

AMHERST (JEFFERY, BARON), a distinguished British military commander, was the son of Jeffery Amherst, of Riverhead, in Kent, Esq., and was born on the 29th of January, 1717. The family is said to have been of great antiquity. He received his ensign's commission in 1731, and having some years after gone to Germany as aide-de-camp to General Ligonier, was present at the battles of Dettingen and Fontenoy. He afterwards became aide-de-camp to the Duke of Cumberland, and as such was present at the battles of Laffeld and Hastenbeck. In 1756, while still abroad, he received the colonelcy of the fifteenth regiment of foot. Two years after he was recalled from the continent and sent to America as major-general of the troops destined for the siege of Louisburg in Cape Breton. After the reduction of Canada in 1760, to which he had materially contributed, he received the thanks of the House of Commons, and was made a Knight of the Bath. Soon after he was appointed commander-in-chief of all the forces in America. On the peace in 1763 he returned to England, when he received from the king the governorship of Virginia. A misunderstanding with his majesty in 1768 occasioned his sudden dismissal from the army; but the matter having been cleared up, he was in a few months reinstated both in his former rank and in the royal favour. In 1770 he was made governor of Guernsey, and two years after, lieutenant-general of the ordnance and commander-in-chief of the forces in England. In 1776 he was created Baron Amherst of Holmesdale, in the county of Kent. He retained his appointment of commander-in-chief till the breaking up of the North administration in 1782, when, on his resigning it, the king gave him the office of gold stick in waiting. In 1787 he received a second patent of nobility with the title of Baron Amherst of Montreal in Canada, and with remainder to his nephew. On the 22d of January, 1793, he was again appointed to the command of the army, which he held till the 10th of February, 1795, when he was succeeded by the Duke of York. On this occasion it is understood that an earldom and the dignity of field-marshal were offered to him, both of which honours he declined at the time, though the following year he accepted the field-marshal's baton. Lord Amherst died at his seat at Montreal near Sevenoaks, Kent, on the 3d of August, 1797, in the eighty-first year of his age. He had been twice married, first to Jane, daughter of Thomas Dalyson, Esq. of Manson, in Lincolnshire, who died on the 7th of January, 1765; and the second time to Elizabeth, daughter of General Cary, and grand-daughter of Lucius Henry, Viscount Falkland; but he left no children, and was succeeded in his title and estates by his nephew, William Pitt Amherst, the present peer. (*Gentleman's Magazine* for 1797, p. 800; and Chalmers's *Biographical Dictionary*.)

AMHERSTBURGH, a town in the western district of Upper Canada, in 42° 5′ N. lat., and 83° 10′ W. long., in the township of Malden, Essex county.

Amherstburgh stands on the northern shore of Lake Erie, near the mouth of the river Detroit, and on its eastern side. Being a frontier town, it has some military defences and contains a garrison. During the war with America in 1813, the military and naval works were destroyed on the approach of a superior American force, but they have been partly restored since the peace. There is a very safe and commodious harbour, with a good anchorage in three and a half fathoms water.

The surrounding country is highly fertile, and the climate good. Apples, pears, peaches, plums, nectarines, and grapes, are produced in great perfection and abundance. The lake and river furnish a great variety and plentiful supply of excellent fish; and the woods contain as great a choice of game and of singing birds. (Bouchette's *Account of the British Dominions in North America*.)

AMIANTHUS. [See ASBESTOS.]

AMIDINE, a peculiar substance, procured by Saussure from wheat and potato starch: 100 parts of the latter were boiled with 1200 parts of water, and put into a bottle furnished with a tube to convey the gases generated. After forty-two days' exposure to a temperature of 68° to 77° of Fahr., small quantities of hydrogen and carbonic acid gases were obtained. On examining the residue, it was found to contain 18·7 of amidine, 35·4 of sugar, resembling that formed by the action of dilute sulphuric acid upon starch, and 17·5 of gum, similar to that procured by roasting starch, and some starch remained unchanged. One hundred parts of potato starch boiled with 1200 of water were exposed also for forty-two days to the atmosphere; they yielded 17 of amidine, 30·4 of sugar, 17·2 of gum, and some unaltered starch.

It appears, therefore, that changes occur in the nature of starch, with, or without, the presence of atmospheric air: in the former case, it was found that a little of its oxygen was converted into carbonic acid gas; in the latter, as already noticed, hydrogen and carbonic acid gases were evolved.

When the residue of the fermentation is treated with cold water, the sugar and gum are readily dissolved, while the amidine is but little soluble in it; boiling water, however, readily dissolves it, and it is to be purified by evaporation to dryness, powdering, washing with a little cold water, redissolving in boiling water, filtering and again evaporating to dryness.

Amidine, thus obtained, is opaque, or semi-transparent, white, or yellowish-white, inodorous, insipid, very friable, soluble in any proportion in water of 140° Fahr., but insoluble in alcohol. It resembles starch in giving a blue colour with iodine, in its action upon barytes-water, subacetate of lead and infusion of galls, but differs from it in being soluble in cold water, and in not gelatinizing with boiling water, even when it forms one-fifth of the solution.

AMIENS, an antient town of France, in the department of Somme, seventy-five miles N. of Paris. It is of Celtic origin, and existed at the time of Cæsar's invasion of Gaul, under the name of Samaro-Briva, which denotes a bridge over the Samara, now the Somme. At a later period it acquired the name of the tribe of which it was the chief town, the Ambiani; this name, under a modified form, it still retains.[*]

When France was divided into provinces, Amiens was the capital of Picardy; and when this division was superseded by that of departments, Amiens became the capital of the department of Somme. It is the seat also of a *Cour Royale*, a court the jurisdiction of which may be compared to that of our own assize courts, but which differs from them in being stationary; of a *Tribunal de Commerce*, a court for the decision of mercantile disputes, the members of which are leading merchants or tradesmen, and are appointed by the commercial body; and of a bishopric, which includes the departments of Somme and Oise.

The town is well-built, with broad, straight streets. The river Somme, which traverses it in three branches, is navigable for small craft. There is a citadel, but the ramparts of the town have been demolished, and serve now as promenades. The chief buildings are, the town-house built by Henry IV., in which is a collection of paintings of the French school, the corn-market, the college, the residence of the prefect, and especially the cathedral, one of the finest specimens of Gothic architecture in France. The nave of this edifice, the loftiest in France, is regarded as a masterpiece; and the lightness of the pillars attracts much admiration: the effect of the whole has, however, been injured by the substitution of plain glass for the stained glass which once filled the windows. There are two fine promenades in the town.

The trade of Amiens is still considerable. Velvet, plush, camblet, quilting, serge, drugget, fine kerseymere, hosiery, and other goods, linen, cotton, and woollen, are either entirely manufactured, or, being brought in from other places in an unfinished state, are prepared for sale in other parts of the country, or for exportation to foreign lands. There are also paper-mills and bleaching-grounds. The town serves as a mart for the numerous manufactures of the neighbourhood as far as the confines of the department. The number of inhabitants is above 42,000.

Of institutions for education, or the promotion of science, Amiens possesses several. There is an *Académie*, an institution ranking with the universities of other countries, and a *Collège* or public school; a capital library of 40,000 volumes; a botanic garden, and an academy of belles lettres, sciences, and arts. It was the birth-place of Voiture, Ducange, the astronomer Delambre, and Peter the Hermit, the instigator of the first crusade.

Amiens, after having been bestowed by Charles VII. of France on the Duke of Burgundy, a prince at that time nearly equal to his sovereign in power, was re-annexed to the crown in the fifteenth century by Louis XI., the son and successor of Charles. In the time of Henry IV. it was taken by the Spaniards by a singular stratagem. A party of soldiers, disguised as peasants, driving a cart loaded with walnuts, having gained admittance, contrived to spill their nuts just by the gate; and while the guards were gathering them up, the town was surprised and taken by the disguised soldiers and their comrades who had followed them. This was in 1597; but the town was recovered within a year. The short peace between England and France, in 1802, was concluded at Amiens.

The arrondissement of Amiens contains 652 square miles, and about 160,000 inhabitants. There are in it 250 communes.

AMIENS (TREATY OF), the treaty of peace between Great Britain on the one part, and France, Spain, and Holland, on the other, signed at Amiens on the 25th of March, 1802. The preliminaries of this peace had been signed at London on the 1st of October, 1801; and on that occasion, it was agreed that the terms of the final treaty should be settled at Amiens, that town being situated about midway between London and Paris. On the 1st of November, accordingly, the Marquis Cornwallis left London for Paris, commissioned to act as plenipotentiary; and on the 1st of December he arrived at Amiens. On the 7th, the Dutch minister, Roger Jean Schimmelpenninck, made his appearance. The Spanish representative, Don Joseph Nicolas D'Azara, did not come till a considerable time after. Joseph Buonaparte was the French plenipotentiary.

It was a long time, after the commissioners had all assembled, before much progress was made in the negotiation; and it was frequently supposed to be on the point of being broken off. The treaty, however, was at last signed on the day we have mentioned—an additional article having been added two days after. On the 29th, Mr. Moore, the assistant secretary to the mission, arrived with the news in London. The proclamation of the peace was made in that city, and in Westminster, on the 29th of April, on the evening of which day a brilliant illumination testified the public joy. The treaty of Amiens consisted of twenty-three articles, including the supplementary one. France agreed to evacuate Naples, and the states of the Church; England, on her part, gave up all her conquests during the war, to the powers to whom they had formerly belonged, with the exception of Trinidad, which had been taken from Spain, and the part of Ceylon which had been possessed by the Dutch. Egypt was restored to Turkey. It was also stipulated, that within three months after the exchange of the ratifications of peace, the English troops should evacuate the islands of Malta, Gozo, and Comino, which should be given back into the possession of the Knights of St. John of Jerusalem, to be held by them on conditions which were enumerated under thirteen heads. It was this last stipulation which afterwards afforded the ostensible ground for the breach between the two principal powers which had been parties to the treaty of Amiens. Hostilities were renewed between France and England by a declaration of war on the part of the latter, on the 17th of May, 1803.

AMILCAR. [See HAMILCAR.]

AMIOT, (LE PERE,) a learned French Jesuit, and a missionary to China. He was born at Toulon in 1718. Having entered the order or society, as it was styled, of the Jesuits, he distinguished himself as much by his natural talents, as by his persevering application to study, especially to mathematics, physics, and the languages. Being sent by his superiors to the eastern missions, he arrived at Macao in 1750, whence he proceeded the following year to Pekin, at the request, it is said, of the emperor, who had heard of his great proficiency in mathematics, a science then much in favour at the court of China. Father Amiot soon won the friendship of the monarch, and he continued ever after to reside at Pekin, for the space of forty-four years, till the day of his death. To his knowledge of the Chinese, he added that of the Mantcheou language, which he studied at Pekin, under a military officer of that nation, and which, as he modestly observes, he found very useful for interpreting many obscure passages in the Chinese writers, whose language, he says, is like no other in the world, and is justly called by the Japanese 'the language of confusion.' The Tartar Mantcheou, on the contrary, is methodic, and better resembles our European languages. Many Chinese works, especially those relative to the military profession, being translated into Mantcheou, as the Tartar conquerors adopted the Chinese system of tactics, Amiot availed himself of both texts, and he thus compiled his own treatise in French, *On the Military Art among the Chinese*, which he extracted from antient works written by Chinese generals before our Christian æra, and which are used for the examination of candidates to the rank of officers. This work was published at Paris by Desguignes, in 1772, with some explanatory remarks on certain passages in which Amiot appeared to have misunderstood, or not clearly rendered, the Chinese text. It was afterwards reprinted in the seventh volume of the collection entitled *Mémoires concernant l'Histoire, les Sciences, et les Arts des Chinois, par les Missionnaires*, 15 vols. 4to, published at Paris in 1776—91. A supplement with plates, sent since from China, was inserted in the eighth volume. In the same collection are found most of Amiot's numerous treatises and other works, with a copious index of them in the tenth volume. In the *Lettres sur les caractères Chinois*, addressed to the London Royal Society, he replies to a question referred to him on the subject of certain hieroglyphs observed by Needham on a bust of Isis in the king's cabinet at Turin, and supposed to resemble the antient Chinese symbolic characters. Amiot demonstrated that there was no analogy between the two. This letter is an elaborate dissertation on the Chinese language. He wrote also *L'antiquité de la Chine prouvée par les monumens*, in answer to an essay written by Father Cibot, another Jesuit, under the assumed name of 'Father Ko, a Chinese Jesuit,' both which are inserted in the first and second volumes of the *Mémoires* already mentioned. Cibot had attacked the Chinese chronology of their dynasties, especially with regard to the six emperors who are said to have reigned before Yao. Amiot defended the Chinese historians, as he did likewise in his Life of Koong-tsée, whom we miscall Confucius, which he derived from the best authorities, and in which he gave a genealogy of the philosopher's family, some of whose descendants were living in Amiot's time, and the line of which is there traced back to the Emperor Hoang-ti, about 2600 years before Christ, and three centuries before Yao. It is from this epoch that Amiot reckons the commencement of the historical times of the Chinese, as distinguished from their doubtful and mythological æras. This opinion is conformable to the *Chronological Abridgment of the History of China*, compiled at Pekin in 1770 by order of the Emperor Kien Long, to which work Amiot wrote a prefatory explanation, a copy of which he addressed to M. Bignon, the king's librarian at Paris. Amiot wrote also a dissertation on Chinese music, ancient and modern, which was published separately at Paris, under the care of the Abbé Roussier, and was afterwards inserted in the sixth volume of the *Mémoires*. He also sent over a translation of one of the best Chinese treatises on music, and the MS. was deposited by Bougainville, secretary to the Academy of Inscriptions and Belles Lettres, in the Royal Library at Paris, where it is to be seen. He translated a Chinese poem in praise of the town of Mookden, composed by the Emperor Kien Long, with numerous notes on the country of Mookden, the cradle of the Mantcheou Tartars. Another important work of Father Amiot, is his Mantcheou and French Dictionary, which was the first published in Europe on that language, and was printed at Paris in 1789, in three vols. 4to. The types were cast at the expense of the minister Bertin, who intrusted the revision to the orientalist Langlès. Amiot also wrote a short Mantcheou grammar, which is found in the thirteenth volume of the 'Memoires.' It was thus that Father Amiot continued to send successively from Pekin to Europe the fruits of his assiduous researches in the literature of the country he had adopted, and where he enjoyed universal esteem. He imparted more information on China, and Chinese lore, than any of the missionaries who had preceded him. At the same time, he had the spiritual direction of the congregation of native Christians in the capital. He died at Pekin, in 1794, aged seventy-seven.

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[*] The capitals of the different Gallic tribes appear in the latter period of the Roman domination to have gone by the name of their tribe in preference to their own original designation; and from hence come most of the modern names of these towns. Thus Mediolanum, capital of the Santones or Santoni, has become Saintes: Cæsaromagus, capital of the Bellovaci, is the present Beauvais, &c. It may be observed that the modern name usually comes from the accusative or ablative form of the antient one.

AMIR AL OMARA, or AMIR AL OMRA. [See Emir al Omara.]

AMLWCH, in the island of Anglesey, was formerly an insignificant fishing village consisting of about six houses; but in consequence of the discovery of the celebrated copper mines in the Parys mountain, in the year 1768, it has become a flourishing town: the inhabitants amounted, in 1801, to 4977; and were increased, in 1831, to 6285. It has a capacious harbour cut out of the solid rock or slate, at the expense of the mining companies, capable of admitting thirty vessels of 200 tons burden, where originally there was only a cleft or opening, too small to receive a single vessel. This harbour is dry at low water. It now returns a member to parliament jointly with Beaumaris, Holyhead, and Llangefni.

AMLWCH COPPER MINES. The discovery of these mines was one of the most important events that took place in the mining districts of this country during the last century, for it opened the source of an abundant supply of copper at a time when that metal was beginning to be in great demand for the sheathing of ships and the making of brass. In the year 1762, one Alexander Fraser repaired to the island of Anglesey in search of mines, and examined more particularly the Parys mountain, which in his opinion presented strong indications of minerals in the interior. He communicated his belief to Sir Nicholas Bayley, and prevailed upon him to sink some trial shafts. But no success attended the operations. Sometime afterwards Sir Nicholas, in granting to Messrs. Roe and Co. of Macclesfield a lease of his mines in Carnarvon, imposed upon those gentlemen an obligation to search the Parys mountain for mines. The search was continued for a long time, at considerable expense, but without any favourable result, and was near being abandoned, when, as a last effort, the miners were divided into small parties, and instructed to sink several trial shafts in the neighbourhood of a spring of water which was supposed to be impregnated with copper. On the second day, much to the joy of all concerned, one of these shafts struck upon a large body of copper ore. This discovery was made on the 2d of March, 1768, and the anniversary of that day has ever since been celebrated by the miners. The surface of the mountain had not been penetrated more than seven feet, when the first solid mass of ore was met with. After the discovery of ore, Roe and Co. were dispossessed of their lease by a lawsuit, and the Parys mine was worked by Lord Uxbridge, Mr. Williams, and Mr. Hughes. Mr. Hughes' interest in the Parys mine was a share in the land in right of his wife. It made the fortune of the two latter. The Mona mine, in the same range of mountains, was soon afterwards opened and worked: it was the sole property of Lord Uxbridge, and now belongs to the present Marquis of Anglesea. Both mines proved exceedingly profitable.

As the excavations proceeded, it was found that the ore did not lie in regular veins or lodes, but in large conglomerate masses, which admitted of being quarried in a cheap and easy manner by means of workings exposed to the day. The ore was mixed with, and imbedded in slate, and descended to various depths, from twenty to fifty fathoms, so that in time the workings assumed the shape of a large deep basin, the sides of which were more or less perpendicular, and the bottom full of deep pits and irregularities. When the mines were in full work, every corner of this immense excavation resounded with the blows of the miners and the thunders occasioned by the constant blastings with gunpowder.

At one time the mines gave employment to 1500 workmen, ninety of whom were employed in the smelting-houses. Some estimate may be formed as to the quantity of ore raised, from the circumstance of there having been at one time a stock of 30,000 tons at the Mona mine, and 14,000 tons at the Parys mine. The principal part of the ore was a sulphuret of copper, intermixed, however, with black copper, blue and green carbonate, and some strings of pure native copper. The richer ores were exported to Swansea, or sent to the smelting works at Stanley, near Liverpool; but those of a poorer kind, containing from 1 to 2½ per cent. were broken into small pieces, and placed in ovens or kilns for the purpose of having the sulphur extracted from them. When the oven or kiln was full, hot coals were applied to various parts of the ore, which soon ignited, and the fire smouldering slowly, disengaged the sulphur, which fell into a chamber, connected by means of flues with the kiln or oven. This process of sublimation lasted from six to ten months, according to the quantity of ore operated upon. When the sulphur was supposed to be thoroughly extracted, the ore was taken from the ovens to the company's smelting houses at Amlwch, and there run into rough copper, technically called metal. One of the smelting-houses contained upwards of thirty reverberatory furnaces; each furnace was charged with twelve cwt. of the roasted ore, which smelted in five hours, and yielded half a cwt. of rough copper or metal, containing about 40 per cent. of pure copper. The sulphur collected in the chamber, as above described, was from time to time taken out, fused, and cast into rolls and cones for the London market.

In excavations so extensive, and occasionally penetrating to the depth of fifty fathoms, there could not fail to accumulate a large body of water. The water was found to hold in solution a portion of sulphate of copper, which was separated in the following manner: large ranges of rectangular pits, thirty-two feet in length, twelve feet in width, and two feet in depth, were constructed; the pits were filled with rows of cast-iron plates, placed on edge, and prevented from touching each other by a projecting snag upon the upper side. In course of time, however, any kind of refuse cast or malleable iron was substituted for the plates, and found to answer quite as well at less than half the expense. The water impregnated with sulphate of copper was pumped up from the excavations, and made to flow along troughs or channels into the pits. A slow but continued action took place upon the surface of the iron, which was gradually dissolved and carried off, leaving nearly an equal quantity of oxide of copper precipitated in its place. The precipitation of copper on so large a scale, at a time when the subject was little understood, gave rise to a vulgar opinion, that the iron was converted into copper. Once in two or three months the stream of water was diverted for a short time, the surface of the iron scraped, and the precipitate removed from the pits to be smelted. Being unavoidably mixed with a considerable portion of iron and earthy matter, the precipitate did not yield more than 50 per cent. of copper, instead of 87 per cent. which the pure oxide contains, but the copper obtained from it was always considered of the best quality. The water, charged with sulphate of iron, after leaving the pits, was received into large shallow pools, where a precipitation of the iron took place, and this being collected and dried, was sold as yellow ochre.

For the last ten or fifteen years these celebrated mines have been on the decline; the great mass of ore is exhausted; and the present limited operations are guided by partial and uncertain indications in the slate or matrix. Not more than one-third of the people are now employed, and the mining prosperity of Amlwch, which once seemed to spring from an inexhaustible source, has almost passed away.

During the most flourishing period it was computed that from 60,000 to 80,000 tons of ore were annually extracted from the Parys and Mona mines. Supposing the ore to have averaged 5 per cent. (which is 3½ per cent. less than the average of the Cornish ores,) the above quantity must have yielded upwards of 3000 tons of copper—a product more than equal to that of the whole of the Cornish mines at the same period. At the time now referred to, the exports of Amlwch consisted of—

The richer sorts of copper ore;
The poorer ditto, ditto, roasted;
Rough copper or metal;
Dried precipitate of copper from the pits;
Refined sulphur;
Ochre;
Alum;
Green vitriol or sulphate of iron.

The produce of the mines, for the last five years, has been from 700 to 800 tons of copper annually, or about one-eighteenth part of the copper produced in the United Kingdom.

The ores mined at present do not yield above four per cent. of metal.

A sulphate of lead was found in considerable quantities mixed with the soil or earth which immediately reposed upon the copper ore. The lead obtained from this sulphate contained from fifty to sixty ounces of silver in each ton, and a great quantity of the sulphate was dug, in the expectation that it would be profitable to smelt it, and afterwards extract the silver. This expectation, however, though apparently well grounded, was never realized; for in separating the sulphate of lead from the soil, and also in the process of smelting, difficulties occurred, which it was found impossible to overcome in practice.

It is exceedingly probable that the Parys mountain, or its immediate neighbourhood, was formerly the scene, if not of successful enterprize in mining and smelting, at least of trial and experiment. Long before the present mines were discovered, a collection of waters upon the summit of the mountain was known by the name of the Mine Pool; and a hearth for smelting lead, some pieces of lead and charcoal, and a plate of copper weighing about 50lbs., all found anterior to the opening of the modern mines, seem to attest that the minerals in the vicinity of Amlwch attracted the notice of a generation remote from our own.

AMMIA′NUS MARCELLI′NUS, a soldier and author who lived in the fourth century, and wrote a history of the emperors from the accession of Nerva, A.D. 96, to the death of Valens in 378; the last profane history written by a Roman subject in the Latin language. He was of Greek family, and born at Antioch; at least Libanius claims him as a fellow-citizen. At an early age he entered the army, in the distinguished service of the household guards of Constantius, son of Constantine. He was peculiarly attached to the fortunes of Ursicinus, the master of the horse, under whom he served, first in the East in 350, afterwards in Gaul, whither he went in 355. He was again sent with Ursicinus into the East, and served under the Emperor Julian in his Persian war, which he related at length and with considerable power. Later in life he retired to Rome, where he wrote his history, in thirty-one books. Of these, the first thirteen are lost, the least valuable part, since they can but have contained an epitome of the history of two centuries and a half. The fourteenth book begins just before the death of Constantius, and the transactions of the reign of Julian extend nearly to the end of the twenty-fifth. The question whether he was a Christian or a pagan has been agitated. Though he has not expressly stated his sentiments, it seems evident to us that at least he was not a Christian. In style he is inflated and vicious; but passages of considerable effect and eloquence occur in his work, which has every appearance of being a faithful and unprejudiced narration of public transactions, in many of which he had been personally engaged. "It is not without sincere regret," says Gibbon, "that I must now take leave of an accurate and faithful guide, who has composed the history of his own times, without indulging the prejudices and passions which usually affect the mind of a contemporary." Chap. xxvi. Some suppose the Greek life of Thucydides to be written by him. The early editions of Ammianus are numerous. The most valuable is that of Gronovius, folio, Lugd. Bat., 1693; which contains the life and prefatory matter of the Valesii. This has been the base of two other editions, with the notes of later commentators, both published at Leipzig, (Lips.) one by Ernesti in 1773, one by Erfurdt in 1808. There is an old English translation by Philemon Holland, (Lond. 1609,) and a French one by Moulines, (Berlin, 1775, Lyons, 1778.)

AMMON, or AMUN, or AMN RA, the name of an Egyptian deity, whom the Greeks considered as synonymous with their Zeus (Jupiter). He is often represented on the monuments of Egypt and in other works of Egyptian art with a ram's head and a human body; about which Herodotus (ii., 42) tells the following odd story, picked up during his travels in Egypt:—'Hercules was exceedingly anxious to have a sight of Zeus, but Zeus did not feel inclined to show himself. At last, when Hercules was very importunate, Zeus hit on the following contrivance: he flayed a ram, and cutting off the head put it before his face; he then got into the skin, and in this guise showed himself to Hercules. From this circumstance the Egyptians represent the image of Zeus with a ram's head.' But the ram's head is not the peculiar property of Ammon: it is found also, for instance, on the head of Cneph, with the appropriate distinguishing symbols. We consider the community of symbols in the representations of different deities, as indicating the origin of the political union of the several tribes or peoples to whom the several deities belonged.

The worship of Ammon was not, like that of Osiris and Isis, common to all the Egyptians: it seems to have been specially of Ethiopian origin. The two chief Ammonian temples which now exist are that at Carnak, on the east side of the Nile, forming part of the extensive ruins of Thebes, and that of Siwah, in the Libyan desert, known to the Greeks by the name of Ammonium.

The god Ammon appears also under the figure of a criosphinx or ram-sphinx, which is an animal with a ram's head and the body of a beast of prey of the feline species. (See *British Museum:—Egyptian Antiquities*, vol. i., and the drawings in the French work on *Egypt. Antiquités*, tom. iii., pl. 32.)

The word Ammon cannot, we think, be satisfactorily explained from the Coptic language, as it now exists. The various guesses and conjectures may be seen in Jablonski's *Pantheon*, vol. i.; out of all the guesses, that which connects the word *Ammon*, or *Amun*, with the Coptic word signifying 'to feed' sheep, is the most probable. (See *Coptic Testament*, John xxi. 15; &c.) Ammon then would be the god of a Nomadic race, and originally a pastoral deity.

We find the *city* or *portion* of Ammon mentioned in Jeremiah xlvi. 25; Ezekiel xxx. 15., under the name of Amon-No; and in Nahum iii. 8., under the name of No-Amon. This city is generally supposed to be the Greek Diospolis, or 'city of Jupiter,' now forming part of the ruins of Thebes. But the No of Nahum is more probably the Diospolis of the Delta.

The name Amon forms a part of the proper name of several Egyptian kings and persons, such as Amenotph (see MEMNON), and Ptamon; and is also often used in the title or qualifying term applied to the name of a king: thus we find on the monuments prefixed to the name of Ramses, the title *Amn-mai*, 'beloved by Ammon.' This may be compared with such Greek proper names as *Diphilus*, 'dear to Jupiter,' and such German names as *Gottlieb*, (Theophilus) 'dear to God,' *Gottfried* (Godfrey) 'peace of God.'

AMMO'NIA, the modern name of the *volatile alkali* formerly so called to distinguish it from the more fixed alkalis: it is a gaseous body, and was first procured in that state by Priestley, who termed it alkaline air. (*Experiments on Air*, vol. ii. p. 370.) He obtained it from sal ammoniac, and hence the present name of the alkali.

Ammonia, like all the other alkalis, is a compound substance; it consists of azote and hydrogen, in proportions hereafter to be mentioned; it exists, combined with various acids, in urine and in some calculi. M. Boussingault (*An. de Chim. et de Phys.*, xliii., p. 334.) found it in a native oxide of iron, and Dr. Marcet (*Phil. Trans.* 1823) detected it in sea water combined with muriatic acid. Ammonia cannot be formed by direct action after its elements have both assumed the gaseous form; it is requisite that one of them should be in the nascent state: it is generated during certain natural processes, and is obtained by several artificial ones; these will be noticed after a description of the method of preparation first employed by Dr. Priestley, and still adopted by chemists, has been given.

Sal ammoniac, a salt already mentioned, is a compound of muriatic acid and ammonia; when it is powdered and mixed with three-fourths of its weight of powdered lime, and heated in a retort, ammoniacal gas is plentifully given out, which must be received in jars filled with and inverted in mercury. The changes which occur during the production of the ammonia are of a complicated nature. Sal ammoniac, or muriate of ammonia, consists of muriatic acid and ammonia, and the acid itself is constituted of chlorine and hydrogen; lime is composed of the metal calcium and oxygen. When the muriate of ammonia and lime act upon each other, the chlorine of the muriatic acid combines with the calcium of the lime, and the resulting chloride of calcium remains in the retort, while the hydrogen of the acid combines with the oxygen of the lime to form water, which evaporates with the ammonia evolved.

The ammonia thus obtained is aëriform; and as it does not become fluid under common circumstances of temperature and pressure, nor solid in any case, is termed a *gas—ammoniacal gas*. Its properties are, that it is colourless, transparent, and of course invisible; possessing the elasticity and mechanical properties of atmospheric air. The smell is peculiar and extremely pungent, and its taste is highly acrid. An animal put into it is immediately killed, and a taper when immersed in it is extinguished: it appears, however, to be slightly inflammable, for the flame is rather enlarged before it goes out; and a small jet of the gas may be burned in oxygen gas. The density of ammoniacal gas is to that of atmospheric air, nearly as 0·5902 to 1; 100 cubic inches weigh rather more than 18 grains. It acts strongly as an alkali, turning vegetable blues green, and yellows reddish brown, and saturates acids forming various salts.

Mr. Faraday (*Phil. Trans.* 1823, p. 189) found, that by subjecting ammoniacal gas to a pressure of about 6½ atmospheres, at the temperature of 50°, it became a colourless transparent fluid, the density of which was 0·760, water being 1.

Water dissolves ammoniacal gas with great rapidity, and in large quantity; a few drops of water thrown up into a jar of the gas instantly condense it; a piece of ice also immediately liquefies in and condenses the gas. Water at 50° is capable of condensing 670 times its volume; the density of the solution diminishes as its strength increases, so that, according to Davy, with whom other chemists nearly agree, when water contains 9½ per cent. of ammonia, its density is 0·9692; but when it holds 32½ per cent., it is reduced to 0·8750. The aqueous solution is colourless, transparent, and has the pungency and alkaline property of the gas: by exposure to the air, the ammonia escapes, and by the application of heat it is expelled from the water; on account of this volatility of ammonia, vegetable colours which have been altered by it regain their original tints as it evaporates, which is not the case when the change has been caused by the fixed alkalis.

The presence of ammonia may be detected by its strong smell, by holding moistened turmeric paper where it is suspected to exist, and by the formation of a white vapour, when exposed to a glass rod moistened with muriatic acid.

Dr. Priestley found that the strong light of a lens produced no effect upon ammoniacal gas. By moderate degrees of heat it is merely expanded, but when passed through an ignited porcelain tube, as was first shown by Dr. Priestley, it is decomposed, and, increasing to nearly double its volume, rendered inflammable. (*Experiments on Air*, vol. ii., p. 393.) He also first proved that it is decomposed by the electric spark, and separated into hydrogen and azotic gases, (vol. iii., p. 389.) These experiments have been repeated by Berthollet, Davy, and Gay-Lussac. Dr. Henry (*Annals of Philosophy*, N. S., viii., p. 347) also found that when ammoniacal gas is electrified, its volume is exactly doubled, and it is resolved into three volumes of hydrogen gas, and one volume of azotic gas. As the result of these experiments, it is now generally admitted, that ammoniacal gas is a compound of three volumes of hydrogen gas and one volume of azotic gas, condensed into two volumes: by weight it is composed of

Three atoms of hydrogen 1 × 3	= 3	or hydrogen	17·64
One atom of azote . .	=14	azote .	82·36
Weight of its atom .	=17		100·

That this is the composition of the gas in question is also shown by comparing its calculated and actual density. According to Dr. Thomson (*Chemistry of Inorganic Bodies*, vol. i., p. 704) 300 cubic inches of hydrogen gas weigh 6·4842 grains, and 100 cubic inches of azotic gas weigh 30·2794 grains, making together 36·7636; but during combination the gases condense to half their volume, consequently 200 cubic inches of ammoniacal gas weigh theoretically 36·7636 grains, and 100 weigh 18·3818. Now according to Allen and Pepys the weight by actual experiment is 18·18 grains, which is sufficiently near the calculated statement to prove its correctness.

Ammonia is used for many purposes both in medicine and in scientific chemistry; as however it would be impossible in some cases, and inconvenient in almost every one, to employ it in its gaseous state, it is used in solution in water, and then frequently called *liquid ammonia:* but this term can be applied with propriety only to the gas rendered fluid by cold and pressure. Solution of ammonia may be readily prepared by mixing muriate of ammonia with lime, in the mode and proportions already mentioned, and passing the gas liberated into water: this may be done either by inserting a glass tube bent at right angles into the mouth of the retort, and then putting the other end into a bottle of water; or, which is better, in case absorption should take place, a tubulated receiver may be used instead of the bent tube, securing it properly by a perforated cork to the retort, and luting it so that it may withstand the pressure of passing the gas into the water.

Having now stated the direct method of preparing ammoniacal gas, its properties, composition, and aqueous solution, it will be proper to notice the different processes, both natural and artificial, by which it is produced in large quantity. The first of these is the putrefaction of animal matter. We have already mentioned that hydrogen and azote are the elements of ammonia, and, with some exceptions, there is this difference between animal and vegetable matter, that the first contains azote, while the latter does not. When, then, animal matter is subjected to decomposition, whether the operation be the natural one of putrefaction, or the artificial one of the application of heat, ammonia is one of the results obtained by the new arrangement of its elements, and it is combined with carbonic acid, forming carbonate of ammonia. It will be readily understood how this happens: the animal matter consisting of hydrogen, azote, oxygen, and carbon, the first two gases unite to form ammonia, and the two latter elements to constitute carbonic acid; it is extremely probable, also, that during putrefaction the oxygen of the atmosphere may assist in the formation of this acid.

Ammonia may be artificially produced from most animal matter, except fat, by subjecting it to heat in iron cylinders; and when bones, hoofs, or horns, are thus decomposed, a large quantity of carbonate of ammonia is obtained, some of which is in a solid form, but the greater portion is dissolved in water and mixed with empyreumatic oil. This liquor has a dark colour, and a pungent, disagreeable smell: when it is purified so as to separate the greater part of the oil, it is the *spirit of hartshorn* of the shops. The hard portion of bone, being mostly phosphate of lime, does not yield any ammonia, but there is intermixed with it a large quantity of a substance termed chemically *gelatine*, which is similar to isinglass, and that this yields ammonia is readily shown by heating it in a retort with a spirit lamp; the product received in a vessel containing turmeric paper soon renders its yellow colour reddish-brown; and there are also produced water, carbonic acid, and empyreumatic oil.

Vegetable matter, when azote is one of its elements, as the gluten of wheat, yields ammonia if heated: coal soot also contains it; but the decomposition of coal, effected during the production of carburetted hydrogen for the purpose of gas illumination, is now an abundant source of ammonia, which, by various processes, is converted into sulphate, muriate, or carbonate.

It has been already observed, that although hydrogen and azote constitute ammonia, yet when they have both assumed the gaseous state they cannot be made to unite. Dr. Austen (*Phil. Trans.*, vol. lxxviii. p. 380) attempted to combine them by electricity, cold, and other methods, but he did not succeed; he found, however, that when iron filings moistened with water were exposed either to azotic gas or atmospheric air, the nascent hydrogen of the decomposed water united with the azotic gas and formed the alkali in question, and it occurred most readily in the pure azotic gas.

Ammonia may also be produced by the action of both elements in their nascent state; if tin filings be put into nitric acid diluted with water, rapid action ensues, with the evolution of much nitric oxide gas, and the formation of peroxide of tin. In this process, a portion both of the nitric acid and water is decomposed, azote from the former, and hydrogen from the latter, both in their nascent state, combine, and the resulting ammonia forming nitrate with the undecomposed nitric acid, this salt is diffused through the peroxide of tin; add lime to this mixture, and owing to its greater affinity for nitric acid than of ammonia for it, nitrate of lime is produced and ammoniacal gas evolved, as may be ascertained by the smell and its action upon turmeric paper. Iron and phosphorus decompose diluted nitric acid with similar results; and it has also been found, that the rust or peroxide of iron formed within houses is capable of absorbing and strongly retaining the ammoniacal vapours there developed. (*Ann. de Chim. et de Phys.* 24—99.)

In the *Quarterly Journal of Science*, &c. (vol. xix. p. 116.) Mr. Faraday has detailed some very curious cases of the production of ammonia, in which the substances yielding it are, according to the present state of chemical science, destitute of the azote supposed to be necessary to its formation. From among numerous experiments, the following may be selected as one of the most striking:—a glass tube was filled with hydrogen gas, a piece of zinc foil dropped into it, and upon that a portion of hydrate of potash, and a slip of moistened turmeric paper was then introduced. The potash was melted by a spirit-lamp and suffered to run upon the zinc, and by continuing the heat, the turmeric paper was reddened owing to the evolution of ammonia. Now the elements included in this operation were oxygen, hydrogen, zinc, and potassium; the source, therefore, of the ammonia is by no means evident, and it is difficult of explanation.

The hydrates of soda, lime, and barytes produce similar effects; and much ammonia may be evolved by their action upon iron, tin, zinc, lead, and arsenic. But spongy platina, silver, and gold do not produce any; the metals, therefore, seem to act according to their power of absorbing oxygen; and water or its elements appear to be necessary to the experiment.

We shall now briefly notice the nature and results of the action of ammonia upon certain elementary bodies. It has been already stated that ammoniacal gas may be burned in oxygen gas; a mixture of these gases may also be fired by the electric spark, the results being water and azotic gas; a little nitric acid is also generated, if the quantity of oxygen gas be sufficient to combine with all the hydrogen of the ammonia. (Dr. Henry, *Phil. Trans.*, 1809.) Chlorine gas, by mere admixture with ammonia, decomposes it partially, and the action is attended with the evolution of light and heat: the chlorine combines with a portion of the hydrogen of the ammonia; muriatic acid is thus formed, which uniting with the ammonia remaining undecomposed, the result is muriate of ammonia, while azotic gas is liberated. The same effects are obtained, if the aqueous solutions of the gases in question be employed; but then the changes are unaccompanied by light or heat.

Ammonia has no action upon carbon, except at a high temperature; if, however, a piece of well-dried charcoal be passed up into ammoniacal gas over mercury, it is capable of absorbing ninety times its volume in twenty-four hours. The gas undergoes no chemical change, and from Saussure's experiments, it appears that the absorption is analogous to the capillary attraction of liquids by very small tubes. Sulphur, when strongly heated in ammoniacal gas, partially decomposes it, and hydrosulphuret of ammonia is one of the products. At a high temperature, phosphorus also decomposes ammonia and phosphuretted hydrogen is formed; when no heat is employed, phosphorus absorbs the gas, and a deep-brown coloured substance is formed which is almost pulverulent: its properties have not been examined. Iodine and ammonia, provided both be perfectly dry, combine without the agency of heat, and form iodide of ammonia. (Colin, *Ann. de Chim.* xci. p. 262.) The compound is formed immediately on mixture: it is a shining viscid liquid, of a brownish-black colour, but as the absorption of ammonia goes on, it loses its lustre and viscidity. It is not fulminating, but, if put in contact with water, the ammonia is decomposed, and a black powder formed, which is the well-known detonating substance *iodide of azote*, generally prepared by putting iodine into the aqueous solution of ammonia.

The action of the metals upon ammonia varies considerably according to their nature. Gay-Lussac and Thénard have shown that potassium and sodium absorb ammoniacal gas, and are covered with a white crust. The absorption is more rapid when the heat of a spirit-lamp is employed; the white crust becomes deep yellow, the surface of the metal is brilliant and smooth, whilst the new compound is greenish, fuses, and runs upon the sides of the tube; when the operation is continued until the potassium entirely disappears, ammoniacal gas is not only absorbed, but a portion is decomposed and hydrogen gas given out. The compound formed is of a deep olive-green colour, its fracture crystalline, and its density greater than that of water. It fuses at a temperature higher than boiling water, does not conduct electricity, burns in oxygen gas, and yields hydrate of potash and azotic gas. Water decomposes it rapidly; the results are potash and ammoniacal gas. Gay-Lussac and Thénard consider it as a compound of azoturet of potassium with ammonia.

When ammoniacal gas is passed over ignited iron or copper, the density of the metals is much diminished; and by the repeated action and decomposition of the gas, iron may be increased in weight, as proved by Despretz, 11·5 per cent., which increase is owing to the absorption of azote by the metal. It has been mentioned under the head of amalgams, that mercury and ammonia, when subjected to the action of voltaic electricity, form a compound which has been termed an amalgam. This experiment was first made by Berzelius and Pontin, and may be thus performed:—put some mercury into an open glass capsule, and place in it a platina wire connected with the negative pole of the battery; pour on the mercury a strong aqueous solution of ammonia, and connect this by a platina wire, at the distance of a line from the mercury, with the positive pole of the battery. When the battery is rendered active, the positive extremity first gives out gas, but soon after it is disengaged also from the mercury, which expands, becomes gradually as thick as butter, is of a silvery-white colour, and eventually increases to five or six times its original volume.

At a temperature of 70° to 80° of Fahrenheit, the amalgam is a soft solid; at 32°, it is a firm crystalline mass. Its density is about 3, water being 1. If exposed to the air it soon becomes covered with a white crust of carbonate of ammonia; and when thrown into water, the mercury returns to its original state, a weak solution of ammonia is formed, and hydrogen gas is evolved equal to half the volume of the amalgam used in the experiment.

Davy improved this process by putting about 50 grains of mercury into a cavity made in a piece of moistened sal-ammoniac, placed on a platina plate attached to the positive pole of the battery, while the mercury was connected by a platina wire with the negative one. This process is not only more easily executed than the foregoing, but the amalgam obtained by it is more permanent.

Great difference of opinion prevails as to the nature of this amalgam. Gay-Lussac and Thénard consider it as a mere combination of mercury and ammonia, while Berzelius regards it as a real amalgam of mercury and *ammonium*, which he considers as a metal, composed of one volume of azotic gas, and four volumes of hydrogen gas; this opinion is, however, entirely hypothetical, and is shown by numerous facts and analogies to be extremely improbable.

Although mercury is the only metal which appears to combine with ammonia, there are several metallic oxides which unite with it. These compounds are called *ammoniurets*, and will be described under each metal: for the present we shall merely mention, that the solution of ammoniuret of zinc is colourless; that of peroxide of copper is purple, and of nickel the same, except when the excess of ammonia is driven off, and then it is green, the ammoniuret of cobalt is of a fine red colour. The solid ammoniurets of silver and gold are extremely explosive substances, and are called fulminating gold and silver. With the various acids, ammonia forms salts: we shall, however, describe only the more important, viz., the acetate, carbonates, muriate, nitrate, oxalate, and sulphate.

Acetate of Ammonia.—This salt is prepared by adding sesquicarbonate of ammonia to dilute acetic acid. Owing to the superior affinity of the acetic acid for the ammonia, the carbonic acid is expelled from it with effervescence, and a colourless solution remains, which, when concentrated, and placed under the exhausted receiver of an air-pump, over sulphuric acid, yields transparent prismatic crystals, the taste of which is hot; they are very deliquescent. According to Dr. Thomson, they are composed of 1 atom of acetic acid, 51; 1 atom of ammonia, 17; and 7 atoms of water, 63; their atomic weight is, therefore, 131.

Acetate of ammonia is directed to be prepared in the *London Pharmacopœia*, and kept in solution under the name of *Liquor Ammoniæ Acetatis*. It is used externally as a refrigerant, and internally as a diaphoretic, and is commonly known by the name of *Spirit of Mindererus*.

Carbonates of Ammonia.—Of these there are three, the *carbonate, sesquicarbonate,* and *bicarbonate*. The carbonate may be procured by mixing one volume of carbonic acid gas and two volumes of ammoniacal gas in a jar over mercury; they immediately condense into a white solid, which is carbonate of ammonia. It may be also prepared by mixing and heating carbonate of potash and muriate of ammonia. By a series of decompositions, the carbonic acid is transferred from the potash to the ammonia of the muriate, and the carbonate formed, being volatile, rises in vapour, and is condensed in the upper part of the subliming vessel. It is a white salt, pungent to the smell, and acrid to the taste; soluble in cold water, and decomposed by hot water. It acts as an alkali upon vegetable colours, and consists of

One atom of carbonic acid	22
One atom of ammonia .	17
Atomic weight . . .	39

It is used in medicine as a stimulant in a preparation called in the *Pharmacopœia*, *Spiritus Ammoniæ Aromaticus*, and commonly *Spirit of Sal Volatile*.

Sesquicarbonate of Ammonia.—This salt is contained in the *Pharmacopœia* under the incorrect name of *Ammoniæ Subcarbonas*, or *subcarbonate of ammonia*. It is directed to be prepared by heating, in a subliming vessel, a mixture of one part of muriate of ammonia, or sal ammoniac, and one part and a half of carbonate of lime or chalk; it is, however, usually, and more economically obtained by decomposing sulphate of ammonia with carbonate of lime. In this case, double decomposition ensues, sesquicarbonate of ammonia is formed, volatilised, and is condensed in the upper part of the vessel, while sulphate of lime remains in the lower.

Sesquicarbonate of ammonia is a colourless, translucent, moderately hard salt; it has a pungent smell, and a sharp, penetrating taste, but less so than the carbonate. It is soluble in about four times its weight of cold water, and is decomposed by hot water. It acts upon vegetable blues and yellows, like an alkali, and on this account, as well as its ammoniacal smell, has been called a subcarbonate.

It is composed of

Three atoms of carbonic acid	66
Two atoms of ammonia . .	34
Two atoms of water . . .	18
Atomic weight	118

As three atoms of carbonic acid are combined with one atom of ammonia, and these being as one and a half to one, this salt, like others similarly constituted, is generally termed a *sesquicarbonate*.

It is used in medicine as a stimulant, and usually called *smelling salts*. It is also employed as a substitute for yeast in making some of the finer kinds of bread. As a chemical re-agent, it is extensively used; and also for preparing various other ammoniacal salts.

Bicarbonate of Ammonia.—This salt may be prepared by mixing, over mercury, equal volumes of carbonic acid and ammoniacal gases, and adding a little water; by passing carbonic acid gas into a solution of sesquicarbonate of ammonia, in which way it may be obtained in crystals; by heating a mixture of equal weights of muriate of ammonia and carbonate of lime in a subliming vessel; or lastly, and with the greatest facility, by exposing powdered sesquicarbonate of ammonia to the air until it becomes inodorous; in this case, a larger proportion of ammonia escapes than remains, and the residue thus becomes a bicarbonate. When obtained by sublimation, it resembles the sesquicarbonate in appearance, but differs from it in being devoid of pungency; it is rather hard, soluble in cold, and decomposed by hot water. When perfect, it has no alkaline action on vegetable colours, like the preceding carbonates. The salt obtained by sublimation, or by exposing the sesquicarbonate to the air, consists of

Two atoms of carbonic acid	54
One atom of ammonia .	17
Two atoms of water . .	18
Atomic weight . . .	89

It is rarely used either in medicine, or as a chemical re-agent.

Muriate of Ammonia.—This salt has been long known, and extensively used, under the name of *Sal Ammoniac*. The substance from which it was first procured, was the soot of camel's dung. It is now largely manufactured in Europe, by combining muriatic acid, either directly or indirectly, with ammonia, obtained from the decomposition of animal matter, but principally from the liquor obtained during the preparation of coal-gas, or carburetted hydrogen. The impure carbonate of ammonia which this liquor contains is either at once saturated with muriatic acid, or first converted into sulphate of ammonia, and afterwards, by decomposing it with common salt, into muriate: the products are sulphate of soda and muriate of ammonia, and this last is separated by crystallization, and sublimed.

Muriate of ammonia, as obtained by sublimation, is an amorphous, translucent, colourless salt; but when separated from water by crystallization, its form is cubic. It has a sharp, saline taste, but no smell, and dissolves readily in water; exposure to a dry air produces no change in it; by heat, it volatilizes without decomposition. Lime and the fixed alkalis decompose it, evolving ammoniacal gas; and sulphuric acid expels the muriatic acid gas. It is composed of equal volumes of muriatic acid gas and ammoniacal gas, as may be shown by the perfect condensation of these proportions in a jar over mercury; or by weight, of

One atom of muriatic acid	37
One atom of ammonia .	17
Atomic weight . . .	54

This salt is much employed in various chemical manufactures. It is generally used for preparing ammoniacal gas, and the sesquicarbonate of ammonia, in the modes already described.

Nitrate of Ammonia.—When sesquicarbonate of ammonia is added to dilute nitric acid, effervescence occurs, owing to the evolution of the carbonic acid of the decomposed ammoniacal salt, and a solution of nitrate of ammonia remains; this, by evaporation, yields slender crystals of nitrate of ammonia; they are colourless, inodorous, very sharply saline to the taste, readily soluble in water, and deliquescent in a moist atmosphere. When heated to about 500° of Fahrenheit, nitrate of ammonia decomposes, and is resolved into water and nitrous oxide gas. Sometimes the solution of nitrate of ammonia, instead of being merely evaporated till crystals are formed, is reduced till the water is so nearly expelled, that the salt solidifies in cooling. In both states it is composed of

One atom of nitric acid	54
One atom of ammonia	17
One atom of water .	9
Atomic weight . .	80

It is principally used for preparing nitrous oxide gas.

Oxalate of Ammonia.—This salt is prepared by adding sesquicarbonate of ammonia to a solution of oxalic acid, until it is saturated. The solution by evaporation yields small prismatic crystals; these are devoid of smell, have a bitter, saline taste, and dissolve readily in water.

Oxalate of ammonia is composed of

One atom of oxalic acid	36
One atom of ammonia	17
Two atoms of water .	18
Atomic weight . . .	71

It is used as a test of the presence of lime, and to precipitate it from solution in chemical analyses.

Sulphate of Ammonia.—It has been already mentioned, that this salt is formed as an intermediate step in preparing muriate of ammonia, and this is the principal purpose to which it is applied. In small quantity, it is best made by saturating dilute sulphuric acid with sesquicarbonate of ammonia. The solution is colourless, and by evaporation yields small prismatic crystals; these have a saline taste, and are readily dissolved by water. Crystallized sulphate of ammonia is composed of

One atom of sulphuric acid	40
One atom of ammonia .	17
Two atoms of water . .	18
Atomic weight	75

According to Dr. Thomson there is a variety of this salt, the crystals of which contain only half as much water as the abovementioned; but this kind is not usually met with.

The general properties of the salts of ammonia are as follows: soluble in water, with few exceptions; decomposed by the fixed alkalis, and alkaline earths, with the evolution of ammonia; decomposed when a magnesian salt and a soluble phosphate are added to them, a crystalline precipitate being formed, which is a double salt, composed of phosphate of ammonia and phosphate of magnesia; decomposed and dissipated by heat, except the acid, like the phosphoric and boracic, be a fixed one, in which case the ammonia is expelled, and the acid remains: a solution of muriate of platina occasions a yellow precipitate in solutions of ammoniacal salts.

AMMONIAC (GUM), a concrete juice produced in Persia, Abyssinia, &c., but the plant from which it is obtained does not appear to have been ascertained. Willdenow refers it to the *Heracleum gummiferum*, in which he is followed by the British Colleges of Physicians. Others refer it to the *Ferula orientalis*. It consists of grains of various sizes, usually called *tears*: they are either separate or agglutinated into masses; their colour is whitish, but they become yellow by the action of the air; they are shining, opaque, irregular in shape, and more or less globular; when cold, ammoniac is rather hard and brittle, it softens by the heat of the hand, but does not entirely liquefy at a stronger heat. The smell is peculiar and disagreeable, and the taste is nauseous, at first mucilaginous and bitter, and afterwards acrid. Its specific gravity is 1·207. When triturated with water, it is partly dissolved, forming an emulsion which becomes clearer on standing. When distilled with water, it loses its volatile oil, and becomes inodorous; the distilled water has the odour of the gum, and small drops of limpid, colourless oil float on its surface. Alcohol takes up about half its weight, forming a brownish-yellow solution; which becomes turbid when mixed with water. It is combustible, burning with a white flame, little smoke, and a strong smell; the ashes left, consist of small portions of the carbonates of potash and lime, and phosphate of lime.

Sulphuric acid readily dissolves ammoniac, and water precipitates the solution; nitric acid converts it into a bitter substance; the fixed alkalies form with it a turbid solution, which is extremely bitter.

According to Bucholz, ammoniac consists of

Resin	72·0
Gum	22·4
Bassorine	1·6
Volatile oil, water and loss	4·0
	100

It is used in medicine as a stimulant and expectorant.

• **AMMONITES**, a nation descended, according to Gen. xix. 38, from the incestuous connexion of Lot with his younger daughter, about the year 1898 B.C. The name of their progenitor, בֶּן־עַמִּי *Ben Ammi*, means *son of my kindred*, and the name *Ammon* has nearly the same signification. There is no etymological connexion between בְּנֵי עַמּוֹן children of עammon, and the Egyptian word Ammon or Amon. The Ammonites, or the children of Ammon, are called by the Septuagint and Josephus, Ammanitæ. The country which they inhabited was situated between the rivers Arnon and Jabbok, N.N.E. of the Moabites, and east of the tribes of Reuben and Gad. Giants dwelt there, we are told, in old time; and the Ammonites called them Zamzummim (זַמְזֻמִּים those who devise wickedness), a people great and many, and tall as the Anakim; but the Lord destroyed the Zamzummim before the Ammonites, who dwelt in their land. The Israelites, under Moses, smote the Amorites, and possessed their land from Arnon unto Jabbok, even unto the children of Ammon, about the year 1452 before Christ: but they did not enter the territory of the Ammonites, for the border of the children of Ammon was strong (Num. xxi. 24). The Israelites were directed not to distress the children of Ammon, because the Lord had given the land unto the children of Lot for a possession. About 1161 B.C., the children of Ammon, under their king, passed over the Jordan, and encamped in Gilead with the pretext of recovering the country which they falsely accused the Israelites of having taken from them 300 years before. Jephthah, who then commanded the Israelites, reminded the king of the Ammonites, that the Israelites never went into the borders of Ammon. In the battle that followed, Jephthah smote the Ammonites from Aroer to Minnith, and subdued them. (Judges x. xi.) In the year 1095 B.C. Nahash, king of the Ammonites, encamped against Jabesh Gilead, and offered to make terms with the inhabitants on condition that he might put out all their right eyes, and lay it for a reproach upon Israel. Upon this, messengers from Jabesh went to Gibeah of Saul; and Saul put the people in three companies; and they came into the midst of the host in the morning watch, and slew the Ammonites until the heat of the day, so that two of them were not left together. After the victory, Samuel said, Let us go to Gilgal and renew the kingdom, and there they made Saul king. (1 Sam. xi.) Nahash afterwards showed kindness unto David: he died about B.C. 1037. When David sent to comfort his son Hanun, the princes of the children of Ammon suspected that he had some design, and the king took David's servants, and treated them shamefully. The Ammonites then hired the Syrians of Beth-Rehob, and 20,000 footmen of Zoba, and of king Maacoh 1000 men, and of Ishtob 12,000. To oppose this force, David sent out Joab, who defeated the Ammonites. Upon this, Hadarezer, the Syrian king, sent and brought out the Syrians from beyond the Euphrates, but David took 700 chariots of the Syrians, and slew 40,000 horsemen, and Shobach, the captain of their host; so the kings that were servants to Hadarezer, made peace with Israel, and the Syrians feared to help the children of Ammon any more. About B.C. 1035, David sent Joab and his servants, and all Israel, and they defeated the children of Ammon, and besieged Rabbah, their metropolis. And Joab took first the royal city, or that part which contained the palace, and the reservoirs and springs of water. And Joab sent messengers to David, and said, I have taken the city of waters, now gather the rest of the Israelites and take Rabbah: lest I take the city and it be called after my name. David took Rabbah, and got the king's crown, the weight whereof was a talent of gold, with the precious stones: and it was set on David's head, and he brought forth the spoil of the city in great abundance. His treatment of the conquered people was harsh and cruel. About B.C. 896, the Ammonites, Moabites, and others came against Jehoshaphat, to battle in Hazazon-tamar, which is En-gedi. Jehoshaphat proclaimed a fast, and Judah gathered themselves together to ask help of the Lord, which came by the discord of the hostile forces. For the children of Ammon and Moab stood up against their comrades, the inhabitants of mount Seir; every one helped to destroy another, and none escaped. And Jehoshaphat and his people stripped off precious jewels from the dead bodies, and riches more than they could carry away, and they were three days in gathering the spoil. And on the fourth day, they blessed the Lord in the valley of Beracha. Therefore, the name of the same place is called Beracha, which means blessing. And the fear of God was on all the kingdoms, when they heard that the Lord had fought against the enemies of Israel.

(2 Chron. xx.) About B.C. 760, Jotham fought with the king of the Ammonites, and compelled the Ammonites to give him the same year 100 talents of silver, and 10,000 measures of wheat, and 10,000 of barley; so much they paid also the second and the third year. (2 Chron. xxvii.)

From the prophetic writings, we derive some further information as to the history and character of the Ammonites. They are accused by Amos (i. 13.) of the barbarous practice of ripping up women with child. Their destruction is predicted by Isaiah, xi. 14; Zephaniah, ii. 9; Jeremiah, xlix. 1-5; Ezekiel, xxv.

About 600 B.C., bands of the Ammonites came with Nebuchadnezzar against Jerusalem, (2 Kings xxiv. 2.) and exulted in the downfall of their once powerful and inveterate enemy. About 457 B.C., Ezra enforced the Mosaical law (Deut. xxiii. 2.), that an Ammonite should not enter into the congregation of the Lord, even to his tenth generation. Consequently, Ezra separated many Israelites from their Ammonitish wives, (Ezra ix. x.) King Solomon, at an earlier period, had violated the Mosaic law, by having Ammonitish women in his harem. (1 Kings xi. 1.) Ezra's adherence to the law of Moses excited the hostility of the Ammonites to the rebuilding of Jerusalem, which was ridiculed by Tobiah the Ammonite, who said, even that which they build, if a fox go up, he shall even break down their stone wall. (Neh. iv. 3.) Nehemiah, who was also a vigorous reformer, cursed and smote those Israelites who had married wives of Ammon and plucked off their hair (Neh. xiii.), about 434 B.C. Judas the Maccabee fought, during the reign of Antiochus Epiphanes, about 164 B.C., many battles with Timotheos, the mighty captain of the Ammonites, who had much people. Judas took their town, Jazar: (Maccabees v.) Rabbah had been already destroyed by Antiochus the Great. (Polyb. v. 71.) In the days of Justin Martyr, the Ammonites were still very numerous; and in the days of Origen, the Ammonites and Edomites went under the general name of Arabians (lib. v.)

Their metropolis, רַבָּה Rabbah, which we must suppose had been rebuilt, is called by Josephus Ραβαδᾶ, by Eusebius Αμμαν, by Polybius and Stephanus Byzantinus, Ραββατάμμανα, and Philadelphia; and by the Arabians, Am-mān. Abulfeda describes its extensive remains (*Tab. Syriæ, ed.* Köhler, p. 91), which were found by Seetzen under the name of *Robba* and *Rabba*. (Zach's *Monatliche Correspondenz*, xviii. p. 433.) These, however, belong to the Greek period, not to the ruins of ancient Rabba. [See PHILADELPHIA.] The surrounding country was called *Arabia Philadelphiensis*. The bed of Og king of Bashan belonged to the curiosities of Rabbah; but how it got there, we are not told. [See AMORITES.] Nine cubits were the length, and four the breadth thereof, (Deut. iii. 2.)

The Ammonites were uncircumcised (Jer. ix. 26.), and worshipped Molech or Milcom, and their idolatry was, by the Ammonitish wives of Solomon, introduced among the Israelites. (1 Kings xi. 7, 33. 2 Kings xxiii. 13.)

Of their kings, we know only Nahash and Hanun, in the time of David, and Baalis, contemporary with Nebuchadnezzar. (Jer. xl.)

AMMO'NIUM. [See SIWAH.]

AMMO'NIUM, a name proposed by Davy to express the supposed metal which amalgamates with mercury, when it is electrified in contact with ammonia, as already described; he thought it scarcely possible to conceive that a substance, which forms with mercury so perfect an amalgam, should not be metallic.—*Phil. Trans.*, 1808.

Although few chemists have adopted this opinion, its probability is still maintained by Berzelius: he considers ammonium to be a compound of 1 volume of azotic gas and 4 volumes of hydrogen gas; these being nearly the proportions of them contained in the mixture of ammoniacal and hydrogen gases, obtained when the amalgam is decomposed by water.

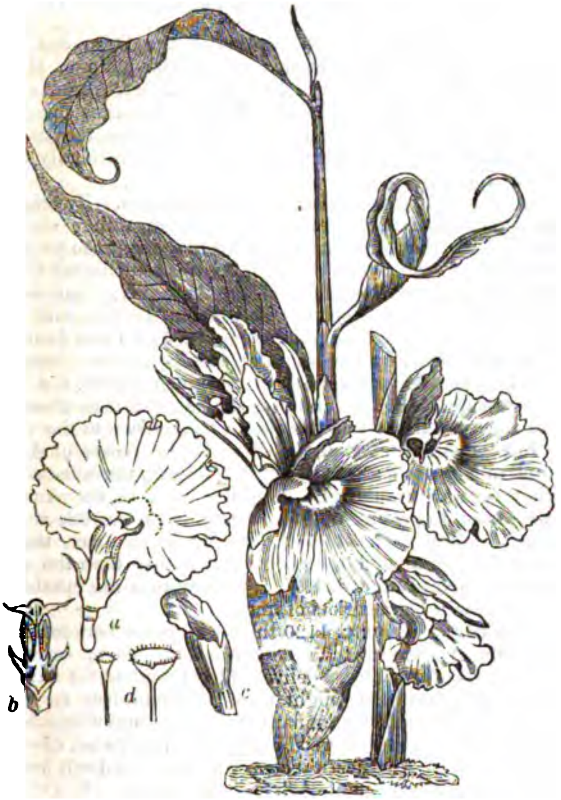
The property of amalgamating with mercury is the only circumstance which denotes an approximation to the nature of a metal in the substance in question; while there are difficulties almost insuperable to such a conclusion. No metal has hitherto been decomposed; mercury is the only substance with which the supposed ammonium has been combined, and it has never been procured in a separate state.

A'MNESTY is a word derived from the Greek *ἀμνηστία*, which, literally, signifies nothing more than non-remembrance. This word, however, both in the Greek and in the Latin language, into which latter it was introduced, (see *Aurelian. Vopisc.* chap. 39,) acquired a more particular signification, and was used to denote a declaration of the person or persons who had newly acquired or recovered the sovereign power in a state, by which they pardoned all persons who composed, supported, or obeyed the government which had been just overthrown. A declaration of this kind may be either absolute and universal, or it may except certain persons specifically named, or certain classes of persons generally described. Thus, in Athens, when Thrasybulus had destroyed the oligarchy of the Thirty Tyrants, and had restored the democratical form of government, an exceptive amnesty of past political offences was declared, from the operation of which the Thirty themselves, and some few persons who had acted in the most invidious offices under them, were excluded. So when Bonaparte returned from Elba in 1815, he published an amnesty from which he excluded thirteen persons, whom he named in a decree published at Lyons. The act of indemnity, passed upon the restoration of Charles II., by which the persons actually concerned in the execution of his father were excluded from the benefit of the royal and parliamentary pardon, is an instance of an amnesty from which a class of persons were excepted by a general description and not by name. Of a like nature was the law passed by the French Chambers in January, 1816, upon the return of Louis XVIII. to the throne of France after the victory at Waterloo, which offered a complete amnesty to 'all persons who had directly or indirectly taken part in the rebellion and usurpation of Napoleon Bonaparte,' with the exception of certain persons, whose names had been previously mentioned in a royal ordinance as the most active partizans of the usurper. It was objected to this French law of amnesty, that it did not point out with sufficient perspicuity the individuals who were to be excepted from its operation. Instead of confining itself to naming the offenders, it went on to except whole classes of offences, by which means a degree of uncertainty and confusion was occasioned, which much retarded the peaceable settlement of the nation. 'In consequence of this course,' says M. de Chateaubriand in a pamphlet published soon after the event, 'punishment and fear have been permitted to hover over France; wounds have been kept open, passions exasperated, and recollections of enmity awakened.' The act of indemnity, passed at the accession of Charles II., was not liable to this objection, by the distinctness of which, as Dr. Johnson said, 'the flutter of innumerable bosoms was stilled,' and a state of public feeling promoted, extremely favourable to the authority and quiet government of the restored prince.

AMOL, a Persian town in the province of Mazanderan. It stands on the river Herauz, which flows through it, about twelve miles from the southern shore of the Caspian sea, in 36° 30′ N. lat. 52° 23′ 55″ E. long. from Greenwich. There is a bridge of twelve arches, and eight feet in width, over the river, the stream of which is full and rapid. The only interesting building in Amol is the ruin of a mausoleum erected by Shah Abbas over the remains of his maternal ancestor, Seyed Quwām-u-deen, otherwise called Meer Buzoorg, king of Saree and Amol, who died in 1378. It was a structure of considerable magnificence, till the greater part of it was thrown down by an earthquake about twenty years ago. There were formerly other extensive ruins in the town and neighbourhood, but of these the only traces now existing are some mounds of earth. Amol is divided into eight muhulehs or districts, and in the winter, when it is fullest, may contain from 35,000 to 40,000 inhabitants. The houses are between 4000 and 5000 in number. The bazars are large and well supplied; but the only traffic carried on is with the country and villages in the immediate vicinity. Amol is the capital of a government of the same name, which yields a revenue of between 7000*l.* and 8000*l.* sterling. The mountains approach close to the town on the south; the space between it and the sea is thickly covered with wood; there are many groups of houses among the trees, but no regular roads. (See *Travels and Adventures in the Persian Provinces on the southern Banks of the Caspian Sea*, by James B. Fraser, 4to., 1826.)

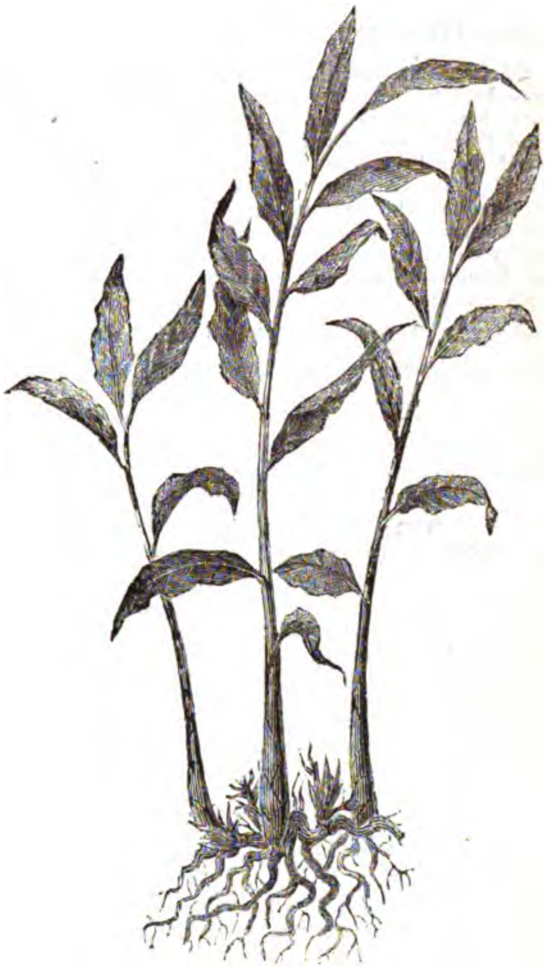
AMO'MUM, a genus of plants bearing aromatic seeds, and belonging to the natural order *Scitamineæ*. It consists of species having white flowers collected in close heads, which arise from the base of the leaves, and only just raise themselves above the ground; the lower lip of the flower is very broad and large compared with the others, and the other has a two-lobed crest; the seeds are contained in a loose skin, and are enclosed in a rather tough capsule which is separated into three cells by as many membranous partitions, and finally opens into three valves. The leaves are of a broadly lanceolate or oval figure tapering to the point, and enwrapping the stem like a sort of sheath.

The cardamoms, grains of Paradise, and mellagetta pepper of the shops, a class of highly aromatic pungent seeds, are produced by different species of amomum, especially by *A. cardamomum*, and *A. grana Paradisi*. In Sierra Leone there is among other species one called *A. grandiflorum*, the seeds of which have a stimulant flavour resembling that of camphor. The following figure of this and of the cardamom plant will furnish an idea of the general characters of the genus.



[Amomum Grandiflorum.]

a. The lip and a back view of the anther.
b. A front view of the anther.
c. Calyx.
d. Stigma.



[Amomum Cardamomum.]

AMOOD, a pergunnah, belonging to the East India Company, in the province of Gujerat. It is a narrow strip, lying along the eastern shore of the Gulf of Cambay, between the western boundary of the Broach pergunnah and the southern boundary of the Jumbooseer pergunnah, formed by the Dhadur river. Its extreme length is 30, and its general breadth 8 miles; but it is much narrower at the north-east end: its superficial content is 221½ square miles.

This area is partitioned in unequal proportions among 44 villages. Rather more than one-half of the land is under cultivation: a large portion of that which is considered unproductive, consists of an extensive salt-flat, which lies along the north-western boundary of the pergunnah, and adjoins the sea. The only port, Ghundhar, is situated in this quarter; its trade is now insignificant, although the town must at some remote period have been a considerable place, as appears from the extensive ruins around it. The lands of Ghundhar are entirely neglected, not an acre has been cultivated for many years, although much of it is considered fit for tillage: the inhabitants are chiefly occupied in making salt. In the cold season salt is produced in the pans in about a month, but in the warm season the evaporation goes on much more rapidly. The gross produce of the salt-pans is thus divided: 50 per cent. to the government, 35 per cent. to the proprietors of the pans, and the remaining 15 per cent. in various proportions among different native functionaries.

Every foot of land in this and the other pergunnahs of the district belongs to some one or other of the villages of which the pergunnah is composed. The strict observance paid to the preservation of their boundaries by the inhabitants of every village in this quarter is remarkable These boundaries are commonly marked by strips of land 20 or 30 yards in breadth, which are left waste; and though they are sometimes ploughed up by common consent, the line remains as fully recognized as if it bore the most visible marks. Every pergunnah has its own hereditary officers of revenue and record, and every village has its establishment of public servants.

Some part of the soil of Amood is sandy, and of a light brown colour, but the greater part is of superior fertility, and well adapted for wheat, which, with millet, forms the principal food of the inhabitants. The wheat is of the bearded kind, and grows to the height of 18 inches: there are commonly about 50 grains of wheat in each ear. It is sown late in September, or early in October, and ripens in March, when it is pulled up by the roots. An experiment was tried in 1819, to ascertain the produce of wheat, which was ascertained to be equal to only 336 pounds, or 6 bushels per acre. The field on which this experiment was made had been fallow the preceding year, but had not been manured. The seed is sown very thin, at the rate of only two-thirds of a bushel to the acre, and the ripening grain is subject to the depredations of very large birds, called kullums, which visit the country just before harvest in large flocks. Numerous herds of antelopes are also commonly met with, and are very destructive to the crops. A considerable quantity of cotton is produced.

The population of Amood has been ascertained to amount

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to 16,347 souls, of whom 3203 are Mohamedans, and 13,144 are Hindoos. The number of houses in the pergunnah is 4075; of cows and buffaloes, 5908; of oxen, 4639; of ploughs, 1752, and of carts, 889.

This pergunnah was obtained by cession from the late Peishwa Dowlut Rao Scindia, under the treaty of Poona, dated 13th June, 1817. (Report of Colonel Williams in *Appendix to the Report of the House of Commons* (1832) *on the Affairs of the East India Company.*)

AMORITES (אֱמֹרִי, *Ἀμοῤῥαῖοι*), the most powerful tribe of the Canaanites, or the aborigines of Palestine. The name Amorites seems sometimes to be used for all the Canaanites, as all the British are by foreigners sometimes called Englishmen. Canaan begat Sidon his first-born, and Heth, and the Jebusite, and the *Amorite*, and the Girgasite, and the Hivite, and the Arkite, and the Sinite, and the Arvadite. These are the sons of Ham. (Gen. x. 15-20.) The Amorites are mentioned among the ten nations whose country was given to the seed of Abraham. (Gen. xv. 19-21.) The Amorites dwelt chiefly in the mountains, which afterwards belonged to the tribe of Judah. (Numb. xiii. 29. Deut. i. 20.) The name אֱמֹרִי has been explained by Simonis and Gesenius by *mountaineer:* אָמִיר means *head, top of a tree*, and أمير *head of a tribe*, emir, chieftain, prince. Perhaps the name was given because the *Amorites* were like *Emirs* at the head of the Canaanitish tribes. Others have translated אֱמֹרִי *amarus, bitter, embittered*, from מרר; or *rebel*, from מרה; or *talking, eloquent*, from אמר. The word אֱמֹרִי occurs in the singular number only, which is often used collectively for the whole Amoritish nation. Some Amorites dwelt in the plains bordering upon the tribe of Dan, and others between the rivers Jordan and Arnon. The river Arnon was the border between Moab and the Amorites. (Num. xxi. 13.) Of the cities of the Amorites it was said to the people of Israel, 'Thou shalt save alive nothing that breatheth: but thou shalt utterly destroy the Hittites, *Amorites*, Canaanites, Perizites, Hivites, and Jebusites, as the Lord thy God has commanded thee, that they teach you not to do after all their abominations, which they have done unto their gods.' (Deut. xx. 16.) Even their sons and their daughters have they burnt in the fire to their gods. (Deut. xii. 31.) 'Whoever of the children of Israel or of the strangers that sojourn in Israel, giveth of his seed unto Moloch shall be put to death.' (Lev. xx. 2.)

The Amorites were of tall stature. According to Amos, (ii. 9.) they were high as cedars and strong as oaks. This poetical description is illustrated by the historical statement, that the size of the iron bedstead of the Amoritish king, Og of Bashan, was nine cubits by four. (Deut. iii. 11.) Hence we may infer, that Og's stature was gigantic, although it did not fill his iron bedstead any more than the Stuarts filled the enormous bedsteads at Hampton Court. But it is most likely that this bedstead, as it is called, was a kind of divan. But the biblical statement could not bridle the flights of rabbinical imagination, who, regardless of the sacred text which they professed to illustrate, surpassed all the extravagancies of Arabian, Persian, and Indian poesy; in the *Jalkut Shimoni*, Moses told the angel of death that Sihon and Og were so vast, that they could not be drowned in the deluge, its waters reaching only to their ancles. Sihon was harder than a wall and taller than any tower, and no creature on earth could withstand his strength. But after the demon with whom he was connected had been chained, Israel was let loose upon him and discomfited him and the Amorites. The Sevachir declares that Og, putting his hand against the windows of heaven, and his feet against the fountains of the great deep, stopped the deluge, until the water being made hot scalded the giant to the bone, who now, mounting the ark, rode out the storm. If Og retained his appetite, he must have been an inconvenient passenger, for his bill of fare was daily 1000 oxen, 1000 head of game, and 1000 measures of wine. According to Berachoth, Og, having ascertained that the camp of Israel was three miles in extent, tore up a sheet of rock of the same size, with the view to crush all arts of war, by putting this extinguisher upon the history of Israel. But whilst Og held the rock over his head it was bored by insects, broken into pieces, which fell on his shoulders, and nearly strangled the giant. Joshua, watching this dilemma, took an axe ten ells long, and being himself ten ells high, he jumped another ten ells, struck Og in the ancle and lamed him for life, until he was finally destroyed at the age of 900 years. (Blackwood's *Magazine*, 1832, p. 744.)

So much seems certain, that in antient times the natives of Syria exceeded in stature the inhabitants of the desert and of Egypt.

The four confederate kings (Genesis xiv.), who plundered Sodom and Gomorrah and took Lot captive, smote also the Amorites that dwelt in Hazzazon Tamar הַצְצֹן־תָּמָר *amputation or cutting of the palm tree*, which place was afterwards called Engeddi, עֵין גֶּדִי *Kid's Eye* or *Kid's Fountain*, on the western borders of the Dead Sea, (B.C. 1913.) Abram dwelt at this time in the plain of Mamre the Amorite, the brother of Eshcol and Aner, Abram's confederates. Hence we perceive that the Amorites chiefly inhabited the country afterwards occupied by the tribe of Judah, (Gen. xiv. 13.) and that they were on friendly terms with Abram.

The inhabitants of Gideon were Amorites. By feigning to send ambassadors from a great distance they obtained peace with the Israelites under Joshua about the year B.C. 1451. (See Joshua ix.) For making this confederacy Gibeon was attacked by five kings of the Amorites; but Joshua chased them from Gibeon to Bethhoron, Azekah, and Makkedah, where, according to Joshua, (x. 11.) more died from hailstones than by the sword of the Israelites. But after all this, the Amorites retained so much power, that they forced (B.C. 1425) the children of Dan into the mountain, for they would not suffer them to come down to the valley. 'But the Amorites would dwell in Mount Heres in Ajalon, and in Shaalbim; yet the house of Joseph prevailed so that they became tributaries. And the coast of the Amorites was from the going up to Akrabim, from the rock and upward.' (Judges i. 34-36.) The remarkable fact, that the Israelites conquered the mountains sooner than the plains is explained (Judges i. 19.): it was because the inhabitants of the plain had chariots of iron.

About the year B.C. 1120 there was peace between Israel and the Amorites. The Gibeonites (to whom seven descendants of Saul were delivered by David about the year B.C. 1020, that they might revenge themselves for Saul's atrocities) were of the remnant of the Amorites whom Joshua had made hewers of wood and drawers of water. (Jos. ix.; 2 Sam. xx.) Another branch of the Amorites dwelt between the rivers Jordan and Arnon. (Num. xxi. 13., xxii. 36.; Judges xi. 18.) Here Moses and the children of Israel had smitten two kings of the Amorites, namely, Sihon, who dwelt at Heshbon, and Og, king of Bashan, in the plain east of Jordan. These kings had refused to let the Israelites pass through their borders. But it appears that these Amorites were not extirpated, and that their descendants formed, even during the time of the Maccabees, a distinct tribe; for we read in Josephus's *Antiquit.* (xiii. chap. 1.) that the Amorites (*Ἀμαραίου παῖδες*) from Medaba fell suddenly upon the corps of Johannes Gaddis, when he was conveying, according to the command of his brother Jonathan, the baggage of the Jewish host to the Nabathaean Arabs who roved between the Euphrates and the Red Sea. Simon and Jonathan revenged the death of their brother Johannes by falling suddenly upon the splendid train of an Amoritish bridegroom who was leading his bride, the daughter of a rich Arabian, from Gabatha to Medaba. On this occasion 400 men, women and children were killed.

AMOS, the prophet, was a native of the town of Thekoa, which was about six miles south of Bethlehem. He was not a prophet's son, but a herdsman, and a gatherer of sycamore fruit, and the Lord took him as he followed the flock, to prophesy unto Israel. (Amos vii. 14, 15.) Therefore, Amos mentions the kingdom of Judah only incidentally, and hence Dr. Coke, Dr. Adam Clarke, and several commentators before them have vaguely conjectured Amos to be a native of the kingdom of Israel. Amos saw his visions concerning Israel in the days of Uzziah, King of Judah, and in the days of Jeroboam II., King of Israel, two years before the earthquake. (Amos i. 1.) This earthquake is mentioned by Zechariah, (xiv. 5.) 'Ye shall flee, like as ye fled from before the earthquake in the days of Uzziah, King of Judah,' which happened, according to the opinions of the later Jews, when Uzziah went into the temple to burn incense upon the altar, and Azariah, the priest, went in after him, and with him fourscore priests, valiant men who withstood Uzziah, and said, it appertaineth not unto thee to burn incense, but to the priests that are consecrated: go out of the sanctuary. Then Uzziah was wroth, leprosy rose in his forehead, and the priests thrust him out from thence. (2 Chron. xxvi.) According to Josephus, (*Antiquit.* ix. 10. § 4.) the earthquake began during the king's altercation with the priests. A ray of the sun, according to the story, fell through a fissure of the temple into the face of the king and struck him with leprosy. The western part of Mount Olivet rolled four stadia or furlongs to the east side of the mountain, covered many streets and destroyed the king's gardens.

It is probable that the prophecies of Amos were delivered between the years 798—784 before Christ.

With this period, the contents of the book of Amos agree, for the borders of Israel extended from Hamath to the Arnon (Amos vi. 14.), and the vices, which the prophet denounces, are such as usually predominate during periods of temporal prosperity and security. Isaiah, Hosea, and Amos were contemporaries. The opinion that Isaiah, a member of the royal family, was a son of Amos the herdsman, arose from a confusion of the prophet whose name is *Gamos* עָמוֹס (signifying, burden or burdened) with the word אָמוֹץ (strong) *Amots*, the name of the father of Isaiah. The Greeks wrote both names Amōs.

In the Book Περὶ τῶν προφητῶν πῶς ἐκοιμήθησαν καὶ ποῦ κεῖνται, which has been published with the works of Epiphanius, who was bishop of Constantia, in Cyprus, at the end of the fourth century, we read that Amos, born at Thekoa, in the land of Zebulon, the father of Isaiah, was wounded with a sword by Amaziah the priest, at Bethel, whom he had reproved for worshipping calves. The son of Amaziah struck him with a bludgeon on the head, so that he died two days after returning to his country, where he was buried with his fathers. The land of Zebulon may here signify the *sandy region*, the desert of Thekoa, which extends from the south of Jerusalem to the Persian Gulph, at the entrance of which Thekoa was situated, surrounded with tolerable pastures. Or it means the country of שׁוֹבָל the Idumean, Gen. xxxvi. 20, which the Latins called *terra Sobail*. (See H. A. Hamakeri, *Commentatio in libellum de vita et morte Prophetarum*. Amst. 1833. In *Instituti regii Commentariis*.)

Many having repeated St. Jerome's saying, that Amos was 'rude in speech, but not in knowledge,' Bishop Louth, in his twenty-first lecture, shows that Amos was not behind the chief prophets in eloquence. The book of Amos is written in an excellent Hebrew style, but the orthography differs occasionally from the usual standard. Amos, the herdsman, has taken many figures from pastoral life, but he alludes also to history, geography, and astronomy. Thus we see that knowledge, in olden times, was not confined to those who, like Isaiah, were of the blood royal, or priests like Jeremiah, but extended sometimes even to herdsmen.

Chapters i. ii. describe the approaching judgment of Jehovah, which rolls like a thunder-storm over the surrounding states, Damascus, Philistia, Tyrus, Edom, Ammon, Moab, touches upon Judah, and halts over Israel, on account of its injustice, immorality, idolatry, and stubbornness against the providence of Jehovah.

Chapters iii., iv., v., and vi. contain the predictions of the punishment of Israel; and chapters vii.—ix. visions of judgment, in which is interwoven the history of Amaziah's opposition, who said unto Amos, O thou seer, go, flee thee away into the land of Judah, and there eat bread and prophesy there.

The canonical authority of Amos rests upon the internal character of his work, upon the united testimony of the Jewish and Christian church, and upon the use which the apostles made of Amos (v. 25, 26, in Acts vii. 42., Amos ix. 11., and in Acts xv. 16.). Philo, Josephus, and the fathers quote Amos among the minor prophets, and even the author of the book of Tobit (ii. 6.) quotes a passage from Amos, mentioning his name.

AMOY, a celebrated port of China, in the province of Fo-kien, in 20° 45′ north latitude and 118° east longitude. In Mandarin dialect, the name of the place is Hea-mun, which is pronounced by the natives Ha-moy.

The district in which this flourishing town, the emporium of the commerce of the province, is situated, is one of the most barren in all China, and not only yields nothing for exportation, but is dependent even for the necessaries of life on the neighbouring island of Formosa, which has been described as the granary of the eastern coast of China. Notwithstanding this serious disadvantage, the merchants of Amoy are among the most wealthy and enterprising in the Chinese empire; they have formed connexions all along the coast, and have established commercial houses in many parts of the eastern archipelago. Most of the Formosian colonists emigrated from the district of Amoy, with capital supplied by its merchants, and in proportion as the island has flourished, so has Amoy increased in wealth and importance.

During the south-west monsoon, the merchants of Amoy freight their vessels at Formosa with sugar, which they sell at various ports to the northward, returning home with cargoes of drugs. They maintain commercial relations with Manilla, as well as with Tonquin and Cochin China: they annually employ forty large junks in trading with Bankok, the capital of Siam. Junks of the largest class—some of them 800 tons burden—go to Borneo, Macassar, Java, and the Soo-loo islands; and many of them annually visit Sincapore, in order to procure goods of British manufacture.

This port has not always been closed against European vessels. According to the records of the East India Company,—'The King of Tywan, on taking Amoy in 1675, issued a proclamation inviting both Chinese and foreign merchants to trade thither, exempting them from the payment of all duties for three years.' Many vessels, in consequence, resorted to the port, but the exemption was speedily revoked. In 1681, the town was taken by the Tartars; but Europeans were still allowed to trade thither, and continued to do so until 1734, when the exactions of the Mandarins deterred them from continuing so unprofitable an intercourse; and when an English ship went there, ten years after, many vain endeavours and much fruitless discussion were employed to induce the Chinese to trade, so that the vessel was obliged to proceed to Bengal for a cargo.

The ship Amherst visited Amoy last year (1832) with no better success; it appears, however, that the obstacles to her trading all proceeded from the authorities, and not from the people, by whom our countrymen were received in the most friendly manner. The harbour of Amoy is spacious and secure. (Lords' *Report of* 1820-21, *relative to the Trade with the East Indies and China; and Report of Proceedings on a Voyage in the Ship Amherst to the Northern Ports of China*, by Mr. H. H. Lindsay.)

AMPELI'DEÆ, one of the names of the vine tribe. [See VITES.]

AMPHI'BIA, (from the Greek word ἀμφίβιος, which signifies *having a double life*,) a zoological term employed in different senses by different writers. In common conversation we are accustomed to call all mammals, such as seals, otters, beavers, &c., amphibious, whose organization disposes them to resort indifferently either to the land or water for procuring food and other purposes, or whose habits are at once terrestrial and aquatic; thus we usually denominate the common campagnol (*Arvicola amphibia*) and white-bellied shrew (*Sorex fodiens*), the water-rat and water-shrew respectively, and consider them in every respect as amphibious animals. But in this sense of the word every land-animal is more or less amphibious, for all resort occasionally to the water, and with the single exception of man, all appear to have an instinctive power of swimming. Previous to the time of Linnæus, the earlier naturalists attached no more definite meaning to the word than that which was sanctioned by popular custom, and which, it will be observed, is more properly expressed by the term aquatic. The great Swedish philosopher, however, rejected this vague and improper signification, and applied the term generally to the third class of his system of zoology, which comprised not only all the animals since more properly denominated reptiles, such as the tortoises, lizards, serpents, and frogs, but likewise the cartilaginous fishes. Linnæus was evidently ignorant of the true characters and natural limits of this class of animals; the term amphibia was certainly very applicable to many of the genera and species which it embraced, but with regard to the great majority of them it was an absolute misnomer. The shark and the ray are as incapable of existing out of the water, as many of the common lizards are of living in it, and consequently neither the group which Linnæus proposed to establish, nor the name by which he designated it, has been adopted by more recent zoologists. The cartilaginous fishes have been referred to the other aquatic tribes, with which their habits and organic conformation naturally connect them, and the remainder of the class, which stands in Gmelin's celebrated edition of the *Systema Naturæ* under the name amphibia, is admitted into modern systems under the more appropriate designation of reptiles.

Taken in its strict and literal sense, the term amphibious would apply only to such animals as have the power of living indifferently, at the same time, either upon land or in water. To fulfil this condition it is necessary that a truly amphibious animal should be provided with the means of breathing in either of these elements, that is, that it should simultaneously possess both lungs and gills. Now there are four genera of batrachian reptiles which actually do possess this extraordinary double apparatus for extracting the principle which supports animal life indifferently from either element; and these, as Baron Cuvier has justly observed, comprise in reality the only known vertebrated animals which are truly amphibious. They are the *axolotls*, the *menobranchi*, and the *sirens*, all of which inhabit the rivers and lakes of America, and the *proteus* which is found in subterraneous streams connecting certain lakes in Carniola and Hungary. 'The existence and simultaneous action of gills and lungs in these animals,' says Baron Cuvier, in a note to the *Règne Animal*, 'can no longer be doubted as one of the most clearly established facts in natural history; I have before me the lungs of a siren of three feet in length, in which the vascular apparatus is as well developed and as complicated as in any other reptile, yet nevertheless this siren had gills as complete as any other species.' These then are the only strictly amphibious reptiles; but if we were disposed to take the term in a little more extended sense, it might, without impropriety, be applied to the entire order of reptiles which M. Brongniart, and after him all modern naturalists, denominate *batrachians*, because all these animals, without exception, breathe by means of gills in their tadpole state, and only acquire lungs when they assume the more mature and perfect form of reptiles.

Beyond this, however, the term cannot with propriety be extended to the reptiles in general, because these animals, though the limited quantity of their respiration enables them to remain under water for a much longer period than birds or mammals, can no more absolutely dispense with breathing than the higher classes, and like them would inevitably be drowned if prevented for any length of time from coming to the surface to breathe. For further information upon this subject, see REPTILE, BATRACHIANS, and AQUATIC ANIMALS.

AMPHIBOLI'TE, a name sometimes given to the simple mineral more commonly called hornblende, and which was introduced by Haüy, the mineralogist, who uselessly changed many names. He called hornblende *amphibole*, because it is easily mistaken for augite, another simple mineral closely allied to it in composition, from ἀμφίβολος, *amphibolos*, equivocal.

AMPHI'CTYONS, members of a celebrated council in ancient Greece, called the Amphictyonic Council.

According to the popular story, this council was founded by Amphictyon, son of Deucalion, who lived, if he lived at all, many centuries before the Trojan war. It is supposed by a writer quoted by Pausanias, x. 8., to derive its name, with a slight alteration, from a word signifying 'settlers around a place.' Strabo, who professes to know nothing of its founder, says that Acrisius, the mythological king of Argos, fixed its constitution, and regulated its proceedings. Amidst the darkness which hangs over its origin, we discover with certainty, that it was one of the earliest institutions in Greece. No full or clear account has been given of it during any period of its existence by those who had the means of informing us. The fullest information is supplied by Æschines the orator; but before any attempt is made, by the help of some short notices from other writers, and of conjecture, to trace its earlier history, it may not be amiss to state what is certainly known of this council as it existed in his time.

According to Æschines, the Greek nations which had a right to be represented in the council, were the Thessalians, Bœotians, Dorians, Ionians, Perrhæbians, Magnesians, Locrians, Œtæans, Phthiots, Malians, Phocians. Each nation was represented by certain sovereign states, of which it was supposed to be the parent: thus Sparta, conjointly with other Dorian states, represented the Dorian nation. Amongst the states thus united in representing their common nation, there was a perfect equality. Sparta enjoyed no superiority over Dorium and Cytinium, two inconsiderable towns in Doris, and the deputies of Athens, one of the representatives of the Ionian nation, sat in the council on equal terms with those of Eretria in Eubœa, and of Priene, an Ionian colony in Asia Minor. From a rather doubtful passage in Æschines, *De Fals. Leg.*, 43. compared with a statement in Diodorus, xvi. 60. it seems that each nation, whatever might be the number of its constituent states, had two, and only two votes. The council had two regular sessions in each year, meeting in the spring at Delphi, and in the autumn near Pylæ, otherwise called Thermopylæ; but special meetings were sometimes called before the usual time. From its meeting at Pylæ, a session of the Amphictyons was called a Pylæa, and the deputies were called Pylagoræ, that is, councillors at Pylæ. There were also deputies distinguished by the name of Hieromnemons, whose office it was, as their name implies, to attend to matters pertaining to religion. Athens sent three Pylagoræ and one Hieromnemon. The former were appointed for each session; the latter probably for a longer period, perhaps for the year, or two sessions. The council entertained charges laid before it in relation to offences committed against the Delphic god, made decrees thereupon, and appointed persons to execute them. These decrees, as we learn from Diodorus, xvi. 24. were registered at Delphi. The oath taken by the deputies bound the Amphictyons not to destroy any of the Amphictyonic cities, or to debar them from the use of their fountains in peace or war; to make war on any who should transgress in these particulars, and to destroy their cities; to punish with hand, foot, voice, and with all their might, any who should plunder the property of the god, (the Delphic Apollo,) or should be privy to, or devise anything against that which was in his temple. This is the oldest form of the Amphictyonic oath which has been recorded, and is expressly called by Æschines the ancient oath of the Amphictyons. It has inadvertently been attributed to Solon by Mr. Mitford, who has apparently confounded it with another oath imposed on a particular occasion. An ordinary council consisted only of the deputed Pylagoræ and Hieromnemons; but on some occasions at Delphi, all who were present with the Amphictyonic deputies to sacrifice in the temple and consult the oracle of the god, were summoned to attend, and then it received the name of an *ecclesia* or assembly. Beside the list of Amphictyonic nations given by Æschines, we have one from Pausanias which differs a little from that of Æschines, and another from Harpocration which differs slightly from both. The orator, whilst he speaks generally of twelve nations, names only eleven. Strabo agrees with him in the larger number. It is further remarkable, that whilst Æschines places the Thessalians at the head of his list, Demosthenes, *De Pac.* p. 62. expressly excludes them from a seat in the council.

Æschines has left us much in the dark as to the usual mode of proceeding in the Amphictyonic sessions; and we shall look elsewhere in vain for certain information. It should seem that all the Pylagoræ sat in the council and took part in its deliberations; but if the common opinion mentioned above, respecting the two votes allowed to each nation, be correct, it is certain that they did not all vote. The regulations according to which the decisions of the twelve nations were made can only be conjectured. We know that the religious matters which fell under the jurisdiction of the Amphictyonic body were managed principally, at least, by the Hieromnemons, who appear, from a verse in Aristophanes, *Nub.* 613., to have been appointed by lot, but we are not as well informed respecting the limits which separated their duties from those of the Pylagoræ, nor respecting the relative rank which they held in the council. (See *Æsch. contr. Ctes.* p. 68—72. *Fals. Leg.* p. 43.) The little that is told is to be found for the most part in the ancient lexicographers and scholiasts, or commentators, who knew perhaps nothing about the matter, and whose accounts are sufficiently perplexing to give room for great variety of opinions among modern writers. Some have seemed to themselves to discover that the office of the Hieromnemons was of comparatively late creation, that these new deputies were of higher rank than the Pylagoræ, and that one of them always presided in the council; others again have supposed, what, indeed, an ancient lexicographer has expressly asserted, that they acted as secretaries or scribes. Two Amphictyonic decrees are found at length in the oration of Demosthenes on the Crown, both of which begin thus: 'When Cleinagoras was priest, at the vernal Pylæa, it was resolved by the Pylagoræ and the Synedri (joint councillors) of the Amphictyons, and the common body of the Amphictyons.' Some have assumed that Cleinagoras the priest was the presiding Hieromnemon, and others that the Hieromnemons are comprehended under the general name of Pylagoræ. Æschines again has mentioned a decree in which the Hieromnemons were ordered to repair at an appointed time to a session at Pylæ, carrying with them the copy of a certain decree lately made by the council. Of the council, as it existed before the time of Æschines, a few notices are to be found in the ancient historians, some of which are not unimportant. According to Herodotus, vii. 200. the council held its meetings near Thermopylæ, in a plain which surrounded the village of Anthela, and in which was a temple dedicated to the Amphictyonic Ceres; to whom, as Strabo tells us, ix. 429. the Amphictyons sacrificed at every session. This temple, according to Callimachus, *Ep.* 41. was founded by Acrisius; and hence arose, as Müller supposes in his history of the Dorians, (vol. i. p. 289, English translation,) the tradition mentioned above.

We are told by Strabo, ix. 418. that after the destruction of Crissa by an Amphictyonic army, under the command of Eurylochus, a Thessalian prince, the Amphictyons instituted the celebrated games, which from that time were called the Pythian, in addition to the simple musical contests already established by the Delphians. Pausanias also, x. 7., attributes to the Amphictyons, both the institution and subsequent regulation of the games; and it is supposed by the most skilful critics, that one occasion of the exercise of this authority, recorded by Pausanias, can be identified with the victory of Eurylochus, mentioned by Strabo. According to this supposition, the Crissæan, and the celebrated Cirrhæan war, are the same, and Eurylochus must have lived as late as B.C. 591. But the history of these matters is full of difficulty, partly occasioned by the frequent confusion of the names of Crissa and Cirrha.

From the scanty materials left us by the ancient records, the following sketch of the history of this famous council is offered to the reader, as resting on some degree of probability:—

The council was originally formed by a confederacy of Greek nations or tribes, which inhabited a part of the country afterwards called Thessaly. In the lists which have come down to us of the constituent tribes, the names belong for the most part to those hordes of primitive Greeks which are first heard of, and some of which continued to dwell north of the Malian bay. The bond of union was the common worship of Ceres, near whose temple at Anthela its meetings were held. With the worship of the goddess was afterwards joined that of the Delphic Apollo; and thenceforth the council met alternately at Delphi and Pylæ. Its original seat and old connexions were kept in remembrance by the continued use of the term Pylæa, to designate its sessions wherever held; though eventually the Delphic god enjoyed more than an equal share of consideration in the confederacy. It may be remarked that the Pythian Apollo, whose worship in its progress southwards can be faintly traced from the confines of Macedonia, was the peculiar god of the Dorians who were of the Hellenic race; whilst the worship of Ceres was probably of Pelasgic origin, and appears at one time to have been placed in opposition to that of Apollo, and in great measure to have retired before it. There is no direct authority for asserting that the joint worship was not coeval with the establishment of the council; but it seems probable from facts, which it is not necessary to examine here, that an Amphictyonic confederacy existed among the older residents, the worshippers of Ceres, in the neighbourhood of the Malian bay, before the hostile intruders with their rival deity were joined with them in a friendly coalition. The council met for religious purposes, the main object being to protect the temples and maintain the worship of the two deities. With religion were joined, according to the customs of the times, political objects; and the jurisdiction of the Amphictyons extended to matters which concerned the safety and internal peace of the confederacy. Hence the Amphictyonic laws, the provisions of which may be partly understood from the terms of the Amphictyonic oath. Confederacies and councils, similar to those of the Amphictyons, were common among the ancient Greeks. Such were those which united in federal republics the Greek colonists of Asia Minor, of the Æolian, Ionian, and Dorian nations. Such also was the confederacy of seven states whose council met in the temple of Neptune in the island of Calauria, and which is even called by Strabo, viii. 374, an Amphictyonic council.

The greater celebrity of the northern Amphictyons is attributable partly to the superior fame and authority of the Delphic Apollo; still more, perhaps, to their connexion with powerful states which grew into importance at a comparatively late period. The migrating hordes, sent forth from the tribes of which originally or in very early times the confederacy was composed, carried with them their Amphictyonic rights, and thus at every remove lengthened the arms of the council. The great Dorian migration especially planted Amphictyonic cities in the remotest parts of Southern Greece. But this diffusion, whilst it extended its fame, was eventually fatal to its political authority. The early members, nearly equal perhaps in rank and power, whilst they remained in the neighbourhood of Mounts Œta and Parnassus, might be willing to submit their differences to the judgment of the Amphictyonic body. But the case was altered when Athens and Sparta became the leading powers in Greece. Sparta, for instance, would not readily pay obedience to the decrees of a distant council, in which the deputies of some inconsiderable towns in Doris sat on equal terms with their own. Accordingly in a most important period of Grecian history, during a long series of bloody contests between Amphictyonic states, we are unable to discover a single mark of the council's interference. On the other hand, we have from Thucydides i. 112, a strong negative proof of the insignificance into which its authority had fallen. The Phocians (B. C. 448) possessed themselves by force of the temple of Apollo at Delphi; were deprived of it by the Lacedæmonians, by whom it was restored to the Delphians; and were again replaced by the Athenians. In this, which is expressly called by the historian a sacred war, not even an allusion is made to the existence of an Amphictyonic council. After the decay of its political power there still remained its religious jurisdiction; but it is not easy to determine its limits or the objects to which it was directed. In a treaty of peace made (B. C. 421) between the Peloponnesians and the Athenians (Thucyd. v. 17), it was provided that the temple of Apollo at Delphi, and the Delphians, should be independent. This provision, however, appears to have had reference especially to the claims of the Phocians to include Delphi in the number of their towns, and not to have interfered in any respect with the superintendence of the temple and oracle, which the Amphictyons had long exercised in conjunction with the Delphians. We have seen that the Amphictyons were charged in the earliest times with the duty of protecting the temple and the worship of the god. But the right of superintendence, of regulating the mode of proceeding in consulting the oracle, in making the sacrifices, and in the celebration of the games, was apparently of much later origin, and may, with some probability, be dated from the victory gained by Eurylochus and the Amphictyonic army. The exercise of this right had the effect of preserving to the council permanently a considerable degree of importance. In early times the Delphic god had enjoyed immense authority. He sent out colonies, founded cities, and originated weighty measures of various kinds. Before the times of which we have lately been speaking, his influence had been somewhat diminished; but the oracle was still most anxiously consulted both on public and private matters. The custody of the temple was also an object of jealous interest on account of the vast treasures contained within its walls.

The Greek writers, who notice the religious jurisdiction of the council, point our attention almost exclusively to Delphi; but it may be inferred from a remarkable fact mentioned by Tacitus, *Ann.* iv. 14, that it was much more extensive. The Samians, when petitioning in the time of the Emperor Tiberius for the confirmation of a certain privilege to their temple of Juno, pleaded an ancient decree of the Amphictyons in their favour. The words of the historian seem to imply that the decree was made at an early period in the existence of Greek colonies in Asia Minor, and he says that the decision of the Amphictyons on all matters had at that time pre-eminent authority.

The sacred wars, as they were called, which were originated by the Amphictyons in the exercise of their judicial authority, can here be noticed only so far as they help to illustrate the immediate subject of inquiry. The Cirrhæan war, in the time of Solon, has already been incidentally mentioned. The port of Cirrha, a town on the Crissæan bay, afforded the readiest access from the coast to Delphi. The Cirrhæans, availing themselves of their situation, grievously oppressed by heavy exactions the numerous pilgrims to the Delphic temple. The Amphictyons, by direction of the oracle, proclaimed a sacred war to avenge the cause of the god; that is, to correct an abuse which was generally offensive, and particularly injurious to the interests of the Delphians. Cirrha was destroyed, the inhabitants reduced to slavery, their lands consecrated to Apollo, and a curse was pronounced on all who should hereafter cultivate them. We are told that Solon acted a prominent part on this occasion, and that great deference was shown to his counsels. Mr. Mitford, indeed, has discovered without help from history, which is altogether silent on the subject, that he was the author of sundry important innovations, and that he in fact remodelled the constitution of the Amphictyonic body. He has even been able to catch a view of the secret intentions of the legislator, and of the political principles which guided him. But in further assigning to Solon the command of the Amphictyonic army, he is opposed to the direct testimony of the ancient historians.

From the conclusion of the Cirrhæan war to the time of Philip of Macedon, an interval exceeding two centuries, we hear little more of the Amphictyons, than that they rebuilt the temple at Delphi, which had been destroyed by fire B.C. 548; that they set a price on the head of Ephialtes, who betrayed the cause of the Greeks at Thermopylæ, and conferred public honours on the patriots who died there; and that they erected a monument to the famous diver Scyllias as a reward for the information which, as the story goes, he conveyed under water from the Thessalian coast to the commanders of the Grecian fleet at Artemisium. If Plutarch may be trusted, the power of the Amphictyons had not at this time fallen into contempt. When a proposition was made by the Lacedæmonians to expel from the council all the states which had not taken part in the war against the Persians, it was resisted successfully by Themistocles, on the ground that the exclusion of three considerable states, Argos, Thebes, and the Thessalians, would give to the more powerful of the remaining members a preponderating influence in the council dangerous to the rest of Greece.

After having, for a long period, nearly lost sight of the Amphictyons in history, we find them venturing, in the fallen fortunes of Sparta, to impose a heavy fine on that state as a punishment for an old offence, the seizure of the Theban Cadmeia, the payment of which, however, they made no attempt to enforce. In this case, as well as in the celebrated Phocian war, the Amphictyonic council can be considered only as an instrument in the hands of the Thebans, who after their successful resistance to Sparta, appear to have acquired a preponderating influence in it, and who found it convenient to use its name and authority, whilst prosecuting their own schemes of vengeance or ambition. Though the charge brought against the Phocians was that of impiety in cultivating a part of the accursed Cirrhæan plain, there is no reason to think that any religious feeling was excited, at least in the earlier part of the contest; and Amphictyonic states were eagerly engaged as combatants on both sides. For an account of this war, the reader is referred to a general history of Greece. The council was so far affected by the result, that it was compelled to receive a new member, and in fact a master, in the person of Philip of Macedon, who was thus rewarded for his important services at the expense of the Phocians, who were expelled from the confederacy. They were, however, at a subsequent period restored, in consequence of their noble exertions in the cause of Greece and the Delphic God against the Gauls. It may be remarked, that the testimony of the Phocian general Philomelus, whatever may be its value, is rather in favour of the supposition that the council was not always connected with Delphi. He justifies his opposition to its decrees, on the ground that the right which the Amphictyons claimed was comparatively a modern usurpation. In the case of the Amphissians, whose crime was similar to that of the Phocians, the name of the Amphictyons was again readily employed; but Æschines, who seems to have been the principal instigator of the war, had doubtless a higher object in view than that of punishing the Amphissians for impiety.

The Amphictyonic council long survived the independence of Greece, and was, probably, in the constant exercise of its religious functions. So late as the battle of Actium, it retained enough of its former dignity at least, to induce Augustus to claim a place in it for his new city of Nicopolis. Strabo says that in his time it had ceased to exist. If his words are to be understood literally, it must have been revived; for we know from Pausanias (x. 8.), that it was in existence in the second century after Christ. It reckoned at that time twelve constituent states, who furnished in all thirty deputies; but a preponderance was given to the new town of Nicopolis, which sent six deputies to each meeting. Delphi sent two to each meeting, and Athens, one deputy: the other states sent their deputies according to a certain cycle, and not to every meeting. For the time of its final dissolution, we have no authority on which we can rely.

It is not easy to estimate with much certainty the effects produced on the Greek nation generally, by the institution of this council. It is, however, something more than conjecture, that the country which was the seat of the original members of the Amphictyonic confederacy, was also the cradle of the Greek nation, such as it is known to us in the historical ages. This country was subject to incursions from barbarous tribes, especially on its western frontier, probably of a very different character from the occupants of whom we have been speaking. In the pressure of these incursions, the Amphictyonic confederacy may have been a powerful instrument of preservation, and must have tended to maintain at least the separation of its members from their foreign neighbours, and so to preserve the peculiar character of that gifted people, from which knowledge and civilization have flowed over the whole western world. It may also have aided the cause of humanity; for it is reasonable to suppose that in earlier times, differences between its own members were occasionally composed by interference of the council; and, thus, it may have been a partial check on the butchery of war, and may at least have diminished the miseries resulting from the cruel lust of military renown. In one respect, its influence was greatly and permanently beneficial. In common with the great public festivals, it helped to give a national unity to numerous independent states, of which the Greek nation was composed. But it had a merit which did not belong to those festivals in an equal degree. It cannot be doubted that the Amphictyonic laws, which regulated the originally small confederacy, were the foundation of that international law which was recognised throughout Greece; and which, imperfect as it was, had some effect in regulating beneficially national intercourse among the Greeks in peace and war, and, so far as it went, was opposed to that brute force and lawless aggression, which no Greek felt himself restrained by any law from exercising towards those who were not of the Greek name. To the investigator of that dark but interesting period in the existence of the Greek nation, which precedes its authentic records, the hints which have been left us on the earlier days of this council, faint and scanty as they are, have still their value. They contribute something to those fragments of evidence with which the learning and still more the ingenuity of the present generation are converting mythical legends into a body of ancient history.

AMPHIDESMA, among zoologists, is the name of a genus of marine bivalve shells, which live in the sand on the sea-coast of tropical climates. The shells are oval or rounded, sometimes rather twisted and slightly gaping behind. They have two hinge teeth in each valve, and often distinct compressed lateral ones. The elastic cartilage is placed in a small triangular cavity just behind the hinge teeth. The animals of these shells are unknown; but they are supposed to have long syphons, like the Tellens, as the shells have a broad, deep inflation on the back edge oı the submarginal scar, formed by the attachment of the muscles which retract these syphons, as in the Tellens, from which genus it simply differs in the position of its cartilage.

Lamarck gave the name of *Amphidesma* to this genus because he observed that it had a ligament and a cartilage, which he regarded as peculiar to this genus, he having, like the rest of the zoologists before the appearance of the

Conchological Observations in the *Zoological Journal*, considered what is usually called the ligament of bivalves as only one substance. It is, however, two substances, of very different structure and use; the outer, or ligament, being inelastic, and only employed to keep the two valves together, is formed of fibres extending from the edge of one valve to the other; but the cartilage is elastic and formed of perpendicular fibres, like the prismatic crystalline-structured shell, its use being to separate the valves from one another when the muscles which keep them closed are relaxed. When the valves are closed, this part is compressed by their edge. For this purpose it is sometimes, as in the shell under consideration, placed in a small triangular cavity close to the hinge, when the shell is said to have an internal cartilage, the ligament being still in its usual place. In other shells it is placed, along with the ligament, on the margin of the valves, and is pressed, when the valves are closed, against the ligament itself, which forms its outer wall. The resistance which the ligament offers is the means of opening the shell. The cartilage has opaline reflections, and the cartilages of some large shells, as the mother-of-pearl shells, are sold by the jewellers under the name of *Peacock-stone*, or *black opals*. They are not so much used now as formerly, but they are still much sought after on the Continent, especially in Portugal.

AMPHILA, BAY OF, a bay extending for about sixteen miles along the west coast of the Red Sea, in 14° 30′ N. lat. and 41° E. long. from Greenwich. Mr. Salt has given a chart of it on a large scale, from a survey, in his *Voyage to Abyssinia*, quarto, London, 1814. There are thirteen islands in the bay, the largest of which, called also Amphila, lying near its south-eastern extremity, is not quite a mile in length. Of these islands one only is a rock of calcareous stone; the others are all composed of corallines, madrepores, and other marine alluvia, strongly cemented together, and covered with a thin layer of soil. None of them are now inhabited, though on one, called Kutto, there are the ruins of some houses. On the main land at the bottom of the bay is the village of Duroro, and farther to the south-east, the smaller village of Madir. Between these and the sea is a sort of thick jungle of rack trees. This district was formerly part of the old kingdom of Dankali, and still retains that name. Mr. Salt thinks it probable that Amphila is not a native word, but a corruption of the Greek Ἀντιφίλου λιμὴν, mentioned by Strabo. Casaub. p. 771. (Salt's *Abyssinia*, chap. iv.)

AMPHI′POLIS, an ancient Greek city, on the left or eastern bank of the river Strymon, just below its egress from the lake Kerkine, now called Takino, and about three miles above its influx to the sea. This town was at first called Ennea Hodoi (the nine ways), and belonged to the Edonians, a Thracian people. The first attempt at colonization here was by Aristagoras of Miletus, who failed in the attempt, (B.C. 497.)

The Athenians next made an unsuccessful attempt, (B.C. 465,) and sustained a severe loss, but they took Ennea Hodoi in the year 437 B.C., and established there a colony. They enlarged and fortified the town, to which Hagnon, the leader of the colony, gave the name of Amphipolis, because the river Strymon flowed round a large part of it, forming nearly a circle; a wall was built across, and thus the town was defended on every side. This is Thucydides' account, (lib. iv. cap. 102) which some geographers have interpreted as if the town had stood between two branches of the river, which do not exist. In several maps, also, the Angitas, which flows from the eastward into the lake Kerkine, is mistaken for the Strymon which enters it from the north. The latter is called Struma by the Bulgarian inhabitants who are very numerous in this district. During the Peloponnesian war, (B.C. 424,) the Lacedæmonians, under their general Brasidas, took Amphipolis. Cleon, being sent by the Athenians to retake it, was beaten by Brasidas in a combat under the walls of the town, where both generals lost their lives. The importance of Amphipolis was derived from its situation on the banks of a navigable river, a short distance from the sea, and from its neighbourhood to the gold mines of Mount Pangæus, and to the fine forests of Kerkine, from which, even now, many cargoes of timber are annually shipped at the mouth of the Strymon. Amphipolis was taken by Philip, king of Macedonia. Amphipolis has long been in ruins, and a village of about 100 houses, called Jeni-Keui, inhabited by Turks and Greeks, occupies part of its former site. It lies about twenty miles south-east of the large town of Serres, th residence of a bey, and fifty-four miles north-east of Salonichi. M. Cousinéry, formerly French consul at Salonichi gives an account of the ruins of Amphipolis, which h repeatedly visited, and a view of the site of the antien town, and the course of the river, &c., in his *Voyage dans l Macédoine*. He found some traces of the town wall some remains of sculpture, and a curious Greek inscription, being a decree of banishment against two citizens of Amphipolis, one of whom, Stratocles, is perhaps the envoy of that name mentioned by Demosthenes in the first Olynthiac, who became obnoxious to Philip for his attachment to Athens. A number of medals are still found among the ruins of Amphipolis. M. Cousinéry visited also the ruins of Eion, formerly a town near Amphipolis, on the left bank and at the mouth of the Strymon. The great Roman road, called the Via Egnatia, ran through Amphipolis, or perhaps rather through Eion.

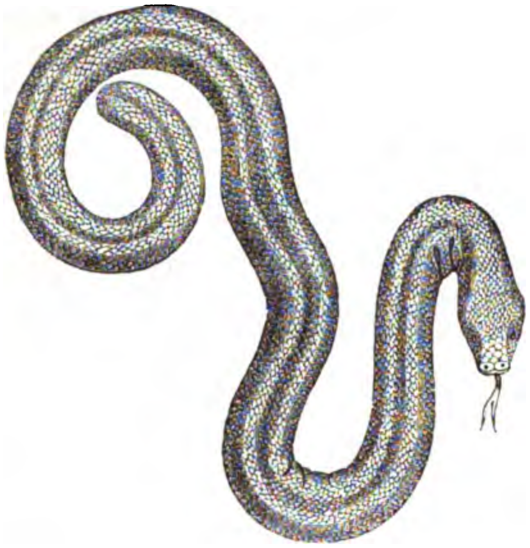
AMPHIPROSTYLE. This is an architectural term, compounded of three Greek words. It is used to designate structures having the form of an antient Greek or Roman parallelogramic temple, with a prostyle or portico on each of its ends or fronts, but with no columns on its sides or flanks. The plan of the temple of Jupiter Panhellenius, at Ægina, given with the article Æɢɪɴᴀ, will exactly exemplify this arrangement, if the flanking rows of columns forming the lateral ambulatories are supposed to be removed. This would leave (independently of the internal hypæthral disposition in the particular instance) an exact representation of what is intended, in its ordinary acceptation, by the term Amphiprostyle, or, to retain the Greek form, Amphiprostylos; and the structure, having thus four columns in front, would be an *amphi-tetra-prostylon*. (See also Pʀᴏsᴛʏʟᴇ.)

AMPHISBÆNA, (from ἀμφίσβαινα, which signifies, an animal that can walk in both directions,) in zoology a genus of serpents, distinguished by their bodies having nearly the same uniform thickness from the head to the extremity of the tail, by their small mouths and extremely diminutive eyes, their remarkably short tails, and the numerous rings of small square scales which completely surround this organ and the body. A range of small pores runs in front of the vent, which is situated nearly at the end of the tail; the jaws alone are provided with a single row of small conical teeth, the palate being without any; and even those of the jaws are few and distant from one another. They are, moreover, destitute of fangs, and are consequently harmless and inoffensive, living for the most part upon ants and other small insects, and inhabiting ant-hills and burrows which they themselves construct under ground. The nature of their food does not require these animals to possess the power of dilating the mouth and gullet to the extraordinary extent that is observed in the boas, pythons, and other serpents in general, which live for the most part upon animals proportionally much larger than themselves, and in order to admit the huge mouthful have the upper and under jaws both equally moveable upon the cranium. In the amphisbæna, on the contrary, the upper jaw is fixed to the skull and intermaxillary bones, as in birds and mammals, so that the head remains constantly in the same plane with the body,—a form which permits the animal to move equally well in either direction, namely, either backwards or forwards, and which has acquired for it the name by which it is distinguished.

The head of the amphisbæna is so small, and the tail so thick and short, that it is difficult at first sight to distinguish one from the other, and this circumstance, united to the animal's habit of proceeding either backwards or forwards as the occasion may require, has given rise to the popular belief very generally spread throughout Brazil and other parts of South America, the native countries of this genus, that it possesses two heads, one at each extremity, and that it is impossible to destroy the animal by simple cutting, as the two heads mutually seek one another in case of such a serious accident, and soon re-unite as if nothing had happened. Ignorance is the parent of superstition and absurdity, and one wonder naturally produces twenty: it is not therefore surprising that, among an ignorant and credulous people, the singularity of the amphisbæna's form and habits should have given rise to this and a multitude of other gross fictions. 'Another snake,' says Stedman, in his History of Surinam, 'which I also observed here, is about three feet long, and annulated with different colours; it is called amphisbæna from the supposition of its having two heads; and the truth is, that from its cylindrical form the head and tail so much resemble each other that the error is almost pardonable; besides which, the eyes are nearly imperceptible. This is the snake which, being supposed blind, and vulgarly said to be fed by the large ants already described, is in this country honoured with the name of King of the Emmets. The flesh of the amphisbæna, dried and reduced to a fine powder, is confidently administered as a sovereign and infallible remedy in all cases of dislocation and broken bones; it being very naturally inferred that an animal which has the power of healing an entire amputation in its own case, should at least be able to cure a simple fracture in the case of another. Two centuries have scarcely passed since opinions equally credulous and absurd were universally prevalent among the most enlightened nations of Europe, when grave and learned physicians administered the bezoar or rhinoceros' horn with as much confidence as the simple Brazilian at present does the powdered flesh of the amphisbæna.

The genus amphisbæna, as at present defined, contains only American species, which are confined to Brazil, Surinam, and other tropical parts of the continent. Of these the following are the principal.

1. The *A. fuliginosa*, the first, and still the best known species of the whole genus, is, like all the other amphisbænas, confined to the hotter regions of South America, and does not inhabit Ceylon or any other part of the East Indies, as Linnæus and Lacepède have erroneously supposed, and asserted on the authority of Seba. The general colour of this serpent is a deep brown varied with shades of white, more or less intense according to the difference of the individual and the season of casting the old and acquiring the new external skin. It grows to the length of eighteen inches or two feet, of which, however, the tail measures only an inch or fifteen lines. The body is surrounded by upwards of two hundred rings, and the tail by twenty-five or thirty; the eyes are covered and almost concealed by a membrane, which, added to their naturally diminutive size, has given rise to the popular opinion that the animal was entirely deprived of sight; an opinion extended with no better reason to the common blind-worm (*Anguis fragilis*). It lives upon worms and insects, particularly ants, in the mounds of which it usually conceals itself. The antipathy which most people entertain against serpents in general has given rise to a belief common among travellers, that this species is venomous, but without the slightest foundation in reality, as it is entirely destitute of fangs, and its teeth in other respects so small as to be incapable of inflicting a wound.


[Amphisbæna fuliginosa.]

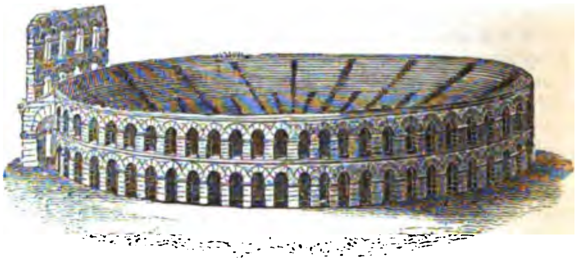
2. *A. alba*, so called from its colour, which is that of uniform pale straw without any marks or spots. The head of this species is short and thick, and its mouth small. The body usually measures from one foot six to one foot nine or ten inches, and is surrounded by two hundred and twenty-three rings; the tail is from an inch and a half to two inches in length, and is surrounded by sixteen or eighteen rings. The thickness of the body seldom exceeds that of a man's fore-finger, and is uniform throughout its whole length; that of the former species, on the contrary, equals the thickness of a child's wrist of ten or twelve years old. The *A. alba* inhabits the same localities and lives in the same manner as the *A. fuliginosa*, from which indeed it differs only in size, colour, the proportionate length of the tail and body, and in having the mouth provided with a greater number of teeth, all, however, equally small and weak.

3. *A. cæca*, a species mentioned by Baron Cuvier in the second edition of the *Règne Animal*, but without any detailed description. It inhabits the island of Martinique, and is said to be entirely deprived of sight, at least M. Cuvier was unable to discern any trace of eyes. He supposes it, nevertheless, to be identical with the *Amphisbæna vermicularis* of Spix, which that naturalist describes as having eyes scarcely perceptible.

The works of Prince Maximilian of Neuwied and M. Spix on the general zoology and erpetology of Brazil contain descriptions of three or four smaller species of amphisbænas.

AMPHI'SCII, literally *double shadowed*, a Greek term applied by antient astronomers to the inhabitants of the torrid zone, with whom the sun passes the meridian at noon, sometimes on the north, sometimes on the south, of the zenith, and whose shadows at noon are therefore turned to the south during one part of the year, and to the north during the remainder.

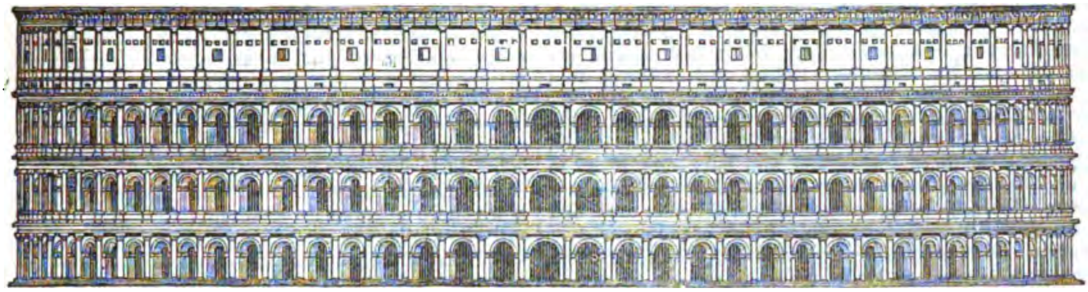
AMPHITHE'ATRE, the name by which a species of structure much used by the Romans, and combining the forms and some of the uses of the antient theatre and circus, is generally distinguished; indeed most of the Roman classical writers apply to it the name of circus also. A distinction, however, is now always made; the term amphitheatre being applied to the species of structure here referred to, and circus being restricted to the Roman stadium or hippodrome. [See CIRCUS.]


[Amphitheatre of Verona.]

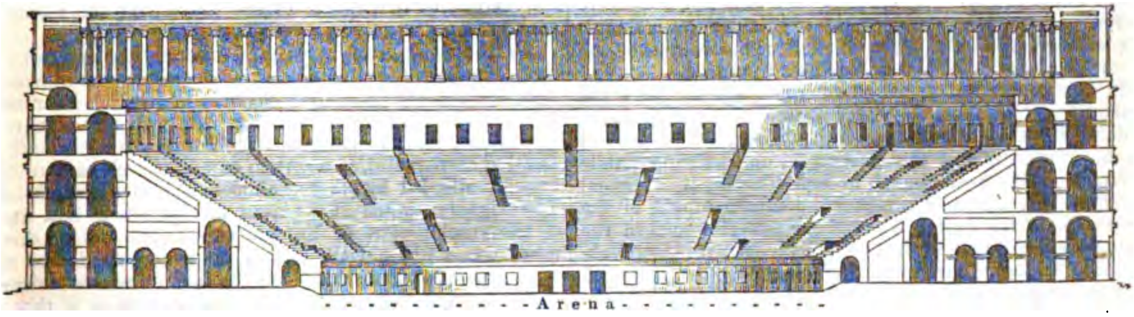
The name amphitheatre seems intended to convey the idea of a double theatre; but what is termed a theatre is, with reference to its original uses, more strictly an odeum, and what we call an amphitheatre was truly a theatre. The one was for hearing music and recitations, and the other for seeing sights,—as the words import. [See THEATRE.]

The form of the amphitheatre is, on the plan, that of an ellipsis, with a series of arcaded concentric walls, separating corridors which have constructions with staircases and radiating passages between them. It encloses an open space called the arena, either on, or a very little above or below the level of the surface of the ground on which the structure is raised. From the innermost concentric wall,—which bounds the arena, and which will be from ten to fifteen feet above its level,—an inclined plane runs upwards and outwards over the intermediate wall, staircases, and corridors, to a gallery or galleries over the outermost corridors. The inner and upper part of the inclined plane is covered with a graduated series of benches following the general form of the plan; these are intercepted at intervals by radial passages leading by a more easy graduation to and from the staircases which pass through the substructions of the benches to the corridors. These corridors, in the principal stories, continue uninterruptedly all round the edifice, and afford easy access to, and egress from, every part. In cases where the radiating passages through the bank of benches were few, concentric platforms or precinctions went round to make the communications complete. The external elevation of an amphitheatre is almost dictated by its internal arrangement and construction, and it generally falls into two or more stories of open arches, which are necessary to give light and air to the corridors and staircases.

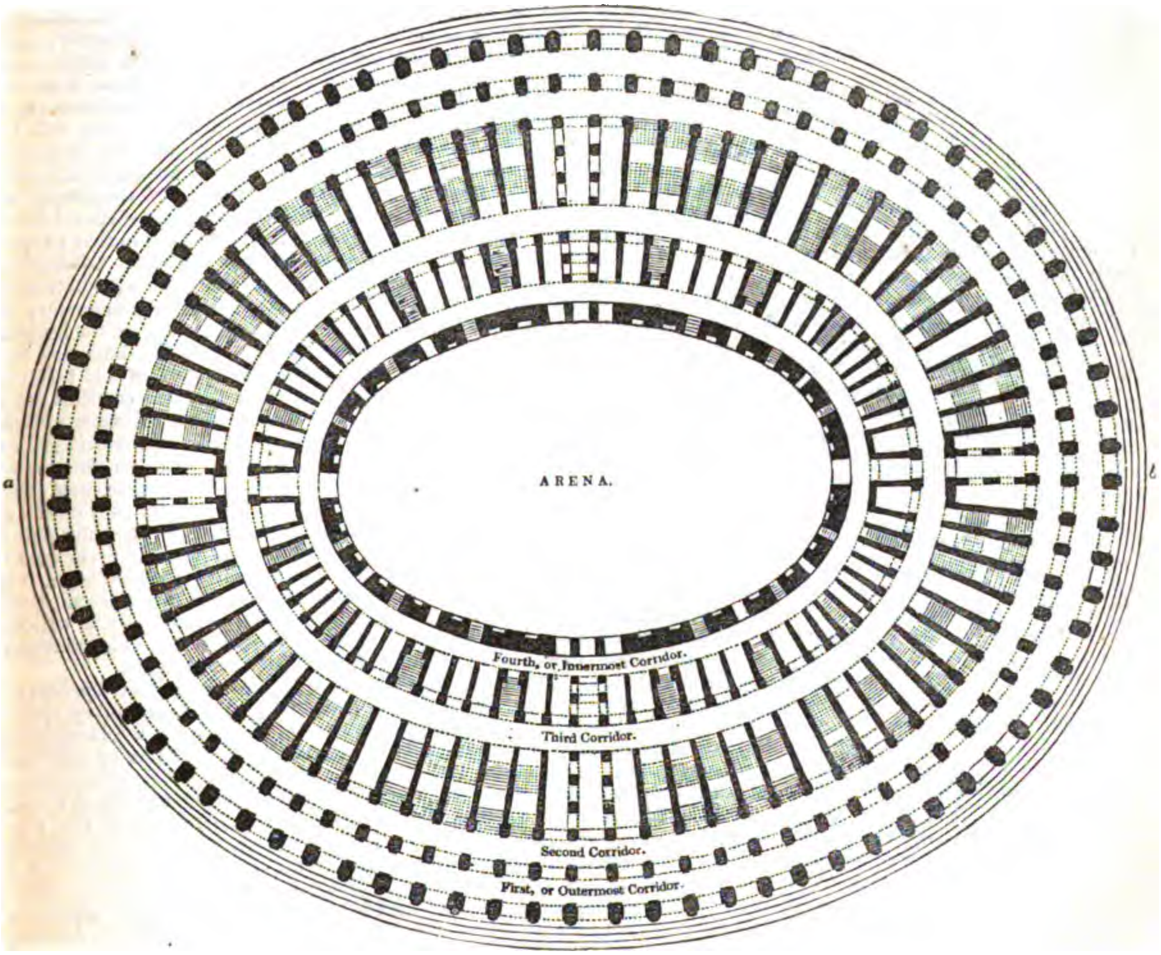
The Amphitheatre seems to have been contrived for the more convenient exhibition of such shows as were confined



[Longitudinal Elevation of the Flavian Amphitheatre, or Colosseum, Rome.]



[Longitudinal Section—on the line from *a* to *b* of the plan of an Amphitheatre—The Colosseum.]



[Ground Plan of an Amphitheatre—The Colosseum.]

throughout to the same place, such as combats, which could not be seen advantageously along the length of the circus; and moreover the circus had not the lofty stereobate, podium, or cincture, to protect the spectators from the savage and powerful brute animals which were frequently used in the public shows of the Romans. Indeed, it is reported that this defect was a cause of the abandonment of the circus for such exhibitions as required the use of wild beasts. The great length also of the circus would be a sufficient reason for adopting the more compressed and lofty form given to the amphitheatre, whose arrangement admits of a far greater number of persons being brought within a smaller area, and consequently within more convenient view of the arena.

At first, and for some time, amphitheatres were constructed of timber. Several accidents occurred, indeed, in consequence of the use of such, from fire, and from their incapacity to bear the weights they were subjected to; and, in one instance, it is related by Tacitus, (*Annal.* iv. 62,) that an amphitheatre of this kind fell during the exhibition of the shows, in the town of Fidena, when 50,000 persons were either killed or hurt. Afterwards they were more securely and more permanently constructed of brick or stone, according to the facilities the place afforded, or the means of the people at whose expense the structures were laid.

It was in the latest period of the Republic that the Romans were debased by the gladiatorial and other shows which led to the use and construction of amphitheatres; and to the gratification of this passion for demoralizing public spectacles may be attributed, in some degree, its eventual overthrow, in all but form, and the establishment of the despotism of the emperors. All the powerful men in the state who aimed still higher, sought favour with the people by these barbarous entertainments; and the sums expended and the numbers of men and beasts engaged, and for the most part destroyed, in furnishing them seem almost incredible.

The difference in the national characteristics of the Greeks and Romans is by nothing more forcibly illustrated than by the constant indications of theatres or odeums which mark the sites or immediate vicinities of antient Greek cities, and the remains of amphitheatres which are common to those of the Romans.

To save unnecessary expense, the Grecian theatre was formed on or in the side of a hill, whenever the locality would afford this advantage; the seats were generally cut in the living rock, and such constructions added before it in the formation of the orchestra and proscenium and their accessories, as were absolutely necessary to complete the theatre. The amphitheatre of the Romans was raised, for the most part, within the town or city, on the level plain, of costly magnificence, and generally of enormous extent, while their theatres are in every respect secondary, and of inferior importance. Indeed, theatres for music and the drama are seldom found among the remains of purely Roman cities, but almost every Roman colony, and even camp, bears indications of a constructed or excavated amphitheatre. The great mother city of Rome herself can hardly be said to exhibit the remains of a theatre, unless it be that which is called the theatre of Marcellus; and even this appears to have been more used for games of the circus, or amphitheatrical shows, than for dramatic representations, and is not of extraordinary extent. But the Colosseum would contain from eighty to a hundred thousand persons;—and the little city of Pompeii, which has indeed two theatres, has, moreover, an amphitheatre, whose arena alone would contain them both. The Grecian cities of Sicily, on the contrary, exhibit remains and indications of spacious theatres where those of the amphitheatres of their Roman masters are few and unimportant; and the old cities of Greece itself, and the Grecian cities of Asia Minor, are almost entirely free from the pollution of the latter species of structure,—the Roman garrisons appearing to have contented themselves with castrensian or camp-built amphitheatres alone. Of this sort,—the Castrensian amphitheatre,—we have indications still existing in England;—the principal are at Cirencester and Dorchester; but these were originally little more than mere excavations, or turf-built cinctures made up with what walling was absolutely necessary to form the grand concentric bank of benches. In the provinces of Gaul,—both transalpine and cisalpine,—Nismes and Verona, by the remains of their amphitheatres, show how much more completely the inhabitants were nationalized, or Romanized, than were those of Greece or of Britain.

There is, perhaps, no species of structure peculiar to the Romans, with the details of which we are so well informed, as of those of the amphitheatre, and there is hardly any one of which we have fewer descriptions by antient writers. The remains which still exist in various places tell us much more plainly what they were than the most elaborate descriptions can do; and although there is no example of an amphitheatre in complete preservation, or even nearly so, yet the existing specimens preserve the various parts so completely, that there is but little difficulty in supplying from one of them what is defective in another. Still there are minor particulars of which we must remain ignorant, unless we take them from such descriptions as exist, or supply them from analogy. We know of no sort of antient edifice, generally, in which so much ingenuity is displayed in the arrangement, or so much skill in the construction, as were exemplified by the Romans in the design and execution of the amphitheatre; but here the merit ends,—for in architectural demerit, the external composition of the amphitheatre is hardly outdone by the triumphal arch, which is the worst that ever was imagined before the *revival*, as it is called, of architecture in the fifteenth century.

As the most remarkable, and one of the most perfect in its details, of the remaining examples of the amphitheatre, that which is known as the Colosseum at Rome is here used to illustrate this kind of edifice; the plan and elevation are almost entirely made out from the existing remains; and the section also, to a certain extent, as well as from the analogy afforded by other examples and from probability. The vignette sketch at the head of this article is a view of the amphitheatre of Verona, as it exists, looking down into it; this will aid the section in giving an idea of the arrangement of the benches, and the mode of access to them.

The form of the external periphery of the plan is that of an ellipsis, whose conjugate diameter, or minor axis, is to the transverse, or major axis, as five to six, nearly,—the length through, from outside to outside of the external wall, being 620 feet, and the breadth to the same extent, 513 feet; but as these dimensions are variously stated by different authorities, something may be allowed for inaccuracy, and the proportion between one diameter and the other may be fairly assumed in the original draft to have been as above stated. Indeed, if the projection of the substructions be added to each diametrical length, that proportion will be produced as nearly as possible, and in this the architect appears to have erred; for if he had any reason for the proportion assumed between the conjugate and transverse, or between the breadth and length of the ellipsis, it should have been taken on the extent of the outer wall, so that its periphery might be true, which is not the case. Of course, in the diminishing series of concentric walls the proportion of the ellipsis is continually altering, so that the diameters of the arena are as five to eight, as nearly as may be, the length being 287 feet, and the breadth 180 feet. The difference between the external and internal diameters, of 333 feet, or 166 ft. 6 in. at each end, is occupied by four corridors and two blocks of radiating substructions,—in, or between, which are the staircases and ways from the outer corridors to the inner, and to the arena, together with the concentric or encircling walls which gird the structure, separate the corridors, and enclose the arena. Two of the surrounding corridors lie together, or adjoin each other, on the outer side; and in this particular, the Colosseum exceeds every other structure of the kind of which we have any knowledge, all the rest having but one only; it thus acquires a second gallery, as may be perceived by referring to the section, in which, also, it is singular. The space covered by this immense edifice will be found to be little short of six acres.

The outer encircling wall is pierced with eighty openings, leaving, of course, an equal number of piers; every opening is arched, and in or against every pier is a column projecting about half its diameter, and supporting an entablature which runs in an unbroken line all round the structure. With the exception of the four central openings, which lie on the diameters of the ellipsis, and are each nearly two feet wider than the rest, all the openings are very nearly the same, their width being 14 feet 6 inches. An exactly similar series of arches, diminished only in proportion to the smaller extent of the ellipsis, separates the second corridor from the first; and another, bearing the same relation to the second series that the second does to the first, or outer, bounds the second corridor. The inner faces of the outer piers, both faces of the piers of the intermediate series, and the outer faces of the piers of the innermost series, have pilasters projecting from them, corresponding in height with the external columnar ordinance, and bearing a moulded architrave, from the top of which semicircular arches are turned over the corridors and continued all round the edifice. The accompanying plan and section exhibit the general arrangement of the corridors here described, though the details cannot, on so small a scale, be made obvious. The elevation shows how a second and third columnar ordinance, with corresponding and nearly similar arched intervals, superimpose the lowest, and each other, and that each of these two upper ordinances rests upon a continued stylobate or dado, which is broken into every interval, or under every column. The section indicates the repetition of the double series of outer corridors in every story, or behind every one of the three columnar ordinances, and above the outermost corridor in the third story, a mezzanine, or small middle story, for a corridor behind the first, and under the second, or upper, gallery. The same diagrams show that the third story of columns is superimposed by a pilastraded ordinance on a continued and recessed dado also, with a deep plinth: they show, moreover, that a bold and massive entablature crowns the whole elevation, and runs its cornice round in one unbroken line.

From the third series of eighty piers, on the ground story, as many walls, with the exceptions to be noticed, run inwards to the third concentric corridor, which is arched over as the outer ones are; the walls are continued on the other side of it to the fourth or innermost corridor, which is bounded on the other side by the massive wall of the podium encircling the arena, and is also arched over, though it is not so lofty as the other three corridors are. Between the radiating walls of the two blocks separating the second from the third, and the third from the fourth corridors, are, of course, as many intervals. Some of these form the traversing passages; and the rest, in the outer block, contain the staircases which lead to the upper concentric corridors and so onward to the upper benches and galleries;—in the inner block are those which lead to the lower benches, and small staircases in the thickness of the innermost wall conduct to the benches immediately on the podium. The benches extend in one long graduated and concentric series from the podium up to the level of the second story of the outer corridors, and over all the constructions within the second of them: they are bounded above by a wall which is pierced with doors. These give access from the upper and inner corridor, to the radiating flights of steps which intercept the benches at intervals, and cut them up into wedges, by which name in Latin, *cunei*, the divisions thus made were distinguished. This encircling wall has windows in it also, which may have been requisite to aid in ventilating the immense area; or they may have been intended merely to afford a view of the arena to persons who could not find room on the benches. The section shows that the radiating flights of steps intercepting the benches do not run through their whole extent, but are themselves intercepted and taken up again,—other lines or flights commencing intermediately, and at intermediate heights. Access is given to these flights at their upper ends, by doorways from the corridors behind, sometimes directly, and sometimes by means of the internal staircases; and in most cases a short reversed flight of steps is made on the outside of the doorways, or vomitories, as they are termed, to afford headway, and avoid intercepting the benches further back than could be possibly helped. Almost every thing that appears in the section above the level of the third story, except the external wall itself, is restored from analogy and conjecture. The peristyle, or encircling range of columns before the upper gallery, is entirely from conjecture; but for the galleries themselves there is sufficient evidence in the existing indications of stairs, and in the toothings of the remaining walls and piers. The benches in the grand series were probably of stone, perhaps of marble, but in the galleries it is most likely they were of wood, and graduated so as to give their occupiers a view of the arena.

The most distinguished seats were those on the podium, and these were assigned to the emperor,—whose place was, by way of eminence, called the *suggestum*,—and to the senators, to foreign ambassadors, and to the great officers of the state. The *cunei*, or wedges, behind and above, were assigned to different classes, according to their rank, station, and tribe. The Vestal virgins had one of the best positions assigned to them, and with them sat such ladies of high rank as could obtain the advantage, but the women generally occupied the galleries.

As the plan indicates, the four central entrances,—those which lie on the ends of the diameters of the ellipsis,—are wider than the corresponding parts of the rest of the structure. They were arcaded through, and finished more carefully, especially those leading from the sides, or on the minor axis; these, it is most likely, were reserved for those persons who went to the seats on the podium, and as they gave access also to the arena, they would of necessity be more strictly guarded.

It does not appear that any part of the structure above the level of the ground, and outside of the arena, was appropriated as dens for the beasts which were used in the shows; for indeed, the corridor leading to the principal seats in the amphitheatre must have been traversed by them in their way to the arena, if that were the case. Substructions were discovered and excavated a few years ago over the whole extent of the arena; these lead to a belief that it was floored with wood, so that the animals required for the day may have been kept in dens under the floor, and allowed to issue at traps in it. But some have supposed dens ranged all round the arena, within its surface and below the podium, from which the beasts would issue to the combat directly.

In the Colosseum the great crowning cornice of the external elevation is pierced through at regular intervals with square holes or mortises, from which grooves are cut down through the rest of the entablature flush with the outer surface of the wall; and every mortise and groove is immediately above a strong projecting stone or corbel at about two thirds the height of the pilastraded ordinance. These are supposed to have been used to insert and receive poles to carry an awning strained over the whole enclosure to protect the spectators from the sun and from rain. If this were the case, there must have been some intermediate support for it of which we are not aware; such an extent of cloth or canvass could hardly have been borne in that manner.

The external elevation is composed,—as it has been already described, and as the elevation indicates,—of three series or stories of attached or engaged columns with their usual accessories, and a pilastraded ordinance, forming a species of attic, which is pierced with windows,—one in every other interspace. The lowest ordinance of columns rests on the upper step of the substructions, or on the ground floor of the structure; it is of what is termed the Doric style or order, but in the debased Roman manner, and its entablature wants the distinguishing feature of that style, the triglyph,—indeed, it may be more aptly designated by the Vitruvian term Tuscan, since it certainly is not Doric, and may be of the latter. The intervening arches are semicircular; they spring from moulded imposts, and have moulded archivolts on their outer faces. The second ordinance is in the Roman Ionic style, having voluted capitals to the columns; and the third is in the Corinthian or foliated style: these, as before stated, rest upon continued, but broken or recessed, stylobata, but their entablatures are, like the rest, perfectly unbroken throughout, and the arches in the intercolumniations in both, correspond exactly—except in minor details—with those of the lowest or Doric ordinance. The pilasters have foliated capitals also, and are called composite; they rest on deep plinths under which there is a continued and recessed dado superimposing the Corinthian entablature;—this dado is pierced with holes or small windows alternating with those of the ordinance above, to give light to the corridor behind the lower and under the upper gallery on the inside. The crowning entablature is made bold and effective by deep modillion blocks or consoles occupying the whole depth of the frieze.

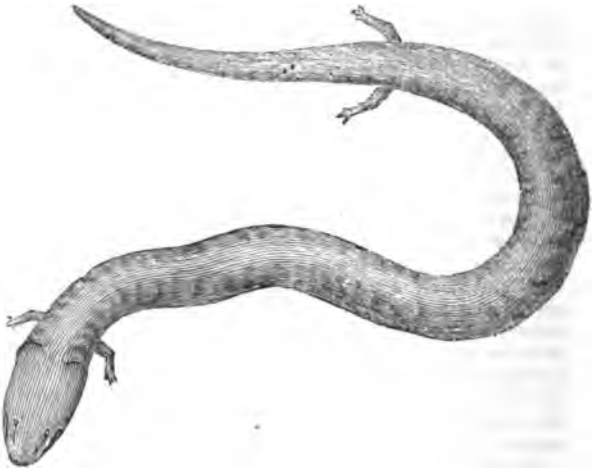
The style of these architectural decorations is, for the most part, as rude and tasteless as it well can be. The storied columnar ordinances, too, besides being themselves bad in detail, are bad in the composition, or in their collocation with arches; for—taking them separately—the columns of each ordinance are too far apart to support their entablature sufficiently, which, therefore, itself appears weak, and they look straggling and inefficient. Taken together, the ordinances but repeat these faults, and have in the whole a poor and mean effect; the shelf-like cornices of their entablatures cut up, and destroy the simplicity of, the elevation, which no observer would suppose to be, as it is, nearly 160 feet high. The storied series of arches with simple blocking courses alone, and continued unbroken stereobata under each arcaded story, and with the broad and simple attic—without pilasters—but crowned nevertheless by the fine bold entablature, would have been a far nobler composition. The practice here exemplified, nevertheless, which may be fairly termed a vice, seems to have pervaded the architecture of the Romans, for either columnar or pilastraded ordinances, and sometimes, as in this case, both, are found on almost all the examples that remain to us of their amphitheatres. Internally, however, the amphitheatre must have been strikingly grand and impressive; here none of the littlenesses of storied columns appeared, but the long unbroken lines of the podium, and the graduated series of the benches, and the galleries with the encircling peristyle above—when it existed—would have been as beautiful in general effect, as anything architecture ever produced.

There are varieties in the arrangement of the details of the amphitheatre, as other examples show. Intermediate concentric galleries, platforms, or precinctions sometimes intercepted the great bank of graduated benches to serve as passages of communication; and sometimes each staircase communicated directly and exclusively with one vomitory, instead of leading to encircling corridors which communicated generally, and gave access alike to every part of the enclosure.

Next in importance to the Colosseum at Rome, of existing structures of the kind, is the Amphitheatre of Verona. The prefixed vignette will give a tolerable idea of its state of preservation. The great external cincture is entirely gone, with the exception of four arches and their accessories; but the great bank of concentric benches, with the staircases leading to them, and the parts about the arena, remain in a comparatively perfect state. The outer cincture was pierced with seventy-two arches, which number appears in the inner, with the corresponding radiating walls to the traversing passages and staircases,—for this had not a second encircling corridor on the outside of the stairs block as the Colosseum has. The outer dimensions of this structure were 500 feet by 404 feet; the length of its arena is 242 feet, and its breadth or length, on the conjugate, 146 feet; the form, of course, was elliptical.

The amphitheatre at Nismes in Languedoc is large and in comparatively good preservation;—the great external cincture of an amphitheatre remains in a very perfect state at Pola in Istria;—Rome contains the remains of a second amphitheatre called the Castrensian;—there are also considerable remains of an amphitheatre at Capua, and of another at Pozzuoli near Naples. That of Pompeii, it has been already remarked, was an extensive structure,—it was in many respects peculiar, but it is not so well preserved as some other examples which have been more exposed, as it suffered considerably from earthquakes before it was buried. At Pæstum, there are indications of an amphitheatre, though not a large one; at Catania, in Sicily, the upper and outer encircling corridor of an extensive amphitheatre is accessible, considerably under the level of the modern city, buried by the torrents of lava from Mount Ætna. Syracuse and several others of the antient cities of Sicily exhibit remains or indications of small amphitheatres. Indeed, wherever Roman remains are found to any extent, whether at home or abroad, some indication may be almost certainly discovered of the existence at some time of an amphitheatre.

AMPHIUMA, in zoology, a singular genus of batrachian reptiles, first noticed by Dr. Garden in 1771, in a letter to Linnæus. The remarkable and anomalous order of batrachians, to which this genus belongs, are more extensively spread throughout the New World, and exhibit a far greater diversity of organic modification in the western hemisphere, than in all the rest of the earth together. It is here alone that the *menopomæ*, the *amphiumæ*, the *axolotls*, the *menobranchi*, and the *sirens*, are to be found: these singular animals abound in all the lakes and stagnant waters, and astonish the observer equally by the variety as by the novelty of their forms. The most remarkable character of these reptiles is the complete metamorphosis which they undergo in their progress from youth to maturity; a metamorphosis which not only affects their outward form, but entirely changes their systems of circulation and respiration. When first separated from the spawn or egg, they appear in what is called the tadpole form, respiring by means of gills and inhabiting the waters. At this period they have neither legs nor arms, but a long tail compressed sidewise enables them to move about in the manner of fishes. Gradually, however, they acquire legs and feet, and whilst the formation of these members is in progress, the lungs likewise are developed, in some genera entirely replacing the gills, in others continuing to exist and act simultaneously with these organs throughout the remainder of the animal's life.



[Amphiuma tridactylum.]

The external form of the amphiuma is very similar to that of the common eel, but the whole anatomy and physiology of the animal approximates it more nearly to the common water-newt (*Triton marmorata*) than to any other known species. From this creature indeed it differs principally in the extreme length of its body and the diminutive size of its extremities, which rather resemble small tentaculi than actual legs. The only two known species inhabit the stagnant pools and ditches in the neighbourhood of New Orleans, and those in Florida, Georgia, and South Carolina. They bury themselves in the mud at the bottom of the ditches, particularly on the approach of winter, and vast numbers of them are sometimes found in draining and clearing ponds, at the depth of three or four feet from the surface. They are also capable of existing on land, but as their food in all probability exists only in the water, they never voluntarily abandon that element. The two known species, *A. didactyla* and *A. tridactyla*, differ principally in the number of their toes, the one having only two, the other three on each foot.

A'MPHORA, in its ordinary acceptation, means an earthen vessel, used as a measure for liquids both by the Greeks and Romans. It received its name on account of its two ears or handles. The proper form of the Greek word is *Amphoreus*. It is generally two feet, or two feet and a half in height; and the body, which is usually about six inches in diameter ending upwards with a short neck, tapers toward the lower part almost to a point. The Attic amphora contained three Roman urnæ, or seventy-two sextaries, equal to about two gallons, five pints and a half of English wine-measure. The Roman, sometimes called the Italic amphora, contained two urnæ or forty-eight sextaries, about seven gallons, one pint English. Homer mentions amphoræ both of gold and stone; and the Egyptians had them of brass. There are various specimens of earthen amphoræ in the British Museum, in the Elgin and Townley Galleries.

The amphora is still the largest liquid measure used by the Venetians, containing sixteen quarts.

There was another amphora among the Romans, which was a dry-measure, and contained about three bushels.

Earthen amphoræ of the Roman time have been occasionally found in England. Like other domestic vessels of the Romans, they appear to have been sometimes used as funeral urns. Columella says they were used to preserve olives in. When filled with wine, they were usually lined with pitch or some other coating, on account of the porous nature of the material of which they were formed. Amphoræ were placed as urinals in the public streets of Rome till the time of Vespasian.

AMPLITUDE, the angular distance of a celestial body from the east point when it rises, or from the west point when it sets. It depends upon the declination of the star and the latitude of the place, and may be computed from the formula,

$$\text{sin. amplitude} = \frac{\text{sin. declination}}{\text{cos. latitude.}}$$

It must be measured towards the north or south points of the horizon, according as the declination is north or south. For the fixed stars, the amplitude remains the same throughout the year: but for the sun it varies with the declination, being nothing at the equinoxes, and about 3¼ points of the compass at the solstices, or more exactly 39° 44′ of amplitude, in the latitude of London; that is, at the summer solstice, it rises between N.E. by E. and N.E., and sets between N.W. by W. and N.W.; and at the winter solstice, it rises between S.E. by E. and S.E., and sets between S.W. by W. and S.W.

The term amplitude was also applied to what is more commonly called the *range* of a gun; that is, the whole horizontal distance which the gun will carry. It is sometimes also used in the integral calculus.

AMPTHILL. [See BEDFORDSHIRE.]

AMPULLA'RIA is used by zoologists as the name of a genus of fresh-water spiral univalve shells, which inhabits the rivers and ponds of India, Africa, and South America. They are of a globular or rather depressed form, are covered with a thick olive or black *Periostraca*, and often banded. Their mouth is ovate, with the lips complete all round, and often slightly thickened or reflexed. The animals are somewhat similar to the common pond snail, (*Paladina*,) but they have the front of the head nicked and furnished with two slight conical horn-like processes, and they have long slender tentacles, with the eyes placed on small pedicels at their outer base; these horns and the tentacles often contract into a spiral form. But the great peculiarity of these animals is, that, unlike all other molluscous animals with comb-like gills, they have a large bag, which opens beneath, placed on the side of the respiratory cavity, which they probably can fill with water; and it is this structure which most likely gives them the power of living for a long time out of water, specimens having been brought from Egypt to Paris alive, by only packing them in a little sawdust. Their operculum is formed of concentric rings with the nucleus nearly in the centre; in the species which come from India, this part is generally shelly, but in those of America and Africa it is always horny. The Indian species lay globular pale green eggs about the size of small peas, which are placed in clusters on sticks and other things in the ditches; the eggs when dry form most beautiful objects. Some of the African species are reversed, or have the whirls of the shell turned from the right to the left, and these have been separated into a genus, under the name of *Lanistes*, on this account. It has been generally supposed by the geologist, that all the species of this genus are purely fresh water, but the large Egyptian species, *A. ovata*, discovered by Olivier in Egypt, lives in lake Mareotis, where the water is salt, therefore there is no proof that some of the fossil species are not marine.

AMPURDAN, a district in Spain in the province of Catalonia, between the river Ter and the town of Rosas. It comprises thirty-two miles in length, and twenty-four in breadth, and is the most fertile part of the province. It produces wheat, barley, Indian corn, and wine. The capital is AMPURIAS.

AMPU'RIAS, a town of Catalonia of some note in antient times, but now sunk into insignificance. It is situated on an elevated spot near the Gulf of Rosas, 42° 7′ N. lat., and about 3° E. long., fifteen miles east of Gerona, and about seventy miles N.E. of Barcelona. At a very antient period, this town was named Emporium, on account of its extensive trade: a Greek colony from Marseilles settled there, perhaps about the year 545 B.C. Ampurias had antiently a square harbour on the east side of the town, very capacious and secure, part of the wall of which is still visible upon a rock washed by the sea. The port has been obstructed by the great quantity of sand carried down by the rivers Fluvia and Ter, which empty themselves into the sea not far from Ampurias. On the western side of the town, ruins of walls and edifices are still seen, and until the last century, medals, coins, and other relics of its former splendour were found. Under the empire, about the second century of our æra, its decline began, and it is now reduced to forty miserable houses inhabited by poor farmers. In the time of the Goths it was still a place of some consideration, and an episcopal see. Ampurias belongs to the district of Gerona. Castellon de Ampurias, a town not far from it, is frequently mistaken for the same city. (See Strabo, book iii. p. 160 Casaub.; Miñano; Masdeu, *España Griega*.)

AMPUTATION, from *amputo*, to cut off; the operation of cutting off a limb from the body. Such is the constitution of the animal body in general, and especially of the more perfectly organized body, that if one part of it be diseased, the whole system suffers, while a general disturbance of the system cannot exist long without producing specific disease in some individual organ. Hence constitutional and local diseases are found to exert a most important influence over each other. Some local diseases are of an incurable nature, and proceed progressively from bad to worse. At first, these diseases may not materially affect the general health, but in their progress they produce so much constitutional disturbance, as to endanger life, and ultimately to destroy it. In this case, life is really endangered and destroyed by the local malady; remove that, provided the removal can be effected before the general health is irreparably impaired, and not only is death averted, but health itself is restored. Hence, in all ages, the necessity and advantage have been obvious enough, of removing a part of the body for the sake of preserving the remainder, and men have always been willing to submit to the loss of a limb in order to save the body, on the ground 'that it is better to live with three limbs than to die with four.'

But although it must always have been clear, that it is a gain to save life even at the cost of a limb, when nothing but the removal of the limb can preserve the body, yet it was not always easy to make the sacrifice. Whoever understands the circulation of the blood, and considers the quantity that is sent, and that must necessarily be sent, to each member of the body for its nourishment, and the magnitude of the blood-vessels that are divided in cutting off a limb, will readily perceive how impossible it must have been to perform the operation of amputation before any certain mode was known of stopping the flow of blood from the wounded blood-vessels. But no such mode of stopping hæmorrhage was known to the antients: consequently, though they daily saw the necessity of performing the operation of amputation, yet they looked upon the operation with terror, and shrunk from the responsibility of undertaking it. And no wonder: when they did venture upon it, the consequences were appalling. They cut through the flesh with a red-hot knife, hoping by this means to prevent a fatal loss of blood. After having performed this operation, they dressed the wound with scalding oil, in order to complete what the burning knife may have left imperfect. But these expedients stopped only for a short time the flow of blood. The whole surface of the wound was converted into an eschar, which for a time stopped the bleeding. But the eschar being dead matter it was at length thrown off by the action of the living parts beneath. The moment this took place, the mouths of the blood-vessels were again opened, hæmorrhage took place just as at first, and the patient perished from loss of blood. The uniformity with which this event took place after amputation performed in this mode, could not but cause the operation to be regarded with dismay. Nevertheless, it is pretty clear, that in the time of Celsus, the surgeons of that age were not without some notion of the true mode of stopping hæmorrhage from wounded blood-vessels, for that writer gives particular directions to take hold of the vessels, to tie them in two places, and then to divide the intermediate portion; certain, however, it is, that this practice was not extended to amputation, because nothing was ever amputated by the antients but a part absolutely mortified or dead; and in a part thus mortified or dead, it is not practicable to secure the blood-vessels by the needle and ligature. The general introduction into surgery, of the method of stopping hæmorrhage by taking up the divided blood-vessel with a needle, and placing a ligature around it, must, therefore, be considered as much a modern improvement, as if no allusion whatever had been made to it by antient writers.

But if a knowledge of the mode of stopping hæmorrhage by tying the blood-vessel, be indispensable to the safety of surgical operations in general, the knowledge of some mode of preventing the loss of blood during the actual performance of an operation is indispensable to the safety of the operation of amputation in particular. So large are the trunks of the main blood-vessels that supply the limbs, and so great is the quantity of blood that flows from them in a short space of time, that loss of life is always the consequence of a want of command over these great vessels. By the invention of the instrument termed the tourniquet, an invention of the seventeenth century, (for an account of the construction and application of which instrument, see

Art. Tourniquet,) this command is obtained. By these instruments, then, namely, the tourniquet, and the needle and ligature, modern surgeons have such a perfect command over the blood-vessels, that operations may be performed, in which the largest trunks are divided without the loss scarcely of a single drop of blood. On this account, the mere removal of a limb excites in the modern surgeon no degree of anxiety; the operation of amputation is scarcely ever attended with the slightest hazard; nevertheless, there are circumstances connected with amputation of the greatest possible importance, delicacy, and difficulty, on a clear and correct view of which life depends; to obtain such a view, the most extensive knowlege, and the most accurate discrimination, are requisite; while, to act in conformity with it, a high degree of moral courage is often no less necessary. Perhaps the determination of the exact time at which to amputate is sometimes among the most difficult points of surgery; that is, the determination of the time when the preservation of the limb is no longer possible; and when, therefore, it is right to put an immediate stop to any further exhaustion of the health and strength by the removal of the limb. The discrimination of the cases that absolutely require amputation, in contradistinction to those in which the necessity of amputation may be superseded by skilful surgical treatment; the easiest and safest methods of performing the operation; and the best mode of treating the patient after the operation has been performed, involve considerations of the last importance which are often not without considerable difficulty, but these are considerations purely and exclusively professional, and cannot be treated of in a work like the present. No one, however, can look into the modern books which treat of this subject without being struck with the prodigious advancement which surgery has made in recent times; without being deeply impressed with a sense of the debt of gratitude due to the illustrious men who found surgery a mean, and not infrequently a mischievous art, and who have exalted it into a noble and beneficent science.

AMRITSIR, a very antient town, formerly called Chak, the holy capital of the people called Seiks, or Sikhs, in 31° 33′ N. lat., and 74° 48′ E. long. In Burnes' map of the Indus, the latitude and longitude are somewhat more. It owes its present name to a tank 135 paces square, which was built by the Gooroo Ramdas, who improved the town to such a degree that, for a time, it bore the name of Ramdaspoor. Ramdas died in 1581, and in the course of time the name of Amritsir—the pool of immortality—was transferred from the tank just mentioned to the whole town. This town is without any external walls, its houses are built of bricks and lofty, but the apartments are small and the streets are narrow.

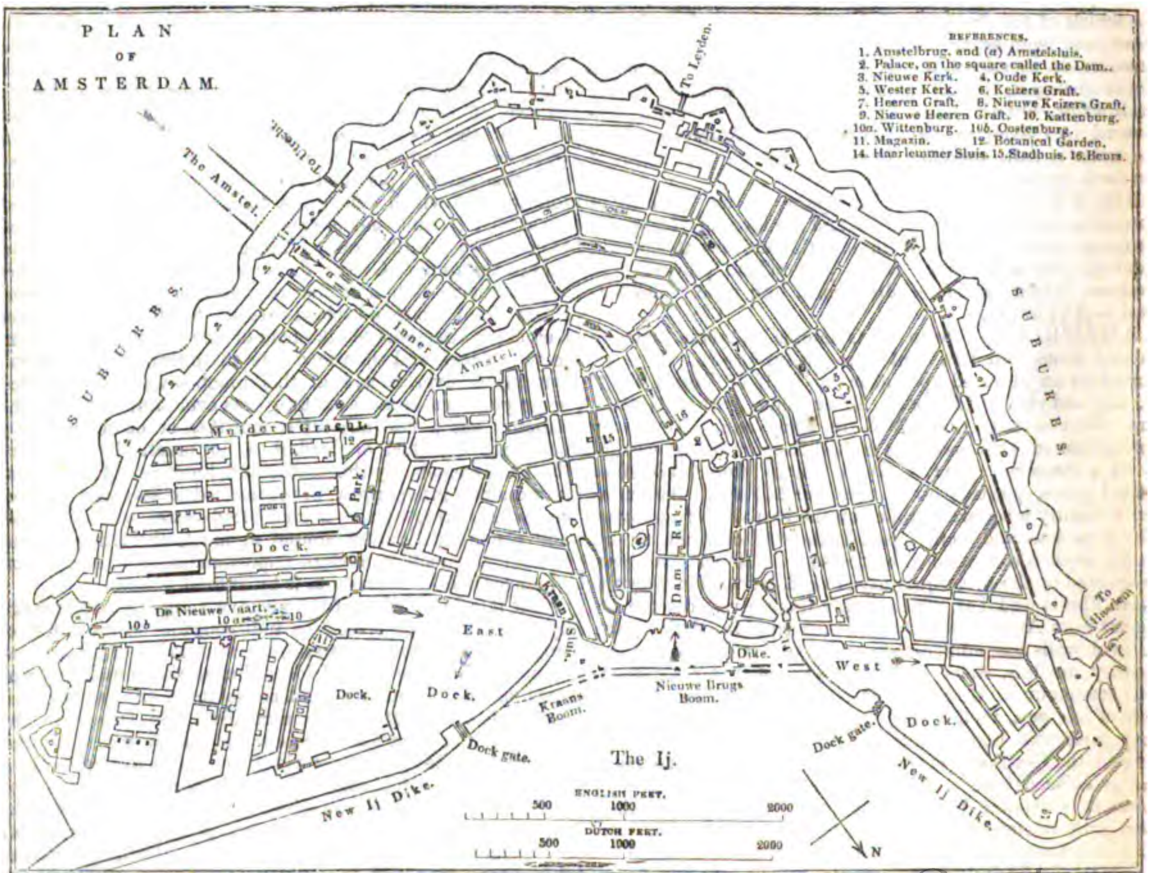
Amritsir has a considerable trade in the shawls and saffron of Cashmere, and is a place of great opulence owing to the resort of merchants and to its being the residence of some bankers of extensive dealings. Its native manufactures are confined to coarse cloths and inferior silk goods. The Rajah Runjeet Singh of Lahore, to whom the district is subject, has lately built a fort here, which he calls Runjeetghur, and he has improved the town by bringing a canal to it from the Ravee, the Hydraotes of Arrian.

The sacred pool has a temple in its centre, which is viewed with a high degree of veneration by the inhabitants, and is dedicated to Govind Singh, who died in 1708, and was the last Gooroo, or religious leader of the Sikhs. A book, containing the code of laws, written by Govind Singh, is deposited in this temple, in the service of which upwards of 500 priests are retained.

Amritsir is about 44 miles east from the city of Lahore, which is on the Ravee, and 1312 miles travelling distance north-west from Calcutta.

(Rennell's *Memoir of a Map of Hindostan*; *Manuscript Documents at the India Board, quoted by* Hamilton; *Report of House of Commons on the affairs of the East India Company*, August, 1832.)

AMSTERDAM, the capital of the province of New Holland, and the commercial capital of the Kingdom of Holland, though not the seat of government, stands on the south bank of the Ij, or Y, a gulf of the Zuider Zee, in 52° 23′ N. lat. and 4° 54 E. long. The small river Amstel runs into the Y through the city, and gives to it the Latinized name of Amstelodamum, and its old name of Amstelredamme or Amsteldam; the word *dam*, which so often occurs in the names of Dutch towns, means 'a dyke, or embankment of earth to separate two lakes or canals.' The Amstel, four


PLAN OF AMSTERDAM.
REFERENCES.
1. Amstelbrug, and (a) Amstelsluis.
2. Palace, on the square called the Dam.
3. Nieuwe Kerk. 4. Oude Kerk.
5. Wester Kerk. 6. Keizers Graft.
7. Heeren Graft. 8. Nieuwe Keizers Graft.
9. Nieuwe Heeren Graft. 10. Kattenburg.
10a. Wittenburg. 10b. Oostenburg.
11. Magazin. 12. Botanical Garden.
14. Haarlemmer Sluis. 15. Stadhuis. 16. Beurs.
To Leyden.
To Utrecht.
The Amstel.
SUBURBS.
SUBURBS.
Inner Amstel.
Muider Gracht.
Park.
Dock.
De Nieuwe Vaart.
East
Dock.
Dock.
Dock gate.
Kraans Sluis.
Kraans Boom.
Dam
Rak
Dike.
Nieuwe Brugs Boom.
West
Dock.
Dock gate.
To Haarlem.
The Ij.
New Ij Dike.
New Ij Dike.
ENGLISH FEET.
500 1000 2000
DUTCH FEET.
500 1000 2000
N

miles south of the city, is joined by the Vecht, a branch of the old Rhine which runs past Utrecht. Amsterdam is thirty-two miles north-east of the Hague, and 107 north of Brussels, the capital of Belgium. The city is in the form of a crescent with the two horns projecting into the Y, and forming a kind of port. The Y forms the port of Amsterdam, which was formerly only protected by a double row of piles driven into the ground through the water: the two rows were about seventy feet asunder. About twenty-one openings, called *booms*, were left for ships to pass through, but were carefully closed at night. Large vessels which could not pass through were moored outside in the *laag* or harbour. Between the town and the inner row of piles was the harbour for the small craft. At present two dikes enclose the east and west docks respectively. One begins near the Kraan Sluis and runs eastward, having an entrance called the Dok Sluis; the other commences near the Haarlemmer Sluis and runs westward. (See *Plan of Amsterdam*, 1830, door C. van Baarsel & Zoon.) On the land side it is surrounded by ditches and ramparts, which are now planted, after the Dutch fashion, with trees, and make an agreeable promenade: the Plantaadje (place planted with trees) on the south side of the town is the chief place of resort on Sundays and holidays. The approach to this capital on the land side, especially from Haarlem, is described as very striking; the view extends over spacious meadows, covered with luxuriant grass, to the capital, where the tall masts of ships, spires, and houses are all mingled together; and this scene of activity and wealth is in the midst of a marsh, which seems every moment threatened with inundation from the brimfull canals and waters which surround it. But these form the best defence of Amsterdam, and enable the inhabitants to lay the whole country around under water.

Amsterdam was originally a salt marsh, and in order to make a foundation for houses, it was necessary to drive large piles of wood or rather masts through a layer of peat, which in some places is said to be forty or fifty feet thick. The nature of the soil may differ somewhat in different parts; the following facts will show still better its character. In 1605, a well was dug in one of the hospitals of Amsterdam (Oude Mannen-en vrouwen Gasthuis) to the depth of 232 Dutch feet. After seven feet of earth, there were found nine feet of peat, and then soft clay, sand, earth, clay rather hard, and earth, altogether making fifty-one feet of depth. Then came ten feet of sand, in which stratum the piles of Amsterdam chiefly rest. At the depth of seventy feet there was found one foot of pieces of peat. Sand, through which they did not make their way, was found at the depth of 232 feet. (See *Tooneel der Vereenigde Nederlanden*, &c. *door* Halma und Brouer, Leeuwarden, 1725.)

Such is the substructure of a town which now contains above 200,000 inhabitants. The streets are generally in straight lines along the banks of the canals, which intersect the city; among the finest are the Heeren Graft or Gragt, and the Keizers Gragt, both of which are magnificent streets. Those in the central parts of the town are narrow and without foot-pavement. The private houses are nearly all of brick, painted and ornamented with different colours. The Kalver Straat is filled with shops for jewellery, porcelain, China, books, pictures, and other articles of luxury, and though narrow, this defect is compensated by the rich display of merchandize. Several of the streets are lined with fine rows of elms, walnut trees, and limes. The canals within the town, or *gragten*, as the Dutch call them, are so numerous that the city is divided into ninety islands, which communicate by 290 bridges: the Amstel itself divides the town into the eastern or old, and western or new part, and is crossed by a bridge, the Amstel-Brug, partly built of brick and partly of stone, with thirty-five arches; it is about 610 English feet long, sixty-four and a half wide, and furnished with iron balustrades. Through the eleven central arches large ships pass. Near the bridge is the great sluice, (Amstelsluis,) by which the waters of the river can be either dammed out, or allowed to flow through the city. By shutting the gates the course of the Amstel is stopped, and the country round the city laid under water.

Amsterdam contains thirteen churches for the reformed religion, one English Presbyterian, one English Episcopal, one of the Remonstrants, three Lutheran, two Anabaptist, one of the United Brethren, sixteen Catholic, one Armenian, one Greek, five Jansenist, one Portuguese and one German Synagogue, in all forty-seven places of worship, or one for every 4255 persons. The number of charitable institutions is considerable.

This city has twelve public places, but not one of them is either large or magnificent: the *bogt* (bend) of the Heerengragt is a kind of circus which contains some of the best houses in Amsterdam. In the Dam we see the *Stadhuis*, or old town-hall of Amsterdam, built of Bremen and Bentheim stone, and said to rest on 13,659 piles of wood (Halma): it is 282 feet long, 235 deep, and 116 high, and crowned with a tower. The interior is adorned with a profusion of marble, statues, and pictures, which attest the splendor of the Amsterdam merchant, when he erected this edifice in 1648, during the glorious days of the republic. The marble hall is, perhaps, the finest room in Europe, being 120 feet long, 56 feet broad, and 98 feet high. Louis Buonaparte, who had a great liking for palaces, contrived to get possession of this when he was King of Holland, and the present royal family retain it as a palace. The *Beurs*, or exchange, is a large old building with nothing remarkable, except the concourse of merchants from all countries.

The church of St. Nicholas or the Old Church, (*Oude Kerk*,) is of great antiquity, but its precise date is unknown. In 1578 the Reformed service was first performed in it. The length of the church with the tower is about 278 feet; the tower itself is 221½ feet high: the width of the church at the transepts, measured on the inside, 207¾, and on the outside 192 feet. This church contains the tombs and monuments of many of the great warriors and seamen of Holland: among them is the monument of Admiral Heemskirk.

The New Church (*Nieuwe Kerk*) was originally built, partly on the model of the cathedral of Amiens, but being burnt down in 1645, it was speedily rebuilt, and is, in the opinion of the Dutch, one of the handsomest churches in Europe. Its pulpit is a curious specimen of carving; and the great organ is also much admired. It is 850 feet long, says a Dutch description, 210 wide at the transepts; the upper part rests on 52 pillars of hard stone, and the church is lighted by 75 large windows. It is also conspicuous for its noble and incomparable bronze (or brass?) ornaments of the quire, which consist of six quadrangular fluted columns, and fourteen other small pillars, with two great doors, adorned with two lions holding the arms of the city, and surrounded with well-executed leaf-work: all this, weighing many thousand pounds, rests on a noble marble base. This bronze work, which from top to bottom is 30 feet high, is cleaned twice a-year.

In the high quire of this church is the marble monument of the great Dutch admiral De Ruyter. In another part of this church is erected a monument to the hero Van Speyk.

The Admiralty buildings, the dock-yard, the extensive magazines, on Kattenburg, and even the model-room are accessible to strangers. Near the dock-yard is a marine school, called the *Kweek-School*, or seminary, for the instruction of youths in naval tactics. The warehouses and quays of the East and West India Companies, though they are very considerable, will not excite the wonder of any person who has visited the banks of the Thames.

Among the many literary establishments of Amsterdam we must mention the academy on the Keizergragt, a large and tolerably handsome building, whose title is indicated by the words FELIX MERITIS, in large gilt letters, under the pediment. This academy is divided into five sections, which embrace the various departments of science and learning. There is also an observatory. The *Doctrina et Amicitia* is another learned society, which has a library, museum, and news-room in the Kalver Straat. The botanical garden is not extensive, but contains some old specimens of Cape plants.

Among the places of amusement are three theatres. Among the prisons, the *Rasphuis*, where the criminals used to saw various foreign woods, and the *Spinhuis* (spinning-house) for females, are best known.

The commerce of Amsterdam was founded by the industry and perseverance of its inhabitants, to which the institution of the bank in 1609 has materially contributed. This is one of the oldest establishments of the kind in Europe, and has always been conducted with the utmost regularity and good faith. Amsterdam is a great depôt both for the commodities of the East and West Indies, with which it carries on a great trade through the Dutch colonies and its own trading companies.

The approach to Amsterdam from the North Sea or

German Ocean is through the passage formed by the Texel and the extreme point of North Holland into the Zuider Zee, the navigation of which is difficult: near the entrance is a bar called the Pampus, over which ships are taken by means of large vessels or boxes, called camels, which being passed under the ship, and then exhausted of their water, buoy the whole up several feet. But since the completion in 1825, of the great HELDER CANAL, (54 English miles long,) Amsterdam has at all seasons a safe and easy communication with the Texel by means of an inland navigation through the whole length of North Holland. By means of its canals Amsterdam has an easy water communication with Utrecht and the Rhine, with Haarlem, the Haag, Leyden, Delft, and Rotterdam. One steam-boat is employed during summer in conveying passengers to Hamburg, and two smaller ones as ferry-boats across the Zuider Zee. Amsterdam has no water that is fit to drink or suitable for culinary purposes, but what is brought in boats from the Vecht, a distance of fifteen miles: the pure water of Utrecht is sold in the streets for table use and for making tea and coffee. The want of so indispensable a necessary must be unfavourable to health, and the stench that arises from the canals in the hot days of summer is sometimes almost intolerable. The fuel of this great city is chiefly turf, which is found in great abundance in most parts of the kingdom. Billets of wood are occasionally used, and coals from Newcastle or the Forth by those who can afford to pay for them. It is remarked that Amsterdam has changed so little for the last century, that the guides and descriptions of this city, published a century ago, may still be considered as correct and useful companions. The origin of Amsterdam is traced to a small fishing place, established on the Amstel, probably during the twelfth century; but the date has not been ascertained by Dutch antiquaries; the name Amsteldam first occurs in a letter of Count Floris, A.D. 1275, in which he exempts the town of Amstelredamme from certain tolls or taxes. In 1482 it was walled, and from 1578, when the states of Zeeland and Holland united with Brabant, Flanders, &c., in the pacification of Ghent, it began to acquire that commercial superiority which Antwerp had hitherto possessed; and of which its various sufferings tended to deprive it. When the Schelde was closed in 1648, the commerce of Amsterdam increased still more at the expence of Antwerp. The area on which the town stands has of course been extended at different periods, but, as far as we can learn, not since 1658.

The chief articles of import are West and East India produce, tobacco, hides, rice, linseed, and grain: the value of imports of the chief articles into Amsterdam by sea was,—in 1829, 2,107,852*l.*; 1830, 1,864,891*l.*; 1831, 1,904,261*l.* The chief exports to Great Britain are cheese, oil-cake, oak-bark, and grain.

In 1827, 1887 ships entered the port of Amsterdam.

The number of vessels that cleared at Amsterdam was, in 1829, 1975: in 1830, 1996: in 1831, 1624. Those to Great Britain were respectively in the three years, 82,114, and 209.

The manufactures of Amsterdam are considerable: the principal are the bleaching of wax and linen cloth, the manufacturing of tobacco, leather, silk, sugar, calico-printing, cotton-spinning, diamond cutting, cannon foundry, and ship-building.

Population of Amsterdam in	1814	180,000
	1820	195,000
	1829	201,000
January 1st,	1830	202,364

Of this number, 202,364, there were 90,332 males, and 112,032 females.

	Males.	Females.	Total.
Deaths in Amsterdam in 1829	4056	3942	7998
Births „ „	3785	3618	7403

In this year there were 25 deaths of persons above the age of 90, of whom 17 were females.

Büsching states the number of houses in Amsterdam, in 1732, at 26,835, which, we suspect, is more than the present number, and adds that the population was supposed not to exceed 200,000. The burials from 1747 to 1752, a period of six years, averaged 8247 each year.

The lowest ranges of the thermometer noted at Amsterdam are,

1798	30th December	2	Fahrenheit.
1823	21st January	4	„
1830	2d February	1	„

AMSTERDAM, a small island in the Indian Ocean, discovered in 1697, by Van Vlaming, a Dutch navigator, and situated in 34° 42′ S. lat., and 76° 51′ E. long.

This island is about four miles and a quarter long from north to south, and two and a quarter from east to west; but so much of its area is occupied by a basin or harbour, that its surface does not contain more than between seven and eight square miles of land. The basin, here mentioned, was formerly a large volcano, into the eastern side of which the sea has forced a passage by the action of its waves, which roll with an uninterrupted current from the east.

The width of the breach thus made is 1000 feet, but the part of the opening through which the tide flows is only one-fifth of that width. The original form of the crater was that of an ellipse, its largest diameter being 3000 feet, and its smallest 2550 feet; it had thus a circumference of nearly a mile and three-quarters, and as its sides rise to the height of 700 feet, at an angle of 65° with the horizon, the brim of the basin has a circuit of rather more than two miles: it must therefore have been one of the largest kind of craters. The depth of water in the centre of the basin is 174 feet, which, added to the height of the sides above the water, gives 874 feet for its entire depth.

The coast in every other part is inaccessible, and exhibits everywhere successive streams of lava. To the north of the entrance of the harbour, and a short distance from it, is an insulated rock, of a pyramidal form, which rises out of the sea to the height of between 200 and 300 feet. This rock is composed of forty or fifty horizontal layers of lava, piled regularly one upon the other. The face of these layers is cracked and divided by perpendicular fissures, many of which are filled with veins of obsidian or volcanic glass, and the same appearance is visible several feet below the surface of the sea. In other of the fissures are some curious specimens of zeolite. Signs of fusion are evident on every part of the surface of this rock, which seen from a short distance has the appearance of scoria from an iron furnace. Obsidian and pumice-stone abound on all the coast.

The slanting sides of the crater contain many thermal springs, some of which run freely, while others ooze out in the form of mud. The temperature of these springs is various, some being 196° of Fahrenheit, and others at the boiling heat; the temperature of the surrounding atmosphere when these temperatures were taken being 62°. Swamps and stagnant pools of water, varying in their heat from 80° to 130°, are found on every part of the island. Most of the springs are brackish; one of them, the temperature of which is 112°, is strongly chalybeate.

The soil is altogether volcanic; it is spongy and porous, and trembles under the feet. If the ear be applied to the surface, a sound like that of bubbling water may be heard.

The sea on the coast abounds with fish. Among these are some red-coloured perch, from six to twelve inches in length; another species of perch from three to four feet long; rock-cod and bream. The quantity of cray-fish seen crawling on the bar, at the entrance of the crater at low water, is almost incredible; and they are so plentiful in the open sea, that if a basket baited with flesh be lowered to some depth for a few minutes, it will be found half filled with cray-fish when drawn up.

No frutescent plant is found on the island. The list of its vegetables is confined to mosses, and other genera of the cryptogamous class, with a few kinds of grasses. Not a single quadruped of any kind inhabits the island, which is likewise free from all insects, with the exception of the common fly. Land birds are never seen here, but the number of aquatic birds which resort hither to lay their eggs is astonishing. Among these are the white and the brown albatross; crested penguin; black, grey, blue, and stormy petrel; puffin; silver bird, or sea-swallow; and a small brown duck, not larger than a thrush.

The shore of Amsterdam island is resorted to by great numbers of seals, for which reason this speck in the ocean, nearly 2000 miles distant from any land, except the little island of St. Paul, is visited by the Americans, who carry the skins which they there procure, to China.

A paper in the twentieth volume of the *Philosophical Transactions*, which gives an account of the discovery of this island by Van Vlaming, states, that the sea was then so crowded by seals and sea-lions, 'that it was necessary to kill them in order to effect a passage for the ship to the shore.' These animals, although still abundant, are certainly not now in sufficient numbers to obstruct the passage. Another marvellous statement in the same paper was to the effect, that fish might be caught in the sea with one hand and cooked with the other, in the natural boiling springs, and this assertion has certainly been corroborated by Mr. Barrow, who, in 1793, dropped some perch 'living, off the hooks into a boiling spring, and found them cooked to perfection in fifteen minutes.'

Amsterdam island is about midway between Australia and Madagascar.—(*Philosophical Transactions*, vol. xx.; Barrow's *Voyage to Cochin China*.)

AMSTERDAM, NEW. [See BERBICE.]

AMU. [See OXUS.]

AMULET, in barbarous Latin, *Amuletum*, or *Amoletum*. Some suppose the word to be of Arabic origin. An amulet hung round the neck, or carried in any other way about the person, is absurdly believed to have the effect of warding off morbid infections and other dangers, and even of curing diseases by which the body has been already attacked. The belief in the efficacy of amulets has subsisted at some time among almost every people, and the thing has been denoted by a great variety of names, which it is unnecessary here to enumerate. The phylacteries, or bits of parchment with passages from the Bible written upon them, which the Jews were wont to carry about with them, were amulets; of just the same character are those inscribed with sentences from the Koran, which the Moorish priests sell to the negroes of Africa, and to which the latter give the name of *Fetishes*. This superstition, which existed also among the Greeks and Romans, appears to have in early times prevailed extensively among the converts to Christianity, if we may judge by the denunciations directed against it by St. Chrysostom, and others of the fathers. But even down to our own day, it has continued to be an article of the popular creed, that certain medical preparations, and other things, merely carried about the person, have the power both of repelling and of healing diseases. Even the celebrated Robert Boyle adopts this notion, assuring us that he once experienced the efficacy of such an amulet in his own case. 'Having been one summer,' he says, 'frequently subject to bleed at the nose, and reduced to employ several remedies to check that distemper; that which I found the most effectual to stanch the blood was some moss of a dead man's skull, (sent for a present out of Ireland, where it is far less rare than in most other countries,) though it did but touch my skin till the herb was a little warmed by it.' (*Essay of the Porousness of Animal Bodies.* See also his *Essays on the Usefulness of Natural Philosophy*, and his *Experimental Discourse on some Unheeded Causes of the Insalubrity and Salubrity of the Air.*) The anodyne necklace, which consists of beads formed from the roots of white bryony, and is sometimes hung around the necks of infants with the view of assisting their teething, is an instance of the still surviving confidence in the medical virtue of amulets. Such also is the belief generally entertained by seafaring people, that a child's caul on board their ship will preserve them from being lost—and many other examples might be easily quoted.

AMUR, one of the largest rivers of Asia. If we except the two largest rivers of Siberia, (Oby and Lena,) and those of China, (Hoang-ho and Yantse-kiang,) only the Irawaddy, in the Burmese empire, is superior to it in the length of its course. The sources of the Amur are situated near 110°, and its mouth about 143° E. long. The mouth is opposite the northern extremity of the island of Taraikai, formerly called Saghalien, in 53° N. lat.

This river carries off nearly all the waters of the slopes and the mountains in which the great Asiatic desert, Gobi or Shamo, terminates towards the east; and it would be advantageous to geographical science if we were well acquainted with the country which it traverses. But as only a comparatively very small tract of country along its sources belongs to the Russian empire, and all the remainder of its course is subject to the Chinese, who do not admit European travellers into their territories, our knowledge of this part of the globe is very deficient.

The true source of the Amur is the river Onon, which rises near the 110th meridian, in 50° N. lat., in that range of the King-gan Oöla which is called *Kentei-Khan*. This river, which waters a country at present nearly uninhabited, is famous in Mongol history, the great hero, *Tshingis-khan*, was born, and distinguished himself in his youth, on its banks. The Onon first runs from west to east for about 160 miles, and afterwards to the north-east for about 320 miles, till it joins the Ingoda. The latter river rises on the eastern declivity of the Tshokondo, the highest summit of the range, which separates the tributaries of the Amur from those of the lake of Baikal, or of the Yablonoi Krebet; and runs nearly parallel to the Onon till it joins it, after a course of about 160 miles. After this junction the river is called Shilka by the Russians, and Saghalien-Ula by the Mandshoo, and continues under this name its north-eastern course for about 260 miles, when it meets the Argun or Ergunê, a large river, which in its upper course is called Kherlon, and has its sources also in the Kentei-Khan, near the 110th meridian, but about three degrees farther to the south, in 47° N. lat. The Kherlon runs, according to the Chinese geography, in the first part of its course, to the north for about seventy miles, then for about thirty-five miles to the south-east, and afterwards to the north-east for 320 miles. It then changes the direction of its course to the east, making its way through two ranges of high mountains, and after having run in this direction for about a hundred miles, it falls into the large lake of Kulun or Dalai Nor, whose circumference is considered by the Chinese to be about 600 *li*, or nearly 210 miles. From this lake the river issues under the name of Argun, forms the boundary between the Chinese and Russian empire, and, after a north-north-eastern and northern course of about 400 miles, joins the Shilka, in 53° 23′ N. lat.

After this junction the river is called Amur by the Russians, who adopted this name from the Ghileaki, a tribe of the Tunguses, living near its mouth, in whose language Amur or Yamur signifies the great river, or the great water. The Mandshoo preserve the name of Saghalien-Ula (river of Black Water).

The Amur does not long continue its north-eastern course. An extensive mountain-range, the King-gan Yalo, stretching from south to north, obliges the river to take the same direction. But it soon forces its way through the mountains, forming for perhaps a hundred miles a succession of rapids till it enters the plain situated to the east of the mountain-range. The rapids formed in this extensive tract do not seem to render the river unnavigable, though at present it is not used.

During its passage through the mountains, the Amur changes the direction of its course from north to east, declines afterwards to the south-east and south, and continues in this direction till, from the 54th parallel, it has descended to the 48th. It then resumes its eastern course, and at its most southern point, (47⅛° lat.,) its waters are increased by those of the Sungari or Songari Ula, which by the Chinese is considered as the principal river. The Songari Ula rises nearly under the 42d parallel in a mountain-mass called Tshang-pe Shan, (the White Mountain or Mount Blanc, on account of the snow with which its summit is always covered,) which extends along the northern coast of the Hoang-hai, (Yellow Sea,) and forms the northern boundary of the peninsula of Corea. Its general course lies N.N.W. till it joins the Naun or Nonni Ula, a large river which descends along the eastern side of the King-gan Yalo mountains, from the 52d parallel to the 46th in an opposite direction from north-west to south-east. After this junction the Songari-Ula runs E.N.E. till it joins the Amur.

At a considerable distance from the junction with the Songari Ula, the Amur again changes its course, running henceforth to the N.N.E. up to its embouchure, and traversing the country between the meridians of 125 and 140, and between the parallels of 47 and 53. In this part of its course it receives another considerable river, the Usuri-Ula, which runs parallel to the Pacific Ocean, from which it is divided by a high mountain-range; but this tributary of the Amur is entirely unknown.

The whole course of the Amur, from the sources of the Onon to its mouth, amounts, perhaps, to nearly 2000 miles, owing to the great and frequent changes of its direction; in a straight line, the sources and mouth are only about 1330 miles distant from one another.

As far as this river is known it abounds in fish, but though they are the same species as those of the rivers in Europe, they are, as Pallas observes, distinguished by some peculiarities. The most common are two kinds of carp, (*Cyprinus leptocephalus*, Pall., *Cyprinus labio*, Pall.,) barbels, and a smaller kind of shad-fish (*Silurus asotus*). The beluga, a larger kind of sturgeon, is frequently caught in the Shilka, but the common sturgeon is rare, as well as a kind of trout

(*Salmo oxyrhynchus*). Craw-fish, which are not found in the north of Asia, are very frequent in all the tributaries of the Onon and Shilka, but they are smaller and smoother than those in Europe. The common pike is yellow like gold and spotted like the fish in India: Pallas, at the first view, was inclined to consider them as a distinct species. Pearl-oysters are found in the Onon and some of its tributaries, and the common barnacle in some lakes attains an extraordinary size and thickness. Pallas got some which were upwards of a foot long, and from three to four-tenths of an inch thick.

The country watered by this river and its branches is divided by the King-gan Yalo mountains into two parts, quite different in their character; this mountain range is to be considered as the eastern boundary of the great desert of Gobi or Shamo, and the country to the west of it, about the Onon and Argun, preserves many of the characteristics of the desert. It is considerably elevated above the level of the sea, but as yet the elevation of no part of it has been exactly determined. To this elevation it must chiefly be attributed, that the Shilka and the Argun, both of which are slow rivers, are commonly covered with ice from five to six months in the year, though they flow under the parallels of London and Paris. The air, like that of the great desert, is very dry. Rain in summer and snow in winter are far from being abundant. The greatest part of the soil, perhaps more than nine tenths, is sandy and sterile, and unfit for agricultural purposes, and of the remainder a small portion only is actually cultivated: but in that part of this region which belongs to the Russian empire, and which may amount to nearly one-third, agriculture was much more attended to before the Cossacks conquered it. On their arrival here, in the middle of the seventeenth century, they found very large tracts cultivated with care, but the cruelties and vexations exercised by them obliged a whole nation, the Da-ures, from which this country is called Da-uria, to abandon their native soil and to take refuge within the Chinese empire.

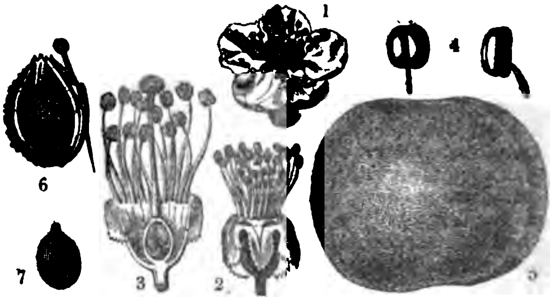
The country to the east of the King-gan Yalo, which belongs altogether to the Chinese empire, exhibits an entirely different appearance. Though the mountains which separate the valleys along the Amur, Songari-Ula, and Na-un-Ula, rise to great height, the valleys seem not to be greatly elevated above the level of the sea. This is indicated by a much milder climate, by the frequency of large forests of oak, lime-trees, and hazel-nut trees, which replace the scanty woods of fir and larch of Da-uria, as well as by the abundance of a kind of cherry-tree. The ground along the river, and even to a certain height on the slopes of the mountains, is cultivated, and produces barley, rye, wheat, buck-wheat, and hemp, and between the fields extend fine meadows. Since the accession of the present dynasty to the throne of China, many persons are banished to these valleys for their crimes or misdemeanors; and this policy, it is said, contributes powerfully to improve the state of agriculture. The valley of the Usuri, however, seems to be more elevated, and is therefore chiefly inhabited by a branch of the Mandshoo, who still follow a pastoral life. The mountains which divide this valley from that of the Songari-Ula produce a plant, which is regarded as a great treasure, the *ginseng*, which in China is considered a panacea; this is the only place where it is found on the old continent. [See GINSENG.]

Not far from the banks of the Shilka, and on those of a small river called the Nertsha, the Russians have built the town of Nertshinsk, which, according to Captain Cochrane, does not contain more than 1000 inhabitants. The principal town in the Chinese territories is Kirin or Girin-Ula on the Songari-Ula, the seat of a provincial government. In the valley of the Na-un-Ula is the town of Naun-Koten, and in that of the Usuri, Ninguta, the native place and patrimony of the Mandshoo dynasty at present reigning in China.

The Russian part of Da-uria has been abandoned by all the native nations, except a small number of Tunguses who still wander about with their herds. In the Chinese territories some aborigines are still found. [See MANDSHOORIA.] (*Travels of* Pallas and Timkowsky; Ritter's *Erdkunde von Asien.*)

AMURATH. [See MURAD.]

AMYGDA'LEÆ, a natural order of plants belonging to the division of polypetalous dicotyledons, among which it is known by its bearing the kind of fruit called a drupe, by the stamens being numerous and arising from the orifice of a tubular calyx, and by the leaves yielding the fluid called prussic acid. Owing to the last circumstance, the species are all more or less poisonous, especially in those parts where the prussic acid is concentrated, as the leaves of the common laurel, the skin of the kernel of the almond, &c. On the other hand, those parts in which the prussic acid exists either in very minute quantity, or not at all, as the succulent fruit, and sometimes the kernel, are harmless, and are often valuable articles of food. It is on this account that, while the general character of the foliage is either unwholesome or suspicious, the fruit of many of them is much cultivated. The peach, the nectarine, the plum, the cherry, the almond, the apricot, prune, damson, and bullace are produced by different species of this order.



[Amygdaleæ.]

1. An expanded flower. 2. The same with the corolla removed.
3. The same cut through. 4. Anthers. 5. Drupe.
6. Stone. 7. Embryo.

Besides the substance already mentioned, the bark of amygdaleæ yields a gum which is similar in its properties to gum arabic; and an astringent substance which gives some of the species so much efficacy in fevers, that their bark has been compared for utility to that of Peru; and even in some cases, as the coccomiglia bark of Calabria, the produce of prunus coccomilia, has been preferred.

AMYGDALOID, the name of a variety of the trap rocks, when in a uniform base there are imbedded round or almond-shaped bodies, consisting of agate, calcareous spar, or zeolites, like almonds in a cake; the term is derived from the Greek *ἀμυγδαλο-ειδής*, *resembling an almond.*

AMY'GDALUS, the genus from which the order derives its name, comprehends the almond, and the peach and nectarine, besides a few bushes, the chief interest of which arises from their gay appearance.

A. communis, the common almond, is a native of Barbary, whence it had not been transferred into Italy in the time of Cato; it has, however, been so long cultivated all over the south of Europe and the temperate parts of Asia as to have become, as it were, naturalized in the whole of the Old World from Madrid to Canton. In this country, it is only grown for the sake of its beautiful vernal flowers; but in the countries that have a long and hot summer, it is the fruit for which it is esteemed. This, which is produced in immense quantities, is partly exported into northern countries, and partly pressed for oil, or consumed for various domestic purposes. Although botanists distinguish only one species of eatable almond, yet there are many varieties, of which the principal are the bitter and the sweet; of each of which the French and Italians have several sub-varieties distinguished by the hardness or softness of their shell, and the form or size of the kernel. These have all been introduced into England, but none of them are capable of ripening their fruit in the neighbourhood of London, except in unusually fine hot summers, preceded by mild and uninterrupted springs.

A. Persica, the peach, once called the Persian apple, because it was introduced from that country into Europe, has, for ages, been an object of careful cultivation for the sake of its delicious fruit, and has almost naturalized itself even in the New World. In our gardens many varieties are known, which are classed under the two heads of peaches and nectarines according as their fruit is smooth or downy: of the varieties there are few that are not worthy of cultivation, but the best are, perhaps, the red magdalen, noblesse, and royal George peaches, and the Smith's Newington, or tawny nectarine. For a late crop of peaches, the têton de Venus may be recommended; but not the Catherine, nor indeed any of the thick-skinned October peaches, which, however excellent in the south of Europe, seldom ripen, and never acquire their natural flavour in this country. For preserving, the blood red, or sanguinole peach, the flesh of which is of the deepest crimson, is worth a place in a garden.

For the mode of cultivating the peach and nectarine, see PEACH.

AMYOT, JAQUES, great almoner of France, bishop of Auxerre, commander of the order of the Holy Ghost, rose to these high dignities and to wealth from the humblest rank in life. He was a native of Melun (1514), chief town of the department of *Seine et Marne*, about thirty miles from Paris. His father was a butcher or a currier, it has not been ascertained which, but in very limited circumstances. When he came to Paris to continue his studies, he was obliged to act as servant to some of his fellow students, in order to procure the means of subsistence, the only weekly allowance which he received from his friends being a loaf of bread. After studying under the learned professors of the college of France, which had then been recently founded, and after taking his degree of master of arts, at the early age of nineteen, he went to Bourges to study law; there he distinguished himself so much as to induce the king's lecturer, Jacques Colin, to intrust him with the education of his nephews. Subsequently, through the patronage of Marguerite de Valois, sister of Francis I., Amyot obtained a Greek and Latin chair at the University of Bourges. Whilst he was filling that situation, he undertook a translation of Plutarch's Lives, of which he dedicated the first books to the king, Henri II. The monarch, as a mark of his approbation, gave him the abbey of Bello-sane, and desired him, at the same time, to continue a work so replete with merit. This circumstance gave him an opportunity of displaying talents of another kind; for, under the pretence of going to Italy to consult some manuscripts, he was entrusted with a letter from Henry the Second to the council of Trent, then assembled. Although he was not invested with any public character or authority, he displayed nevertheless much firmness and adroitness in his mission; so great, in fact, was the satisfaction which the Cardinal of Tournon felt on this occasion, that he recommended him to Henry II. as a fit person to be the tutor of his three younger sons. Charles IX., on his coming to the throne of France, made Amyot his great almoner and keeper of the University of Paris; soon after he gave him the vacant see of Auxerre. It is said that, at the death of Charles IX., and on the day his funeral took place at St. Denis, the Parliament of Paris sent for Amyot, that he might say grace for them, acting as king of France. We should here observe that Henri III., the brother and successor of Charles, was yet in Poland; the Parliament might, therefore, suppose themselves to be reigning in his absence: besides, there was then a party who wished to put the crown on the head of the Duc d'Anjou, second brother of the late king Charles, the same who had been on the eve of marrying Elizabeth of England, and to refuse it to the king of Poland. Amyot disobeyed the command, and hid himself. Henri III., on his accession to the throne, continued him in his dignities, and moreover made him commander of the order of the Holy Ghost. Amyot had much to suffer from the league to which he was thought to be an enemy; he was even accused of having been privy to, and having participated in, the assassination of the Duc de Guise, at Blois (December, 1588). So inveterate were the leaguers against him, that they attacked and plundered him some time after as he was returning to Auxerre; nor, indeed, could he appease this hostile spirit until he had obtained a formal absolution from the Pope's nuncio, of the crime of participation of which he was suspected. He was, however, afterwards allowed to finish his days in quietness, in his diocese, where he died in 1593.

As a literary man, Amyot stands high; no one did more service to French letters. His translation of Plutarch's Lives, which was made from the Latin, is spirited and elegant; and it is remarkable that the best translation of Plutarch in English, North's, is made from Amyot's French. His other works consist of French translations of other Greek works, of which the principal are, The Æthiopic History of Heliodorus, seven books of Diodorus, the Pastoral Loves of Daphnis and Chloe, &c. He has, besides, given an Account of his Journey to Trent, in a letter addressed to M. de Morveilliers. He composed a treaty on royal eloquence for the use of his pupil, Henri III., which was printed, for the first time only, in 1805, under the reign of Napoleon. It was at the suggestion of Amyot that Henri III. founded, in 1575 a Greek and Latin library.

Amyot has been accused of avarice; this charge is, however, partly refuted by the fact of his having spent large sums for the repairs and embellishments of the churches of his diocese. He left the sum of 700,000 francs at his death, although he frequently complained of his having been ruined by the league.

AMYRI'DEÆ, a natural order of plants consisting of tropical trees, the leaves, bark, and fruit of which abound in fragrant resin. It is known among polypetalous dicotyledonous orders by its hypogynous stamens, which are twice as numerous as the petals, by the large disk in which the ovarium is inserted, and by its one-seeded, fleshy fruit, covered all over with resinous glands.

The odoriferous substances called gum elemi, bdellium, and resin of Coumia are all produced by different species of amyrideæ.

ANA, a Latin termination of the neuter plural form. It appears in our language, divested of the sign of gender, number, and case, in such words as subterranean, metropolitan, Christian, Anglican, Ciceronian, Johnsonian. The Latin *ana* is the form appropriated to the neuter plural; and, therefore, *Ciceroniana*, for instance, would signify, matters, or things of any sort, about, or appertaining to Cicero.

In modern times this termination has been used to denote collections, either of remarks made by celebrated individuals in conversation, or of extracts from their note books, letters, or even published works, or, generally, of particulars respecting them.

Such collections have been made in all ages, and in every country in which literature has been cultivated. For an enumeration of antient works, still existing or known to have once existed, of a similar character to the modern *ana*, the reader may consult Christopher Wolf's preface to the *Casauboniana*, and the *Introductio in Notitiam Rei Litterariæ* of B. G. Struvius, with the notes of J. C. Fischer, Frankfort, 1754, chap. viii., sections 11, 12, 13, and 14. These writers mention as coming under this description the Proverbs of Solomon, those collections of the sayings of the wise which are to be found in many oriental languages, those which the disciples of Pythagoras and of other antient philosophers are stated to have made of the remarks that fell from their masters, the Απομνημονεύματα, or *Memorabilia*, of Socrates recorded by Xenophon, the sayings of Epictetus, said to have been collected by Arrian in the four last books (now lost) of his *Commentary on the Enchiridion*, and in his twelve books of *Homilies*, the *Deipnosophistæ* of Athenæus, the Biographies of Plutarch and Diogenes Laertius, the Facetiæ attributed to Hierocles, the several collections of Stobæus, the *Meditations* of Marcus Antoninus, the books of apophthegms by Cæsar, mentioned in Cicero's *Letters*, the jests and bons mots of Cicero, said to have been collected by his freedman Tyro, the *Natural History* of Pliny, the *Noctes Atticæ* of Aulus Gellius, &c. The catalogue, it must be confessed, is constructed upon sufficiently liberal principles; but a good many of the performances which it comprehends might certainly have been called *Ana* in the modern sense.

A curious approach to an anticipation of the modern use of the word occurs in a letter of Francesco Barbaro to Poggio Bracciolini, in which, alluding to some literary anecdotes which Poggio and his friend Bartolomeo Montepulciano had collected in Germany, and were bringing home with them, he says, that as certain sorts of apples and pears are called *Appiana* and *Malliana* from having been first introduced by persons of the names of Appius and Mallius, so these importations of theirs will be afterwards called Poggiana and Montepolitiana. The letter is dated in 1417. It is given in Lenfant's *Poggiana*, at the end of the second volume, where it was first printed entire. But it does not appear to have been till after the middle of the seventeenth century that the exact modern application of such epithets came into fashion. In 1659 we find Guy Patin, in one of his curious gossipping letters, speaking of having in his possession certain manuscript Borboniana, Grotiana, and Naudæana, meaning collections of anecdotes respecting Nicolas Bourbon (the younger), Grotius, and Gabriel Naudé. Very soon after this appeared the first printed *Ana*.

This was the collection of the colloquial remarks of Joseph Scaliger, now distinguished as the *Scaligerana Secunda*. Two brothers, Jean and Nicholas de Vassan, the sons of a M. Vassan, Sieur de Remi-Mesnil, and whose mother was a sister of the eminent scholars Peter and Francis

Pithou, having gone to study at Leyden, carried with them letters of recommendation from Casaubon to Scaliger, who was then one of the professors in that university. In consequence they were much at his house, and heard a great deal of his conversation, both in company and in private. Such of his observations upon all sorts of subjects as they considered to be most valuable or remarkable they wrote down, till the collection at last formed a thick octavo volume. On their return to France they gave their manuscript to the learned brothers Claude, Pierre, and Jacques Du Puy; and the latter lent it to M. Sarran, who took a copy of it which came into the possession of his son, Isaac Sarran. From him it passed into the hands of Hadrian Daillé, a French protestant clergyman, and a man of letters, who gave the book a new form by arranging the remarks according to the alphabetical order of their subjects. From Daillé Isaac Vossius, in the course of a visit which he made to Paris, procured the manuscript, but, as it appears, without any notion on the part of the lender that he would make any other than a private use of it. Having, however, got it home with him to Holland, he transcribed it, and some time after sent his copy to the press. The book was published in 1666, with the title of *Scaligeriana, sive Excerpta ex ore Josephi Scaligeri:* per FF. PP., (contraction for *Fratres Puteanos.*) This impression, however, so abounded in inaccuracies, that Daillé, notwithstanding his regret that the publication had taken place at all, felt himself called upon to give to the world a new and more correct edition, which appeared accordingly the following year, with the title of *Scaligerana; editio altera, ad verum exemplar restituta, et innumeris iisque fœdissimis mendis, quibus prior illa passim scatebat, diligentissime purgata.* There is some uncertainty as to where these volumes were published. That of Vossius (which, however, does not bear his name) is a 16mo. volume of 368 pages, in rather a large type, and, in the only copies which we have seen, is stated to have been printed at Geneva, by Peter Columesius. All the accounts also, as far as we know, state that it bore this impress, though actually printed by Vlacq, at the Hague. But it is certain that Daillé, in the advertisement prefixed to his own edition, speaks of it as actually announcing itself on its title-page to have been published at the Hague; 'Hagæ-comitum (si titulus vera fert)' are his words. Daillé's edition, again, which is a 12mo. of 268 pages, but in so much smaller a type as to contain a good deal more matter than the other, professes to be printed at Cologne, by Gerbrandus Scagen. But it is said to have been really printed at Rouen. It is very incorrectly printed, and has a long list of errata prefixed; but, besides being considerably more full, it is purified from many gross blunders, which make the edition published by Vossius frequently unintelligible. In his prefatory address (to which however he does not put his name), Daillé complains in indignant terms of the publication at the Hague, which he says had taken place not only without the consent of those to whom the manuscript belonged, but in opposition to their most strenuous remonstrances and menaces. He also corrects the title, which, in the original, he says, is Scaligerana, not Scaligeriana. The word *excerpta* he thinks must be a printer's blunder for *excepta.* He likewise gives the true history of the manuscript, and refutes the assertion of the Hague edition, that its contents had been taken down from the lips of Scaliger by the Du Puys. It would appear, however, that Vossius, or his publisher, paid no attention to any of these corrections; for a new impression, in all respects the same with the first, was published by Vlacq at the Hague, in 1668. Some of the copies of this edition bear the impress of Leyden; but they are said to differ in nothing else from the others.

It happened, however, that the Vassans were not the only persons by whom Scaliger's conversations had been noted down. Before they knew him, and, indeed, while he lived in Touraine, and before he went to Leyden, a physician of the name of François Vertunien, who attended the family of the MM. Chateigners de la Rochepozai, in whose house Scaliger resided, had been in the habit for seventeen years, namely from 1575 to 1592, of keeping a record of the remarks that dropt from the lips of the great scholar. Vertunien's papers remained for a long time after his death almost unknown, till they were at length purchased from a person into whose hands they had fallen by M. de Sigogne, an advocate of the parliament of Poitiers. By him they were committed for publication to the care of Tanneguy le Févre, (better known by his Latinized name of Tanaquillus Faber;) and they accordingly appeared along with the former in 1669, bearing the following title, *Prima Scaligerana, nusquam antehac edita, cum Prefatione T. Fabri; quibus adjuncta et altera Scaligerana, quam antea emendatiora, cum notis cujusdam V. D. anonymi.* The volume is a 12mo., and the new matter fills 150 pages in a large type; that which had been printed before filling 257 in a much smaller type. Throughout both, the notes are intermixed with the text. It bears to be printed at Groningen by Peter Smithæus; but is understood to have been actually printed at Saumur. In the copy of this edition in the British Museum, which appears to be perfect, there is no preface, although one is announced in the title-page; but in a subsequent edition, bearing to be printed at Utrecht by Peter Elzevir, in 1670, there is a strange address, made up principally of bursts of Greek and Latin verse, entitled, *Ad Aeliam Borellum Præfatio,* and having Le Févre's name subscribed, in which the writer says, that he has determined not to publish the promised preface, having, after he had begun to write it, been induced to desist by certain considerations which he does not choose to specify. It would, he intimates, have contained some things not generally known. The Scaligerana Prima are all, or nearly all, in Latin; the Secunda, partly in Latin and partly in French. They were afterwards mixed together and arranged under one alphabet; being first published in this form, we believe, at Cologne in 1695, in a 12mo. of 418 pages, with the title, *Scaligerana, ou Bons Mots, Rencontres Agréables, et Remarques Judicieuses, de* J. Scaliger, *avec des Notes de* M. le Févre *et de* M. de Colomiès. Such is an outline of the leading particulars, which have not always been correctly stated, of this curious portion of literary history. A German author, John Theodore Leubscher, published a short dissertation in 4to., at Wittemberg, in 1695, entitled *Historia Scaligeranorum;* and the subject is examined at greater length by Des Maizeaux, in his edition of the *Scaligerana, &c.,* in two vols., Amsterdam, 1740. As in all other collections of this kind, both the *Scaligerana* contain many things which it may be very much doubted if the person to whom they are attributed ever uttered. Any deficiency either of competency, of care, or of fidelity in the reporter, must of course have left its proportionate produce of error or misrepresentation. But even if we could be certain that the report had been given with the most perfect accuracy, it would be unfair to regard statements and opinions, thus delivered in unpremeditated conversation, as affording a true measure either of the judgment, or the information of the speaker. They may convey to us an idea of the general style and spirit of his manner of talking, and in that way give us some insight into his character; but that is almost their only value. As elucidations of the subjects treated of, they are commonly worth very little. The publication of the *Scaligerana,* accordingly, did not add to the reputation of Joseph Scaliger. The multifarious learning for which he had been celebrated was discovered to have been pretty frequently at fault in these extemporaneous displays; and having all the arrogance, with but little of the genius of his father, he was thought in most of his sallies, to have given more evidence of a bad temper than of a brilliant wit. The indecency and licentiousness of some of his jests, also, equalled their dulness.

The next of the Ana which appeared was the *Perroniana,* being notes (in French) of the conversations of Cardinal du Perron. It appeared in 1669, in a 16mo. volume of 332 pages, with the following title; *Perroniana, sive Excerpta ex ore Cardinalis Perronii: Per FF. PP.;* and, like the first published *Scaligerana,* which it closely resembled in all respects, bore the impress of P. Columesius, at Geneva. It is believed, however, to have been printed at the Hague; and there is no doubt that this book also was sent to the press by Isaac Vossius, who had obtained it from Daillé in the same manner as he had the Scaligerana. These notes had been taken down by Christophe du Puy, or Puteanus, the elder brother of Claude, Pierre, and Jacques, already mentioned; their manuscript had been copied by Claude Sarran in 1642; and from this copy Daillé had made another transcript in 1663, arranging the remarks in alphabetical order. Menage, we may remark, in his *Anti-Baillet,* Part i. chap. 80, says that the edition given by Vossius was actually published at Rouen. However this may be, in the same year, and with a similar title-page, the same person gave to the world another of these collections, the

Thuana, or remarks of the President de Thou. This he had also obtained from Daillé, to whom, like the others, they had come through Sarran, the notes having been originally taken by one of the Du Puys, but which of the brothers is uncertain. Daillé was as much dissatisfied with the editions published by Vossius of the *Perroniana* and *Thuana*, as he had been with that of the *Scaligerana;* and he caused both to be reprinted the same year at Rouen, as is believed, although the title-page says at Cologne. Both of these Ana contain some curious articles, the *Perroniana* particularly; but mixed with what is valuable, are many other things which very little deserved to be recorded; and upon the whole, neither collection can be said to come up to the expectation naturally raised by its title.

As publications, however, these works had extraordinary success; and the avidity with which they were read, produced a long succession of similar productions. It was in France, or at least in the French language, that most of the Ana appeared; and their popularity may be said to have lasted for fully half a century. In a history of French literature, therefore, an account of these collections would form an important chapter. In this place we must confine our further notice of them to little more than an enumeration of those that are best known.

One of the most valuable of this class of publications, is the *Menagiana*, a record of the conversations of Menage, who was a man of distinguished wit and talent, as well as a great scholar. He died in 1692, and the following year the *Menagiana* appeared in a 12mo. volume, both at Paris and Amsterdam. The persons by whom the materials were supplied, and the expense of the publication defrayed, were his friends Galland, Boivin, Dubos, Pinson, and De Valois. The same year was published a satire upon the work and the individual whom it commemorated, under the title of *Anti-Menagiana*—the production of a physician of Blois, of the name of Jean Bernier, whose pen, however, was not a very sharp one. A second volume of the *Menagiana* appeared in 1694; the materials of which were principally contributed by the Abbé Faydit; and two years after, a new addition of the whole was published at Amsterdam. The original edition, however, contains several things which were suppressed in those that followed. The book was republished at Paris, in 1715, by Bernard de la Monnoye, accompanied with such copious annotations as increased it to four volumes; and in the following year a new edition of the same size appeared at Amsterdam, in which De la Monnoye's additions were separated from the original, and placed in the two concluding volumes by themselves. This is the form in which the *Menagiana* has since been printed. Bayle passes a high eulogium in his dictionary upon the *Menagiana*, describing it as a nobler monument erected to the glory of Menage, than all the works published by himself, learned and able as they generally were. Upon the whole, indeed, this is perhaps the best of the Ana.

Another collection of considerable value is the Chevræana, which was published by Urbain Chevreau himself, in two volumes, 12mo., at Paris, in 1697, and again at Amsterdam, in 1700. Along with this may be mentioned the *Parrhasiana, or Remarks and Opinions of Theodore Parrhase*, under which title the well-known critic, John le Clerc, published, at Amsterdam, in 1699 and 1701, two volumes of his own lucubrations. In keeping with the name he assumed, which was intended to mean the frank speaker, the *Parrhasiana* contained a formal defence of several of his own works, in which he spoke of them in a manner that would have come with more grace from any other of their admirers than from the author himself. Another of the collections bearing this title, which does not consist of conversations reported by others, but of observations recorded by the individual himself, is the *Huetiana*, or thoughts on different subjects, of the celebrated Bishop of Avranches, which was published from his papers at Paris, in 1722, the year after his death, by the Abbé Joseph Thoulier d'Olivet: but, although this collection contains several elaborate and instructive articles, still, deliberately prepared as it was, it partakes, in great part, of the frivolity of the class to which it belongs. It would appear that persons writing under this title conceived they had a licence to trifle. The *Casaubоniana*, also, which Christopher Wolf published at Hamburg, in 1710, were transcribed by him from Isaac Casaubon's own note-book, or *Ephemerides*, as he had entitled it, which had been bequeathed to the Bodleian library by his son Meric. This collection, too, has had the common fate, and has been considered to contain little or nothing worthy of the fame of the great scholar.

Some of the *Ana* are understood to be little better than forgeries throughout. Such, for example, is the character of the collection entitled *Naudæana et Patiniana, or Remarkable Singularities noted down from the Conversation of Gabriel Naudé and Guy Patin*, which was first published at Paris, in 1701. In so far, at least, as Naudé is concerned, the jests which are recorded in this work are probably about as authentic as those recounted in the hawkers' pamphlet, so popular in Scotland, professing to be a collection of the sayings of George Buchanan, which, had it been compiled in France, indeed, might possibly have received the title of Buchananana, and under that pompous designation have held a very different literary rank from what it can at present lay claim to. The *Sant-Evremoniana*, first published at Amsterdam, in 1702, is believed to be, for the most part, another of these impositions. This collection is singular, as having been published during the life-time of the person from whom it takes its name. St. Evremond lived till the following year, when he died at London, at the age of 92. He denied the authenticity of this work a short time before it made its appearance, by a letter published in the *Ephemerides Parisiennes*. Its author, or compiler, was a person of the name of Charles Cotolendi,—from whom is also believed to have proceeded a burlesque production, of little talent, entitled *Arlequiniana*, first published at Paris, in 1694.

Of the remaining *Ana*, some of the most famous are the *Poggiana, or the Life, Character, Sentences, and Bons Mots of Poggio (Bracciolini) the Florentine*, published at Amsterdam, in 1720, in two volumes, 8vo., by James Lenfant, a protestant minister, who (although the work contained little that had not been before in print) was thought to have somewhat disregarded the decencies of his profession, in giving a new impression of so licentious a miscellany; the *Furetieriana, or Bons Mots of Antoine Furetière*, (author of the *Dictionnaire Universel de la Langue Française*,) published by the Sieur Guy-Marais, in 1696; the *Valesiana, or Thoughts of Adrien de Valois*, the Royal Historiographer, published by his son, in 1695; the *Pithœana, or Conversations of Francis Pithou*, which had been collected by his nephew, and which M. Teissier printed from a copy made by M. La Croze, in the third volume of his additions to the *Eloges* extracted from the writings of M. de Thou, Berlin, 1704; and the *Segraisiana, or Opinions of the poet Jean Renaud de Segrais*, which were taken down by a person placed behind the tapestry in a house which he frequented. This book was published both at Paris and Amsterdam, in 1722, about twenty years after the death of Segrais. So many persons still alive, however, were injuriously mentioned, or alluded to, in the book, that it was suppressed at Paris almost as soon as it appeared. It is extremely questionable for how much of its malice Segrais is really responsible. Voltaire has characterised it as being of all the *Anas* the one that best deserves to be set down in the list of printed lies, and, above all, of lies in which there is no wit. But Segrais was a man of true talent, as Voltaire himself, in his *Age of Louis XIV.*, has testified.

There are also the *Rabutiniana*, the *Santoliana*, the *Conringiana*, the *Launoiana*, the *Varillasiana*, the *Borboniana*, the *Chevaneana*, the *Sorberiana*, the *Sevigniana*, the *Longueruana*, the *Bolæana*, the *Carpentariana*, the *Ducatiana*, &c. To these may be added a few German productions, such as the *Taubmanniana*, the *Wigandiana*, the *Schurtzfleischiana*, the *Gundlingiana*. Of our English *Ana*, by far the most celebrated is the *Walpoliana*, being a collection of the conversational remarks of Horace Walpole, together with a good many fragments copied from his papers, which was first given soon after his death in portions in the *Monthly Magazine*, and then published, with large additions, in a separate form. Both in curious information and liveliness of manner, the *Walpoliana* may be favorably compared with the best French publications of the same class. Our other English *Anas*, such as the *Addisoniana*, the *Johnsoniana*, the *Swiftiana*, the *Mooriana*, are, most of them, merely collections of anecdotes taken from the common biographies of the persons to whom they refer, or of extracts from their works.

There are various publications, also, both in French and English, which might seem, from their titles, to belong to the class of *Ana*, but which are really of quite a different description. It may be sufficient merely to name a few of these, such as, the *Caribbæana, containing Letters and Dissertations, chiefly wrote by several hands in the West Indies*, 2 vols., 4to., London, 1741; the *Joineriana, or the Book of Scraps*, (by Samuel Patterson,) 2 vols., 8vo., London, 1772; the *Anonimiana, or Miscellanies of Poetry, Eloquence, and Erudition*, 12mo., Paris, 1700; the *Gasconiana*, a collection of bons mots of the Gascons, by M. de Montfort, Amsterdam, 1708; the *Pantalo-Phebeana*, a satire on Fontenelle and others, the production of a M. Bel, a counsellor of the Parliament of Bourdeaux; the *Panagiana Panurgica*, a critique by M. de Premonval, or the book entitled *Les Mœurs*, which was written by François Vincent Toussaint, &c.

On the other hand, there are many works, which, without bearing the characteristic title of such collections, belong in all other respects to the class of the *Ana*. We have already enumerated several productions of the antients, which are of this description. One of the earliest and most celebrated of such works in modern times is the *Colloquia*, or *Table-Talk* of Luther, first published in German at Eisleben, in 1565, and afterwards in Latin at Francfort, in 1571. There is an English translation of this work, by Captain Henry Bell, published in 1652. Another is the *Locorum Communium Collectanea ex Lectionibus D. Philippi Melanchthonis*, published in 1562, by John Manlius. There is also a volume, however, published at Altdorf, in 1771, by G. T. Strobel, with the title of *Melanchthoniana*. Another very celebrated work of this kind is the *Table-Talk of John Selden*, which is stated to have been collected by Richard Milward, and was first published in 1689. But although this work is commonly reckoned among the *Ana*, it is hardly of the same class with most of those that have been so designated, containing as it does little or nothing that is anecdotical, and consisting almost entirely of maxims which have no special reference to the person by whom they are said to have been uttered. It has been said that there was in existence another *Seldeniana*, or *Collection of the Conversations of Selden*, in French, being a translation from an English original entirely different from the *Table-Talk*. This is mentioned in a curious book entitled *Mélanges d'Histoire et de Littérature, recueillis par* De Vigneul-Marville, first published at Rouen in 1699, which has itself been commonly reckoned among the *Ana*, and is one of the most valuable of that class of publications. It is, indeed, often referred to under the title of the *Marvilliana*. Its author was Noel Bonaventure d'Argonne; but in the latest editions it has been extended to three volumes, the last of which is an addition to the original work, by the Abbé Banier. Under this head we may also mention the *Mélanges Historiques* of Paul Colomiès, first published in 1675, and since repeatedly printed under the title of *Colomesiana*. And we might add to the list, probably, several scores of works in both our own and other languages, which are in like manner *ana* in every thing except in their titles. Boswell's *Life of Johnson*, for instance, is undoubtedly the most remarkable work of this description in existence.

Mr. Southey has published a little work in two volumes with the title of *Omniana*, being a collection of detached remarks on a variety of subjects; but the same title had been previously adopted in a French publication, of which, however, we know nothing more than that it is called *Omniana, ou Extrait des Archives de la Société Universelle des Gobe-mouches*, par C. A. Moucheron, son prêmier aide-de-camp, 12mo., Paris, 1808. It would appear to be a burlesque production.

One of the volumes of the great French work, the *Encyclopédie Méthodique*, bears the title of *Encyclopediana*, and professes to be a collection of every thing that is most curious and valuable in the different publications of this class. The remarks and anecdotes are arranged in alphabetical order; but there is no reference in general to the sources from which they have been obtained. The following works, apparently of a similar description, had also appeared before this; *Elite des Bons Mots, &c., principalement des Livres en Ana*, 2 vols., 12mo., Amst., 1707; and *Nouvelle Bibliothèque de Littérature, d'Histoire, &c., ou Choix des meilleurs Morceaux tirés des Ana*, (par Guillaume Grivel,) 2 vols., 12mo., Lille et Paris, 1765. We have in English, *Selections from the French Anas*, translated, 2 vols., 12mo., Oxford, 1797. No complete collection of the *Anas* has ever been printed; but there are several partial collections. One of the best of these is the *Scaligerana, Thuana, Perroniana, Pithœana, et Colomesiana, avec Notes par* Pierre Des Maizeaux, 2 vols., 12mo., Amst., 1740. Another larger collection, but without notes, was printed in 10 vols., 8vo., at Amsterdam in 1799, with the title of *Ana; ou Collection de Bons Mots, Contes, Pensées détachées*, &c., *des Hommes célèbres, tirées de différens Recueils*. This is a complete reprint, with short prefaces attached to each work, of the *Furetieriana*, the *Poggiana*, the *Menagiana*, the *Marvilliana*, the *Carpentariana*, the *Valesiana*, the *Huetiana*, (to which is added the *Lettre par Huet sur l'Origine des Romans*,) the *Chevræana*, the *Sevigniana*, and the *Bolæana*.

The most complete list of these publications which has appeared, is that given by Peignot in his *Repertoire des Bibliographies Speciales, Curieuses, et Instructives*, 8vo., Paris, 1810, in which 109 titles ending in *ana* are enumerated. This writer absurdly conceives the termination in question to be a corruption or contraction of the word *anecdota*, the title *Menagiana*, for instance, being, he says, when written properly and at full length, *Menagianecdota*. For further information on the subject of the *Ana*, the reader may consult the preface, by Wolf, to the *Casauboniana*, 12mo., Hamburgh, 1710; the *Nouveaux Mémoires d'Histoire, de Critique, et de Littérature*, par M. l'Abbé d'Artigny, 8vo., Paris, 1749, tom. i. pp. 287, &c., and tom. vii. pp. 1, &c.; B. G. Struvii *Introductio in Notitiam Rei Litterariæ, cura Jo. Ch. Fischeri*, 8vo., Franc., 1754, pp. 752—763; *Morhofii Polyhistor*, lib. i. cap. xvi.; *Gott. Stollii Introductio in Historiam Litterariam*, per C. H. Langium; 4to., Jenae, 1728, pp. 54, &c.; and various other authorities referred to by Peignot. There is a well known little poem by La Monnoye, in which he enumerates the names of the most celebrated *Ana*, published and unpublished, concluding with the couplet,

Messieurs, nul de tous ces ana
Ne vaut l'Ypecacuanha.

The verses may be found in his collected poems, and also in his edition of the *Menagiana*. In something of the same spirit, Voltaire has said of these collections, that we are indebted for them for the most part to those bookmakers who live on the follies of the dead.

ANABAPTISTS, a religious sect. The word, composed of two Greek terms, properly signifies those who baptize a second time, or insist upon the necessity of a second baptism in persons whom they admit to their communion. It is sometimes applied to designate that large body of Christians in our own and other Protestant countries, one of whose articles of belief is, that baptism ought only to be administered to adults, and who, accordingly, rebaptize those who seek to join them. But this application of the name is quite unwarranted, and one against which the community in question have always protested. They do not maintain the necessity of a new or second baptism, nor are those who have been born and brought up in their persuasion ever baptized twice. Others, who may have been previously baptized in infancy, are, indeed, baptized once again when they have grown up; but this is done on the principle that the former ceremony was no baptism at all. *Baptists* is the designation assumed by those who thus hold the doctrines of the non-validity of infant, and the necessity of adult baptism; and they will accordingly be properly noticed under that head.

We are not aware, indeed, that there has ever been a sect which maintained the necessity of two successive baptisms. On the other hand it is certain, that there were various sects in the earlier ages of the church which agreed with the modern Baptists in allowing no validity except to adult baptism. But the epithet Anabaptists appears to have been first employed to describe a body of fanatics who made their appearance in Germany soon after the commencement of the Reformation; and although it has been since frequently applied to other religious bodies as being alleged to have sprung from these, such a use of it can only be considered as one of those imputations with which different sects have been in the habit of assailing each other.

The Anabaptists were, no doubt, the growth of the Reformation—though Protestant writers have laboured hard to make it appear that such was not the case. They were the ultra-radicals of the Reformation. Munzer, Stubner, and Storck, who were the first heads and apostles of the sect, had all been disciples of Luther; although no person could have more earnestly condemned their proceedings, than did that great reformer. They first began to preach their peculiar doctrines in the town of Wittenberg, in Saxony, in the year 1521. In 1525, their followers, composed almost exclusively of the lowest rabble, rose in a general rebellion against the established authorities throughout that province, Suabia, Thuringia, and Franconia. But this insurrection, which it is but fair to remark was partly of a political character, and occasioned by the oppression to which the peasantry were subjected, was soon defeated; and Munzer himself, being taken, was put to death. The novel notions, however, which he had preached, spread as usual under persecution; and, some years afterwards, the mischief broke out again with new fury. In 1532, a numerous mob of these fanatics, conducted by John Matthias, a baker, of Haerlem, and John Boccoldt, a tailor, of Leyden, suddenly attacked the city of Münster during the night, and made themselves masters of the place. Their adherents immediately flocked thither from all quarters; and elated by their success, the congregated enthusiasts are stated to have given themselves up to extravagances far exceeding anything they had before practised. Matthias named Münster Mount Zion, and proclaimed himself its king. Having madly undertaken, however, attended with only thirty followers, to attack and disperse the forces which came to recover the town, he perished, with all who accompanied him. John of Leyden now assumed the royal dignity, and under his conduct the multitude is said to have proceeded to wilder excesses than ever. The city, however, was at length recaptured by the army which the Bishop had brought up against it, on the 24th of June, 1535; and Boccoldt, having fallen into the hands of the victors, was soon after executed with the most terrific cruelties that hatred and revenge could dictate.

The most extravagant tenets, as well as conduct, have been commonly ascribed to the Anabaptists of Münster; but the accounts of a proscribed sect by their enemies, it is to be remembered, are scarcely to be received with implicit credit. The doctrine which gave occasion to their distinctive appellation was one of the least remarkable of all their peculiar articles of belief, although they are said to have inculcated it with singular emphasis and vehemence, being in the habit of declaring that infant baptism was an invention of the devil. A much more pernicious principle which they are accused of having held, at least in so far as the peace of society was concerned, was that of the unwarrantableness of all civil government, and the emancipation of the faithful from subjection to either laws or taxes. They are also said to have maintained that, among the saints, all things ought to be in common. Their speculative theology is described as having been much the same with that which has been, and still is, patronised by various other denominations of enthusiasts. It rested principally on the notion that God made his will known to them individually by special inspirations, by way of enhancing the importance of which they are said to have expressed themselves with some degree almost of contempt or disparagement of the written word. Besides the internal impressions which they called inspirations, they had dreams and visions in which they put much confidence; and some of them conceived themselves to have the gift of prophecy, which they were especially accustomed to exercise in predicting the speedy approach of the end of the world. Akin to these delusions was another favourite and fundamental dogma, that every true believer attained even in this life perfect freedom from sin. This position soon led them a great way. Finding that what had commonly been called sin could not be altogether extirpated from the bosoms even of the stoutest believers, they found it necessary, in order to save the doctrine, to declare that certain things which had hitherto been deemed contrary to the divine law, were not so at all, but in reality either indifferent or meritorious. It does not appear that they are accused of having gone quite to the extreme to which the principle in question has sometimes led, of maintaining generally that the belief of the sinner sanctified or neutralized his sin, or, in other words, that an act which would have been sinful in another became divested of its sinful character when committed by a believer. If all that is stated of them be true, indeed, they were under no necessity to resort to this device in order to give a loose to their inclinations, having put down in their list of universally permissible indulgences most of those things to which there is any violent disposition in the multitude of mankind. They condemned, for instance, with great severity, all ornamental attire, and some even went the length of objecting to clothing altogether. Boccoldt himself, in one of his fits of exaltation, solemnly promenaded the streets of Münster, stark naked. The love of dress, they said, was an artificial vanity, and as such hateful to God. But whatever, on the other hand, they held to be natural, they looked upon as harmless or commendable. Boccoldt is stated to have urged upon his followers, as in the highest degree conducive to their spiritual welfare, the practice of a liberal polygamy, and to have illustrated and enforced his doctrine by taking to himself no fewer than fourteen wives.

For a long time after the events which have been related, it was dangerous in Germany and other parts of the continent to profess an adherence to the doctrine of adult baptism, those who held that tenet being all most absurdly classed as belonging to the sect of the Anabaptists of Münster. It has been commonly said that to avoid the persecution to which they were subjected, the remains of these fanatics in course of time adopted various new denominations, some congregations calling themselves Mennonites, after an eminent leader of the sect, others Waterlandians, from the place of their principal church, others Baptists, &c. But there is really no proof that any of the communities bearing these names had, in their origin, any connexion whatever with the Münster insurgents. They were merely confounded with these madmen in consequence of holding the doctrine of the invalidity of infant baptism, which the Münster Anabaptists were also said to have preached. This accidental coincidence, indeed, was ground of identification enough for the genius of persecution in a former age, as it continues to be for that of intolerance and calumny in the present. But such misrepresentation is really not more reasonable than it would be for Roman Catholic writers, as some of them have done, to describe the Protestants generally as followers of the principles of John of Leyden, because they all, in common with him, reject the authority of the Pope; or for the Jews to bring a similar charge against the whole body of believers in Christianity. For further information on the subject of the Münster Anabaptists, the reader may be directed to Mosheim's *Ecclesiastical History*, section iii., part ii., chapter iii., where he will find the subject treated with great learning, though not in a spirit of much liberality or candour. The principal works relating to the Anabaptists are all referred to in that dissertation.

ANA'BASIS, the title of a Greek work, in seven books, by Xenophon of Athens, which describes the circumstances of an expedition undertaken by the younger Cyrus, B.C. 401, against his brother Artaxerxes, King of Persia. The expedition is remarkable as being the first long march of which we possess a detailed account, and also the oldest extant document which gave to Europeans any tolerably precise notion of the countries watered by the Upper Tigris and Euphrates.

The army of Cyrus contained a large body of Greek mercenaries, among whom Xenophon, at first, held no military rank: he went apparently as a mere spectator, and only took command after the death of most of the generals. Cyrus set out from Sardes (now Sart) 38° 34′ N. lat. 28° E. long., and marched through Asia Minor to the passes in Mount Taurus that lead into Cilicia. He next passed through Tarsus, along the Gulf of Scanderoon, and through the north part of Syria to the Euphrates, which he crossed at Thapsacus, about 35°14′ N. lat. He then marched S.E. through Mesopotamia, crossing the Araxes (the Khabour); and finally lost his life in an engagement with his brother on the plains of Cunaxa, (the site of which is unknown,) about forty miles from Babylon, (now Hillah,) 32° 28′ N. lat. 44° 14′ E. long.

From this point commenced the retreat, commonly known as the Retreat of the Ten Thousand. Instead of returning by the way which they came, it was determined to reach some of the Greek colonies on the Black Sea. Accordingly they crossed the Tigris; and advancing along the east bank of this river up the stream, they crossed in succession the Diala, and other tributaries of the Tigris. They followed the course of this river, till they were stopped about 37°20′ N. lat., by the mountains pressing close on the river, and allowing no passage along its banks. They then crossed the mountains, and advanced probably nearly due north, but their course from this point is very uncertain. It is probable that the army passed to the west of Lake Van, and in its progress it must have crossed the Morad or Eastern Euphrates, and that branch of the Araxes which is now the Faz, and is called by Xenophon the Phasis. After enduring much hardship from snow, want of food and clothing, and the opposition of the native tribes, the army at last reached Trapezus, now Trebisond, on the Black Sea, in 41° 2′ N. lat. 39° 28½′ E. long. From Trapezus the army marched along the coast westwards for about 100 miles (direct distance) to Cotyora.

The narrative of Xenophon contains a statement of the army's marches, with some few omissions, expressed in Persian parasangs, at the rate of thirty stadia to a parasang. The following are the distances given by him in round numbers:—

	Stadia.
From Ephesus to Cunaxa	16,050
From Cunaxa to Cotyora (eight months) . .	18,600
	34,650

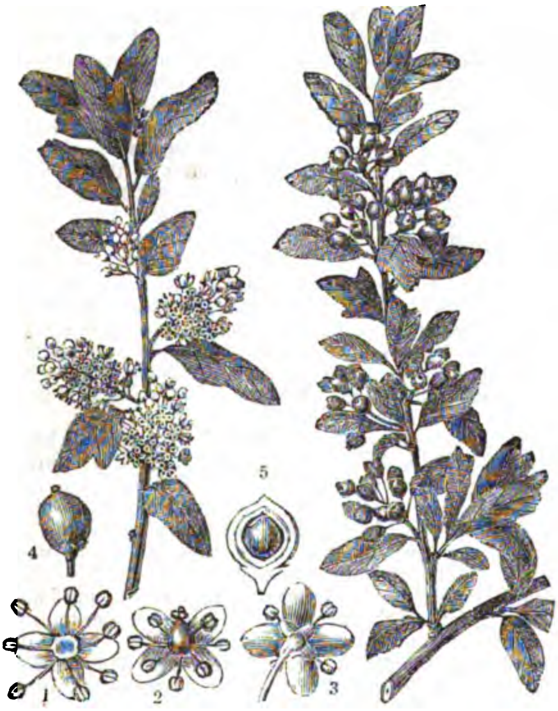
Xenophon adds the march of the Greek auxiliaries from Ephesus to Sardes (about 50 miles) to the distance from Sardes to Cunaxa.

The march may be considered as having terminated at Cotyora, as the army sailed from this place to Sinope, now Sinub: their troubles, however, continued till they reached Byzantium, now Constantinople, and even beyond that point.

If we take the stadia of Xenophon at the rate of ten to a mile, an estimate which is above the truth, we find the whole distance marched to be 3465 English miles, which was accomplished in fifteen months, and a large part of it through an unknown mountainous and hostile country and in an inclement season. The reader will find the expedition of the younger Cyrus discussed in the work of Major Rennel, and the various difficulties that occur in the narrative of Xenophon explained, as far as means of information will allow, with the Major's usual good sense and sagacity. [See XENOPHON.]

Anabasis is also the name given by Arrian, who was in all things an imitator of Xenophon, to his work in seven books, in which he describes the campaigns of Alexander the Great. [See ARRIAN.]

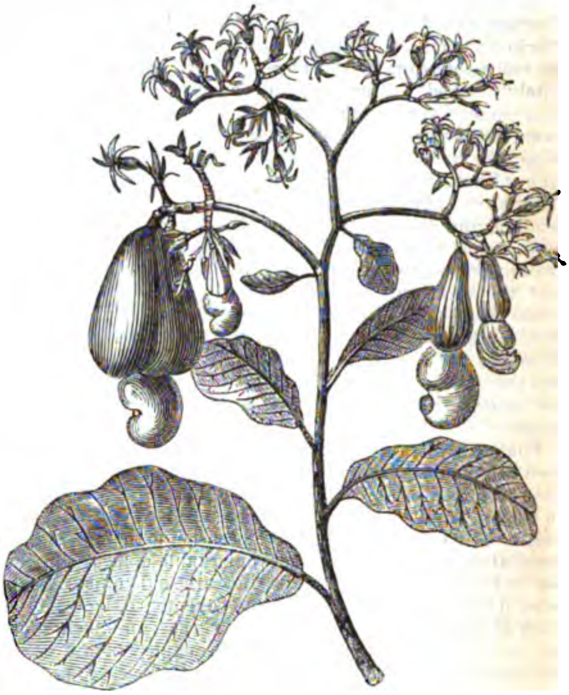
ANACARDIA'CEÆ, or the CASHEW tribe, is a natural order of plants, consisting exclusively of woody plants, abounding in an acrid resin, which is easily discovered by bruising the leaves, but which is not indicated by its being collected in transparent receptacles in the leaves, as is most commonly the case. They are polypetalous dicotyledons, with perigynous stamens, a simple, one-seeded, superior fruit, and alternate leaves without stipulæ. Their juice is often used as a kind of varnish, for which it is well adapted in consequence of its turning hard and black when dry. It is, however, often dangerous to use, because of the extreme acridity of the fumes, which are apt to produce severe inflammation in many constitutions,



[Anacardiaceæ duvaua dependens.]
1. Male flower. 2. Hermaphrodite do.
3. Back of do. 4. Fruit.
5. Section of do. All slightly magnified.

The best-known genera of the order are, in the first place, *rhus*, or the sumach, so many species of which are cultivated in our gardens; and the *pistacias*, the nuts of which are served at desserts, and their juice is commonly sold in the shops under the name of mastich and Scio turpentine. Besides these, there are the Chilian *duvauas*, which resemble myrtles, the *mango*, the fruit of which is so delicious in tropical countries, and the *Cashew*, or *Acajou nut*, anacardium, from which the order takes its name.

The last, *Anacardium occidentale*, is a small tree found all over the West Indies, where it is much cultivated for the sake of its bunches of fragrant rosy flowers, as well as of its fruit. Its stem, if wounded, yields abundantly a milk, which, when inspissated, becomes intensely black and hard; besides which, it secretes a gum not inferior to gum arabic. The nut is a kidney-shaped body, seated on a large fleshy protuberance resembling a peach, or an apple, and being in fact, the extremely dilated disk or receptacle; the latter is sometimes red, sometimes white, and is employed by the West Indians in various ways. The nuts contain, in abundance, beneath the outer shell, the black caustic oil of the order, which, when volatilized by heat, as happens in the process of roasting, is apt to produce erysipelas and other disagreeable affections in the face of persons standing over the fumes; the kernel is a well-known wholesome article of food. In the West Indies it is used as an ingredient in puddings, is eaten raw, and is roasted for the purpose of mixing with Madeira wine, to which it is thought to communicate a peculiarly agreeable flavour. In this country, the Cashew nut never flowers, and can only be cultivated as a tender stove plant.



[Anacardium occidentale.]

ANACHARSIS THE YOUNGER. [See BARTHELEMY.]

AN'ACREON, one of the most famous lyric poets of Greece. Little is known of his personal history. He was born at Teos, a city of Ionia, in Asia Minor, and was probably of obscure birth, since the name of his father has not been ascertained, and four persons are mentioned by Suidas, to whom that honour has been ascribed. Madame Dacier, on the other hand, has endeavoured to prove that he was a relation of Solon and Pisistratus, and a descendant of Codrus, and thus connected with the noblest blood of Athens; but it has been shown by Bayle, that the passage of Plato, on which she founds this assertion (Charmides, 157, ed. Steph.; p. 54. Priestley), cannot be made to bear such a meaning. The exact periods of his birth and death are unknown; but he began to be distinguished in the 35th Olymp. B.C. 559, about the beginning of the reign of Cyrus, and he came to Athens in the reign of Hipparchus, B. C. 525, according to Clinton. There is nothing irreconcileable in these dates, though rather distant; since he lived to the age of 85. It is said that he was unable to take any food except raisins, from extreme old age, and that he was at last choked by a grape-stone, but this anecdote bears too much the appearance of a poetical fiction, founded on the uniform tenor of his writings. He was held in high esteem by Polycrates, tyrant of Samos, and Hipparchus, son of Pisistratus, tyrant of Athens, two of the most eminent men of their age. The latter, we are told by Plato, (Hipparchus, 228 Steph.) sent a fifty-oared ship to bring the Teian poet to Athens. His old age seems to have been spent at Abdera in Thrace, whither the Teians emigrated, and founded a new city, when Teos was attacked by the Persian troops of Cyrus, commanded by Harpagus (B.C. 538). Some persons have pretended that an amorous connexion existed between Anacreon and Sappho; and there are verses extant, said to have been addressed by Anacreon to Sappho, and by Sappho to Anacreon; (Athenæus, xiii. 598-9, ed. Casaub.) but this involves a manifest anachronism. Of his personal character we know little; but if his own testimony of himself is to be believed, his life was spent in a course of debauchery and drunkenness; love and wine being the only things which he professes to think worth a wise man's attention. Athenæus, however, (x. p. 429, ed. Casaub.) and Madame Dacier, consider him to have been a man of temperate habits, and regard this garb of immorality merely as a poetic assumption. A statue was erected at Athens, representing him as a drunken man in the act of singing.

Some of the odes of Anacreon are written in the Ionic dialect, and generally in the iambic measure. Suidas says that he also wrote Elegiacs; but none of these remain. His extant poems are entirely amatory and convivial, and are generally admitted to afford the best specimens extant of this kind of composition. As such they have been much admired, and very frequently imitated and translated. Few, however, have succeeded in preserving the elegant simplicity of Anacreon, who seldom indulges in the forced conceits and extravagant prettinesses which so often disfigure the poems of his imitators. Some of the odes attributed to him are very deficient in real poetic feeling, and savour very little of the character of that remote age in which the writer lived. Some also, if we may judge from the language, are undoubtedly the productions of an age long after that of the poet. Of those who have attempted to present him in an English dress, the most celebrated, and the most successful, are Cowley, who translated twelve odes, and Moore. But the translations of the former should rather be called paraphrases; and the version of the latter is too much loaded with ornament, too studiously brilliant, to convey an exact idea of the style of his original. Some pretty specimens of the poet (including one or two of Cowley's translations) will be found in Merivale's *Anthology*.

Anacreon was first edited by H. Stephens, who got possession of two manuscripts, and published them, after careful collation, in 4to., in 1554. Many learned men at the time believed this to be a literary forgery, a supposition highly honourable to Stephens' powers of Greek composition; but this notion was dispelled by the discovery of the Vatican manuscript. It has been doubted, however, whether all the odes bearing the name of Anacreon, though ancient, belong to that poet. Pauw and Fischer believe the greater part of them to belong to authors of much later date. Tanaquil Faber stigmatised the 6th, 18th, 23rd, 24th, 25th, 26th, 27th, 32nd, 39th, 41st, 50th, 51st, 53rd, and 55th as spurious, chiefly on the ground of metrical inaccuracy, and of their being written in the Dorian, instead of the Ionian dialect. His daughter, however, the celebrated Madame Dacier, who translated Anacreon into French, does not always think him justified in rejecting them. A doubt has recently been suggested (Merivale's *Anthology*), whether the poems now passing under the name of Anacreon are those which were extant in the time of Horace, on the ground that there is only one passage in Horace which appears to have been taken from the Grecian lyrist; that beginning 'Vitas hinnuleo me similis, Chloe.' (Od. i. 23. 1.) This argument, however, does not appear conclusive.

The best edition of Anacreon, we believe, is by Mehlhorn, Glogau, 1825; the third of Fischer, Lips., 1793; and Brunck's second edition, Strassburg, 1786, are also highly spoken of. There are many pocket editions of this author, and many remarkable only for typographical luxury, which we need not here particularise.

ANADYR is a river in Siberia, little known, and principally remarkable for being the only considerable river of the globe, whose sources lie within the Polar circle, between the 68° and 69° N. lat. It rises in a lake in that range of the *Aldan* mountains, which traverses the north-eastern extremity of Asia, and terminates in Cape *Tshukotshkoi-Noss*, at Behring's Strait. The first third part of its course is directed to the south-west through nearly 3° of lat. till it passes to the south of the Polar circle. It then turns suddenly to the east, and continues in this direction, though declining insensibly to the south; but the lower part of its course lies nearly parallel to the Polar circle, at the distance of about 2½° of lat. In its eastern course it passes through 13° of long. It falls into the Bay of Anadyr, a large gulph of the Sea of Kamtshatka, forming an æstuary at its mouth. The whole course of this river is upwards of 500 miles.

The country which is traversed by this river is almost entirely covered with rocky, naked, and barren hills, which sometimes rise to the height of mountains, though, as it seems, they do not attain the line of eternal snow. As the winter lasts about nine months, and all this time the ground is frozen and covered with snow, even the patches of low ground along the river are not available to the rearing of cattle; and the rein-deer and the dog are the only domestic animals of the nations which inhabit this corner of the world. The rein-deer in a wild state is very numerous, distinguished by its spotted skin, and forms the most important object of chase with the inhabitants. The greatest part of the population inhabit the country about the mouth of the river, and the small bays in its neighbourhood, where the great number of fish and marine animals, especially of morses (*Tricherus Rosmarus, L.*), affords them abundant food. These people have fixed habitations, but those who live on the produce of their herds of rein-deer, and of the chase, wander about like the Laplanders.

The country on the north of the river is inhabited by the *Tshukshes*, who, according to Captain Cook, are not of a diminutive size, as was formerly believed, but rather tall, well made, and strong. They have defended themselves with valour and success against the Russians, and are not obliged to pay a tribute like the other nations of Siberia. To the south of the Anadyr, there is another nation, the *Korakes*, who are neither so tall, nor so well made as the Tshukshes, nor so brave. They are subject to the Russians, and obliged to pay an annual tribute. (Captain Cook's *Third Voyage*, Georgi's *Travels*, and the *Map* in Pallas' *Travels.*)

ANAGA'LLIS, a genus of the natural order *primulaceæ*, among which it is known by its flat, or wheel-shaped corollas, and by its capsule opening into two halves, of which the upper fits the under like the lid of a box. A very common species is the *pimpernel*, or *poor man's weather-glass*, so called because its flowers generally open at eight in the morning and close in the afternoon, and also refuse to expand in rainy weather. It is a little trailing plant with brick-red flowers, very abundant in corn fields; it was once thought useful in cases of madness, especially such as arose from the bite of rabid animals, but it is in no esteem at the present day. A far more beautiful species is the *anagallis tenella*, which grows in the drier parts of marshes, along with *pinguicula* and *drosera*; it has delicate flesh-coloured flowers, in the centre of which grows a cone of stamens covered all over with glittering transparent hairs; these and its peculiarly neat appearance, entitle it to be called the queen of British wild flowers. One or two foreign species, with large blossoms, are cultivated in greenhouses.

ANAGNI, the ancient Anagnia, once the capital of the Hernici, is now a town of between 5000 and 6000 inhabitants, in the Campagna of Rome, with a bishop's see. It stands on a hill above the valley of the Sacco, near the Via Latina, or road leading into the kingdom of Naples by San Germano, in the middle of a fertile, agricultural district. It is the residence of many noble families, twelve of the oldest of which are called *the twelve stars of Anagni*, having at their head the family of Caetani, from which sprung Pope Boniface VIII., and that of Conti, which has given the Church of Rome four pontiffs, among whom is Innocent III. Anagni often afforded a refuge to the popes during the troubles of the middle ages. Here Alexander III. excommunicated Frederic Barbarossa, and here the turbulent and irascible Boniface VIII. was surprised and made prisoner in 1303, by the Colonna faction, stimulated by his enemy Philip le Bel of France; owing to this affront, the old man soon after died of grief. It lies 35 miles east by south of Rome.

A'NAGRAM signifies a new word formed out of the letters of any given word by the process of writing them over again, as the term literally signifies, or placing them in a new order. Sometimes the anagram is formed out of two or more words, and it may be itself always either one word or several. Some traces of this species of trifling have been detected in the writings of the antients; but the taste for it does not seem to have spread much among the Greeks or Romans. Although instances of the use of the anagram for various purposes may have been discovered of an earlier date, the artifice appears to have first become fashionable in modern literature in the early part, or towards the middle, of the sixteenth century. Many authors, instead of putting their names on the title-pages of their works, have, with an affectation of modesty, used the anagrams of their names. At one time also the anagram was much made use of by mathematicians in announcing discoveries, the credit or property of which they wished to secure to themselves without revealing the secret in which they consisted. Huyghens, Galileo, and Newton, intimated several of their discoveries in this way. (See the *Life of Galileo* in the *Library of Useful Knowledge*, chap. viii.)

ANALEPTICS, from a Greek verb which signifies to *restore*, comprise all the means, whether medicines, diet, or regimen, which are generally employed to restore the vigour of the system when it has fallen below the healthy standard, either from previous disease or any other cause. The term analeptic was formerly applied indiscriminately to any medicine which increased the powers of the system, whether it belonged to the class of stimulants or to the class of tonics; but as the progress of chemistry, anatomy, and physiology has enabled us to recognize a difference in the chemical composition of members of these two classes of medicinal agents, as well as in their manner of acting upon the human frame, we propose to limit the application of the word to the latter of them, or to tonics, reserving the consideration of the other till we come to the word stimulant. The following brief explanation of their effects will suffice to justify this proceeding. Stimulants act primarily on the nervous system, while tonics act primarily on the muscles and blood-vessels. Stimulants render the movements more frequent; tonics render them stronger. Stimulants, as we see with wine, exhaust the excitability; tonics, within a certain limit, maintain it. The action of the one is immediate and transitory, that of the other is slow and progressive, but more permanent, as is the case from Cinchona bark, or food. To take an example from their effects on the stomach, excitants quicken the digestion, as we see with capsicum or cayenne pepper, which we take with articles difficult to digest, as salmon; while tonics render the digestion more perfect, as occurs when we use cinchona in convalescence from disease. Though the most perceptible effect of tonics be upon the muscular system, as it is by a display of its powers that we judge of strength, yet the whole system feels the benefit of them when appropriately administered. Every person knows that he can, at one time, lift a weight with ease which, at another time, he cannot move but with difficulty and exertion. In the former case, he is pronounced *strong*; in the latter, *weak*.

The nature of the muscular fibre need not be discussed here; it is enough for us to remark, that to execute its functions properly, it must be in a certain state of tension, that it may be possessed of sufficient elasticity. A cord proceeding from a fixed point cannot influence a moveable body till it be drawn tight; so a muscle cannot raise a limb unless it possess a certain degree of tightness. The difference of the power of muscles varies greatly, according to the state of health or disease of the individual. If a muscle be taken from an animal in good health, it will not only bear a greater weight than the same muscle taken from an animal which has long been sick, but the former will be many days before it goes to decay and allows the weight to drop, while the latter will decay very speedily.

To maintain the muscular fibres in this condition, a due supply of blood and of nervous energy is requisite. The sources of these are in a healthful and vigorous digestion, and as this rarely goes on when the system is much disordered, or suffering under general or considerable local disease, scarcely any morbid action, or even the natural exercise of mind or body, if pushed to an extreme, can continue without producing debility. Tonics are, sooner or later, required, seldom, indeed, to remove disease, but to obviate its effects, or that of the treatment it has been necessary to employ. The use of these requires the greatest circumspection, for, till we have removed the cause of the disease, they can rarely be of service; on the contrary, they often do harm.

We have above pointed out the connexion between the state of the digestive functions and the energy of the other functions, and it is important to bear in mind that anything loading and oppressing the stomach and bowels will lessen the tone of the system, diminish the disposition for exertion, and clog alike the action of mind and body. A judicious practitioner will here give, according to circumstances, an emetic or a purgative, and repeat this last for three or four days successively: in proportion as these act well, the languor and listlessness disappear, the mind resumes its wonted activity, for the cloud which had obscured the mental faculties is dissipated, and all again is energy, elasticity, and strength. An unskilful practitioner, and still more frequently the patient or his friends, would recommend some stimulant, a little brandy, or some bitters, under the influence of which all the symptoms become aggravated. It is a still worse case when the debility which occurs at the commencement of fevers, particularly ague and typhus, is so treated, though this is not so common an occurrence. A state of great irritation (morbid sensibility), or subacute inflammation of the mucous or inner membrane of the stomach, is a frequent condition of that organ with the inhabitants of towns, particularly among merchants and others engaged in extensive business which engrosses their whole attention, giving rise to much anxiety and leaving little time for exercise or food at proper times. The employment here of tonics, in the first instance, will only convert a manageable case into a difficult and serious one. It is, therefore, rather in the stage of convalescence from acute disease that tonics are required, and as a sequence to other medicines, than articles to be employed in the commencement, if we except some affections of the nervous system.

We need not enter into details respecting the particular action of tonics upon each set of organs of the body, as it may be stated generally that they all, sooner or later, begin to execute their functions more vigorously, the stomach first feeling the beneficial effects. But this state of improved action follows their use (*i.e.*, when they are medicinal or material tonics) only for a time; for their continued employment leaves the stomach in a state of debility, perhaps greater than at first—a fact of which we should never lose sight. These remarks will, we trust, induce all to observe caution both in taking upon themselves to use the articles termed analeptics merely because they feel weak, without knowing what is the cause of the weakness, or in urging their friends to have recourse to them at the commencement of disease, or even when it is subsiding, as more relapses are occasioned by a premature employment of tonics, whether medicinal or dietetic, than by all other causes combined.

It is impossible to enumerate here, and give directions for the use of, all the analeptics, comprising, as they do, medicines, food, and regimen. The medicines are either from the mineral or vegetable kingdoms: when the former, they are chiefly preparations of the metals, as the salts of iron and flowers of zinc (oxide of zinc); from the latter, they are invariably bitter substances, as Cinchona bark, Calumba, quassia, chamomile, &c. The analeptic means which fall under the head of regimen are, bathing, exercise, and the diversion of the mind.

The employment of the medicines will be stated under the diseases to which they are suited; bathing will be treated of under that head: it is, therefore, only upon the last two means that we will make any remarks here.

An examination of the human frame demonstrates that it was intended for motion, alternately with repose, and not for a state of absolute quiescence. Nor is the mind, which is furnished with so many faculties and provided with so many organs of sense, which serve to connect it with the external world, less calculated for active exertion. Any attempt to contravene the law of nature which enjoins a reasonable exercise of mind and body, brings a punishment upon the individual; the mind which he allows to be inactive loses the capacity for exertion, when required, and the body becomes a prey to disease in some shape or form. The action of the muscles is necessary to aid in circulating the blood and in completing the process of digestion, as well as to ensure a regular motion of the bowels. Where the muscles are not exercised, the blood, instead of reaching the surface and the extreme vessels, accumulates in the large internal trunks, leaving the skin dry and bloodless, as seen in young chlorotic females, who, instead of appearing buoyant with life in every limb, are as pale, and almost as inanimate, as a statue. Disorders of the nervous system, as hysteria, likewise show themselves. These states can only be warded off by regular exercise. The rising generation would be much benefited, if instruction in any branch of natural history formed a part of their education; young persons would then be furnished with motives for taking exercise out of doors—to the manifest advantage of the figure of the body and the tendencies of the mind. This is well explained and enforced in a note (p. 101) to a small work called *Botanical Geography*, published by Relfe, Cornhill.

Where older people have neglected exercise, it is more difficult to find means to induce them to resume its use; but some such device as the following may be tried: 'Ogul, a voluptuary, who could be managed but with difficulty by his physician, on finding himself extremely ill from indolence and intemperance, requested advice:—"Eat a basilisk stewed in rose-water," replied the physician. In vain did the slaves search for a *basilisk*, until they met with Zadig, who, approaching Ogul, exclaimed, "Behold that which thou desirest! But, my lord," continued he, "it is not to be eaten; all its virtues must enter through thy pores; I have, therefore, inclosed it in a little ball, blown up, and covered with a fine skin; thou must strike this ball with all thy might, and I must strike it back again, for a considerable time, and by observing this regimen and taking no other drink than rose-water for a few days, thou wilt see and acknowledge the effect of my art." The first day Ogul was out of breath, and thought he should have died of fatigue; the second he was less fatigued, and slept better. in eight days he recovered all his strength; Zadig then said to him, "There is no such thing in nature as a basilisk! but *thou hast taken exercise and been temperate, and hast, therefore, recovered thy health!*"

The Indian rubber, or caoutchouc balls will be found as useful for those confined by the weather within doors during the winter months, as the ball of Zadig.

It is possible to fatigue the body beyond a proper point, in which case repose becomes necessary; but this is a rare occurrence compared with the instances where the mind is stretched beyond its natural power to bear by the ambitious student, the covetous and care-worn merchant, or the adventurer in political life. If, in consequence of long-continued exertion, the balance of the mind be not already lost, abstraction from his books for the one, and a withdrawing from their pursuits for the others, with change of scene and occupation, must be enjoined: by doing this before it is too late, each may, in time, return to his usual station, to be useful in his sphere to himself and others, and may still be permitted to enjoy the greatest of earthly blessings,—a sound mind in a healthy body.

ANALOGY is the similarity of ratios or relations. A *ratio*, or *relation*, means that two objects (which are called *the terms of the ratio*) are considered together in reference either to some quality which they have in common, or to some manner in which one has affected the other. Thus, two things may stand in a certain relation to each other in respect of their quantity, magnitude, shape, colour, strength, height, &c.; in which cases the subject of comparison is common to both, and belongs to them to a greater or less amount. Thus, when we say that one thing is larger, taller, thicker, smaller, darker, more beautiful, more lasting, more desirable, more formidable, more probable, &c. than another, we mean that each of the pairs in question having in common the quality referred to, the former has it in a greater degree than the latter. These, which might be called *ratios of degree*, differ altogether from the other class, which includes all those relations arising from the manner in which one term of the ratio has affected the other, or is necessarily connected with it, and not from any attribute which they possess in common. Thus, we may speak of the relation of God and man, of the relations of men as members of the same political society or of different political societies, of the relation of a bird to its egg, of a tree to its fruit, &c.; in which instances some act done by one to the other party, or by both reciprocally, or some influence which one term has exercised over the other, is signified, and not any quality or attribute common to both. In some cases of the latter kind there are words which express each term of the ratio *in respect of the relation;* and, therefore, they mutually imply each other. Such are, for example, parent and child, debtor and creditor, agent and principal, lessor and lessee, &c. As in these cases it is impossible to conceive the one without conceiving the other term, the latter might be called *ratios of implication**, as distinguished from those ratios in which a comparison is made of qualities existing independently in the things compared. For example, there cannot be a husband without a wife, or subjects without a sovereign, nor is there any quality which a husband has, as husband, independent of the wife, or the sovereign as sovereign independent of the subject; but although there cannot be a short man or a tall man without a man of middle size, yet the height of the short or tall man is an absolute quantity, and independent of the comparison. In the cases of a common property, or ratios *of degree*, there are words which denote the *relation* of one term to the other, as lowness, height, depth, and consequently imply both terms of the ratio; but there is no word which expresses the *term* of the ratio itself, as in the case of ratios of *implication*. (See Locke, *On the Understanding*, b. ii. c. 25.)

When two ratios are compared, that is, when it is affirmed that the relation of two things is like the relation of two other things, the two ratios together form an *analogy*, and each pair of the corresponding terms of the two ratios is *analogous*. Thus, the bark stands in a similar relation to a tree as the skin to an animal; and consequently the one bears an analogy to the other: so the feathers of a bird are analogous to the hair of a quadruped, the admiral of a fleet is analogous to the general of an army. Of this nature are all fables and parables, in which the circumstances of the person to whom the lesson is addressed are illustrated by a parallel case, that is, by supposing a relation similar to that in which he is placed. Thus the case of a man who affects to despise what is out of his reach, is vividly portrayed by the fable of the Fox and the Grapes; and so in other cases: the parables of Holy Writ are instances of a similar mode of instruction, only the examples are not, as in fables, chosen among irrational animals. [See FABLE.] The same is the principle of grammatical and etymological analogy: thus, if *to give* is conjugated *I give, thou givest, he gives*, *to live* would be conjugated *I live, thou livest, he lives;* the inflexions of the verbs standing in a like relation to each. So the verb *rattle* is derived from *to rate*, as *prattle* from *to prate*, and *hobble* from *to hop: little* is derived from the old word *lite*, as *mychel* or *myckle* from *much*, &c. Thus, *kingly* is to *king*, as *royal* to the French *roy*, and *regal* to the Latin *rex*, or rather to the root *reg*, which two latter substantives have not been naturalized in English. The formation and development of language proceed almost exclusively on this principle.

From what has been said it is evident, 1. That in an analogy there must be two ratios, and consequently four terms or objects of comparison; and 2. That there is no connexion between resemblance and analogy, and that things may be analogous without being similar, and similar without being analogous. 1. With regard to the first of these propositions, it should, however, be observed that, although there must be four terms, it is not necessary that all the four terms should be different. If there was such a necessity, one of the chief uses of analogy, as an engine of argument and discovery of truth, would be destroyed. All that is required is, that there should be two distinct ratios: of what terms those ratios may consist is indifferent. Thus, in the case of brethren, the parents are in an analogous situation in respect of each brother: so the grandfather is to the son as the son is to the grandson. In such cases as these, both the relations are known: frequently, however, the relation in which one thing stands to another being known enables us to discover, with greater or less certainty, the relation which the same thing bears to something else, which is unknown. Thus the moral government of mankind by the Deity, in this world, furnishes a means of conjecturing his religious government, both in this world and the next, independently of a Divine Revelation. So the past conduct or performances of a nation, a government, a minister, a general, a lawyer, an architect, a painter, a poet, a racehorse, &c., afford materials for judging what will be their future conduct or performances under similar circumstances. It is to this most important use of analogy that Quintilian refers, when he says that its purpose is to discover what is unknown by what is known, to prove what is uncertain by what is certain.

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* There are some words used to denote the state of one of the terms of a ratio of implication when the relation has been destroyed: thus, *widow*, means an unmarried woman who was once a wife, *orphan*, a child whose father is dead, &c. Sometimes the terms denoting a relation are applied by anticipation before the ratio begins to exist: thus a person is popularly called an heir in the ancestor's lifetime, although *nemo est heres viventis*.

2. Resemblance being the similarity of some sensible quality, as form, colour, taste, smell, or sound, it has evidently no connexion with analogy; and if things analogous happen to resemble one another, their resemblance is a mere accident, independent of their analogy. Thus, two brothers may resemble each other; but they might equally resemble each other without being brothers, and would be equally brothers if they did not resemble each other. The confusion of analogy and resemblance is, however, of very frequent occurrence, and numerous examples of it might be cited. It is, we believe, the opinion of several commentators on the New Testament, that, in the passage of St. Matthew where the Holy Ghost is stated to have descended 'as a dove,' it is meant, not that the Holy Ghost descended in the form of a dove, but that the Holy Ghost descended as a dove descends. In a similar manner, Homer says that Apollo and Minerva sat, like birds, on the branches of a tree near the Scæan gate of Troy; by which he meant, as birds sit on the branches, so did the god and goddess: but Pope, in his translation, represents them as undergoing a change of form, and assuming the appearance of birds.

The above examples may serve to illustrate an error of frequent occurrence in the use of the argument from analogy. As, in the instances just cited, the similitude is extended beyond its proper limits, and it is supposed that because the two objects are like each other in *one* respect, they are like in *all;* so the analogy between two things is sometimes pressed beyond its just application, and is carried out of the bounds of the relation in virtue of which the comparison was made. Thus the injunction to be 'as wise as serpents and harmless as doves,' does not recommend to our imitation either the envenomed ferocity of the one, or the helpless timidity of the other animal. Two false analogies may be mentioned which at one time had a powerful influence on political discussions, nor are even now quite exploded, viz., that the existence of the human race, and the existence of nations, are analogous to the life of a single man. For some purposes these two relations might doubtless be compared; but when it is argued that a nation will pass through a series of changes corresponding to the childhood, manhood, and old age of a single human being, or that the early state of mankind was like the innocence and simplicity of an infant, the comparison is unwarrantably wrested out of the range of its proper application. The notion of the corruption of a nation by luxury appears to have had a like origin; for *single individuals* may be, and often are, depraved by a sudden change from poverty to riches; but the process by which a *nation* enriches itself, is a mark of habits very different from vicious indulgence and effeminate indolence.

All analogical comparisons are made by means of abstraction; a certain attribute belonging to each of two objects is considered separately from all the other attributes which those objects may possess, and a comparison is instituted between them in respect of that common attribute. Thus, the analogy between the skin of an animal and the bark of a tree arises from our leaving out of our consideration all those circumstances in which they differ, such as their colour, consistency, animation, sensibility, &c., and paying attention only to the use of each, as the outward covering, in one case, of the body and limbs of the organized being, and in the other, as the outward covering of the woody matter of the tree. [See ABSTRACTION.] It is by a like process of abstraction, that an extended and vague meaning is given to many general terms, particularly those belonging to the moral sciences; and in this manner they are applied to objects to which they are only *analogous*, and which they do not properly designate. Thus a *law*, in its original and strict sense, is a general command of one rational being to another: but as one of the effects of such a command is to produce a uniformity of conduct in the person or persons to whom the command is addressed, the word has been transferred to inanimate objects in which there is a uniformity of phenomena; and although there is no command received, no command given, and no intelligence to work upon, we yet speak of the laws which regulate the motion of matter, the succession of the seasons, the diffusion of heat and light, and other physical appearances which follow in a constant relation of cause to effect. In this case the proper characteristics of a law being neglected, one of its relations is alone considered; and hence the analogical application just mentioned. When such an application is made, not from a vague or inaccurate use of language, but from a desire to add beauty or energy to the expression by the transfer of words, this transfer, and sometimes the transferred word itself, is called a *metaphor*. Thus when Shakspeare represents Macbeth as saying of Duncan that

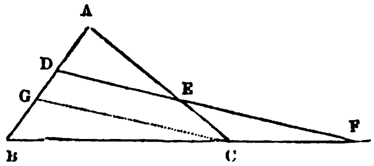
> His virtues
> Will plead like angels, *trumpet-tongued*, against
> The deep damnation of his taking-off,

he means that Duncan's virtues will arrest the public attention as forcibly as the sound of trumpets. The analogy is obtained by referring the two objects compared to the general class of things which instantly attract universal notice. [See METAPHOR.]

The word *proportion* properly signifies an analogy of quantities or magnitudes, as a proportion of numbers, lines, surfaces, &c. In popular usage, however, *proportion* is commonly made synonymous with *ratio*, as when we speak of the proportion of deaths to births, the proportion of wages to profits, the proportion of convictions to commitments, &c. Sometimes also it is used for *portion*, as when we speak of a large proportion, a small proportion, a fair proportion; in this case, however, a ratio is meant, as the *part* is considered as bearing a certain relation to the *whole*. On the subject of Analogy, see Aristotle's *Poetic*, c. 21; *Rhetoric*, b. ii. c. 2; *Hist. An.* l. c. 1; Coplestone in the Appendix to *Whately's Rhetoric;* Whately's *Rhet.* part i. c. 2. s. 6.

ANA'LYSIS, a Greek word, signifying literally *the act of unloosing* or *untying;* its opposite is *synthesis*, which is the act of putting together. The modern meaning of the term analysis, is the process by which facts, results, or reasonings are separated into their simple and component parts, or by means of which a simple truth is obtained, when given in a more complicated form; so that, in its most general sense, the greatest part of human knowledge consists in the results of analysis. It is, however, for the most part applied in a more particular manner to the methods employed in those branches of inquiry, which most strikingly exhibit direct analysis; viz., mathematics and natural philosophy, particularly chemistry. By a very incorrect misnomer, algebra, the differential calculus, &c., have been called by the general name of *analysis*, in opposition, not to *synthesis*, but to *geometry*, in which latter science synthetical methods are most usually applied. This perversion of the term prevails on the Continent to such an extent, that it must always be taken for granted, that '*analyse*' stands for the algebraical branches of pure mathematics. In this sense it is again subdivided into 'algebraical analysis' and 'infinitesimal analysis,' the latter including the fluxional or differential calculus. And by 'geometrical analysis' is frequently understood the application of algebra to geometry. It must, however, be remarked, that the exact sciences have appropriated this word, simply because in these branches of knowledge the use of analysis has been made most conspicuous.

Confining ourselves to the primitive meaning of the term, it is obvious that all discovery must be entirely either the work of analysis or of accident; and that, therefore, geometrical analysis must be as old as geometry. Nevertheless this does not appear from the earliest treatises. The work of Euclid is strictly synthetical. Instead of taking the proposition asserted, and examining it by means of preceding propositions, and in the mean time assuming it to be true, in order to ascertain whether the results deduced from it agree or disagree with what has been already proved,—Euclid first enunciates the point which he means to establish, and then proceeds to put together the considerations by which it is demonstrated, leaving the learner nothing to do but to judge of the truth or falsehood of each argument as it arises, without taking into consideration the methods by which the arguments themselves were first obtained. This is the natural and proper method of teaching what has already been discovered, for its own sake; not only because it neglects to introduce difficult and embarrassing considerations, and allows of the subject being broken up into portions which are easily learnt at one time, but because there is, in reality, no perfectly general and certain method of analysis which can be made obvious to the beginner. In attempting the analysis of a new problem, though the discoverer will naturally first try those methods which have been successful in preceding cases, he has no means of assuring himself beforehand which will be successful. The chemist is similarly circumstanced. Let a new substance, or one supposed to be such, be presented to him, from which he is required to find out whether it is already known, or if not, of what it is composed. No effective analysis can commence without requiring the results of all his previous knowledge, for he must have some method of recognising each and every substance with which he is acquainted, previously to pronouncing whether or not that under consideration is one of them. He must then proceed to trials of that substance with various others, and nothing but the sagacity which arises from previous experience can direct him in his choice of the methods to be employed. No general rules of analysis can be laid down, that is, no processes which must end in the discovery of the component parts required. The same observations may be made on mathematical analysis. We give a geometrical instance, with its result, and the synthetical form of the proposition arising out of it.



The sides of a triangle ABC are cut in D, E, and F, by a straight line. Six segments are thus formed, AD and DB, whose sum is the side AB; AE and EC, whose sum is the side AC; and BF and FC, whose difference is the side BC. It is required to investigate the relation which exists between these six segments, if there be any relation.

Some relations will be thrown out of the question upon the slightest consideration: the sum of the six lines is not the same in every triangle, neither is their product. Leaving this unorganized method of examination, we recollect, that if CB were parallel to DE, the then similar triangles ADE, ABC, would give a well-known relation between AD, DB, AE, and EC. To try whether this may help us, draw CG parallel to DE, which gives the proportion

$$AD : DG :: AE : EC,$$

or if we represent the lines by the number of units which they contain,

$$AD \times EC = AE \times DG \quad . \quad . \quad (1.)$$

Because GC is parallel to DF, we have

$$GD : BD :: CF : BF,$$

$$\text{or } GD \times BF = BD \times CF \quad . \quad . \quad (2.)$$

and the equations (1) and (2) multiplied together, and the result divided by the common factor GD, gives

$$AD \times EC \times BF = AE \times BD \times CF \quad . \quad . \quad (3.)$$

whence the relation required between the six lines is as follows:—Let them be separated into two lots of three lines each, in such a way that no two lines which have a common extremity are both in the same lot; then the product of the first three will be equal to the product of the second three.

If instead of asking for the relation, if any exist, between the six lines, the equation (3) had been given, and it had been required to detect whether it were true or false, the process would have been similar; and we should have found that the equation (3) is true, and a necessary consequence of the proposition, that a line drawn parallel to one side of a triangle divides the other sides into proportional segments.

The synthetical form of the preceding process differs from it much less on the paper than would be the case in the mind of a student, who had actually hit upon the solution in the progress of investigation. For, not being able to tell the various steps by which one of our readers would endeavour to arrive at the same conclusion, we are obliged to prompt him with a right guess, and thereby give him only a synthetical description of that which was in our minds an analytical process. It only remains, therefore, to make the demonstration synthetical in form, which, as will now be readily seen, will consist in stating the proposition to be proved, directing to draw CG parallel to DF, without giving any reason, and combining the steps of the preceding demonstration.

The geometrical analysis is generally ascribed to the school of Plato; but, in reality, as we have already observed, must be of a date as early as geometrical reasoning itself. The use of PORISMS, or problems, [see also LOCI,] admitting an indefinite number of solutions, the establishment of the properties of the CONIC SECTIONS, and the various efforts made for the DUPLICATION of the cube and the TRISECTION of the angle, all of which were the work of the school already mentioned, most certainly increased the power of the analyst, that is, made the means of discovery more obvious and more successful: but there is nothing in the methods which entitles them to the exclusive appellation of geometrical analysis.

The peculiar distinction between algebra and geometry is, that the analytical method is pursued in the former from the commencement. The solution of a problem consists in inquiring into the consequences of the solution *supposed to be found*, by introducing at every step some known truth, such as will produce a more simple consequence, and thus reasoning backwards, so to speak, until at last the answer itself is directly produced in numbers, which was before implicitly involved in the conditions of the problem. The methods are more general than in geometry, that is, a larger number of problems may be solved by each process. The same observations apply still more strongly to the higher parts of algebra, and the differential calculus.

The solution of equations of the first four degrees, and the approximation to that of all higher degrees, render the analytical solution of a vast number of common problems a matter of certainty. The solution of differential equations, where that can be done, is an additional step of even a more important character. Within the last half century, mathematical analysis has made considerable approaches to a state which enables us to determine, almost immediately, whether a problem can be solved by such means as we possess, or not; no small advantage, when it is considered how much time was previously wasted in the attempt to attain results which have since been shown to be impossible.

ANALYSIS. Chemical analysis is the separation of compound bodies, either into their simpler or their elementary constituents. When merely the number and nature of these are ascertained, it is termed *qualitative* analysis; but when their proportions also are determined, the analysis is *quantitative*. If the analysis consist only in determining the quantities of the *simpler* constituents of a compound, it is *proximate*, as when carbonate of potash is separated into carbonic acid and potash: but when the operation is extended, and the carbonic acid is resolved into carbon and oxygen, and the potash into potassium and oxygen, the analysis is *ultimate;* for neither carbon, oxygen, nor potassium is divisible into two or more kinds of matter.

ANAMOUR, the antient Anemurium, is the most southern part of Asia Minor, and described by Strabo (p. 669) as the nearest point of the mainland to Cyprus. It is in 36° 2′ N. lat., 32° 50′ E. long. 'Cape Anamour terminates on a high, bluff knob, one side of which is inaccessible; the other has been well fortified by a castle and outworks, placed on the summit, from whence a flanked wall with towers descends to the shore, and separates it from the rest of the promontory.' There are two channels cut in the rock, several miles in length, and on different levels, which supply the castle with water; where they are carried across the ravines, they rest on arches. Here are the remains of two theatres; and beyond the walls a great number of detached tombs, each constructed of two chambers, with arched roofs. No inscriptions were found. The place is now altogether deserted; and the present castle of Anamour is about six miles east of the cape, on the edge of the sea. (Beaufort's *Karamania*.)

ANANASSA, or the PINE APPLE, is a genus of the natural order *Bromeliaceæ*, found wild in the woods of South America, and now commonly cultivated in the gardens of rich Europeans. It is distinguished from the bromelia, to which it was once referred, by its succulent fruit collected in a compact head.

Of *Ananassa sativa*, the common pine-apple, a great number of varieties are known, of which the Moscow and common queen, the black Jamaica, and the Antigua queen are the best for summer use, the Enville and the Trinidad the largest, the black Jamaica the best for winter use, and the blood-red the worst for any purpose or season.

The fruit is a mass of flowers, the calyxes and bracteæ of which are fleshy and grow firmly together into a single head; it is the points of these parts that together form what gardeners call the pips, that is to say, the rhomboidal spaces into which the surface is divided. When wild, pine-apples bear seeds like other plants; but in a state of cultivation, generally owing to the succulence of all the parts, no seeds are produced, and consequently the plants can only be multiplied by suckers, or by their branches, which gardeners call the gills and crown. The latter, which surmounts the fruit, is in reality the end of the branch round which the flowers are arranged, and if it has any tendency to ramification, as sometimes happens, it becomes what is called double. In the island of Penang in the Indian archipelago, there is a sort, all the flowers of which always change into branches, each of which bears a pine, terminated by a crown, so that a great cluster of pine-apples is produced by a single stem; specimens of this sort are called double pines. They have never been produced in England.

The pine-apple was undoubtedly unknown before the discovery of America; its incomparable flavour soon, however, caused it to be introduced into Africa and Asia, where, in a suitable climate, it multiplied so rapidly as to acquire as firm a footing in those countries as their aboriginal plants. In Asia it has even improved so much in quality, that the Burmese pines, which have never yet reached England, are said to be the finest in the world. With this exception it is believed that we already possess the best varieties that exist; and it is undoubted that, except in the kingdom of Burma, the most delicious specimens of the fruit are produced in England. For the probable reasons of this, and the method pursued in the cultivation of the pine-apple in this country, see Pine-Apple.

ANANI'AS was a son of that Onias, the high priest, who, being exiled from Jerusalem, built a Jewish temple near Heliopolis, in Lower Egypt, and founded the town of Onion on the eastern frontier of the Delta. Ananias and his brother Helcias, or Chelcias, were appointed the commanders of the Egyptian army by Cleopatra, when she warred against her son Lathurus, in the year 102 B.C. Ananias remonstrated against the intention of Cleopatra to seize the dominions of her confederate Alexander Jannæus, and assured her that the Jews would take revenge if she succeeded in killing Jannæus. Cleopatra, considering that Ananias and Jannæus were related to each other, and that many Jews served in her own army, gave up her treacherous plan. (Jost's *Geschichte der Juden*, vol. ii. p. 309—311.)

ANANI'AS (חֲנַנְיָה grace of Jehovah) is the name of several Jews. Ananias, the son of Nebedæus, was high-priest from the year 50-66 after Christ. He was sent to Rome by Quadratus, the governor of Syria, in order to exculpate himself concerning the quarrels of the Jews with the Samaritans; Agrippina interceded for Ananias, and he was set at liberty. He condemned the apostle St. Paul. (See Acts xxii. 23, 24; and xxv. 1.) At the commencement of the Jewish war, Ananias and his brother concealed themselves in an aqueduct, but were discovered and killed.

ANAPÆST, a foot in Greek and Latin metre, consisting of two short syllables followed by a long. It was sometimes called Antidactylus, as being the opposite of the dactyle, which consists of a long syllable followed by two short. Assuming accent in English to be the same thing with quantity in Greek and Latin, the word *témporal* would be an example of a dactyle, and the word *superádd* of an anapæst. From the tendency of English enunciation to carry back the accent towards the beginning of polysyllables, there are not many single words which make anapæsts in our language. But the foot frequently results from the union of two or more words; as in *Dŏ yoŭ heār*, *Lĕt ălōne*; and sometimes it is found in part of a single word; as, for instance, in the three middle syllables of the word *antĭcĭpātion*. The predominance of dactyles in English, and of anapæsts in French, forms one of the most marked distinctions between the musical character of the one language, and that of the other.

ANAPÆSTIC VERSE, a species of verse composed of a succession of anapæsts. Among the Greeks, the anapæstic verse was freely used both in tragedy and comedy; some forms of it occur very often in Aristophanes. Both in tragedy and comedy, the anapæstic verse admits also dactyles and spondees. In English, only poems of the lighter sort have been usually written in anapæstic verse. Anstey's *New Bath Guide* may be quoted as a well-known example. The line is often reduced to eleven syllables, by the retrenchment of the first, or the substitution at the beginning of an iambus instead of the anapæst. Thus, in the following lines from the work just mentioned,

> 'For I'm told the discourses of persons refined
> Are better than books for improving the mind,
> But a great deal of judgment's required in the skimming
> The polite conversation of sensible women,'

it will be observed, that the first foot of the second line consists only of one short or unaccented syllable followed by a long; and a similar retrenchment might be made of the commencing syllable of any of the others, without spoiling its prosody.

ANAPLI. [See Nauplia.]

ANARCHY properly means the entire absence of political government; the condition of a society or collection of human beings inhabiting the same country, who are not subject to a common sovereign. Every society of persons living in a *state of nature* (as it is termed) is in a state of anarchy; whether that state of nature should exist in a society which has never known political rule, as a horde of savages, or should arise in a political society in consequence of resistance on the part of the subjects to the sovereign, by which the person or persons in whom the sovereignty is lodged are forcibly deprived of that power. Such intervals are commonly of short duration; but after most revolutions, by which a violent change of government has been effected, there has been a short period during which there was no person or body of persons who exercised the executive or legislative sovereignty,—that is to say, a period of anarchy.

Anarchy is sometimes used in a transferred or improper sense to signify the condition of a political society, in which, according to the writer or speaker, there has been an undue remissness or supineness of the sovereign, and especially of those who wield the executive sovereignty. In the former sense, anarchy means the state of a society in which there is *no* political government; in its second sense, it means the state of a political society in which there has been a *deficient* exercise of the sovereign power. As an insufficiency of government is likely to lead to no government at all, the term *anarchy* has, by a common exaggeration, been used to signify the small degree, where it properly means the entire absence. [See Sovereignty.]

ANAS, the duck, a genus of birds under which Linnæus included a great number of species now separated into several genera by recent naturalists; and even Temminck, Drapiez, and others, who adhere to the original Linnæan genus, find it convenient to separate the goose and the swan, and to distinguish the others according as they possess or want a loose membrane covering the hind claw. Illiger ranks the swan with the ducks, from which he separates the goose. Baron Cuvier and Lesson have proposed a great number of subdivisions, and Leach and Fleming have established several new genera. The following are Temminck's characteristics, with some slight modifications:—

The bill of middle size, strong, straight, covered with a thin membrane, and always depressed towards the point, which is rounded, blunt, clawed; margins of the two mandibles toothed with laminæ. Nostrils almost at the surface of the bill, at some distance from the base, somewhat oval, half closed by the flat membrane that lines the nostrils. Legs short, feathered to the knees, drawn back towards the belly; three toes placed before, wholly webbed; hind toe free, and jointed high upon the shank (*tarsus*). Wings of middle size, the first quill either as long as the second, or rather shorter.

ANASTA'SIUS I., Emperor of Constantinople, succeeded Zeno, A.D. 492, through the interest of Ariadne, Zeno's widow, who afterwards married him. Anastasius was then sixty years of age. He was called *Silentiarius*, because he had been one of the officers whose duty it was to maintain peace and silence within the precincts of the imperial palace. Longinus, Zeno's brother, who aspired to the throne, was sent to Alexandria, where he took priest's orders. The beginning of Anastasius' reign was favourable; he abolished several obnoxious taxes, and checked the abuse introduced by Zeno, of selling the public offices to the highest bidder. He also encouraged men of letters, and was himself a man of some learning. Theodoricus, king of the Goths, who, after defeating Odoacer, had made himself master of all Italy, sent an embassy to Anastasius, who recognised his title to the kingdom of Italy, and sent him the purple in token of it. But their good understanding did not last long. Theodoricus invaded part of Illyria and Mœsia, and defeated the Greek troops near the river Margus, now the Mórava in Servia. Anastasius, on his side, sent a fleet and army which ravaged the coast of Italy as far as Tarentum, in 508.

Anastasius became obnoxious, on account of his avarice, to the people of Constantinople, who pulled down his statues and dragged them through the streets; and he was himself assailed with a shower of stones while in the Circus, and with some difficulty saved his life. To add to his misfortunes, the empire was attacked by the Bulgarians, the Arabs, and the Persians. The Persians invaded Armenia, and took the town of Amida or Diarbekr on the Tigris, but were defeated by Justinus, who afterwards became emperor. A truce was concluded between Anastasius and Cabades, king of Persia, which lasted twenty years. Anastasius, like many other Byzantine emperors, had the vanity of appearing as a theologian, and of meddling in religious controversies. This nearly cost him his crown; his attempt to introduce some changes in the liturgy occasioned tumults at Constantinople, attended by fires and bloodshed. Several provinces also revolted, and raised to the command one Vitalianus, a Scythian, who advanced to the gates of Constantinople, and Anastasius only obtained peace on condition of becoming reconciled to the church. He had involved himself in disputes with Pope Symmachus, for defending the memory of Acacius, the late Patriarch of Constantinople, who had been excommunicated by Pope Felix II., under the reign of the Emperor Zeno. The Council of Calchedon having declared the Bishop of Constantinople to be next in place to him of Rome, Acacius had contested this decree, and had endeavoured to assert his own precedence, which became a source of schism between the two sees. Anastasius' religious principles, however, seem to have been very unsteady, and he was even accused of favouring Manicheism. Anastasius died suddenly, in 518, at a very advanced age, and was succeeded by Justinus I.

ANASTASIUS II., Emperor of Constantinople. His original name was Artemius, while he was secretary to the Emperor Philippicus Bardanes. After the deposition of Philippicus in 713, he was proclaimed emperor, and sent a new exarch to Italy, and declared himself a follower of the Western church. Constantinople being threatened by the Saracens, Anastasius, to effect a diversion, sent a large fleet with an army to Alexandria, but the troops revolted on arriving at Rhodes, and returned to Constantinople, where they proclaimed emperor one Theodosius, a receiver of the taxes, who, however, alarmed at his dangerous promotion, ran away from them. The insurgents plundered and burnt part of the city, and Anastasius having retired to Nicæa, in Bithynia, was defeated and obliged to surrender, with permission to retire to a convent, and to become a monk. Theodosius III. was then proclaimed emperor in 716, but being unequal to the task, he resigned the crown the following year to Leo, called the Isaurian. Anastasius, from his convent at Thessalonica, made an attempt to recover the throne, and having obtained assistance from the Bulgarians, appeared before Constantinople. Leo, however, bribed the chiefs of the Bulgarians, who delivered Anastasius into his hands. Anastasius was beheaded with several of his followers, and their property confiscated by Leo, in 719.

ANASTASIUS I., Pope, a native of Rome, succeeded Siricus about the year 398. He was a contemporary of St. Jerome, who speaks highly of his probity and apostolic zeal. He condemned the doctrine of Origen, and he also expelled Rufinus from the communion of the church. The latter wrote an Apology which is found in Constant's collection of the *Epistles of the Popes*. Anastasius died in 402, and was succeeded by Innocent I.

ANASTASIUS II., a native of Rome, succeeded Gelasius I. in 496. He endeavoured to put an end to the schism then existing between the see of Constantinople and that of Rome about the question of precedence. He also wrote a congratulatory letter to Clovis, king of the Franks, on his conversion to Christianity. He died, after a short pontificate, in 498.

ANASTASIUS III., likewise a Roman, succeeded Sergius III. in 911, and died the following year.

ANASTASIUS IV., Cardinal Conrad, Bishop of Sabina, was elected Pope in 1153, after the death of Eugenius III. Rome was then in a very disturbed state, owing to the schism of Arnaldo of Brescia and his followers. Anastasius died in 1154, and was succeeded by Adrian IV.

ANASTOM'OSIS, from ἀνὰ, *through*, and στομα, *a mouth*, signifies the communication of blood-vessels with each other by the opening of the one into the other. The blood-vessels are the tubes by which the different parts of the body are supplied with nourishment. If the blood-vessels destined to nourish a part be obstructed so that it cannot receive a due supply of blood, that part must necessarily die, or, as it is technically termed, mortify. But the blood-vessels are soft compressible tubes, liable, by innumerable circumstances, to have their sides brought so closely into contact as to prevent the flow of a single particle of blood through them. In order to prevent the consequences that would result to the system from the operation of causes thus tending to impede the circulation, provision is made for the freest possible communication between the main trunks of the blood-vessels and their branches, and between one branch and another. It will be shown hereafter [see AORTA] that all the arteries of the body spring from one great trunk which issues from the heart, and which passes from the heart through the chest, into the abdomen, where it divides into large branches which supply the lower extremities. In this course this vessel gives off innumerable branches, which supply different parts of the body, and these branches form innumerable unions with other branches which proceed from the main trunk of the artery. All the branches which form such communications are called *anastomosing* branches, and this union of branch with branch is termed *anastomosis*. Now so numerous are these anastomosing branches, and so competent are they to carry on the circulation, that if the main trunk of the aorta be tied in the abdomen, or even in the chest, the lower extremities will receive a sufficient supply of blood to maintain their vitality through these collateral or anastomosing branches. The knowledge of this fact enables the modern surgeon to perform with ease and safety operations which the surgeon of former times would have pronounced impossible. Anastomosis is of two kinds, that between large trunks, and that between small branches. When the communication is direct between two large trunks, there is no difficulty in conceiving that the circulation may readily go on though one of the trunks be obstructed, because the trunk which remains open may transmit a sufficient quantity of blood to nourish the part to which it is destined. But when a limb is supplied by one large artery only, and when that is obstructed, how does the limb receive a sufficient quantity of blood to support it? Suppose there is an obstacle to the free passage of the blood through its usual channel, namely, the main artery of the limb. What is the consequence? —the blood is driven in greater quantity, and with greater force into those branches which spring from the main artery above the seat of the obstruction. These branches, in consequence of receiving a greater influx of blood than usual, gradually enlarge in diameter, and transmit through them a proportionally larger quantity of blood. At the same time, the more minute branches, which anastomose with the branches given off below the obstruction, are in like manner dilated and admit a correspondingly free passage of blood to the inferior part of the limb. At first the circulation is in this manner carried on through a congeries of minute anastomosing arteries, but in a short time a few of these channels become more enlarged than the rest: as these increase in size, the smaller vessels gradually collapse, and thus ultimately a few large communications constitute permanent channels through which the blood is transmitted to the parts which it is destined to supply. Such is the beautiful provision established in every part of the body to secure to it a due supply of blood, if any obstacle should obstruct the course of this vital fluid through its accustomed channel.

ANA'THEMA, a Greek word, properly signifying, a thing set apart and devoted. Among the Greeks a piece of armour or anything else which was offered to the gods, and placed in a temple, was called an ἀνάθημα, (*anathéma*,) or offering. Tripods, votive tablets with inscriptions, such as may be seen in the Elgin collection of the British Museum, numbered 209 to 218, belong to the class of *anathémata*. But the dedication or setting apart might be to the powers of evil as well as to those of good, or, according to Pagan notions, to the infernal as well as to the celestial gods. Hence the word came, in one of its applications, to signify much the same thing with the word accursed. It is thus that it is principally used in the New Testament. In this sense the form *anáthema* (ἀνάθημα) was employed, and not *anathéma*, though both are really the same word. In the decrees of popes and councils, also, a common form of expression is, whosoever shall do, or not do, or believe, or not believe, a particular act or dogma, 'let him be anathema,' that is, let him be held excommunicated, separated from the society of the faithful, and branded with the curse of the church. On the other hand, a heretic, when he renounced his errors and was received into the bosom of the church, was accustomed to declare his heresy 'anathema,' or a thing accursed. In English we more frequently use the term anathema in the sense of the curse or severe denunciation itself than for the object of the curse; as when we speak of the church directing its anathema against any particular opinion.

ANA'TIDÆ (*Leach*), the duck-kind, a group formed by Dr. Leach to include his genera formed from the great genus *Anas* of Linnæus, and comprehending Oidemia, Somateria, Clangula, Nyroca, Tadorna, Spathulea, Querquedula, Anas, Cygnus, and Anser. Lesson professes himself to be at a loss to apply properly these British generic names. He himself gives, as what he terms subgenera, Maceranas, Macroramphus, Hydrobates, Histrionicus, Platypus, Fuligula, Micropterus, Clypeata, Tadorna, Moschatus, Anas, Anseranas, and Querquedula.

ANATO'LIA, or **NATO'LIA**, is a geographical term now generally considered as synonymous in extent with Asia Minor. It is derived from the Greek ἀνατολή, (*anátole*,) the 'east,' or the 'part where the sun rises,' and, in this respect, may be compared with the French term 'Levant,' which is used to express generally the countries bordering on the eastern shores of the Mediterranean. The word Anatolia, as a geographical term, originated under the Greek empire, and referred to the country which lay east of the seat of government. Anatolia or Anadoli, in a more restricted sense, is used to indicate that tract of country which stretches along the western and a large portion of the northern shores of Asia Minor. Adopting such a restriction, geographers divide Asia Minor into three unequal parts, Anadoli already mentioned, Karamania on the south-east, and Roum to the north-east. But Captain Beaufort, who surveyed the southern coast of Asia Minor, remarks, that however convenient as a geographical distinction, the term 'Karamania is neither used by the present inhabitants, nor is it recognised by the government.' The Pasha of Anadoli (Anatolia) has military jurisdiction over all authorities within the barrier of the Euphrates. Anatolia, taken, then, in its extended sense, represents the whole territory contained within 36° and 42° N. lat., and 26° and 40° E. long. It is bounded on the north by the Black Sea, on the west by the Ægean, or Archipelago, and on the south by the Mediterranean; its eastern frontier extends to the Euphrates and Armenia.

If we were to attempt to name a natural boundary on the east for this portion of the earth's surface, which should be somewhat in accordance with the received notions as to its political limits, we might consider it as commencing at Cape Hynzyr on the Gulf of Scanderoon, and running between N.E. and N.N.E. along the mountain range of Amanus to the neighbourhood of Malatieh near the Euphrates, and up that river to the point (about 40° N lat.) where the Euphrates, from a course due east and west, takes a course to the S.W. From this point a line drawn along the meridian of 40°, and striking the Black Sea about twenty-five miles east of Trebizond, might be considered as completing the eastern boundary. But no *real* physical boundary exists in the northern part of the peninsula of Asia Minor, for the high plateaus and mountains which belong to the peninsula stretch eastward into Armenia.

The term Asia Minor is one of comparatively recent date: it was unknown to Greek, and, we believe, Roman geographers, at least under the early emperors; nor do we know when the term first came into use. It is, however, now pretty well established, and is the most commonly received term for denoting that extensive country of a peninsular form, the limits of which we have just attempted to define. From a notion early prevalent and long-continued, that the distance from the Gulf of Scanderoon on the south coast to the neighbourhood of Amisus (Samsun) on the north was much less than it really is,—arose a vague idea of Asia Minor (as we understand the term) being a kind of insulated mass from the rest of the continent. The Euphrates running along its eastern frontier for so considerable a distance from north to south, favoured this notion. Herodotus reckons Asia Minor among one of his Actæ. [See Actium and Asia.] From the coast of mountainous Cilicia to Sinope on the Euxine, he assigned a breadth of only five days' journey for a stout pedestrian. The real breadth of the narrowest part, which is considerably less than the true breadth of the line described by Herodotus, is somewhat more than 300 English miles, reckoning from the gulf of Issus to Fatsah, west of Cerasus, on the Black Sea. The width assigned by Eratosthenes, 3000 stadia, is very near the truth: Pliny, with his usual inaccuracy, gives it 200 Roman miles, about 100 short of the mark. D'Anville, in his *Map of Asia Minor*, made the Isthmus too narrow by a whole degree, or about seventy miles, which consequently led to error in his positions all through the interior of the country, and compelled him to make amends for this loss of space by pushing the limits of the peninsula too far to the east. (See Major Rennell's *Treatise on the Comparative Geography of Western Asia*, vol. i.) Major Rennell says that the peninsula of Asia Minor is about one-sixteenth less than the peninsula including Spain and Portugal: the eastern limit of Asia Minor, adopted by Major Rennell, is the line of 300 miles between the Gulf of Issus and the Black Sea.

Asia Minor was known to the later Greeks under the divisions of Mysia, Lydia, and Caria, occupying the western shores. Those of Lycia, Pamphylia with Pisidia, and Cilicia, to which Lycaonia was sometimes added, bounded it to the south; and on the north coast were Bithynia, Paphlagonia, and Pontus. The elevated plains of the interior presented to the east Cappadocia, extending over the mountains to the borders of the Euphrates; and Phrygia on the west, bounded towards the sea by Mysia, Lydia, and Caria. Adjoining these two great internal divisions to the north was Galatia, a division of later date than the rest, having originated in the Gallic invasion, B.C. 278. Its chief town was Ancyra. This province in fact arose from the dismemberment of parts of Phrygia and Cappadocia. The Greeks established colonies and built towns on all the three coasts of the Peninsula, but their occupation was most complete and continuous on the west side. Here we find, lying from north to south, the districts of Æolis, Ionia, and the little Dorian confederation in the S.W. angle of Caria. The several antient political divisions are briefly noticed under the separate heads.

By the Romans this country was sometimes divided into Asia within and Asia beyond Taurus. Our imperfect knowledge of the country prevents us from placing any reliance upon statements of the divisions in existence under the present government. The Turks are represented to have parcelled out this territory into pashalics under seven general heads, confounding all the antient distinctions. This account is taken from Malte Brun, who makes the statement on the authority of a Turkish geographer, a MS. translation of whose work, without date, is preserved in the Royal Library at Paris. The following are his divisions:—1. the Pashalic of Anadouhly, (Anatolia,) extending over Mysia, Lydia, Phrygia Proper, Lycia, Caria, Pamphylia, Pisidia, the larger part of Galatia, and Paphlagonia; 2. the Pashalic of Siwas, (Sebaste,) containing Eastern Galatia, and the upper part of Pontus; 3. the Pashalic of Tarabozan, (Trebisond,) being Cappadocian Pontus and southern Colchis. Hadgi-Khalfah, the geographer, mentioned above, considers this pashalic as a dependence on Armenia. 4. The Pashalic of Konieh, (Iconium,) containing Central and Western Cappadocia, Lycaonia, and Isauria; 5. the Pashalic of Merasche, (Merash,) bordering on Syria, and containing Commagene, Cataonia, and part of Cilicia; 6. the Pashalic of Adana, being Cilicia Proper; 7. the Mousselimlik of Cyprus, held of the Grand Vizier, being an appanage of his office. The work in question is of antient date, and no mention is made in it of the feudatory possessions of Chapwan Oglu and Kara Osman Oglu, so long the delight of their people, and the protectors of European travellers. Before the Greek revolution, important changes had occurred in the general administration of Anatolia. These great feudatories had been swept from their possessions by the Sultan, jealous at the success and vigour of their sway; and since that event, Smyrna and Ionia have been elevated into a pashalic. The following divisions are given by Balbi as those now constituting the divisions or eyalets of Asia Minor: Anadoli, Adana, Caramania, Marach, Sivas, and Trebizond.

Asia Minor, though the seat of early civilization, and still containing numerous traces of former prosperity, is a country very little known. The southern coast was surveyed by Captain Beaufort, who commenced at Yedy Booroon or the Seven Capes, just to the west of the river Xanthus in Lycia, in July 1811. The survey was continued along the coast to Ayas, (Ægæ) in the gulf of Scanderoon, and was unfortunately interrupted before that interesting bay could be examined, owing to the commanding officer being disabled by a treacherous assault of some vagabonds from the mountains. The west coast from the entrance of the Dardanelles to the point where Captain Beaufort's operations commenced is not yet so accurately laid down; but Captain Copeland, who has finished his survey of the coast of Macedonia, is now engaged on the west coast of Asia Minor, and, perhaps, may have an opportunity of peeping into the Dardanelles. There is a Spanish survey of the Dardanelles, of the sea of Marmara, and the channel of Constantinople, with some additions made by the Hydrographical Office of the British Admiralty; and the north coast of Asia Minor is laid down from French and Russian surveys, (the French survey by Captain Gauttier,) but not with that minuteness that is still desirable.

The southern coast, as far as it was surveyed by Captain Beaufort, presents an irregular outline, formed by two huge semicircular sweeps presenting their convex side to the sea, and by two other bold sweeps with their convex side running into the land. There is, however, no deep gulf or bay with the exception of that of Issus or Scanderoon, which runs up between Asia Minor and Syria. Few coasts present so bold a front to the sea. From the gulf of Glaucus to the extensive plain which opens behind Adalia, an almost uninterrupted mass of lofty mountains presses near the shore, and sometimes, as at the Climax, forms the immediate boundary of the waves. From the mouth of the Eurymedon to the peninsula of Cape Cavaliere there is a series of bold promontories; and in some parts bare rocky hills form the coast, as between Selinty and Anamour, backed by lofty mountains. Near the eastern extremity of the coast surveyed, the wide plains of the level Cilicia open on the sea, commencing near the city of Soli, and extending some distance along the N.W. coast of the Gulf of Issus. There are very few and inconsiderable islands on this coast, and the same is true of the northern coast: the reason will be apparent when we come to consider the direction of the principal mountain-ranges of the peninsula.

The western coast of the peninsula presents as jagged and irregular an outline as almost any coast in the world, and in many respects very much resembles the opposite shore of Greece. Deep bays with bold projecting peninsulas, and islands which are continuations of the adjacent promontories of the main-land, characterize this coast. Though it has few rivers with a large volume of water, the courses of the Mæander, the Caystrus, the Hermus, and the Caicus, which exceed those of the southern slope, (with the exception, perhaps, of the rivers which water the eastern Cilician plain,) and their general direction from west to east, show that they lie in the longitudinal valleys, whose mountain barriers extend to the coast of the Archipelago. The channel of the Dardanelles, the antient Hellespontus, separates Europe from Asia by a strait about forty miles long, and at its narrowest part not more than one mile broad. The wider opening of the Propontis or Sea of Marmara, about 140 miles long, (taking the longest line,) and 45 broad in the widest part, is succeeded by the narrow channel of Constantinople, (14 miles long,) which unites the Sea of Marmara and the Black Sea. The coast of the Black Sea presents no very deep indentations or bays; and though the mountains are never very far removed from the shore, a considerable extent of coast from the entrance of the Black Sea along the shore of Bithynia is comparatively low; but as we advance eastward, we find the high lands near the shore, and the depth of water as marked on the charts very great. From Cape Karempi (Carambis) for some distance eastward, the coast is marked as high; and from the neighbourhood of Sinub (Sinope) as far as the town of Samsun (Amisus) it has the same general character. From the mouth of the Yeshil Ermak to Cape Yasoun, a distance of 70 miles, the coast is low; the remainder, as far as Trebizond, is more elevated, though as far as we know, not lined with such high cliffs and rocks as characterize some other parts of the coast.

As the great mountain ranges on the north and south sides of the peninsula have a general direction corresponding to that of the coasts, and as the rivers on all the three sides of the peninsula enter the sea at right angles to the general coast line, it follows that the valleys of the streams that enter the sea on the north and south must be of a very different character from those of the Mæander and the Hermus, which enter the sea on the west. But few streams on the southern coast traverse any considerable ranges of hills, and, perhaps, none penetrate from the north side of the great barrier of Taurus to the Mediterranean. The Pyramus (Jihoon) passes by a deep cleft through the mountain barrier (Strabo calls it Taurus: *Casaub.* p. 536) which unites the range of Amanus with the range of Taurus, after it has taken its great turn to the north. According to the description of Strabo, an eye-witness, this must be one of the most magnificent mountain-passes in the world. On the north side some considerable rivers intersect the mountain-chains, forming deep gorges and narrow transverse valleys that give this country quite a different appearance from that of the western side of the peninsula. Such is the gorge in which Amasia, the birth-place of Strabo, stands, on the Iris (Yeshil Ermak).

The grand characteristic features of the geography of Asia Minor are the vast ranges of mountains which traverse it; two chains detached from the plateau of Armenia, one, the more southern, the Anti-Taurus of the antients, the other, the Paryadres, known by the modern name of Tcheldir, or Keldir, unite probably near Kesariah, in the knot of Mount Argæus, now called Argis-Dagh. Covered on its summit by perpetual snows, this circumstance must determine in so low a latitude the elevation of this mountain to be from 9,000 to 10,000 feet. The southern chain, which is, in fact, the Taurus, in its most definite sense, detaching itself from Mount Argæus and the Anti-Taurus, first takes a southerly direction to the neighbourhood where the Pylæ Ciliciæ (the mountain pass of Cilicia) are situated. It then runs in a general westerly direction, but in an irregular line like the coast; and, as far as we can form a conjecture, terminates in the peninsulas of Cnidus and Halicarnassus, forming the southern boundary of the valley of the Mæander. The highest part of the Taurus seems, however, to take a southern course along the west side of the valley of Adalia; and its bold summits press close on the whole coast of the antient Lycia, and perhaps nearly fill the interior. Strabo traces the range of Taurus as far as the coast of the mainland opposite to Rhodes. The mountain above Phaselis, called Takhtalu, the antient Solyma, is 7800 feet high; but some summits in the interior must be still higher, for while Takhtalu, in August, had but a few streaks of snow on its peak, 'many of the distant mountains in the interior were completely white for a fourth part of the way down their sides.' (Beaufort's *Karamania.*)

This range of Taurus is the great southern wall which is the boundary of the high lands in the interior: its steep side is on the south. A branch, the Sultan-Dagh, detaches itself from the main mass in about 37° 40′ N. lat., and near the lake of Egerder: it turns to the N. and N.W., where it is the Paroreius of Strabo, and continuing a westerly course, forms by one branch the northern boundary of the Mæander valley, under the antient name of Messogis. The range of Tmolus, which lies between the Hermus and Caystrus, appears to detach itself from the Messogis at the head of the valley of the Caystrus. Along the northern part of the peninsula we find mountain ranges, of considerable elevation, extending eastward from the Hellespont into Armenia. Though there is doubtless more than one range, or, at least, smaller ranges bordering on the chief one, and running in this direction, still we trace the great mountain line from west to east under the antient names of Ida and Temnon in Mysia, Olympus in the neighbourhood of Brusa, and eastwards, where the Sangarius makes its way through it. As the range approaches the Halys it had the name of Olgassys, now Ulguz-Dagh. Strabo appears to give the name of Olgassys to a parallel range farther north than the continuous chain of the Olympus, which is the Olgassys of Ptolemy, and runs in the direction from Osmanjik to Amasia. From Amasia the range is continued to Trebizond, and is consequently, during the greater part of its course, at some distance from the sea, between which and the main range there are plains and hills, but no high mountains. This range east of Amasia is entirely omitted in some maps.

Major Rennell considers that the northern and southern ranges are connected by a western range, 'the ridge named in modern geography Morad, which connects by an oblique course from N.W. to S.E. Mount Olympus with Taurus, and at the same time separates the waters of the Sangarius from those of the Mæander and Hermus.' But this western range, if we are to understand by it a continuous chain, appears not to exist. The interior of Asia Minor between the great southern wall and the northern barrier which we have described, is, no doubt, intersected by numerous chains, which, however, have in general a westerly direction, though they are no doubt often connected by offsets in a transverse direction. The Morad of Major Rennell can be considered as nothing more than the general line, along which we may trace the decline of the central plateaus towards the west; and the high points in it would appear to belong to the central mountains which prolong their course on a base of less elevation to terminate in the promontories and headlands of the western shore. The mountain *Tamouedj*, seen by various travellers from Olympus in a southerly direction, is apparently a knot formed by the angular junction of the western mass of Temnon with the more eastern system of Olympus.

The centre of Asia Minor is an immense plateau supported by the ranges of mountains which we have described. Part of it is drained by the rivers that flow into the Black Sea; but an extensive tract, bounded by the great barrier of Taurus to the south, is covered with salt marshes, lakes, and rivers, possessing no visible outlet. This plateau is about 250 miles long from N. and E. to S. and W., and 150 miles broad. The chain of lakes is described as extending from the neighbourhood of Synnada (38° 50′ N. lat., 31° E. long.) to the Tyanitis, which lies at the foot of the Cilician Taurus, at the point where it turns to the north. In rainy seasons these lakes overflow, and, Leake says, would entirely submerge 200 miles of land, were it not for the ridges that traverse the plains and separate them into basins. He further states, 'that these basins form themselves into three principal recipients, having no communication, unless it be in most extraordinary seasons.' These are, 1. Kara-Hissâr and Ak-Shehr; 2. that of Ilgún and Ladik; 3. that of Konieh, receiving the overflowing of Sidyshehr and Beyshehr; 4. the basin lying between the Cicilian Taurus on the south-east, and the opposite Cappadocian mountains on the north-west now called Hassan-Dagh. To these we may add the basin or basins west of the Sultan-Dagh range, the Paroreius of Strabo, which contain the large lakes of Egerder, and Burdoor (the antient Ascania, which is very salt), and numerous other small lakes. Under any other government these inundations would produce most abundant harvests; but they now run nearly to waste in watering pastures. The salt lake of Tuzla, the Tatta of Strabo, is one of the most curious features of Asia Minor; it is 30 miles in length, and furnishes with that useful article a vast tract of country. Strabo says, that anything immersed was soon covered by the saline incrustations, and birds were unable to fly if they dipped their wings into it. Leake tells us, 'that Sultan Murad IV. made a causeway across the lake, on the occasion of his army marching to take Bagdad from the Persians.' Consequently it must be extremely shallow, and subject to excessive evaporation during the summer and autumn heats. The salt lakes of this high plateau, which borders on the great range of Taurus, are found at intervals from the meridian of 30° to beyond 34°, and on both sides of the parallel of 38° for, perhaps, sixty or seventy miles. They appear to belong to the basins of the high lands, which admit no outlet. The formation of the elevated regions of Asia Minor was known to Strabo, who being a native of the peninsula and personally acquainted with many parts, might have left us a description more complete than any modern has had the opportunity of making, if accuracy of detail and of observation had always characterised his writings. But exactness of geographical description is, from the nature of the subject, not easily attainable, and appears still to wait for improvement from more exact observation and a better nomenclature. 'The mountain plains (ὀροπέδια) of Lycaonia,' says Strabo (p. 568), 'are cold, without trees, and serve as pasture for the wild ass.'

The rivers of Asia Minor have more celebrity than importance. The most considerable flow into the Black Sea. The Halys, now the Kizil-Ermak, is described as taking its rise by two branches in the higher ranges of the Taurus, in Cappadocia. These two main branches, after flowing through more than three degrees of longitude, unite about 39° 10′ N. lat. from which point the course of the river northward is exceedingly irregular. It falls into the Black Sea by one mouth, according to a French authority, at the boundary of Pontus and Paphlagonia. Tournefort describes it to be at its mouth about the width of the Seine at Paris. The whole course is probably not less than 400 miles. The Halys is the most western of the peninsular rivers which flow from the highest level of the interior; and as in the case of the large rivers of this portion of Asia Minor, its numerous branches unite before it descends to the lowest level, through which it appears to flow in a single channel. Its upper streams run in longitudinal valleys, and, we believe, should be represented differently from what they are in our common maps: this will be briefly discussed under the head of HALYS. The Halys is the largest river of Asia Minor; it formed once the boundary between the Lydian and the Median empires, and was considered by the early Greeks as a kind of natural dividing line of the peninsula. It might, perhaps, seem fanciful to derive its name from the Greek word for *salt*, (ἅλς; see Strabo, 546,) but we can hardly help believing that the name is descriptive, and was first given by the Greeks to its upper waters which border on the salt plains. It runs near salt tracts also in the middle part of its course. The modern Turkish name, Kizil-Ermak, means the Red River, but its true name is said to be *Aito-su*.

The Iris, now the Yeshil-Ermak, rises probably on the north side of the Paryadres, but its remotest sources are still doubtful. It runs past Tocat, and thence in a general north direction in a deep valley to Amasiah, the birth-place of Strabo. A few miles below Amasiah it is joined by the river of Kara Hissar, the Lycus of Strabo: the united stream flows through a lower country and enters the Black Sea about 15 miles east of Samsun (Amisus). The plain of Themiscyra, the fabled abode of the Amazons, was also watered by the Thermodon, now the Tarmeh; its origin and its course are not well known, but its length is abridged in some maps most marvellously and incorrectly. West of the Halys, the Parthenius or Bartin, once the boundary of Bithynia and Paphlagonia in the lower part of its course, does not appear to traverse the great mountain barrier of the northern side of the peninsula. Its outlet is a little to the west of the antient Amastris.

The Sangarius, now the Sakaria, is a large river. It is said to be formed by two chief branches: the Ailah, or S.E. branch is formed by various streams, one of which is the river of Angora. The Ailah joins the S.W. branch, the antient Thymbrius, about 39° 50′ N. lat. 31° E. long., and taking first a N.W. and then a N. course, flows into the Euxine through a part of the great 'Sea of Trees,' which runs east towards Boli. The Sangarius with the Halys and the Iris are probably the only three rivers between Trebizond and the entrance of the Dardanelles whose sources are in the high central plateaus, and whose courses traverse the northern mountain boundary of the high lands. The other streams that flow into the Euxine are almost countless in number, but their sources are in the lower and subordinate parallel ranges that lie to the north of the Olympus and its eastern prolongation, and consequently their courses are short and their volume of water inconsiderable. The streams which enter the sea of Marmara from the range of Olympus and its western prolongation appear to us to be exaggerated in most maps.

The rivers that flow into the Archipelago have been already alluded to as running in valleys of a different character from those of the Euxine. The four chief rivers, going from north to south, are the Caicus, Hermus, Caystrus, and Mæander; they run through valleys almost unrivalled for beauty and fertility. Two of these, the Hermus and the Mæander, probably originate in the western extremity of the central plateaus, but the upper streams of the Mæander are by no means yet satisfactorily described.

The rivers of the southern coast have necessarily short courses, though the volume of water brought down from the mountains is sometimes very considerable, and carries with it such quantities of sand and small stones as to have produced apparently very considerable changes in the embouchures of these rivers. The Eurymedon, which is 420 feet wide at its mouth, has a curved bar across the entrance with only one foot water on it, though inside the bar there are fifteen. The Calycadnus, the modern Ghiuk Sooyoo, brings down a prodigious quantity of matter, which at the outlet of the stream being acted on by the current from the east, has formed a large projecting deposit to the west of the river's mouth. Between the mouth of the Cydnus and the

Sihoon (the antient Sarus), which are near one another, similar changes have taken place.

The Pyramus rolls down a continued volume of sand and earth, and is described by Captain Beaufort of the width of only 490 feet at its mouth. Almost all the rivers of Asia Minor make these deposits; and bars and external banks being allowed to form, the character of the coast is often affected. In this way alterations occur in the relative positions of places, which puzzle geographers in their attempts to reconcile differences.

In the survey of Captain Beaufort, we have every evidence of the former grandeur of this southern country, of the extent and magnificence of its cities, and of the number and excellence of its bays and harbours. So changed and degraded are its people in these days, that their existence now presents only a scene of listless inactivity. During the winter they reside on the coast; in summer many of them retire to the mountains. They frequently lead a course of lawless violence in open opposition to the Porte, and are described as especially suspicious and inhospitable to Europeans.

A most remarkable feature of Asia Minor is its fresh and salt water lakes. The whole country being formed by parallel ranges between the Mediterranean and the opposite Euxine, and these being often connected by transverse chains, cut up the country into an immense number of longitudinal valleys, deep gorges, high plateaus, and lower basins. The salt lakes, as we have remarked, appear to belong to the higher levels of the south, the centre, and the south-east. Bithynia, the region of the fresh-water lakes, contains five large and beautiful lakes besides smaller pieces of water; of these the Ascanius (to be distinguished from a southern lake of the same name already mentioned) is the most beautiful: at its eastern extremity stands Nicæa, or Isnik, celebrated in ecclesiastical history for its great council.

A few remarks are necessary on the existing roads in the interior of Asia Minor; but no road in the European acceptation of the term has ever existed of their own construction in the empire of the Turks. Asia Minor still presents remains of the Roman lines of communication; and of the Roman bridges many yet are in use. Relays of post-horses are still maintained by the Turks at distant intervals. They are principally stationed at the large towns of the leading routes. The most frequented road is that from Smyrna to Constantinople, and the only one by which there is a regular communication, except by caravans. Important as is the trade between these great cities and the rest of Europe, this correspondence takes place but twice a month, and is managed by the Austrian mission and consulate, which, as well as the Russian, despatch, at stated periods, a post to the European capitals. The Porte keeps in constant employment a corps of Tatar couriers, by means of whom they make all their communications. On a smaller scale every pasha has a similar establishment. The route from Smyrna to Constantinople passes over the rugged tops of the Sipylus to Magnesia at the foot of the mountains. Proceeding across the valley of the Hermus, the Tatars pass within sight of Thyatira to the east. This is a considerable place, and contains a large Greek population. Its size is about that of Magnesia. Much cotton is grown in the neighbourhood. The valley of the Caicus is then crossed; the direction of the course being constantly north with a slight bearing eastward. The country displays a remarkably bold outline and every capability of fertility, though little favoured by the hand of man. The land journey terminates at Moukalitsh, whence the traveller embarks on the Macestus, or at Moudania, the port of Brusa, according to the circumstances of the weather. This journey is never performed wholly by land, except during the prevalence of the northerly gales in winter, as the distance is increased a third by proceeding round the Gulph of Nicomedia. In Turkey, the traveller is frequently astonished amidst the general desolation at the extreme care manifested in keeping up the tanks and fountains, stationed at convenient distances. The burial places are always planted with cypresses, and frequently exhibit more of care and art than the habitations of the living. Both the khans, where travellers are received, and the mosques, but too frequently betoken the ruined state of the country. No caravans travel from Smyrna to Constantinople, the sea being the cheapest mode of conveying goods.

Of the routes traversing Asia Minor from north to south, that from Constantinople to the southern pashalics proceeds from Moudania to Brusa, already mentioned, and by its beautiful and fertile territory across the range of Olympus, to Kutaya, formerly Kotyæum on the Thymbrius, the residence of the beylerbey of Anatolia, the highest authority of Asia Minor. The city stands at the foot of the Poorsac-dagh, in a cluster of mountains, bounded by a fertile plain to the south. It is a large place, and though not so flourishing as formerly, still contains 50,000 or 60,000 people, of whom 10,000 are Armenians carrying on a profitable trade, and about half that number Greeks. Kinneir, between Kutaya and Konieh, visited Afium-Kara-Hissar. Another route, entirely by land, leads from Constantinople to Konieh, through Isnik (Nicæa) and Eski-Shehr, (Dorylæum) a town of little importance, watered by the Thymbrius, and now, as formerly, known for its natural hot baths. The two lines join at Kutaya. Konieh, the antient Iconium, the seat of government of a pasha of three tails, was the residence of the sultans of the Seljukian dynasty. It contains about 30,000 inhabitants, and has little or no trade, the territory being much neglected. To the east are extensive marshes. The plain of Konieh is considered the largest in Asia Minor, and according to Leake, presents an uninterrupted level of the finest soil, quite uncultivated, except in the immediate neighbourhood of some widely-dispersed villages. 'Another characteristic of these Asiatic plains,' he says, 'is the exactness of the levels, and the peculiarity of their extending without any previous slope to the foot of the mountains, which rise from them like lofty islands out of the surface of the ocean.' Proceeding to the chain of Taurus, Leake passed Karamán, a poor, and greatly reduced town, and ascended the mountains in the direction of Mout (Claudiopolis), a place wretched in itself, with a yet more wretched population, though governed by a pasha of two tails. It appeared to this traveller, that the highest mountain near the pass must have a height of between 6000 and 7000 feet. Thence the route led down to Gulnar, or Celenderis, in Cilicia Tracheia.

Another route, advancing in the same direction from the Bosporus, at Eski-shehr pursues an exact eastern course, and reaches Angora, through a country everywhere infested with tribes of Turcomans. Angora (Ancyra) is the capital of Galatia. It is situated on an elevated plain, famed for its fruit, and produces goat-hair nearly as fine as silk, which is made into camlet. Angora has fallen from its importance as a place of trade. Pococke, an old traveller, calls its population 100,000. Kinneir states it at 20,000. Both accounts may possibly have been true, for such a change is a probable consequence of the misery of Turkish rule. Kinneir tells us, that the valuable Angora goat is only to be found within the boundary of Wulli-khan, to the west, and the Halys, to the east. It immediately deteriorates on leaving this district. The territory to the S. E. of Angora, is covered with Turcoman encampments. These people pay no tribute to the Porte, which is without power to enforce it, or to rid the country of them. From Angora, Kinneir proceeded to Ooscat, the capital of Chapwan Oglu, then a place of importance, and of considerable population, but now probably, since the destruction of the family, in utter ruin. Hence a route leads past Kesariah to the celebrated pass of the Taurus, known to the antients as the Pylæ Ciliciæ, where the Romans had a military station, to protect the position. But the regular road to these defiles from the Bosporus, and the north-west of Asia Minor, is much more direct than by Kesariah. Having reached Angora, it proceeds in a course far to the west of the other line, and passes the great chain of Hassan-Dagh. The Cilician defiles are described as extremely difficult, ranging, according to Kinneir, for some distance at a width only of from 50 to 200 yards. The country, in descending to Tarsus, is cultivated, and produces wheat and barley. Here the Tatar couriers embark for Egypt and the coast of Syria. By the route leading entirely overland from Constantinople to Kesariah, by Iznikmid, Angora, and Kir-Shehr, the great caravan, which is annually formed at Scutari, proceeds to the east for the purpose of taking the pilgrims of the capital to the birth-place and tomb of their prophet at Mecca and Medina. From Smyrna, two great trading lines proceed. The caravans frequenting the first, march in a direction due east to Allah-Shehr, (Philadelphia,) at the northern base of Tmolus. This town has a population of from 15,000 to 20,000. Hence they proceed by Afium-Kara-Hissar, to Konieh, carrying the manufactures of Europe and colonial produce into the heart of the country. From Philadelphia a route proceeds across the Ak-Dagh, or White Mountains (the antient Messogis) to Adalia, on the Pamphyiian sea. It passes by Hierapolis. The town is a mass of grand ruins; and Arundel tells us 'that the road up to it is at the eastern end a petrifaction, overlooking many green spots, once vineyards and gardens, separated by partitions of the same material.'

The other line of trade, direct south of Smyrna, crosses the valley of the Caystrus, and proceeds to Guzel-Hissar, the antient Tralles, a large and important place in the rich and fertile valley of the Mæander. Seated in such a district, this town could not fail to have a large population. Though subject to malaria in autumn, it is supposed to contain from 30,000 to 40,000 people. The trade consists chiefly of cotton, corn, and fruit. Thence the route proceeds to Melaso (Mylasa), famous for its produce of tobacco, amongst the best grown in Turkey. Taking a south-eastern direction here, this line ends at Patara in Lycia. Since the commencement of the Greek war, all the trade of the western and southern shores of Asia Minor has, of necessity, been conducted by the internal lines of communication; the sea having been literally swept by the cruisers and pirates of all the small vessels engaged in commerce. Other roads besides those mentioned have at various times been followed by traders and travellers. One route follows the valley of the Mæander, and continues along the north side of Taurus and through the lake countries to Konieh, which is a great central point towards which the routes leading to the Pylæ Cilicia necessarily tend. The route usually followed by travellers in going from Upper Persia or Armenia to Constantinople is, through Kara-Hissar, Tocat, Amasiah, Osmanjik, the forests west of Boli, (see Morier's *Travels*, p. 358,) across the Sangarius to Isnikmid, the antient Nicomedia, and thence to Scutari opposite Constantinople. The miseries of civil war and the dread of piracy being unknown on the shores of the Black Sea, they may be safely navigated by small vessels during more than six months of the year, and this facility of water-carriage bestows comparative prosperity on the north of Asia Minor.

No general description would convey a correct idea of the climate of Asia Minor, which presents probably more varieties than the peninsula of Spain and Portugal, with which we have compared it as to extent of surface. The comparison may be carried farther. In the numerous chains of lofty mountains which traverse them, in their high plateaus, and in the diversity of climate depending on the configuration of surface, there is a considerable resemblance between the two countries. The climate of both is also materially affected by the adjacent seas. The western shores of Asia Minor occupied by the Greek colonies, and known by the antient names of Æolis and Ionia, have been celebrated in all ages for their genial climate, and for the fertility of their valleys. The summers here, as generally through Asia Minor, are hot, and especially where the local situation does not allow the passage of a free current of air. Smyrna, owing to its situation, is never considered a healthy place. But even on the west coast severe cold is occasionally felt in winter, and neither the southern latitude nor the proximity of the Ægean can overcome the effect of the immense masses of high land which lie to the north in Europe, and to the east in Asia. The snowy peaks of Taurus continue even to the valley of the Mæander on the south side. The high plains of the interior are described as excessively cold in the winter season, though of their absolute elevation no certain statements appear to exist. The contrasts sometimes exhibited between the high regions and the adjacent lower valleys are such as characterise all countries which have a similar configuration of surface. 'At Siwas (Sebaste)', says Fontanier, 'the plague made no great progress, owing to the salubrity of the air, the proximity of the high mountains, and the elevation of the plateau on which the town stands. It is not so at Tocat, where the climate is much warmer, and where the cultivation of silk is carried on, but at Siwas they are obliged to import fruits and grapes, which will not grow there.' Yet Tocat is only twenty hours' journey N.N.W. of Siwas, and though it lies in a deep valley of the Iris, is still considerably elevated above the shores of the Black Sea.

The general effect of great elevation upon vegetable productions, even in southern latitudes, and the application of this principle to the physical structure of Asia Minor, were well known to Strabo. 'It is not at all surprising that the elevated and mountainous parts of these countries (he is speaking of Bactriana and Aria) are cold; for even in southern climates mountains are cold, and in general all elevated surfaces are cold, even if they be plains. Accordingly the parts of Cappadocia on the Euxine are much farther north than those bordering on the Taurus: but Bagadania, a great plain which lies between Mount Argæus and Taurus, has hardly any fruit trees, though it is farther south than the borders of the Euxine by 3000 stadia. The vicinity of Sinope, Amisus, and Phanaræa, on the contrary, for the most part, allow the culture of the olive.' (Casaub. p. 73.) Strabo is mistaken about the 3000 stadia: the distance is not so much.

The northern shore of Asia Minor being exceedingly humid, parts of the mountain slope, from the edge of the high plains, are covered with magnificent forest trees of a great variety. The forests, stretching west from Boli, the great and almost inexhaustible source of supply to the Turkish navy, contain ash, elm, plane, poplar, larch, and beech, and some oaks of large size. (Morier, p. 359.) It is known to the Turks by the significant name of *Agatch Degnis*, or Sea of Trees. Major Rennell assigns to this forest a length of 120 miles from west to east, and forty in breadth. The Sangarius passes through the western part of it, and the southern extends into the limits of the antient Galatia. Few parts of the world present, within the same limits, more striking contrasts than the 'sea of trees,' and the high levels of Lycaonia, which Strabo characterizes by the expressive terms of 'cold and bare.'

The coast of the Euxine and the valleys of the northern side of the peninsula are probably the finest part of Asia Minor. On the south, the immense mass of Taurus, rising like a wall, and in parts capped with eternal snow, leaves between the Mediterranean and its basis a comparatively narrow slip, and gives to the climate of the southern coast, combined with its geographical position, a character very different from that of the north side of the peninsula. The amount of rain is much less, and the summer heat of the coast is often excessive. Unlike the northern shore, which appears to be well supplied with ever-flowing rivulets, some portions of the Lycian shore, where the mountains press close on the sea, have no water from April to November, but what they can keep in reservoirs. The winter torrents cease with the rains. (Beaufort's *Karamania.*) The mountains of Karamania are in general well wooded, and Alexandria is mainly supplied with fuel from them. The timber of this coast, at least that near the shore, is mainly pine, but not in general of large dimensions. The mountains of Taurus contain a great variety of forest trees and shrubs. (Leake, 107.)

This country has, no doubt, at some period, been the seat of violent volcanic action, though perhaps not within the limits of authentic history. Volcanic products are abundant in the peninsula; and the Greek name Κατακεκαυμένη or burnt, which was applied to the district on the confines of Lydia and Phrygia, preserved, perhaps, the only historical record of those great physical revolutions. The western part of Asia Minor has also often experienced most destructive earthquakes, which have not only shaken the country from Sardes to the valley of the Mæander, but also the neighbouring island of Cos. (See Thucyd. viii. 41.) The country in which the earthquakes were most violent in antient times is the same which Strabo describes (p. 578) as the Burnt Region; of the country near the Mæander, he says in his usual obscure manner—'nearly the whole district of the Mæander is liable to earthquakes, and is burrowed under by channels full of fire and water as far as the interior of the country.' The whole western part of Asia Minor is full of thermal springs; they are found also at Brusa near the range of Olympus.

Of the rocks of this peninsula we possess but little information from travellers, though, perhaps, no country in the world would better repay the labours of a skilful observer. The great interior range of Taurus has never yet been examined, and our knowledge of the mountains generally of this peninsula, so rich in minerals and striking phenomena, is extremely scanty. From Captain Beaufort's survey of the southern coast, we learn that, from Patara to Cape Cavaliere, where the high rocks of the coast nearly terminate, a limestone formation shows itself at almost every point. The rivers also are loaded with calcareous sediment, and, like the streams of other countries where limestone prevails, are found unfit for drinking. The bold limestone cliffs are generally of a white colour; those of Cavaliere, of white marble, rise perpendicularly from the sea to the altitude of six and seven hundred feet, and show most singular contortions of strata, of which Captain

Beaufort has given a sketch. On the low parts of the shore a breccia, compounded of gravel, sand, and fragments of quartz cemented in a calcareous paste, sometimes presents a hard unyielding beach. The singular effects produced by the rapid deposition of calcareous matter are noticed by Captain Beaufort at a place on the coast called Laara, near the outlet of the river Catarrhactes, and he refers for similar instances to Chandler's description of the petrified cascade at Hierapolis in the valley of the Mæander.

The limestone formation seems to prevail in the high ranges on the north side of Asia Minor; and, according to M. Fontanier, the mountains which bound the east side of the valley of Siwas exhibit calcareous rocks at the base, covered on the south slope by enormous masses of gypsum, in which the rain, by infiltration, hollows out numerous caverns; the waters, loaded with sulphate of lime, run off along the calcareous mass beneath, and, forming a lake in the plain of Siwas, discharge the discoloured streams into the hitherto pure waters of the Kizil Ermak. In the mountains on the route from Kara Hissár to Siwas this traveller observed, between Andras and Tchiftlik, the limestone of the Pyrenees alternating with serpentine; above the older limestone he remarked a more recent formation containing pectens with radii four inches long (p. 138). Between Siwas and Tocat, we remark the prevalence of limestone, though other rocks appear also; and the same may be remarked of the neighbourhood of Amasia. In going on the west route from Amasia, Fontanier remarks between Marcivan and Haggi-Kevi 'a plain of granite:' as the word granite is often rather vaguely used, and as the information does not go beyond what we have stated, it is difficult to know exactly what is meant. Malte-Brun's remark, 'that from the Sangarius to the Halys we meet with nothing but granite rocks,' is absurd, and contrary to well-known facts. In the neighbourhood of Tossia, west of the Halys, and on the route to Constantinople, Fontanier marks his 'secondary limestone and chalk.' The mountains above Boli, the antient Hadrianopolis, which lies farther west on the same route, are of 'a white calcareous material, with veins of black, and susceptible of a fine polish.' (Fontanier.) In fact we may trace the limestones of Asia Minor from the neighbourhood of Trebizond to the island of Marmara, in the sea of the same name, which derives its denomination from its quarries of marble. There is no doubt that Asia Minor presents one of the most extensive deposits of calcareous matter in the world. The marble quarries of Synnada, from which the wealthy Romans imported large blocks to their capital, are in the very centre of the peninsula at the north-western extremity of the basins of the interior lakes.

Asia Minor abounds in mineral wealth, as we know both from antient writers and from its commerce at the present day. The Chalybes, in the north-east angle, near the coast, were known in the earliest ages as the workers of metals; and the same region is still the great mining district of the peninsula. But it is only in the mountains of the northern portions of the peninsula that we are acquainted with the working of mines; nor, as far as we know, do any writers speak of them in the great southern range of Taurus, a region that belongs to the terra incognita of the world. Copper is worked near Trebizond, Siwas, Niksar, Amasia, Samsoun on the Black Sea, and numerous other places. Fontanier mentions a mine also at Maden in Karamania. Lead in combination with silver is found at Gurcoutch, Husseinabad and other places (Fontanier, p. 254); and lead not worked is said to be found near Kara Hissar, which stands on the great eastern branch of the antient Iris. Unieh on the coast east of Samsoun exports rock alum: in the time of Strabo the cinnabar mines of Olgassys were worked, though we believe they are now no longer known; and the gold sands of Pactolus washed down from the range of Tmolus once helped to fill the treasures of the Lydian kings.

The political history of Asia Minor forms a large chapter in the history of the world. Its position on the western frontier of Asia has rendered it the seat of numerous struggles for sovereignty; its extent of sea-coast at one epoch developed its maritime capabilities, and the diversified nature of its surface has in all ages saved many of its inhabitants from the dominion of the conqueror. Herodotus informs us that in his day (between B.C. 488 and 400) this peninsula contained thirty nations (ἔθνεα), which attested the numerous revolutions it had already undergone. Though there might not be thirty peoples essentially distinct in physical character and language, we can have no doubt that conquest and colonization had in the time of Herodotus given this country as varied a population as it now possesses. The Phrygians claimed the highest pretensions to antiquity of any of the inhabitants of Asia Minor; next to them the Lydians, under Crœsus, became the rulers of the country from the Ægean to the Halys, at that time the western boundary of the empire of the Medes. But before the Lydian kingdom attained any strength, Greek colonies from European Greece had occupied a large part of the western coast of the peninsula, and established themselves firmly along this seabord. In course of time the colonies of this nation spread northward along the shores of the Euxine as far as Trapezus, and on the southern coast, though apparently at a later period, as far as the Gulf of Issus. Many of the Greek cities of the interior, whose fine remains we still admire, were not built till after the age of Alexander, and some of them received their greatest embellishment under the Roman emperors. But between the empire of the Lydians and Medes, and the establishment of Greek kingdoms by the successors of Alexander, Asia Minor, which had before been ravaged by barbarians from the east, had to endure for two centuries the yoke of the Persians. The dominion of this nation, originally of nomadic habits, in its form of government, and the unfavourable effects of its political system, very much resembled the Turkish sway in the days of its former vigour; and, indeed, in the present decline of the Turkish power, the parallel may still be continued. The Persians never reduced the mountain tribes of Taurus to obedience, as we see in the case of the Pisidians; nor was their government more than nominal over the tribes of the north-east parts, with whom we become acquainted in the *Anabasis* of Xenophon. Under the Roman dominion, the peninsula attained the most uniform and settled state, and no doubt also the most prosperous condition that it has ever yet enjoyed. The decline of that power, and the feeble sway of the eastern empire, laid open the country to new invasion from the east, and the Mussulmans began to establish themselves in some of the eastern parts of the peninsula, about B.C. 700. When the first crusaders, under Peter the Hermit, landed near Nicæa in 1096, they found the Turks in possession of this part of Asia, and separated from the capital of Alexis only by the waters of the Propontis and the Bosporus. The Turks had then become numerous in Asia Minor, and the population must for some centuries have been gradually undergoing a change. The wild incursions of the crusaders scarcely left a trace behind them in the peninsula; nor could the invasion of the Tatars under Timur, which resulted in the victory of Angora over Bajazet in 1402, and the subsequent capture of Smyrna, produce any permanent effect, though the entrance of so numerous an army must have somewhat modified the population of Asia. The political condition of the country at the present day is as unsettled as ever it was; and within the last year we have seen an army march from the banks of the Nile to the neighbourhood of the Bosporus, and the sultan of Constantinople, in alarm, call in the aid of Russian troops and French diplomacy to stop the progress of the Egyptian arms. The Porte has yielded the Pashalick of Adana, a large part of which is a fertile country, rich in timber, corresponding apparently to the antient Level Cilicia, and with it the command of the mountain-passes, which will henceforward probably be crossed by an invader whenever a convenient opportunity offers. On the north-eastern frontier, the Russian is become the neighbour of the sultan; and thus, both in the European and Asiatic continent, successful revolution on one side, and invasion on the other, have hemmed the once-dreaded Ottoman within much narrower limits.

The principal component parts of the population of Asia Minor at present are, in the towns and villages, Turks, Greeks, Armenians, and Jews. The population that does not belong to the towns is of a nomadic, and probably of a very mixed character; they are generally classed under the denomination of Turcomans, and are sometimes confounded with the Curds, who are really a different people. It is not unlikely, however, that the Curds have spread westward from the mountains of Curdistan proper, and have been mingled with Turks and Turcomans on the west side of the Euphrates as far as Siwas. (For further information on Asia Minor, see Rennel's *Geography of Western Asia, and his Map*; Leake's *Journal of a Tour in Asia Minor*, with the numerous authorities referred to by both; Fontanier, *Voyages en Orient*.)

ANATO'LICO, a town of western Greece, or antient Ætolia. It is built on a rocky island in the midst of the lagoons, or salt-marshes, which form part of the gulf of Mesolunghi, 38° 40′ N. lat. 21° 35′ E. long. It surrendered in March, 1826, to the Egyptian troops under Ibrahim Pasha, and its capture, together with that of the islet of Vassiladi, which was the advanced post of Mesolunghi, contributed to the fall of the latter place, which happened in the following April. The inhabitants of Anatolico, about 2000 in number, were sent free to Arta, in Epirus, and were allowed to take with them such personal property as they could carry. Anatolico belongs now to the new kingdom of Greece. The fishermen of the lagoons of Anatolico use canoes, which they call *monoxyla*, (single pieces of wood,) formed of the hollow trunks of trees.

ANA'TOMY, from a Greek term (ἀνατομή), which literally signifies 'the separation of a thing into parts by cutting;' the term anatomy is used to signify, particularly, dissection, or knowledge acquired by dissection. Anatomy is at once an art and a science; an art, inasmuch as the pursuit of it requires skilful manipulation; and a science, inasmuch as certain general principles are deducible from it. The object of anatomy is to ascertain the structure of organized bodies. Of the two great kingdoms of nature, the inorganic and the organic, it comprehends the whole range of the latter. Like the organized kingdom itself, it forms two divisions, the one including the structure of plants—vegetable anatomy; the other the structure of animals—animal anatomy. Animal anatomy is divided into comparative and human; comparative anatomy includes an account of the structure of all classes of animals, excepting that of man; human anatomy is restricted to an account of the structure of man only. Human anatomy is subdivided into descriptive, general, and pathological. DESCRIPTIVE anatomy comprehends a description of all the various parts or organs of the human body, together with an account of their situation, connexions, and relations, as these circumstances exist in the natural and sound, or, as it is technically termed, the normal condition of the body. The human stomach, for example, is composed of a number of membranes, which are united in a particular manner; a number of blood-vessels which are derived from particular arterial trunks; a number of nerves which proceed from a particular portion of the brain and spinal cord; a number of absorbent vessels and so on: moreover, this organ is always placed in a particular cavity of the body, and is always found to have certain specific connexions or relations with other organs. The anatomy of the human stomach comprehends an account of all the particulars of this kind, which are uniformly found to concur in all human bodies in which the conformation is regular or natural; and so of every other organ of the body: and because such an exposition of the structure of the various organs includes a description of all the circumstances that relate to their organization, it is called *descriptive* anatomy.

After the study of the human body in this mode has been carried to a certain extent, with a certain degree of success, it necessarily gives origin to a second division of the science, that termed GENERAL anatomy. It is found, that many of the circumstances which belong to any one organ, belong at the same time to several organs; and that thus several individual circumstances are common to many organs. Of the membranes, for example, of which it has been stated that the stomach is composed, some are common to it and to the intestines, to the bladder, to the uterus, to the air-passages, and so on. In like manner with respect to any one of these membranes, when its structure is carefully examined, it is found that in many points its organization is exactly similar to that of all other membranes. This view extended leads to further important and interesting results. All the arteries of the body, whatever their situation, size, or office, are found to be composed essentially of the same substances, disposed in nearly the same order and form. All the veins have, in like manner, a structure essentially the same. All the absorbent vessels, all vessels of every kind, all the bones, muscles, and nerves, the whole external covering of the body or the skin, widely as these various structures differ from each other, present no material difference as far as regards the organization of each particular class. Hence various organs of the body are disposed into what are called common systems, and these common systems are said to consist of common substances or tissues. All the vessels, for example, are collected and arranged under one common class, called the vascular system: in like manner, all the bones are collected and arranged under another class, called the osseous system; all the muscles under another, called the muscular system; all the nerves under another, called the nervous system, and so on. The material that enters into the composition of each of these systems consists of a substance of a peculiar nature; but as this substance is more or less generally diffused over the whole body, entering as a constituent element into the various organs, it is termed a common substance, or tissue. What is termed the common cellular tissue, for example, is the substance of which all the membranes and vessels of the body are composed; the muscular tissue is the substance of which all the muscles are composed; the nervous tissue is the substance of which all the nerves are composed: and thus, the structure of the body, analysed in this mode, innumerable and complex as the substances appear to be of which it consists, is ultimately reduced to a very few simple materials, by the combination and modification of which all the different animal substances are produced. That part of anatomy which displays those common substances, and which describes all that relates to these differences, analogies, combinations, and so on, is termed GENERAL Anatomy. Descriptive and general anatomy, then, include an account of the structure of the body as it exists in the state of health. But there is no organ of the body, and no tissue which enters into its composition, which is not subject to disease; in consequence of disease, the regular or natural structure of the component substances of the body becomes changed in a great variety of modes. That part of anatomy which displays these diseased or morbid changes, and which describes all the circumstances relating to them, is called PATHOLOGICAL or MORBID Anatomy. We may say then, that descriptive anatomy comprehends an account of all the parts or organs of the body as they exist in the state of health; general anatomy comprehends an account of all the separate substances of which those organs are composed, not as these substances exist combined in organs, but as they form distinct and peculiar substances; pathological anatomy comprehends an account of all the changes of structure produced by disease, whether in individual organs, or in the primitive or common substances of which these organs are composed.

It is obviously impossible to include in a single article a subject so wide as this. However concise the descriptions under each head might be, it would necessarily swell the account to such a length, as to be incompatible with the plan of the present work. We must, therefore, satisfy ourselves with referring to the separate heads under which the topics comprehended in this subject will be treated. In the mean time, we offer a few observations illustrative of the nature and value of the science of anatomy.

1. In the first place, anatomy is the basis of physiology. It is the object of anatomy to ascertain structure; it is the object of physiology to ascertain function. An organ is constructed in such a manner as to fit it to perform a certain action; the action cannot be understood unless the structure be known; and, often, the structure cannot be known without directly leading to a knowledge of the action. Until the art of anatomy began to be cultivated, the science of physiology was without existence. In proportion as anatomy has been practised, physiology has advanced.

2. In the second place, anatomy and physiology are the basis of the science of medicine. Disease, which it is the object of the physician to detect and to cure, is denoted by disordered function; disordered function cannot be understood without a knowledge of healthy function; healthy function cannot be understood without a knowledge of structure; and structure cannot be understood unless it be examined. The organs in which the most important functions have their seat are placed in the interior of the body, and are completely concealed from the view. There are no means of ascertaining their situation and connexion, much less their nature and operation, excepting that of inspecting the interior of the body. As the most important functions have their seat in organs which are placed in the interior of the body, so those internal organs are also the seats of the most frequent and fatal diseases. Consequently, an accurate acquaintance with the situation of these organs s indispensable in order to ascertain the seats of disease;

but as these organs are completely concealed from the view, it follows that their situation cannot be learnt without the study of anatomy. In several regions of the body, organs the most different in structure and function are placed close to each other. Diseases the most diversified, requiring not only not the same, but opposite treatment, may consequently exist in the same region of the body. Without the accurate discrimination of these diseases, it is often impossible to save life; but the discrimination of these diseases is absolutely impossible without that knowledge which the study of anatomy only can impart.

It has been justly observed, that one consideration, which shows in a striking light the importance of anatomical knowledge in leading to the detection of disease, is, that the seat of pain is often at a distance from the affected organ. In disease of the liver, pain is generally felt at the top of the right shoulder, because a nerve which goes to the liver is united with a nerve which supplies the shoulder. In disease of the lung, there is often no pain in the lung; but much uneasiness at the top of the windpipe. In disease of the hip-joint, there is often no pain in the hip, but severe pain at the knee. In all these cases, the attention is apt to be carried away from the real seat of the malady. Even in the present day, abundance of practitioners apply their remedies to the seat of the pain, wholly ignorant of the true seat of the disease: mistakes of this kind, often fatal, are inevitable without a knowledge of anatomy, while with that knowledge they are scarcely possible.

3. If the knowledge of anatomy be thus obviously important to the physician, it is still more manifest that it must be indispensable to the surgeon. Without a minute and exact knowledge of the structure, situation, and relation of organs, the surgeon cannot proceed a single step in the practice of his art without the most imminent peril. Many opportunities will occur in the course of this work of illustrating this truth; but perhaps the most striking proofs of it are afforded under the heads AMPUTATION, ANEURISM, HÆMORRHAGE, HERNIA, and LITHOTOMY. It has been justly stated, that no one can form an adequate conception but those who have witnessed it, of the confusion and terror occasioned by the sight of a human being from whose body the blood is gushing in torrents, and which none of the spectators are able to relieve. In all such cases, there is one thing proper to be done, the prompt performance of which is generally as certainly successful, as the neglect of it is inevitably fatal. It is impossible to conceive a more terrible situation than that of a medical man who knows not what to do on such an emergency. But the antient surgeons were constantly placed in this situation; and the dread inspired by it retarded the progress of surgery more than all other causes put together. Not only were they prevented through terror from interfering with the most painful and destructive diseases which experience has proved to be capable of safe and easy removal, but in general they were afraid to cut even the most trivial tumour. They never thought of amputating until the limb had mortified, and the dead had separated from the living parts; and being ignorant of the means of stopping hæmorrhage, they were afraid to cut into the living flesh. But surgeons now know that there is one simple and effectual means of stopping hæmorrhage, namely, compression of the bleeding vessel. If pressure be made on the trunk of an artery, though blood be flowing from a thousand branches given off from it, the bleeding will immediately cease. Should the situation of the artery be such as to allow of effectual external pressure, nothing further is requisite; the pressure being applied, the bleeding is staunched at once: should the situation of the vessel place it beyond the reach of external pressure, it is necessary to cut down upon it, and to secure it by the application of a ligature. Paré may be pardoned for supposing that he was led to the discovery of this invaluable remedy by the inspiration of the Deity. By means of it the most formidable operations may be undertaken with the utmost confidence, because the wounded vessels can be secured the moment they are cut: by the same means, the most frightful hæmorrhages may be effectually stopped; and even when the bleeding is so violent as to threaten immediate death, it may often be averted by the simple expedient of placing the finger upon the wounded vessel until there is time to tie it. But it is obvious that none of these expedients can be employed, and that these bleedings can neither be checked at the moment, nor permanently stopped, without such a knowledge of the course of the trunks and branches of vessels, as can be acquired only by the study of anatomy.

The importance of pathological or morbid anatomy will be readily understood. What are called symptoms are signs of disordered functions; disordered functions are the consequences of irregular or diseased actions; irregular or diseased actions, after they have continued for a certain time, produce a change in the structure of the organs in which they have their seat. Certain disordered actions produce certain specific changes, modified indeed by a great variety of circumstances, which to a considerable extent are ascertainable and ascertained. The medical practitioner, who has an opportunity of comparing the symptom or the external sign, which he observed during life, with the morbid change of structure visible on inspection of the diseased organ after death, learns with exactness what the external sign denotes, that is, what state of the internal organ it expresses. Moreover, the external sign may not have been obtrusive, and yet it may have been present. It is to this comparison of the symptoms of disease during life, with the diseased changes of structure visible in the organs after death, constituting morbid anatomy, that we owe all the exact knowledge of disease which is at present possessed. There is not a single internal malady, the precise nature of which is now known, which has not been brought to light by morbid anatomy. The diseases, the precise nature of which still remains undiscovered, are those, the seats of which there have been few opportunities of inspecting after death, or in which the morbid changes produced in the organs are so slight or transient as hitherto to have eluded detection. Nor is there any probable means by which the true nature of such diseases can ever become better known than that of increasing the facilities of examining the condition of the organs immediately after death. An effectual remedy for a disease may not indeed be discovered when the exact nature of it is ascertained; but the discovery of the exact nature of a disease puts the physician in the right path in searching after the cure, and at all events teaches him what will be useless, and what mischievous. Hence a clearer apprehension of the nature of a disease has always preceded an improved treatment of it. If the plan of the present work admitted of the requisite details, it would be instructive to show how uniformly every exact and certain method of cure has followed and been founded upon that knowledge of disease which has been brought to light by the inspection of the organs after death. Compare, for example, the knowledge which enlightened physicians now have of fever, and the success which attends their treatment of it, with the darkness which rested on this malady, and the inertness or mischievousness of the remedies employed in it only a few years ago. A physician who understands fever, as far as the nature of this malady has been actually elucidated, can tell at the bedside of the sick with astonishing accuracy what internal organs are in a state of diseased action; what the kind of diseased action is in each; what the probable progress of it will be, that is, what morbid change of structure or organic disease it is its natural tendency to produce, and must inevitably produce, if it be allowed to hold on its course without being checked. To this extent his knowledge places the physician in the position in which he would be if the body of his patient were transparent, and he could actually see the processes that are going on in the internal organs. Having this knowledge, he knows with exactness what to attempt by the remedies which he employs: among numberless remedies he knows which to choose as being the best fitted to accomplish the end in view; his remedy being chosen, he knows the proper strength, the proper time, the proper frequency, in a word, the proper mode in which to exhibit it—that is, he knows how to exhibit it in the dose and form the best adapted to the actual condition of the organ which it is his object to relieve. He does not work in the dark. He has a definite purpose to accomplish, and an instrument of known power with which to compass his purpose. He even anticipates events; stops diseased processes at the very commencement; prevents morbid changes of structure, which, if once produced, too often prove incurable. The consequence is, that in a disease which above all others attacks the greatest number of the most important organs, his interference, as far as it has any influence, is conservative; he sees the impending danger and averts it; he protects the vital organs from a shock, which, but for him, would be fatal to them, while the very remedies employed by the ignorant practitioner increase that shock, and concur with the disease in producing death. The great distinction between the enlightened and the ignorant physician is, that the former knows the state of the internal organs, and adapts his remedies to that state; while the latter knows nothing of the morbid processes that are going on, and prescribes for a fancy or a name. Compare, in like manner, the knowledge which enlightened physicians now have of the diseases of childhood, with the obscurity in which the diseases of this period of life were formerly involved. Take, as an example, the knowledge now possessed of the true nature of a malady which used to be exceedingly frequent and almost uniformly fatal among children, namely, water in the brain. A child screamed out suddenly whilst at play. A change was observed in the child's countenance. A physician was sent for in alarm. He found the child restless, irritable, flushed, constantly moving its head on the pillow, the skin hot, and the pulse quick. In a few days the pulse became slow and intermittent; the child from being in a state of constant restlessness, attended with an occasional sudden shriek, fell into stupor; vomiting was often superadded; and in a day or two more, the pulse having become again extremely rapid, the child expired in convulsions. Such is the brief history of the attack, progress, and termination of a malady which used to destroy hundreds of children, and often individual after individual of the same family. But was the history of the disease really thus brief, and its progress really thus rapid? On the contrary, the concourse of symptoms was in fact exceedingly numerous, and their progress remarkably slow. The disease, at the point of time at which the history of it is here taken up, appeared to be seated solely in the head. The head, however, is the last part affected; the brain suffered entirely in consequence of its sympathy with other and distant organs. The disease commences in the abdomen. The child, long before it gave that ominous scream, had been fretful, hot, feverish, either without appetite or with voracious appetite, and those states of the appetite alternating with each other; either with a constipated or a relaxed state of the bowels, and those states also alternating with each other, the stools meantime being always unnatural, and the belly always tumid, hard, and oftentimes tender. These symptoms, because they did not lay the child prostrate upon its bed, were overlooked, or deemed of no consequence. But at last, from the total failure of all the means employed to save the child when the symptoms of brain disease came on, physicians began to take another view of the matter. They availed themselves of every opportunity they could obtain of inspecting the bodies of the children who died of this terrible malady. In the brain they found water indeed, but often only in very small quantity, and sometimes scarcely any; while there were always signs of inflammation, and, in general, signs of recent and active inflammation, in contradistinction to the signs which denote inflammation of a slow or chronic character. On looking farther, they found still more striking appearances of disease in the abdomen; appearances which denoted a disease of a slowly but constantly progressive character—the source of irritation to the whole system—an irritation not perceptibly yet uniformly increasing day by day. The real nature of the malady was now disclosed. The first appearances of disease were observed; the disease was attacked before it had time to be developed; the remedy was applied to the true seat of the malady, the abdomen, and not to the head, which as yet remained unaffected. Under early and judicious treatment, the head thus almost always remained unaffected; and now water of the brain in children is an exceedingly rare disease, hardly ever coming on but in neglected cases of disordered bowels—cases neglected on account of a more than ordinary degree of ignorance or inattention on the part of the mother or the nurse. This is an example of the manner in which an examination of the body, after death, has led to the detection of the true seat and nature of diseases; and it is but one example. A similar account might be given of almost every disease, the seat and nature of which are clearly and certainly understood.

It cannot be necessary to say more in illustration of the necessity of inspecting the body after death. The aversion to the dissection of the human body, which has hitherto prevailed in all ages and nations, is one among the many and grievous evils inflicted on man by superstition. It is the progress of civilization to change this aversion into respect and gratitude. A remarkable proof of this has been recently given by the legislature of our own country. The British legislature had already acquired a bad notoriety among the civilized nations of Europe, for allowing the continuance of a barbarous practice of a barbarous age—for permitting the schools of anatomy to be supplied with subjects for dissection by the odious means of exhumation. At length Scotland first, and afterwards England, gave an appalling lesson to the government of the consequences that sometimes follow its own criminal indifference to the public good. When roused from this lethargy by the appearance of a new species of crime, the possibility of which had been foreseen, and even the probability of the perpetration of which had been predicted, the legislature began to make a provision for the cultivation of anatomy. A part of the public press, conducted by minds base and vulgar, and, therefore, ready to seize occasions for exciting kindred passions, endeavoured to raise a clamour among the people against the purpose of the government. The attempt was a signal failure. Few had been previously aware of the extension of just views on this subject among the mass of the people. There was a profound and universal impression of the usefulness, nay, the indispensable necessity, of anatomy. The destination of his own body to the purpose of public dissection by the philosopher,[*] was scarcely regarded with wonder by the mechanic or even the labourer, though it excited a feeling of deep respect in both. At this moment there is scarcely a woman in the lowest rank who would not be ashamed to refuse permission to her medical attendant to examine the dead body of her husband or child. We trust enough has been said to show to every woman, of whatever rank, that the institution of such an examination is the paramount duty of the medical man; and to teach her that the practitioner, who is not anxious to avail himself of this means of extending his information and correcting his errors, is either too ignorant to appreciate the value of his best guide in the doubtful and difficult path he has to tread, or too much absorbed in a money-getting art to practise his profession as a science. (See *Use of the Dead to the Living*, by Dr. Southwood Smith; *Lecture delivered over the Remains of Jeremy Bentham, Esq., in the Webb Street School of Anatomy and Medicine*, by the same Author; Cooper's *Dictionary of Practical Surgery*, Art. Hæmorrhage, &c.)

ANA'TOMY, COMPARATIVE. The term 'anatomy,' as we have seen in the preceding article, is chiefly applied to the science which determines the nature and relations of the various organs of the human body. A general term is here used in a restricted sense. On the other hand, when we would express the extension of the science of anatomy to the whole animal creation, we employ the general term with the addition of the word 'comparative.' This anomaly has doubtless proceeded from the circumstance that, till within a very recent period, the study of animal structure was almost exclusively confined to the human subject; and that even zoologists were contented with inquiring into the functions of animals, instead of determining the character of the organs which were connected with those functions. By the term comparative anatomy, then, we understand the science which conveys to us a knowledge of the differences in the structure and organization of the whole animal kingdom in all its classes, orders, and species.

It is evident that a science possessing such an extensive range must be exceedingly imperfect; especially when it is borne in mind that scarcely half a century has elapsed since the first attempts were made to simplify, by systematizing, its almost infinite details. It has, however, made sufficient progress, not only to have furnished the most important aids to the study of human anatomy and physiology, but to have supplied a secure and broad foundation for all zoological knowledge, both as regards existing and extinct races. As the basis of modern zoology, comparative anatomy presents a subject of the highest interest.

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[*] By a will, dated as far back as the year 1769, Mr. Bentham, then a young man, left his body for public dissection. The reason at that time assigned for this is expressed in the following remarkable words:—'This my will and special request I make, not out of affectation of singularity, but to the intent and with the desire, that mankind may reap some small benefit in and by my decease, having hitherto had small opportunities to contribute thereto while living.' By a memorandum affixed to this document, it is clear that it had undergone his revision only two months before his death, (June 1832,) and that this part of it was again deliberately and solemnly confirmed. His body he devised to his physician, who was also his disciple and friend, who delivered a public lecture over it; the body was then used in the anatomical school in illustration of a course of lectures to students in anatomy; the skeleton and head, together with several of the organs, are preserved, the two former constituting one of the most beautiful preparations ever made.

Confining ourselves to this point of view, we shall endeavour to exhibit a few very general, and consequently imperfect, notions, of the principles of the science, as they are applied to a systematic arrangement of the animal kingdom.

In its connexion with zoology the universal knowledge of animal structure is properly called comparative; for it is the object of the science to establish those analogies in organization, which are to determine the separation of the vast number of beings that compose the animal kingdom, into classes, orders, and species. Without a knowledge of anatomical structure, at once the most minute and the most extensive, arbitrary distinctions would almost entirely prevail in the classification of species; and if we follow the history of systematic arrangement, we shall find that it began with the rudest and most empirical divisions, and did not assume the precision of a science until a knowledge of the organs, producing certain actions, took the place of the mere observation of the functions of animals without reference to their organs. The most ordinary observation of mankind would enable them to arrange animals into three great classes, according to their faculties of locomotion, and the general character of the place of their movements; and thus all beings would naturally be divided into those which swim in the water, those which fly in the air, and those which only walk on the earth. A more precise investigation would, however, show extreme differences between animals possessing the same sphere of locomotion. For instance, the great external differences of structure and habit would point out, amongst the inhabitants of the air, the necessity of forming two distinct groups, birds and insects; and the same degrees of difference, in terrestrial animals, would divide those which walk from those which creep. This observation of actions became connected with the observation of external organs: it was found that a large group of terrestrial beings might be separated from the rest of the animal world according to the number of their feet—from the birds who possess two feet, the insects who possess six, and the serpents who move without feet—by the name of quadruped, or four-footed. It was thus that the five great classes were established, of quadrupeds, birds, serpents, fishes, and insects.

When zoology assumed the character of a science, and ceased to be only a crude collection of isolated facts, (and this was not attempted before the labours of our own illustrious Ray,) it was gradually perceived that the most important class, that of quadrupeds, was a very unsatisfactory division. A cow was a quadruped, and so was a tortoise; but the one was covered with hair, the other with scales; the one produced its young fully formed and nourished them, the other laid eggs. For some time these contradictions were not reconciled, till science stepped in with the distinction of *viviparous* quadrupeds, and *oviparous* quadrupeds. In the first editions of the *Systema Naturæ*, Linnæus thus divided the animal kingdom: viviparous quadrupeds, birds, amphibia, (since changed for reptiles, and including serpents and oviparous quadrupeds,) fishes, insects, and worms. Nearly twenty years after the system of Linnæus had been given to the world, Brisson, a distinguished French naturalist, separated the cetaceous animals, or whales, from the fishes, and placed them next to the viviparous quadrupeds. He saw the anomaly of classing them with fishes, knowing that they suckled their young, and were in many other important characteristics of organization similar to the highest class in the animal kingdom. Linnæus acknowledged the importance of the distinction, and he even carried the principle farther than Brisson. He rejected the old division of quadruped, which excluded man at one extremity of the scale and the cetacea at the other;—and he adopted the name *mammalia*, which, expressing the mode in which the young of viviparous animals are nourished, makes this great distinction determine the first class of the animal creation.

Up to a certain point, and that reaching to the most important classes of animals, the system of Linnæus, thus amended, was strictly formed upon a view of the great characteristics of anatomical structure. The birds were separated from the mammalia by the evident distinction in their mode of producing and nourishing their young; although the two classes were similar in possessing the heart with two ventricles and two auricles, and having each warm and red blood: the amphibia (or reptiles), respiring by lungs, were separated from the fishes, breathing by gills; although the two classes had each a heart with one ventricle and one auricle, and the blood of each was cold and red. So far the arrangement of Linnæus, with regard to the four highest classes of animals, has been preserved by Cuvier especially, and other naturalists, who have endeavoured strictly to arrange the animal kingdom with reference to the organization of every species. These four classes have been subsequently formed into one great family of *vertebrated* animals; and all the lower classes have been comprised in a second family of *invertebrated*.

When we come to the invertebrated division, we find that the two classes of Linnæus, the insects and the worms, very imperfectly expressed the great differences in the various groups into which so many hundreds and thousands of species might be resolved, when they were viewed with reference to their structure. Cuvier, the most distinguished comparative anatomist that has ever appeared, applied himself to the removal of these omissions and contradictions. He commenced his great task of classifying the invertebrated animals in 1795, and completed his system in 1812. The principle upon which he proceeded was that of seeking some larger and more comprehensive arrangement than that of classes; and he accordingly laid down the following general table of the animal kingdom:—

Four divisions. (*Embranchemens.*)	Vertebrated animals.	(*Vertebrés.*)
	Molluscous animals.	(*Mollusques.*)
	Articulated animals.	(*Articulés.*)
	Radiated animals.	(*Rayonnés.*)

The first division, as we have before mentioned, comprehends the mammalia, birds, reptiles, and fishes of Linnæus. The second comprises those animals with shells that formed a portion of the worms of the old classification. The third includes all the insects of the same classification, and others that were formerly treated as worms; and the fourth, all the animals descending in the scale of being, including the remainder of the chaotic class of worms.

As the classification of Cuvier essentially depends upon organization, it may be desirable, in this place, to present a further Table of the System, in its extension to classes:—

Divisions.	Classes.	Number of Orders.	Examples.
First division. VERTEBRATA. Four classes. Twenty-seven orders.	1. MAMMALIA.	8	Man, Whale.
	2. AVES.	6	Eagle, Duck.
	3. REPTILIA.	4	Tortoise, Frog.
	4. PISCES.	9	Whiting, Lamprey
Second division. MOLLUSCA. Six classes. Fifteen orders.	1. CEPHALOPODA	1	Nautilus.
	2 PTEROPODA.	1	Clio.
	3. GASTEROPODA.	9	Snail, Limpet.
	4. ACEPHALA.	2	Oyster.
	5. BRACHIOPODA.	1	Lingula.
	6. CIRRHOPODA.	1	Barnacle.
Third division. ARTICULATA. Four classes. Twenty-four orders.	1. ANNELIDA.	3	Leech.
	2. CRUSTACEA.	7	Crab.
	3. ARACHNIDA.	2	Spider.
	4. INSECTA.	12	Beetle, Butterfly.
Fourth division. RADIATA. Five classes. Eleven orders.	1. ECHINODERMA.	2	Starfish.
	2. INTESTINA.	2	Tape-worm.
	3. ACALEPHA.	2	Actinia.
	4. POLYPI.	3	Sponge.
	5. INFUSORIA.	2	Monas.

In attempting to estimate the importance, and to point out the peculiar character, of a system of classification of the animal kingdom founded upon comparative anatomy, it will be impossible for us to enter into any minute details, interesting and instructive as they might be, which have reference to the distinctions of species; but it may be desirable to take a rapid view of the leading principles of the larger zoological arrangements.

The division of *vertebrated* animals is one which very happily marks a chain of affinities, connected with the gradual development of the highest organs and functions. The vertebral column is the necessary foundation of a skeleton: it supports the head; and the canal, which passes from one end of it to the other, incloses the common fasciculus of the nerves, which communicates with the nerves of the cranium. When we descend to the *invertebrated* animals, the skeleton no longer exists; the bony substance is altogether wanting, or is external, instead of internal; and the nervous system assumes an entirely different character, till it is gradually lost in the mere irritability of the lowest classes in the scale of animal life.

The organization of the first class of vertebrated animals,

THE ANIMAL KINGDOM.—ARRANGED ACCORDING TO THE SYSTEM OF CUVIER.

ANIMALS, arranged in Four DIVISIONS, Nineteen CLASSES, and Seventy-seven ORDERS.	DIVISION I.—VERTEBRATA; (Vertebrés,) arranged in Four Classes, and Twenty-seven Orders.	CLASS I. MAMMALIA, (Mammifères,) including Eight Orders.			ORDER I.	Bimana	(Bimanes)	Man.
					II.	Quadrumana	(Quadrumanes)	Chimpansea.
					III.	Carnivora	(Carnassiers)	Hyæna.
					IV.	Rodentia	(Rongeurs)	Rat.
					V.	Edentata	(Edentés)	Armadillo.
					VI.	Pachyderma	(Pachydermes)	Hog.
					VII.	Ruminantia	(Ruminants)	Cow.
					VIII.	Cetacea	(Cétacés)	Whale.
		CLASS II. AVES, (Oiseaux,) including Six Orders.			I.	Rapaces	(Oiseaux de Proie)	Hawk.
					II.	Passares	(Passereaux)	Swallow.
					III.	Scansores	(Grimpeurs)	Woodpecker.
					IV.	Gallinæ	(Gallinacés)	Cock.
					V	Grallæ	(Echassiers)	Heron.
					VI.	Palmipedes	(Palmipèdes)	Duck.
		CLASS III. REPTILIA, (Reptiles,) including Four Orders.			I	Chelonia	(Chéloniens)	Tortoise.
					II	Sauria	(Sauriens)	Lizard.
					III.	Ophidia	(Ophidiens)	Snake
					IV.	Batrachia	(Batraciens)	Frog
		CLASS IV. PISCES, (Poissons,) including Two Series.	Series I. Osseous, including 6 Orders.		I.	Acanthopterygii	(Acanthoptérygiens)	Sword-fish.
				Malacopterygii. (Malacoptérygiens)	II.	Abdominales	(Abdominaux)	Salmon.
					III.	Sub-brachiati	(Subrachiens)	Whiting.
					IV.	Apodes	(Apodes)	Eel.
					V.	Lophobranchii	(Lophobranches)	Hippocampus.
					VI.	Plectognathi	(Plectognates)	Sun-fish.
			Series II. Cartilaginous, or Chondropterygii, including 3 Orders.		VII.	Sturiones	(Sturioniens)	Sturgeon.
				Branchiæ fixed.	VIII.	Selachii	(Sélaciens)	Ray.
					IX.	Cyclostomi	(Cyclostomes, or Suceurs)	Lamprey.
	DIVISION II.—MOLLUSCA; (Mollusques,) arranged in Six Classes, and Fifteen Orders.	CLASS I. CEPHALOPODA, (Céphalopodes.)			(one)	Cephalopoda	(Cephalopodes)	Nautilus.
		CLASS II. PTEROPODA, (Ptéropodes.)			(one)	Pteropoda	(Ptéropodes)	Clio australis.
		CLASS III. GASTEROPODA, (Gastéropodes,) including Nine Orders.			I.	Pulmonia	(Pulmonés)	Snail.
					II.	Nudibranchia	(Nudibranches)	Glaucus.
					III.	Inferobranchia	(Inferobranches)	Linguella.
					IV.	Tectibranchia	(Tectibranches)	Bursatella.
					V.	Heteropoda	(Hétéropodes)	Carinaria.
					VI.	Pectinibranchia	(Pectinibranches)	Whelk.
					VII.	Tubulibranchia	(Tubulibranches)	Vermetus.
					VIII.	Scutibranchia	(Scutibranches)	The Sea-ear.
					IX.	Cyclobranchia	(Cyclobranches)	Chiton.
		CLASS IV. ACEPHALA, (Acéphales,) including Two Orders.			I.	Testacea	(Testaces)	Oyster.
					II.	Acephala	(Acéphales sans Coquilles)	Ascidia.
		CLASS V. BRACHIOPODA, (Brachiopodes.)			(one)	Brachiopoda	(Brachiopodes)	Lingula Anatina.
		CLASS VI. CIRRHOPODA, (Cirrhopodes.)			(one)	Cirrhopoda	(Cirrhopodes)	Barnacle.
	DIVISION III.—ARTICULATA; (Articulés,) arranged in Four Classes, and Twenty-four Orders.	CLASS I. ANNELIDA, (Annelides,) including Three Orders.			I.	Tubicola	(Tubicoles)	Amphitrita.
					II.	Dorsibranchia	(Dorsibranches)	Amphinomæ.
					III.	Abranchia	(Abranches)	Leech.
		CLASS II. CRUSTACEA, (Crustaces,) divided into 2 Sections.	Section I. Malacostracia, divided into 5 Orders. (Malacostracés.)	Compound eyes placed on pedicles and moveable.	I.	Decapoda	(Décapodes)	Gebia Stellata.
					II.	Stomapoda	(Stomapodes)	Phyllosoma.
				Eyes sessile and immoveable.	III.	Amphipoda	(Amphipodes)	Gammarus.
					IV.	Læmodipoda	(Læmodipodes)	Whale-Louse.
					V.	Isopoda	(Isopodes)	Anilocra.
			Section II. Entomostracia, divided into 2 Orders. (Entomostracés.)		VI.	Branchiopoda	(Branchopodes)	Branchipus (Cancer stagnalis)
					VII.	Pœcilopoda	(Pœcilopodes)	Dichelestium.
		CLASS III. ARACHNIDA, (Arachnides,) including Two Orders.			I.	Pulmonata	(Pulmonaires)	Phrynus. (Spider.)
					II.	Trachearia	(Trachéennes)	Phalangium.
		CLASS IV. INSECTA, (Insectes,) including Twelve Orders			I.	Myriapoda	(Myriapodes)	Centipede.
					II.	Thysanoura	(Thysanoures)	Velvet Spring-tail.
					III.	Parasita	(Parasites)	Louse.
					IV.	Suctoria	(Suceurs)	Flea.
					V.	Coleoptera	(Coléoptères)	Beetle.
					VI.	Orthoptera	(Orthoptères)	Grasshopper.
					VII.	Hemiptera	(Hémiptères)	Aphis.
					VIII.	Neuroptera	(Neuroptères)	Ant-Lion.
					IX.	Hymenoptera	(Hyménoptères)	Ichneumon-Fly.
					X.	Lepidoptera	(Lepidoptères)	Moth.
					XI.	Rhipiptera	(Rhipiptères)	Xenos.
					XII.	Diptera	(Diptères)	Gnat.
	DIVISION IV.—RADIATA; (Rayonnés,) arranged in Five Classes, and Eleven Orders.	CLASS I. ECHINODERMA, (Echinodermes,) including Two Orders.			I.	Pedicellata	(Pédicellés)	Star-fish.
					II.	Echinoderma	(Echinodermes, *sans pieds*)	Sipunculus.
		CLASS II. INTESTINA, (Intestinaux,) including Two Orders.			I.	Cavitaria	(Cavitaires)	Cerebratula. (Filaria)
					II.	Parenchyma	(Parenchymateux)	Planaria cornuta.
		CLASS III. ACALEPHA, (Acalèphes,) including Two Orders.			I.	Acalepha (simple)	(Acalèphes, simples)	Medusa.
					II.	Hydrostatica	(Hydrostatiques)	Diphyes.
		CLASS IV. POLYPI, (Polypes,) including Three Orders,			I.	Actinia	(Charnus)	Green Actinea.
					II.	Gelatinosa	(Gélatineux)	Cristatella.
					III.	Corallina	(à Polypiers)	Coral.
		CLASS V. INFUSORIA, (Infusoires,) including Two Orders.			I.	Rotifera	(Rotofères)	Wheel Animalcule
					II.	Homogenea	(Homogènes)	Globe Animalcule.

the mammifères, (*mammalia,*) presents an articulated skeleton, generally much more perfect than that of the three other classes of the same division. The greater number have four articulated limbs, parts of the skeleton; and all have a diaphragm between the chest and the abdomen; a heart with two ventricles and two auricles; the blood red and warm; lungs filling the cavity of the chest, through which the blood passes in the course of its circulation. These are the only viviparous animals, properly speaking. The distinctions of *orders* amongst the class of mammalia is principally derived from the differences in the character of the limbs and the teeth. The first five orders possess the common character of having nails at the extremities (*Unguiculata*). These animals are therefore possessed, more or less, of the power of seizing upon objects. The first three orders have also the common character of possessing the three sorts of teeth; the canine, the incisive, and the molar. But the first order (*Bimana*, Man) is distinguished by having hands (that is, four fingers and an opposable thumb) upon the anterior extremities only; while the second (*Quadrumana*) have hands at the four extremities; and the third (*Carnivora*) have no opposable thumb upon either extremity. The fourth order (*Rodentia*) have no canine teeth; and the fifth (*Edentata*) no incisive. The hoofed mammalia (*Ungulata*) form two orders, the *Pachyderma*, and the *Ruminantia*. These are unfitted, from the character of their extremities, for seizing upon objects; they employ them only for locomotion. The eighth order (*Cetacea*) have no hind-limbs developed; and their fore-limbs are very short, and flattened into the form of fins, by which they are fitted for an existence in the water, although it is necessary for them to breathe above the surface.

The second class of vertebrated animals (*Birds*) have many parts of their organization similar to the mammalia. They have a heart with two ventricles and two auricles; warm blood; the cavity of the cranium wholly filled with the brain; and the trunk completely formed by ribs. But, on the other hand, they are oviparous; they have no diaphragm; and only the vertebræ of the neck and tail are moveable. The blood of this class passes through the lungs before its distribution to the other parts of the body; but the lungs are not free; they are attached to the ribs; and the external air passes through them in its way to cavities which are dispersed through the body. It is this circumstance which gives them the power of flying, that is, of using their anterior extremities, or wings, which stand in the place of the fore-arms and fore-legs of the mammalia.

The third class of vertebrated animals (*Reptiles*) offer, in their several orders, very considerable differences in their external characters, and their general habits—much more so than either of the preceding classes. Some have the fore-limbs which distinguish the mammalia and birds; others have very imperfect rudiments of them; and in others they are wholly wanting. But they all agree in having but one ventricle to the heart; in the coldness of their blood; and in their imperfect respiration, consequent upon a portion of the blood passing through the lungs.

The fourth class of vertebrated animals (*Fishes*) differ essentially from the preceding classes. The limbs have disappeared, and fins supply their place; the skeleton is, in many species, very incomplete. They breathe by gills, or branchial openings, instead of lungs, and they have consequently neither trachea, larynx, nor voice. The two great divisions of fishes are the bony and the cartilaginous. In some of the latter, the peculiar character derived from the skeleton of the vertebrated animals has almost disappeared.

When we arrive at the second great family of the animal kingdom, the Invertebrated—when we endeavour to classify that vast series of beings, which, possessing no vertebral column, or skeleton, gradually depart more and more from what we consider the type of the highest organization—we are astonished as much by the extreme differences of the organs, faculties, and habits, of particular classes, as by the unbounded variety of the species which those classes contain. It is in this department of the creation that zoologists have encountered the greatest difficulties, especially since they have founded their science upon the distinctions of anatomical structure. At every step of their knowledge they have felt how much they have yet to know. They have, however, established many of the most important principles and facts.

In all this great family of the invertebrated animals, the supports of muscular action are not furnished by the internal parts of the body;—none of the classes or species respire by cellular lungs; none have a voice; and the nervous system, where any exists, has not its middle part inclosed in a cavity of bone. These are the great general distinctions between the vertebrated and invertebrated families. But the distinctions between the three divisions of the invertebrated animals, and the classes even of the same divisions, are so manifold and important, that we cannot attempt to furnish any adequate notion even of the general structure prevailing in each division, and must content ourselves with the most general outline.

The *Molluscous* division (*Mollusques*)—the fleshy bodies clothed with a shell—have a true circulation of the blood through arterial and venous vessels; they respire by branchiæ (gills); they have a brain, and possess a nervous system. Some have the organs of sight and hearing, while others appear to be limited to those of touch and taste. Some masticate their food, others can only swallow.

The *Articulated* division (*Articulés*), although possessing the common character which is indicated by their name, are so different in other important particulars of their organization, that we must briefly point out the leading peculiarities of each class. The *Annelida* have a long body, composed of rings; they are unprovided with articulated feet; they respire by branchiæ; have a system of circulation; and a long, knotted cord connected with the nervous system. The *Crustacea* have the body and the limbs articulated; the outer covering is bony, as their name implies; they have a system of circulation; and they respire by branchiæ. The *Arachnida* (often confounded with insects) respire by narrow tracheæ, and, not undergoing any transformations, have always articulated feet, and eyes in their head. The *Insects* undergo transformations; and have, in their perfect state, two eyes and two antennæ in the head, six articulated feet, and two tracheæ, which extend through all the body.

When we descend to the last division, the *Radiated*, (*Rayonnés*,) we find that some of the organs which appear to be essential to life, as we see them developed in the preceding divisions, do not exist. The nervous system, whether consisting of a spinal cord, or a system of ganglions, totally disappears; the sexual system does not appear to exist; the head, properly so called, is no longer found; and the organ of sight is extinguished. It is unnecessary for us to trace the last degree in the scale of animal life, to that point when the animal kingdom appears to lose itself in the vegetable; and when the investigations of man, however skilfully conducted, are baffled by the minuteness, as well as the number, of the objects which he desires to examine and to register.

As it may be desirable to refer to the general arrangement by Cuvier of the Animal Kingdom, in Divisions, Classes, and Orders, we have given, in the opposite page, a Synoptical View, translated, with some additions, from the table drawn up by M. Achille Comte.

(See Cuvier, *Leçons d'Anatomie Comparée;* Cuvier, *Ossemens Fossiles;* Blumenbach's *Manual*, by Lawrence and Coulson; Lamarck, *Philosophie Zoologique;* Geoffroy St. Hilaire, *Cours de l'Histoire Naturelle des Mammifères;* Home's *Lectures on Comparative Anatomy.*)

ANAXA'GORAS, a philosopher of the Ionic school, born at Clazomenæ, one of the Greek towns of Ionia, in the first year of the seventieth Olympiad, or in B.C. 500, three years before the death of Pythagoras, and ten before the battle of Marathon. Born both to rank and wealth, he had leisure to apply himself to philosophy and astronomy, under the instructions of Anaximenes. In the twentieth year of his age (that of the battle of Salamis) he went to Athens, where he continued thirty years, engaged in the propagation of his philosophical opinions. He numbered among his hearers Pericles, Euripides, Socrates, Archelaus, who succeeded him as head of the school known by the name of Ionic, and some say, Democritus. He obtained the surname of νοῦς (the mind). It is said that he was the first who taught the distinction between mind and matter: but this is improbable, unless we understand, the first who taught that doctrine at Athens. Of the persecution which drove him from that city, there are different accounts. One is, that he was accused of being in communication with the Persian king, and condemned to death in his absence; another, that he was banished for his opinions, and starved himself to death at Lampsacus; a third, that he was found guilty of impiety for his opinions respecting the Sun, and condemned to death, but saved by the intercession of Pericles; while Plutarch affirms that Pericles was his only accuser. Montucla, without citing his authority, says it was for an essay on the cause of eclipses that he was condemned. However this may be, he departed from Athens, and lived at Lampsacus on the Hellespont till his death, a period of twenty-two years. He died B.C. 428, aged seventy-two.

No works of Anaxagoras have come down to us, nor any astronomical observations from which we might form an opinion of his knowledge. He regarded the heavens as his country, and expressed himself to that effect when reproached for his indifference to his terrestrial birth-place. He is said even to have abandoned his wealth and honours from his zeal for study. When in prison he wrote a treatise on the Quadrature of the Circle; and he also wrote, according to Vitruvius, on Perspective. He is said to have written a treatise entitled *Actinographia*, which Montucla conjectures to be the last-mentioned work.

Among the various opinions attributed to Anaxagoras are the following:—that all substances are composed each of their proper parts, which are small and capable of infinite divisibility (see Lucretius, i. 830, &c.)—that the stars are stones torn from the earth, and set on fire by the æther which pervades the whole upper part of the universe—that the sun is a burning plate or globe, bigger than the Peloponnesus—that the moon receives light from the sun, (Plato says this opinion is anterior to him,) and has seas, hills, and valleys of her own—that the milky way is the shadow of the earth thrown upon the heavens: others say, he thought it consisted of stars of too feeble light to be seen by day—that the rainbow is caused by the clouds being held before the sun as a mirror—that winds are caused by the sun's heat rarefying the air—that earthquakes are caused by the effort of confined air to ascend—that snow is not white, but black (this opinion of his is reported by Cicero)—that the earth is flat, and that its inclination is the cause of the seasons—that the soul has an aërial body—and that sound and echo are conveyed to us by the air. Montucla protests against many of these opinions being supposed to be those of Anaxagoras, but we cannot see with what reason. That they are given by very various and doubtful authorities is true; but there is nothing so absurd in the opinions themselves, compared with others which we know to have existed at the same time, to warrant us in rejecting any one of them on that ground.

He is said, in the seventy-eighth Olympiad, to have foretold the falling of a large stone at Ægos Potami. [See AEROLITES, p. 151.] Sixty-two years afterwards, the prediction was said to have been fulfilled before the defeat of the Athenians on that spot by Lysander.

ANAXIMANDER, the kinsman, pupil, and successor in the Ionic school, of Thales, was born at Miletus in the third year of the forty-second Olympiad, B.C. 610, and died there (as is supposed) about B.C. 547, aged 63. Little is reported of him, except that he was the first who constructed maps (see Agathemerus, lib. I. cap. i.) and gnomons, one of the latter of which he erected at Sparta; and that he first discovered the obliquity of the ecliptic. The latter is improbable; though, if he were the first who constructed a gnomon, it is probable that he would also be the first who gave anything like a measure of the obliquity. He is said, on the authority of a passage in an ancient history of astronomy cited by Fabricius, to have maintained the motion of the earth; but as most others assert that he placed the earth in the centre of the universe, Montucla plausibly conjectures that the passage κινεῖται περὶ τὸ τοῦ κοσμοῦ μέσον, *moves round the centre of the earth*, should be read κεῖται περὶ, &c., *is placed at*, &c. Some say he thought the earth spherical; others that it had the figure of a drum. At Sparta he is said to have predicted an earthquake which threw down the greater part of the city.

The similarity of the names of Anaximander, Anaximenes, and Anaxagoras, who succeeded each other in the Ionic school, has caused many opinions to be attributed to one which are by others given to another. It is, however, we believe, said of Anaximander alone, that he believed the sun, moon, and stars to be enormous wheels, encompassing and revolving round the earth, each having a round orifice in its circumference out of which fire issued; and that the stoppage of this orifice is the cause of eclipses. The latter part of this opinion is also attributed to Anaximenes.

ANAXI'MENES, the pupil and successor of Anaximander. He was born at Miletus. The years of his birth and death are not known, but he is said to have been alive at the overthrow of Crœsus by Cyrus, B.C. 546. Two epistles of his to Pythagoras are preserved by Diogenes Laertius, the genuineness of which may be questioned, since one of them gives an account of the death of Thales (his countryman and predecessor) very different from that given by Diogenes himself.

The opinions attributed to him are very much like those quoted in ANAXIMANDER and ANAXAGORAS. He held, in addition, that air was the first principle of all things—that the contraction of bodies is what is called cold, and their rarefaction heat. This he illustrated by observing that when we blow forcibly, condensing the air with the lips, it is cold; when with the mouth wide open, so as to allow the air to pass freely, it is warm. This is almost the only thing like an appeal to experiment (except the very doubtful measurement of the obliquity—see ANAXIMANDER) which we can find attributed to any of the successors of Thales; and even in this the philosopher is wholly mistaken. The contraction of bodies, generally speaking, produces heat; and their rarefaction, cold. The case cited is not at all in point.

There is another equally inconclusive illustration of the causes of thunder and lightning. Anaximander concluded that thunder is the noise made by the striking of one cloud by another, and lightning the glare arising from the friction. Anaximenes reinforces this conclusion by the observation, that the sea shines when struck by an oar.

ANBURY and CLUB-ROOT, a sort of galls produced by insects on the roots of cabbages, turnips, holyhocks, and other species of cultivated plants, and popularly, but incorrectly, supposed to arise from peculiarities of soil, or from growing the same crop successively on the same field, or to be owing to variations of seasons. Nothing can be more simple than the disproof of all these theoretical notions. If we take some of the cabbages or turnips, whose roots are infected with anbury, and keep them in garden pots covered over with close gauze, in a short time, if the plants be kept growing, the little weevils, evolved from the grubs in the interior of the roots, will make their appearance, ready to multiply their species, by depositing their eggs, as their parents had done, on the first turnip or cabbage they can find; then is the critical time to destroy them, and prevent their increase. The weevil thus arising continues to be no less, but often more, destructive than the grub had proved to be in feeding on the roots; for it thrusts its beak (*rostrum*) into the seed-leaf of the turnip, and greatly injures the crop. Neither of these insects would ever breed in dung. When the turnip is advanced to the rough leaf, these insects either die, as most insects do, when they have laid their eggs, or betake themselves to some other plant, such as clover, which is suited to their taste.

It will be therefore evident, that no peculiar rotation of crops, nor peculiar manure for dressing the soil, can be of any avail in preventing anbury, or in stopping its progress when the insects have obtained a lodgement within the roots. The destruction of the adult insects before they have laid their eggs, is the only remedy, though in the case of so small a species, it is peculiarly difficult to put in practice.

ANCENIS, a town in France in the department of Loire Inférieure (the Lower Loire). It is a neat, pleasant town, situated on the north bank of the Loire, nearly twenty-two miles N.E. from Nantes, the capital of the department. It trades in corn, wood, fruit, wine, brandy, and vinegar. There is an ancient castle commanding the town, long inhabited by the dukes of Bethune. Ancenis has also a '*college*' (high school), hospital, and barracks for cavalry. Population, 3145 (Malte-Brun); or 4000 (Balbi). The arrondissement of Ancenis contains about 41,000 inhabitants.

ANCHOR (from ἄγκυρα), a heavy iron instrument for fixing a vessel in a harbour or road, thence called an *anchorage*. It consists of a strong bar called the shank, having, at one end, a beam called the stock, which lies flat when at the bottom, with a ring beyond it, to which the cable is attached; it terminates at the other end in two opposite arms at right angles to the stock, to which are attached strong triangular plates, called flukes.

The anchor, which, under some form or other, must have been as antient as vessels of any magnitude, is accordingly mentioned by many Greek and Latin authors, by whom also the invention, like many others, which, from clumsy beginnings, have passed through many stages of improvement, is ascribed to various persons. The first anchors were, most probably, what they are now among uncivilized nations, namely, large stones, or crooked pieces of wood loaded with heavy weights. The Chinese, who may be supposed to adhere to antient forms, are said to use chiefly crooked pieces of heavy wood.

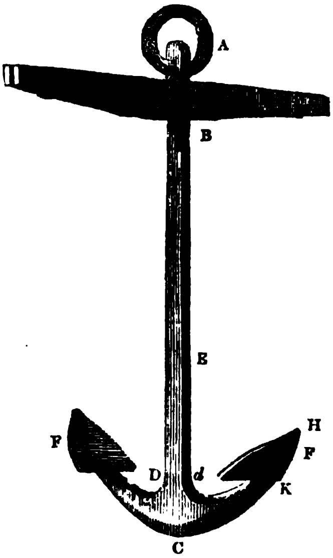
Among the Greeks, the anchor was made latterly of iron. The first anchors had but one fluke; afterwards the other was added: but the anchor was yet without a stock, as appears from antient monuments, and must have been very incomplete till the stock was added, which may, therefore, be considered as the last step towards the present form. Each ship then had several anchors; the chief one was called ἱερα, or sacred, and reserved for the last extremity. The custom and its proverbial application have come down to us in the expression 'sheet anchor;' but the veneration paid to its name has much declined since the custom of paying 5*l.* to the master on letting it go was discontinued in the navy.

The number of anchors carried at both the bows and stern of a ship have been finally reduced to four principal, and these all at the bows. The anchors supplied to men-of-war are the best and small bowers*, the sheet, and the spare: these are of the largest size; to which are added, the stream and the kedge, which are used for particular or for temporary purposes, and are usually carried 'in board.' Since there is but small difference in the form of anchors of different weights, the stream of a large vessel serves for the bower of a smaller. The several parts of an anchor are shown in *fig.* 1.

The principles of the construction may be considered under two heads,—the purposes the machine is to fulfil, and the nature of the strains to which it is exposed. We will take at once the modern form to exemplify these considerations.

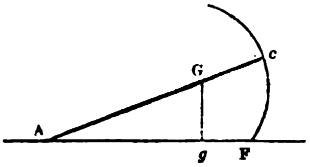
When the anchor is let go from the vessel's side, whether from a horizontal position of the shank (when it is held by the stoppers) or from a vertical position (when held entirely by the cat-stopper), as in *fig.* 1, the heaviest end, or crown, will tend to descend fastest, and the anchor, on having reached the bottom, will, most commonly, fall,—not in the position for holding, but upon the crown and on the end of the stock, because the stock moves with less resistance through the water in the direction of its length than of its breadth. From this position, therefore, the anchor is to be turned over or canted before it can hold. Now, it is evident that, if the stock were very short, the pull of the cable would tend rather to drag the end of the stock along the bottom than to lift up one of the flukes, as must be done in canting the anchor; whereas, if the stock were longer, the cable would act with increased leverage, whatever might be the length of the shank in either case; hence the longer the stock, within the practical limits of stowage, the more certainly will the anchor turn properly, and, when hooked in the ground, the more powerfully will it resist any effort to overset it. Also, it is evident that the anchor will turn the more easily as the arm is shorter. In repairing old anchors, it is common to shorten the shank; in doing this, it is the custom also to shorten the stock in the same proportion. This, which is equivalent, in fact, to lengthening the arms, might, if carried to any extent, prevent the possibility of the anchor turning over, and therefore it appears that when the shank is shortened, the stock should remain unaltered. The amount of force required thus to overturn any given anchor might be found by calculation, or by actual trial; and it is remarked that the result of the former may be diminished by one-seventh when the anchor is under water.

Fig. 1.



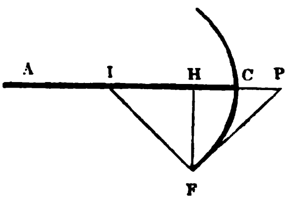
A The ring.
B The stock.
B D The shank.
C The crown.
C H The arm.
D, *d* The throat.
E The trend, at one-third of C A.
F Palms or flukes, of equal base and height
B, *b* The small.
H The bill or peak.†
The end of the shank or A is called the nut.

Fig. 2.



The anchor being in the position of *fig.* 2, its weight, supposed to be collected at the centre of gravity, G, (not including the stock,) tends to force the fluke F into the ground; and this pressure on F will evidently be greater, as the vertical line Gg passes nearer to F; this pressure is $W.\frac{A\,g}{A\,F}$, (W = the weight, exclusive of the stock). As soon as the cable pulls from A, it causes the fluke to catch or hook deeper, that is, it forces the fluke down; and the position of the fluke should be such as to form the angle most favourable for this purpose.

Fig. 3.



Suppose the arm C F imbedded, or the shank lying along the bottom, and the cable acting in the line C A with a tension t; then the pressure on the fluke taking place perpendicular to its surface, draw F I perpendicular to the fluke, and draw F P, tangent to the fluke, meeting A C produced in P; then if P I represent the tension t of the cable, I F will be the perpendicular reaction of the fluke, and P F the force which tends to drive it into the ground: draw F H perpendicular to C A, then H F is that part of P F which is perpendicular to the horizon, or is the effort of t to sink the fluke: let I P F = a, then F P = $t \cos a$, and F H = F P $\sin a = t \cos a \sin a$, which is a maximum when $a = 45°$; or the fluke should be placed at 45° to the shank. Now, it is remarked by seamen, that when an anchor is once started, it is difficult and often impossible to get it to hold again, and as this case is the most urgent of all, it is apparently the one to which the position of the fluke should be calculated.

It would appear, since the weight of a large anchor bears a much higher ratio to any given tension of cable than the weight of a smaller one, that the solution of the problem ought to involve the weight of the anchor, which would give a different angle for anchors of different weights; but it appears from numerous experiments which Lieut. Rodger has made on the qualities, as well as on the strength, of anchors, and which it is to be hoped will be made public, that an anchor, when dragged, always tends to rise out of the ground, thus following the direction in which the loosened soil affords a free passage;—since, therefore, it will not sink till it rests, and since its weight becomes less effective in pressing it farther the deeper it sinks, while the tension of the cable remains the same, it is thus constantly tending to the most favourable angle (when = 45°) till the arm is entirely buried.

It appears from *fig.* 2, that in shortening the shank, the fluke, making already in most anchors the angle with the shank, or F P I in *fig.* 3, too great, will become still more nearly perpendicular to the horizon. In many such cases the pull of the cable will produce scarcely any tendency whatever to sink the fluke; besides which it is to be observed that by lessening the horizontal distance A F, while Fg remains the same, the pressure on the fluke is diminished, and thus on both accounts the qualities of the anchor impaired.

We now come to considerations relative to the strength of the anchor. It is obvious we have not the means of determining the amount of any of the forces concerned, but long experience has marked pretty nearly the limits beyond which the dimensions of anchors need not be carried. With these we can determine satisfactorily the preference which should be given to one form over another.

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* Called formerly bowyers, from being carried at the bows. (Harris's *Lexicon Technicum.*)

† Seamen by custom drop the k in peak and fluke, which they pronounce pea and flue.

The first strain that comes on the anchor when the cable is strained falls on the ring, which had been often broken or straitened, till its dimensions were of late years increased. This pull is conveyed along the shank to the lower arm, which it tends to break off at the greatest distance from the fluke, and therefore the thickness of the arm should increase towards the throat.

The crown, which formerly was a circular arc, of late years formed an angle, till changed by Mr. Pering.

The force to break the arm C F, *Fig.* 3, is the reaction perpendicular to the fluke, or FI, against the tension of the cable. And the moment of this force to break the arm C F at C, is as the perpendicular from C on F I. If the arm F C be straightened into F P meeting A C in P, then the moment of the same force is as P F, which is considerably greater than before. It would be curious, therefore, to know what reason led to change from the curved to the angular form.

In lifting or weighing the anchor, the cable acting perpendicularly to the end of the shank tends to break it, and hence the thickness of the shank should increase with its distance from the ring; also the breadth of the shank should be downwards, and the like holds good of the arms, the chief dimension of which should be in the plane of the cable and shank, thus opposing the greatest strength to the greatest strain. Some foreign anchors reverse this. The cable being thus 'up and down,' the smallest motion of the sea is carried to the anchor, and it is supposed that the chain-cable has thus, from its want of elasticity, frequently broken the anchor. An increased length of shank obviously renders this jerk less sudden and less severe: but increasing the length would require an increase of size or strength of the shank, whose length had already been found too great for the strength necessary in the employment of chain-cables; in order, therefore, to obtain this increase of length without either increase of weight or loss of strength, Lieutenant Rodger constructed his patent hollow-shanked anchor. The principle on which a hollow rod or bar is stronger than a solid one of equal sectional area is well known, but we cannot, within our limits, convey any precise notion of the manner in which the difficulties which attended the application of this principle to the shank of the anchor, were surmounted. An account, with drawings, is given in the *Repertory of Patent Inventions of July*, 1830, in which are given also the results of experiments tried at Hawks and Co.'s manufactory, Newcastle; from these it appears that his anchor broke short-shanked anchors of much greater weight without indicating any distress; and similar superiority has been exhibited on some other occasions.

Since the fluke from its breadth opposes greater resistance to being disturbed in weighing than the arm does, the axis of rotation will be towards the fluke, and accordingly the ground displaced by the angular motion of weighing being less than that displaced by fair pull,—and moreover the fulcrum or axis being near the throat in direct pull,—it seems that the force to lift an anchor out of the ground will be considerably less than the force sufficient by fair pull to bring the anchor home. Besides these strains to which the anchor is exposed by its office, it is liable to accidents; for instance, an anchor let go on a rocky bottom has been found, on heaving it up, to have lost an arm, which was, probably, caused by its striking against a rock obliquely in its descent; and this opinion is corroborated by the case recorded by Mr. Pering, of an anchor broken by swinging from the wharf against the side of the lighter brought to receive it. Again, the shank has been found broken in the middle, though this does not seem to have been accounted for satisfactorily, whether attributed to the chain-cable or to a sudden jerk; and it may here be observed generally, that the anchor descends much more swiftly with a chain-cable than a hemp one, for the stiffness of the hemp opposes a retarding force, while the greater density of the chain adds a continually accelerating force.

The shank and arms were formerly made of iron bars, welded together;—that this was done very imperfectly appears from the fractures in the old anchors. The arms and shank being made separately, were then joined together. A great improvement was made by Mr. Pering, who formed the shank of flat bars, of breadth equal to the depth of the shank, which could be perfectly united. But the greatest of his improvements is considered to be the formation of the arms and part of the shank together, which is done by splitting, or dividing in two, these bars, and throwing the ends back opposite ways for the arms. Over the opening, or angle thus formed, is fixed a truss, and then to this are joined the flukes, and at the other end the remaining part of the shank. The bars are placed with their breadths downwards, thus receiving the strength of the cable in weighing, edgewise; Mr. Rodger places the breadths horizontally, forming the upper and lower halves of the (solid) shank separately, to be united afterwards, in order that the iron may bend rather than break, and with this object the iron is likewise drawn out to make it fibrous.

Various rules have been given for the dimensions of anchors, as, for instance, that the shank should be four-tenths of the main beam (Aubin's *Mar. Dict.*); but it is evident that neither beam nor tonnage relate directly to the magnitude of the anchor, because two similar ships may ride very differently at their anchors. The rough rule in the navy is 1 cwt. to a gun, thus an 80 gun-ship will have an anchor of 80 cwt.; and a merchantman of 200 tons having an anchor 10 cwt., 5 cwt. is added afterwards for every 100 tons; thus 300 tons would give 15 cwt., and so on.

The principal dimensions of the anchors in the navy may be stated shortly thus:—calling the shank 10, the arm is about 3, the breadth and depth of the palm about half this, the thickness or depth at *b*, or the small, ·42, at the throat ·6, which are nearly the dimensions of the arms also, and the breadths about $\frac{4}{5}$ of these, the edges being rounded. These general dimensions are taken from Pering's *Treatise*, 1819, since which other alterations have been made, principally in giving the section a diamond or lozenge form.

The weight of an anchor of 10 feet in length is, according to the same authority, about 11·4 cwt., and since, if the forms of all anchors were alike, the weights would be as the cubes of the lengths, the weight of any anchor might be found by multiplying the cube of its length by ·0114. Thus the weight of an anchor of 14 feet in length would be $14^3 \times \cdot 0114 = 31 \cdot 3$ cwt.; the weight of this anchor is, by the table, 30 cwt., hence as far as 30 or 35 cwt., the rule is near enough, but for larger anchors it gives the result too small, because their thickness is made greater in proportion. The weight of the anchor includes that of the ring.

As to the cost of an anchor, the labour per cwt. is about 24*s.* for an anchor of 10 cwt. and under, and for the largest anchors about 3*l.*; the value of an anchor of 95 cwt., including the iron at about 9*s.* 9*d.* per cwt., is about 300*l.*

The stock consists of two beams of oak, bolted and hooped together; the length is that of the shank and half the diameter of the ring; it is square; the side at the middle is an inch to a foot of the shank, and tapers to half of this at the end. Such a stock is nearly one-fourth of the weight of the anchor. Lieutenant Rodger has proposed a solid stock of African oak, for the greater convenience of stocking or unstocking.

Of late years iron stocks, whose weight is from one-fourth to one-fifth of the anchor, have been much used. Whatever convenience may attend them in small vessels, it seems very clear that their smaller diameter and greater weight under water will cause them to sink deeper in a soft bottom in the event of the anchor not turning over at once, and thus render this more difficult to do, especially as their length is limited to that of the shank. Small vessels require heavier anchors in proportion than larger vessels; the sea, sudden gusts of wind, and the pull of the cable affect the larger vessels less, and they thus preserve a steadier strain.

In forging an anchor, care is taken not to render the iron brittle. The effect of the hammer is to harden the surface by contracting it more than the interior. This is remedied by heating the whole to a dark red-heat, which, by expansion, restores the iron to a uniform state, and it is then suffered to cool gradually. This process is called annealing. A large mass of iron requires a very heavy blow to work it equally, or the outside only will be affected by the hammer; the steam-engine is applied for this purpose in Woolwich dock-yard.

Various forms of anchors have been proposed to answer particular ends; these our limits prevent us from entering upon. We have confined ourselves rather to the principles of the machine, which seem to have been very little considered, and have omitted several points. (See the *Encyc. Metrop.*, Pering's *Treatise on the Anchor*, &c.)

An anchor is said to be 'foul' when the cable is any way entangled with it; to 'come home,' when the ship drags it; to be 'a-wash,' when the stock is hove up to the surface of the water; to be 'a-cock-bill,' when hanging vertically, as in *fig.* 1.

A'NCHORET, sometimes written, and more correctly, Anachoret, a Greek word, signifying a person who has retired from the world. Under Christianity they sprung up about the middle of the third century in Egypt and Syria, where many believers came to hide themselves in caves and solitary wilds, from the fury of the persecution which arose under the Emperor Decius. Paul, commonly called the hermit, has the credit of having been the first regular anchoret. A distinction, however, came afterwards to be drawn between anchorets and hermits; the former name being given only to those who rigidly confined themselves to their caves or cells, and the latter to those who, although they had broken off all commerce with the world, still wandered about at large in the wilds to which they had retired. Both descriptions of recluse were entirely distinguished from the Cœnobites, or those living in communities. Many of the anchorets were laymen; and there were also female as well as male anchorets. From nearly the commencement of the seventh century, the church assumed a jurisdiction over anchorets; and persons were not allowed to enter upon the mode of life in question except by permission of their ecclesiastical superiors, and after an appointed ceremony had been performed, at which the bishop presided. Churches and religious houses in the middle ages would sometimes keep an anchoret shut up in a cell, which was usually attached to the choir of the church. Such an attraction brought great crowds of the devout and the curious to the holy place, which benefited much by their offerings. It was eventually found necessary, in our own as well as in other countries, to lay down certain regulations with a view of discouraging the adoption of this solitary life. The most singular species of anchorets recorded in the history of the church, is that which arose in Syria in the fifth century, and of which Simeon Stylites was the founder. This zealot and his followers, instead of resorting, according to the customary fashion, to caves, elevated themselves into the air, on lofty pillars of stone, on the tops of which they passed their lives. They have hence received the names of pillar saints, holy birds, and aërial martyrs.

ANCHOVY (*Engraulus*, Cuvier), a genus of abdominal malacopterygious fishes, separated by Baron Cuvier from the *clupeæ* or *herrings* of Linnæus, from which they are distinguished by the superior number of their branchiostegous rays, amounting to twelve or upwards, by the gape of the mouth extending behind the eyes, and by the straight and prolonged form of the superior maxillary bones, which form a small muzzle, projecting considerably beyond the mouth. The genus, as at present constituted, consists of six or seven species, all of diminutive size, and with the exception of the common anchovy (*E. encrasicholus*), and a nearly allied species distinguished from it by M. Cuvier, (*E. meletta*) all inhabitants of the tropical seas of India and America. Whether these latter agree with the European species in the savour and other qualities of the flesh, for which it is so highly esteemed among civilized nations, is a doubtful question; at all events we are not aware that the fishing of the native species has ever been attempted either in America or India.

The common anchovy is a small fish, not much longer than the middle finger, of a bluish brown colour on the back and silvery white on the belly. The anal fin is remarkably short, and the dorsal situated immediately above the ventral; these characters will serve readily to distinguish it from the sprat and other kindred species, with which it might otherwise be confounded, and which are, in fact, not unfrequently imposed upon the public for the real anchovy. It abounds in the Mediterranean along the shores of Spain, Italy, and Greece; in the Atlantic it is found along the coasts of Portugal and France, and occasionally has been taken off the shores of England and Holland. Considerable fisheries of anchovies are established along the coasts of Provence and Catalonia; but the most productive of all is off Gorgona, a small island west of Leghorn. The latter fishery is carried on only during the months of May, June, and July, at which period the anchovies quit the deep seas and approach the shores for the purpose of depositing their roe; it is then only that they are found in the Mediterranean, which they enter in enormous shoals, by the straits of Gibraltar, at the commencement of the breeding season, and leave it, after fulfilling this duty, to retire again to the depths of the Atlantic. They are fished for only during the night, and are attracted round the boats by means of charcoal fires which are kept burning in the sterns. After being caught, the heads, gills, and entrails are separated from the bodies, which are salted and arranged in small barrels, varying from five to twenty pounds in weight: this is the only preparation which they undergo, previously to being sent to market; and if proper means be taken to exclude the air, they will in this state keep for a very considerable period. If, when the barrels are opened, the fish are found to be small and firm, round-backed, with a silvery white skin and red flesh, and a plump, compact form, they are probably the true anchovy: if, on the contrary, they taper very much towards the tail, are of a dark brown colour without, and have flabby pale-coloured flesh, they will probably turn out to be the sardine (*E. meletta*), another Mediterranean species frequently mixed with real anchovies, or even sold separately as the genuine fish.

No condiment is more generally known and esteemed than anchovy sauce. Among the Romans, who called it garum, and prepared it exactly in the same manner as we do at present, its reputation was, if possible, still greater than among modern nations, and it appears to have formed an indispensable article of seasoning in their most expensive and luxurious dishes. The mode of preparing anchovy sauce consists simply in bruising and boiling the fish over a slow fire with melted butter; the action of the heat dissolves the whole body to a jelly, and in this form, when brought to a proper consistence, it is potted or bottled for use. This is the most common form of using the anchovy, but it is also sometimes brought to the breakfast table whole, and is then eaten raw. The importation of anchovies into the port of London is very considerable. Up to the year 1829 the average quantity annually imported amounted to about 100,000lbs. In that year, however, the duty was lowered from a shilling to twopence a pound, in consequence of which the importation of 1830 amounted to 260,000lbs, but declined in the following year, 1831, to about 30,000 lbs.

ANCHOVY PEAR. [See LAURUS.]

ANCHYLO'SIS, a Greek word (ἀγκύλωσις), signifying *a bending*. If the Greek orthography were strictly followed, the word would be written *ankylosis*.

An essential part of the apparatus of locomotion in animals consists of the structure termed a joint. (See JOINT.) Joints are so constructed as to produce various kinds and degrees of motion, in the execution of which it is necessary that the different parts constituting the joint should be in close contact with each other. Organized living surfaces, in close contact with each other, have a tendency to grow together; but such a union would at once destroy the action of a joint, and a specific apparatus is provided for the express purpose of preventing this event. What are termed articular surfaces, that is, the surfaces of joints, are covered with a thin and delicate membrane which secretes a peculiar fluid of an unctuous or oily nature, termed *synovia*. This synovia, the oil of joints, is in general effectual in keeping separate and distinct the different parts of the joint, however closely and for however long a time they may be in contact with each other; nevertheless, it does occasionally happen that a firm and complete union takes place between the different articular surfaces: when this occurs, it constitutes what is technically termed anchylosis, or, in common language, a stiff joint. An anchylosis, or a stiff joint, consists then of the immoveable union of two bones naturally connected together in such a manner as to form a moveable joint. All the moveable bones forming joints may become consolidated together, or anchylosed; and cases are on record of a general anchylosis of all the bones of the human body. Whatever keeps a joint motionless for a long time together may give rise to anchylosis. Hence it is apt to occur after the fracture of a bone in the neighbourhood of a joint; because it is necessary to the cure of the fracture that the limb should be fixed in one position, while the inflammation, occasioned by the violence that produces the fracture, often spreads to the joint, and it is one of the ordinary effects of inflammation to agglutinate and consolidate the parts inflamed. Hence inflammation, sprains, dislocation, shocks occasioned by leaping or falling on the feet from great heights, ulcers, are the common causes of anchylosis. But anchylosis cannot always be considered in the light of a disease; at any rate, it is sometimes the happy termination of a formidable malady. The natural cure of many painful and dangerous diseases of the joints is the formation of an anchylosis. When an anchylosis is forming, and is clearly inevitable, and is, indeed, a thing to be desired, the position in which the limb is kept, or the position in which the bones are allowed to unite, is a matter of great importance to the future comfort of the individual. When, for example, from injury done to the hand, the joints of the fingers are undergoing the process of anchylosis, it is very important to keep the fingers bent, because, if they anchylose in that position, the hand will be more useful than it could be were the fingers permanently extended. On the contrary, when there is danger of anchylosis of the knee-joint, the limb should be kept as straight as possible, because, if the leg be extended, the limb will be more useful than if it were permanently bent. On the other hand, when anchylosis of the elbow-joint cannot be prevented, the limb should always be kept bent. Considerations of this sort are of great importance; they are never neglected by the intelligent surgeon; and they tend to lessen the inconvenience and suffering of an inevitable calamity. They ought in every such case to be presented to the view of the patient, who should be made to understand, as far as possible, the ground on which the plan that may be pursued is adopted, in order that he may co-operate with his medical attendant in lessening the evil that cannot be averted, and in securing whatever advantage it is possible to obtain.

ANCIENT, ANCIENTS; or ANTIENT, ANTIENTS. The term *ancient*, which we derive from the French word *ancien*, has the primary meaning of 'very old,' as when we say 'an ancient building,' 'an ancient family,' implying only that many generations have passed since they first came into existence. But it is also used in a more limited sense, with reference to a certain period in the existence of the human race; as when we speak of ancient, as distinguished from modern, history; of the ancient classics, ancient literature, and generally, of the *ancients*. The boundary line between ancient and modern in this latter sense is not very accurately drawn; but according to the vulgar acceptation of the terms, the period of the ancients seems to be closed by the final and complete overthrow of the western Roman empire. With reference to the nations over which that empire extended, the distinction is not altogether arbitrary, or without an intelligible reason. The overthrow of the Roman empire marks the commencement of a new order of things, when we begin to discover the rudiments of those powerful independent nations, of those various languages, and peculiar institutions, which so remarkably distinguish a large portion of what is called modern Europe, from Europe under Roman dominion. There is of course a short interval, which may be considered as doubtful ground, for the possession of which the terms ancient and modern will always be allowed to contend.

It is plain that the reason here given for the commonly received distinction is applicable only to the west and south of Europe; yet the same distinguishing terms are familiarly used, and in many cases the same date arbitrarily assumed with reference to the rest of the world. This practice is attended with many difficulties, and produces no little confusion. The eastern Roman empire, for instance, survived the western by many centuries; nor can any good reason be given why the subjects of Justinian and his predecessors should be classed among the ancients, and those of his successors among the moderns. If the question were asked, where should a Greek author in a late period of the eastern empire be placed, we could not call him either an ancient or modern Greek writer without giving cause for considerable misapprehension. In the case of the oriental nations, the same terms are still applied, and often perhaps with no very distinct notion of their import, even by those who employ them. We hear commonly of ancient and modern Persia, ancient and modern India. Now, in the case of the Persian empire, in seeking for a date, we might choose between the conquests of Alexander the Great, the irruption of the Parthians, the restoration, as it is called, of the old Persian dynasty, and its subjugation by the Mohammedans. Any one of these events, and especially the last, would furnish perhaps better ground for the distinction of ancient and modern Persia, than any thing which occurred at the time of the overthrow of the Roman empire.

It might be expected that the convenience of having at hand such terms as ancient and modern would often lead to some abuse, and this is particularly observable in the vague reference so frequently made to 'the ancients.' There is no definition which excludes from their number any who lived from the time of Noah down to the last Roman emperor; and it is obvious, that there is not much which can be safely predicated of a class so large and comprehensive, yet we often hear of what 'the ancients' said, and did, and thought. Allusion is made to the military tactics or the philosophy of the ancients; comparisons are instituted between the literature of the ancients and moderns; and we are told of the sentiments on certain subjects entertained by the heathen ancients. The truth is that, by 'the ancients,' we must understand, on many of these occasions, Greeks or Romans at certain periods of their national history; and even thus limited, there are few assertions which will hold good of 'the ancients' generally. For the most part, perhaps, the looseness of the expression is corrected and limited by the subject or the context; but it is also true, that real misapprehension has arisen from the practice of throwing together and confounding the most dissimilar things by the help of this comprehensive term.

This is not the place to enter on the consideration of ancient and modern history, but there is an evil in some measure connected with the use of these terms, which it may be worth while to notice. It is to be feared that the common division of the subject of history into two parts, ancient, and modern, too often conveys the notion of an actual separation which does not exist. The young student pictures to himself a great gulf between them. When busy with the ancient part of the subject, he imagines himself to be conversing with beings of a different nature from himself. He believes the narrative, but is affected by it much as he would be by a work of fiction. When he has crossed the gulf, and passed from the obscure regions of ancient history into the stronger realities of modern times, he converses freely with beings of the same flesh and blood with himself. It is not requisite to enumerate all the bad effects which must arise from this impression. It is evil enough that the student must necessarily overlook the important fact, that the subjects of what are called ancient and modern history are so far one and indivisible, that a liberal and comprehensive view of the ancient part is necessary for the profitable study of the modern.

ANCILLA or ANCILLA'RIA, are the names given by Lamarck to a genus of spiral, univalve, marine shells, allied to the olives. Like them they are covered with a hard shining coat, destitute of any periostraca, and are immured in the large foot of the animal, so that the middle of the back of the shell can be alone discovered. They chiefly differ from the *olives* in the suture of the whorl, being callous and not furnished with a groove, formed by a thread-like filament placed at the end of the mantle, which is wanting in this genus: they are also furnished with a small ovate operculum. The species are numerous, and are chiefly confined to tropical climates: some have a small tooth, like the unicorn shell (*Monoceros*), placed at the end of a groove crossing the front of the shell. The best known species is the *ivory shell*, which with a few others differ from the rest of the genus in having the front of its axis deeply pierced.

ANCILLON (CHARLES), the son of David Ancillon, was born at Metz, on the 28th of July, 1659. After having studied at Marburg, Geneva, and Paris, he was admitted to the bar in Paris, and then commenced the practice of his profession in his native place. He was obliged, however, along with his father, to leave Metz on the revocation of the Edict of Nantes. When the elder Ancillon some time after settled in Berlin, Charles followed him thither, and the elector of Brandenburg appointed him judge and director of the French inhabitants of that city. He was afterwards promoted to the offices of inspector of the tribunals of justice for the refugees in Prussia, superintendant of the French school, and royal historiographer; and was also employed by the elector on a diplomatic mission to the Swiss Cantons. He died at Berlin on the 5th of July, 1715. Ancillon, who was one of the most learned lawyers of his time, is the author of various works, both upon subjects connected with his profession and others, the principal of which are enumerated in the *Biographie Universelle*, our authority for the above facts. The production for which he is now chiefly remembered is his *Traité des Eunuques*, 12mo., 1707, which is said to contain a great deal of curious learning.

ANCILLON (DAVID), a very learned French Protestant clergyman, the father of the subject of the preceding article. He was born on the 17th of March, 1617, at Metz, where his father was an eminent lawyer. Having attended for some years the Jesuits' College there, he went to Geneva, in 1633, to complete his studies in philosophy and theology; and in 1641, was licensed to preach by the synod of Charenton, and appointed minister at Meaux, the most important of the stations under their jurisdiction then vacant. Here he remained till 1653, having in the mean time married a lady of large fortune. The match is stated to have been arranged by his congregation, with the view of retaining him among them. In 1653, however, he accepted a call to his native town of Metz; and here he continued to officiate with great reputation till the revocation of the Edict of Nantes, in 1685, when he retired to Francfort. He was soon after chosen minister of the French church at Hanau; but this post, after a short time, he voluntarily resigned, having been induced, it is said, to take this step by the annoyances which he suffered from his brother clergymen, who were jealous of his superior eloquence and reputation. At first he went back to Francfort; but soon proceeded to Berlin, where he was received with great favour by the elector of Brandenburg. Here he continued to reside till his death, on the 3d of September, 1692. He is the author of several works, principally in defence of the reformed faith, the titles of which may be seen in the authorities referred to below. Perhaps, however, the most favourable impression of his varied learning is to be obtained from the work, entitled *Mélange Critique de Littérature Recueilli des Conversations de feu M. Ancillon*, published at Basle, in 1698, in two volumes, 12mo., by his son Charles. It is a collection of the colloquial remarks of M. Ancillon, and has been often classed with the *Scaligerana* and other publications with similar titles, although the editor in his preface gives his reasons for not designating it *Ancilloniana*. An extensive and valuable library which this learned clergyman had collected by a large expenditure during forty years, he was obliged to leave behind him when he fled from Metz on the revocation of the Edict of Nantes; and the books and manuscripts were all pillaged and dispersed. A life of Ancillon was published at Basle, in 1698, by his son Charles, in a duodecimo of 300 pages, (often to be found forming the third volume of the *Mélange Critique*,) with the title of *Discours sur la Vie de feu M. Ancillon et ses Dernieres Heures;* and he is also the subject of an article of considerable length in the second and subsequent editions of Bayle. The above particulars have been chiefly taken from the latter source. (See also the *Biograph. Universelle*.)

ANCLIFFE, or ANCLIFF, a hamlet near the town of Wigan in Lancashire, where was formerly a singular well, called by the inhabitants the 'burning-well.' The true cause of the phenomenon appears to have been the escape of carburetted hydrogen gas from the earth at the bottom of the well, which, passing rapidly through the water, gave it the appearance of boiling, and took fire if a lighted candle was applied to the surface. Leigh (*Nat. Hist. of Lancashire*, &c., Oxford, 1700) thus describes it:—'It is about two miles from Wigan, in a village called Ancliff, in the ground of William Mollineux, Esq. of that place. The well is at the bottom of a tree, the water cold, and without any smell; when any person comes to see it, a man clears the well from all its water: that done, you will immediately hear a hissing noise in a corner of it, and by holding a lighted candle near to it, the sulphureous *halitus* (vapour) immediately takes fire, and afterwards spreads itself upon what water has issued in, and it is only then indeed it ought to be called the burning-well. It is observable, though this sulphureous *halitus* continually mixes with water, yet the water continues cold, nor will it tinge silver.' An account of it by Thomas Shirley, Esq., in the *Philosophical Trans.* No. xxvi. p. 482, corroborates the above statement in its main points. 'When the water was cleared away, the cone of the flame ascended a foot and a half from the surface of the earth: the basis of it was of the compass of a man's hat about the brim. I then caused a bucket full of water to be poured on the fire,' adds Mr. Shirley, 'by which it was presently quenched. I did not perceive the flame to be discoloured like that of sulphureous bodies, nor to have any manifest smell with it. The fumes when they broke out of the earth and pressed against my hand were not, to my best remembrance, at all hot.' The well, or its peculiar property, is now lost. *Beaut. of Eng. and Wales.*

ANCO'NA, a seaport town in the Papal states, on the coast of the Adriatic sea, 43° 38′ N. lat. 13° 35′ E. long. Ancona is the capital of a delegation or province, governed by a delegate who is a prelate of the Roman church. The court of appeal for the whole of the marches and of the duchy of Urbino sits at Ancona. This town is the most commercial place in the Papal states; it carries on a considerable trade by sea, and is a free port. Its harbour, which is good, is protected by two moles, the antient one raised by Trajan, and the new one with the light-house constructed by Pope Clement XII., after the designs of the architect Vanvitelli, who also began the handsome lazzaretto for the quarantine of vessels coming from infected countries, which was completed by Pius VI. On the antient mole stands a fine triumphal arch dedicated to Trajan, his wife, and his sister; the order is Corinthian, and the material Parian marble, which still retains its whiteness. It is entire, though long since stripped of the metal ornaments, statues, and busts with which it was once decorated. The arch has only one gateway, and is ornamented with four columns on each front.

The town of Ancona is built on the declivity of a hill which forms a semicircular promontory. The streets are narrow and gloomy, except one fine street, which Pius VI. opened, leading to the mole. The citadel, built on a hill, commands the town and harbour, but is itself commanded by the neighbouring heights. The cathedral is a very old structure, built outside the town, on the site of the former temple of Venus, and near the point of the cape, from which there is a fine view of the coast of Romagna and of the Adriatic sea. The other remarkable buildings are the town-hall, the merchants'-hall, the arsenal, and the churches of the Dominicans and the Augustins.

Ancona is said by Strabo (p. 241, Casaub.) and Pliny to have been built by some Syracusans who fled from the tyranny of Dionysius. Juvenal calls it a Doric colony; it is probably older than the date assigned to it by Strabo. The name of *Ancon* (ἀγκὼν) means an elbow, such being the shape of the neck of land on which it is built. The Romans made it one of their principal naval stations on the Adriatic. In the middle ages, it governed itself as a republic under the protection of the popes, until 1532, when Clement VII., partly by artifice and partly by force, made himself absolute master of the town. The French occupied it in 1797, and it was afterwards retaken by the Austrians in 1799, after a long siege. A French expedition by sea took possession of the citadel again in 1832.

The situation of Ancona is pleasant and healthy, the country around is very fertile, and the women are reckoned among the handsomest in Italy. The population, according to the latest accounts, is about 30,000, of whom 5000 are Jews. Ancona exports wax, silk, wool, and corn. It is the best, indeed the only good harbour on the Italian coast of the Adriatic between Venice and Manfredonia, and is the common point of departure for the Ionian islands and Greece. Packets are established between Ancona and Corfu.

ANCRE, (MARE'CHAL and MARQUIS D'). To this high military rank and title was raised a poor and obscure Florentine gentleman of the name of Concini dei Concini, son of a notary. He came to Paris in the suite of Maria de' Medici, whom Henri IV. of France espoused after he had repudiated Marguerite de Valois. Concini soon after his arrival married Eleonora Galigai, one of the queen's women of the chamber. Both were ambitious, persevering, and endowed with those abilities which, at that time, ensured success at court. On Maria de' Medici becoming regent after the assassination of Henri IV., the elevation of Concini was extremely rapid. He was first made equerry to the queen, then master of the horse, and soon after his purchasing the marquisate of Ancre (under which name he is known in history) he was made first gentleman of the king's chamber. The dignity of Maréchal of France was also conferred on him by the Queen Regent. Such sudden elevations, and rapid accumulation of immense wealth, not only gave rise to suspicions very unfavourable to his character, but excited the jealousy of the court. His insolence to the young king and his overbearing manner to the nobles were the cause of that hatred which brought him to a dreadful end. For some time attempts were made, but in vain, to hurl the Italian adventurer from his envied elevation; the princes themselves joined against him without success. However, a young man of the name of Laynes, (known afterwards as Duc de Laynes,) who was in great favour with the young king, persuaded him to deliver the queen-mother from the power of her favourite, and urged his insolent bearing to the nobility, and his pernicious influence, with so much success, that at last Louis XIII. ordered the Maréchal to be arrested, and even to be put to death if he resisted. Vitry, a captain of the king's guard, was entrusted with this commission, which he executed to its fullest extent. Ancre was shot dead as he was entering the palace of the Louvre. On hearing the shot, the king looked out at the window, and expressed his satisfaction, which he testified by raising Vitry to the rank of Maréchal of France. The body of the murdered man was first secretly buried at St. Germain l'Auxerrois, but was soon after torn from the tomb by the infuriated mob, who dragged it through the streets on hurdles and then threw it into the highway. Concini's son, sixteen years of age, was obliged to fly to Florence, after having been exposed to all sorts of insults, and deprived of his father's titles and riches. Eleonora soon shared the misfortunes of her husband. She was accused and convicted of sorcery, judaism, and corruption; and was executed at the Place de Grève, on the 8th of July, 1617. During her trial, and at the moment of her execution, she displayed the greatest firmness of mind, saying, the only sorcery she had used towards the queen 'was the power of a strong mind over a weak one.' It is said she was the first instrument of the fortune of Richelieu.

ANCUS MARCIUS, the fourth king of antient Rome, belongs to a period when it is difficult to separate history from fable. The reigns of the kings of Rome seem to mark the chief stages of progress in the political contitutions of the state, rather than the succession of individual monarchs. The names of Romulus, Numa, and Tullus Hostilius are respectively connected with the origin of the three patrician tribes, the Ramnes, the Tities, and the Luceres, and with their settlement upon the several hills called the Palatine, the Quirinal, and the Cælian. Thus, under the three first kings, the patrician part of the Roman constitution had received its full development. To Ancus Martius, tradition assigned the honour of laying the first foundation of the *plebes*, or commonalty, that important element in the state, to which Rome, under the commonwealth, owed nearly all her greatness. His predecessor, attentive solely to war, had neglected the religious institutions established by Numa, and for his impiety had been destroyed by a thunderbolt with all his family. Ancus Marcius, whose mother, according to the tradition, was the daughter of Numa, restored the neglected rites, and endeavoured in all respects to imitate the pacific policy of his grandfather. But the neighbouring states, mistaking his love of peace for timidity or sloth, provoked him to hostilities by repeated aggressions on the Roman territory. In the successive wars with the Latins, the Veientines, and other states, which ensued, he was invariably successful. From the Latins he took the towns Politorium, Tellenæ, Ficana, Medullia, and transferred their inhabitants to his capital, giving them as a place of abode, not indeed any ground within the walls, but a part of the Aventine and the valley near the temple of Venus Murtia which separated that hill from the Palatine. Ancus was thus the founder of the *plebes*, and his assignment of part of the public domain to that body procured him in after times from one party the title of the 'Good Ancus,' (Ennius in Festus, v. *Sos*, quoted too by Lucretius, iii. 1038); others condemned his unworthy love of popularity (Virg. *Æn.* vi. 816). The Latin towns just mentioned are supposed to have been situated between Rome and the coast; and indeed the conquests of the king extended to the mouth of the Tiber, where he established a colony under the name of *Ostia*, thus securing to Rome the navigation of the river. In his war against Veii he was equally successful; and to protect his people on that side he fortified the *Janiculum*, and connected it with the city by means of the Sacred Bridge called the *Pons Sublicius*, in the construction of which no brass or iron was used. This bridge, repaired from time to time under the direction of the college of priests called *Pontifices*, (bridge-makers,) who religiously adhered to the principle of excluding all metal, lasted until the year 23 B.C., when it was carried away by an extraordinary inundation of the Tiber, and its place supplied the following year by a stone bridge erected by the censor Æmilius Lepidus. A still more durable monument connected with the name of Ancus is the prison formed out of a quarry in that side of the Capitoline hill which overlooks the Forum. It would be idle to copy from Dionysius the detailed account of the transactions which are said to have filled the reign of twenty-three or twenty-four years assigned by the chronologists to this monarch. It has been already stated that Ancus Marcius was said to be the grandson of Numa. In this tradition Niebuhr sees a trace of the regulation by which the kings of Rome were chosen alternately from the two leading tribes. The plebeian family of the Marcii vainly endeavoured to refer their origin to this king. (Livy i. 32-35; Dionysius iii. 36-45, with Niebuhr's *Roman History*, translated by Hare and Thirlwall, vol. i. p. 346-350.)

A'NCYLUS is the name of the shell which is usually called the fresh-water limpet. They are small, pellucid, conical shells, with slightly recurved tips. The cavity is simple, and marked with a horse-shoe-shaped muscular scar near the margin, which is interrupted on the middle of the left side over the respiratory holes, as in the genus *Syphonaria*. This animal, like the pond-snail (*Limnea*), has two compressed triangular tentacles, with the eyes sessile on the outer base; and a respiratory cavity placed on the middle of the back, with an aperture closed by a valve opening in the middle of the left side.

This genus is very nearly allied to the pond-snail, *Limnea*, from which it chiefly differs in the simple conical form of its body and shell, and some species, as *Ancylus*, are allied to it by having the apex bent on one side, as if making an approach to the spiral form. It has been placed in several orders, but there is little doubt that its true situation is with the lung-breathing mollusca. Treverianus has mistaken the lid of the respiratory opening for a gill: and Rang places it with the *semiphillediens*. They are found in Europe, America, and the West Indies, attached to stones and plants, and they will live a considerable time out of the water. They are easily known from the *Syphonariæ*, which are the only shells they can be confounded with, by their being sinistral, very thin, and covered with a hairy periostraca.

ANCY'RA, now Angora, or Engour, was one of the most important cities of Asia Minor. Tradition ascribed its origin to Midas, and its inhabitants exhibited in a temple of Jupiter a sacred anchor, which was said to have been discovered at the time of its foundation. This was, probably, a Greek invention, to account for the name of the city, but be this as it may, an anchor appears on the coins struck in the reigns of Antoninus, Severus, and Caracalla. When the hordes of Galli or Galatæ established themselves in the heart of Asia Minor, Ancyra became the capital of a tribe which had originally come from the neighbourhood of Toulouse, called Tectosages. In B.C. 189, the whole of Galatia was subdued by the arms of Manlius, and from this time it was for the most part virtually dependent upon Rome. Towards the close of the Republic, Deiotarus, who, by right, was the Tetrarch of the Tectosages alone, had extended his authority over the other Galatian tribes, and even assumed the title of king: but under Augustus (B.C. 25) it was found convenient to reduce the whole country to the form of a province, of which Ancyra was still the capital. Though deprived of its nominal independence, the city flourished under the favour of Augustus, and the inhabitants in their gratitude appear to have offered religious honours to the monarch. The city was permitted to assume the name *Sebaste*, (the Greek term corresponding to the Latin *Augusta*,) and at the death of the emperor, when an inscription on brass was erected at Rome to commemorate his achievements, the citizens of Ancyra procured a copy and had it inscribed on marble in Greek and Latin, and placed in one of their public buildings, which was probably a temple dedicated to Augustus, under the character of Lunus. This inscription, called the *Monumentum Ancyranum*, was discovered in 1554, by Wrantz, bishop of Agria and ambassador from Ferdinand II., at the Ottoman Porte. A more correct copy was taken by Tournefort in 1701, and by him communicated to Chishull, who ably supplied many of the lost words by conjecture, and published it in his *Asiatic Antiquities*. It has been repeatedly printed since, particularly as an appendix to the writings of Tacitus. (See Oberlin's edition, tom. ii., p. 586.) The greater part of the Latin inscription was still standing in the building as it had been originally put up, but in many parts it had been mutilated in the attempts to remove the copper cramps with which the different pieces of marble had been connected together. Suetonius, in his *Life of Augustus*, c. 101, speaks of the original inscription at Rome, from which the Monumentum Ancyranum was copied. Augustus, says he, besides his will left four volumes, one of them containing a summary of all his achievements, which he wished to be cut in tables of brass and erected in front of his mausoleum. This inscription, by its historical importance, fully deserves the title of *the* monument of Ancyra, but there are many others which are worthy of mention, particularly that which Montfaucon has given in his *Palæographia*, p. 154, containing an enumeration of public festivals at the expense of certain individuals there named. Among these public benefactors, one cannot but remark Albiorix, the son of Ateporix, two names which bear a strong resemblance to those which occur in Cæsar's *History of his Gallic Wars*, as Dumnorix, &c. Other inscriptions may be seen in Tournefort's *Voyage du Levant*, tom. ii., but this traveller was compelled to leave many unnoticed. A skilful antiquary, he observes, would still find inscriptions enough to occupy a year in copying. The high importance of Ancyra under the empire is proved by the numerous coins it issued, and by the immense number of its public buildings, the scattered remains of which are seen in all quarters of the present city. Above all was it celebrated as one of the chief seats of religion, so that Libanius calls it the sacred city. Coins and inscriptions refer to the worship of Jupiter, Ceres, Bacchus, Pallas, Apollo, Cybele, Lunus, Salus, Æsculapius, Serapis, the Dioscuri. It was also the seat of one of the earliest Christian churches, founded, probably, by the apostle St. Paul: accordingly, in the years 314 and 358, Christian councils were held here. Pagan worship, however, had not yet ceased, and when Julian visited Ancyra in 362, he was received without the walls by religious processions from all the temples of the city. As the power of Rome declined, the frontiers were exposed to the ravages of various enemies. In 625, Ancyra was taken by a general of the Persian Chosroes. In the following century it twice fell into the power of the Arabs. In 1085, it was taken by the Turks, but in 1102 recovered for a time by the Franks. After being for a considerable period the capital of the Turkish empire, it again changed masters in consequence of the great battle between Tamerlane and Bajazet, which was fought in the adjoining plain, July 28, 1402. In 1415, it was recovered for the Turks by Mohammed I., and since that period has always belonged to the Ottoman empire. The population, according to the Abbé Belley, consisted of 40,000 Turks, 4000 or 5000 Armenians, having seven churches, and 600 Greeks, having two churches. The present population is not known, though it is considerable. Its chief commerce consists in articles manufactured from the bright, silk-like wool of the Angora goat. At the beginning of the last century, there were resident merchants there from England, France, and Holland. The town is situated near the sources of the most eastern tributary of the Sakaria, or Sangarius, and at a distance, according to our maps, of about twenty miles from the Halys, which, in that quarter, reaches its most western limit. In Leake's *Map*, twelve antient and modern roads are seen to meet in Angora, which is the best evidence of the importance of the city. It has been visited by Tournefort, Lucas, Pococke, Brown, Bruce, Kinneir. It lies in 32° 46′ E. long., 39° 52′ N. lat. (See Tournefort, *Voyage du Levant*, tom. ii., p. 244; *Mémoires de l'Academie des Inscriptions*, tom. xxxix., p. 391; Rasche, *Lexicon Rei Nummariæ*, article 'Ancyra.') There was another Ancyra in Phrygia Epictetus, the precise position of which is unknown. The coins of both towns have the name in the form ΑΝΚΥΡΑ, not ΑΓΚΥΡΑ.

ANDALUCI'A or **ANDALUSI'A**, the most southern of the provinces of Spain, comprises the four Moorish kingdoms of Seville, Cordoba, Jaen, and Granada. It is situated between 36° 4′ and 38° 25′ N. lat., and 2° and 7° 20′ W. long.; is bounded on the north by La Mancha and Estremadura, on the east by Murcia, on the south-east by the Mediterranean, and by Portugal on the west; it extends, in its greatest length, 320 miles from east to west, and 144 from north to south. It was included in the Roman province of Bætica, so called from the river Bætis, now Guadalquivir. The present name, according to the most general opinion, it received from the Vandals, who established themselves in it about the beginning of the fifth century of our æra.

Two chains of mountains traverse this province; the most southern, and that which also has the highest summits, is called the Pœno-Bætic range by some geographers. It extends from Tarifa to Cape Gata, a distance of about 240 miles in length, without reckoning its sinuosities or windings; its breadth, from the Sierra de Bedmar to Cape Sacratif, is from 75 to 80 miles. The direction of this chain is first from south to north, and then from east to west: in its course it takes different names. The Sierra de Gazales, which is the most southern branch of the mountains of Europe, extends from 36° 4′ to 36° 30 N. lat. The Sierras of Ronda, Abdalazis, and Prieta then follow in a direction from south-west to north-east from 5° 12′ to 3° 57′ west long.; then follow the Sierras of Loja, Alhama, Tajada, and Lujar, and approach the shore of the Mediterranean in a direction from north-west to south-east, from 3° 57′ to 2° 57′. From the Picacho de Veleta it takes the name of Sierra Nevada, and then runs from west to east as far as 2° 27′, after which, taking a direction south-east and afterwards south, it becomes the Sierra de Filabres. This Sierra joins the Sierra de Aljamilla, and divides itself into two branches, one of which abuts on the sea at Cape Gata; the other branch proceeds eastwards to the Torre de Roldan. The inferior range of mountains parallel to the Sierra Nevada, for the distance of about 45 miles from Motril to Almeria, is called Alpujarras, an Arabic name, meaning grass and pasture mountains. This chain includes the Sierra de Gador and Contraviesa, and its western extremity joins the heights of Lujar and Jolucar. The strata or rocks which form the Sierra Nevada are inclined in a direction almost parallel to that of the central chain. The slope of the Alpujarras is abrupt on the north, but on the south it extends itself gradually, so that the hills slope down to the sea-shore.

The Sierra Nevada is mainly composed of mica-slate which passes into gneiss and clay-slate: on the south slope the clay-slate rests on the mica-slate, and is covered by a black transition limestone rock, rich in sulphuret of lead. Near Granada there is a quarry of serpentine on the banks of the Genil: it is green, mixed with a great quantity of blue, and susceptible of a good polish. Fine marbles, also, and alabasters of a brilliant white colour, but of a very soft quality, are found near Granada. This chain has several points covered with perpetual snow, the highest of which Mulhacen, is 11,660 feet above the sea. The next in height is the Picacho de Veleta, 11,385 feet. This point offers one of the most imposing views in Europe. In the centre of a magnificent panorama, the observer beholds himself surrounded by snow and tremendous precipices; farther on to the north he perceives the inferior summits of the chain, terminating in verdant plains bounded by the summits of the Sierra Morena, a distance of about eighty miles, and on the south he beholds at his feet the waves of the Mediterranean beating against the rocks of the shores, and in a clear day he may perceive the coast of Africa, distant about 125 miles. The lake of Caldera, which is the source of the Guadalfeo, is on the Mulhacen and 10,112 feet above the sea. The Sierra de Gador is 6575 feet high, and covered with snow three parts of the year. The Cresta de Gallo, or Cock's Comb, in the Sierra de Ronda, to the S.E. of the town of that name, is the first point discovered by ships approaching Cadiz. The hermitage of Nuestra Señora de las Nieves, (our Lady of the Snow,) on the same mountain, is elevated 6011 feet. (See *Orographie de l'Europe*.)

This range being so contiguous to the sea, the rivers on the south side may more properly be called torrents than rivers: the principal of these, the Guadiaro, the Guadaljorce, the Adra, the Almeria, and the Guadalfeo, fall into the Mediterranean. The Genil, the Darro, celebrated for the particles of gold found in the sand which it carries, the Guadiana Menor, and a few others of less note, swell with their waters the current of the Guadalquivir.

A branch of the Pœno-Bætic chain which serves as a boundary to the plains of Granada on the north, connects it with the Marianic range by its junction with the Sierra de Cazorla. The length of this chain from Cape St. Vincent to the Sierra Segura, in Murcia, including the mountains of the Algarves, is about 360 miles, and its greatest breadth between Cordoba and the river Guadalmez nearly sixty. From its eastern extremity to the source of the river Tinto, near the boundary of Spain and Portugal, between 2° 32′, and 6° 12′ W. long., it runs from E.N.E. to W.S.W., that is, almost parallel to the Pœno-Bætic, and takes the names of Sierra de los Pedroches, Cordoba, Constantina, Guadalcanal, and Monasterio. At the last point it is divided into two branches, one of which takes the name of Sierra Albaleira, and runs in a western direction to the banks of the Guadiana; the second proceeds south-westwards under the name of Sierra de Aroche, and is separated by the Guadiana from the Sierras of Caldeiraõ and Monchique in Portugal: the Caldeiraõ runs W.N.W., and the latter S.W., and partly form the southern limits of the province of Alemtejo in Portugal. This range does not contain any remarkable summits, nor any of sufficient elevation to retain the snow for nine months in the year. The heath, kermes-oak, and other plants of shining and dark green leaves, with which it is covered, give it a dark appearance, from which the name of Sierra Morena, or Dark Mountain, is given to part of the range. Its formation is principally schistose; the Sierra de Caldeiraõ presents volcanic remains, and basalt is found near Almagro on the high road from Madrid to Cadiz. Though the Marianic range is the great boundary between the waters of the Guadiana and Guadalquivir, yet many rivers which have their sources on the north side of the chain intersect it, and fall into the Guadalquivir on its right bank; except the Tinto and a few more, which empty themselves into the ocean between Moguer and Huelva. The Sierra Morena contains the richest deposit of minerals in Spain: it produces mercury, lead, copper, silver, and gold: it is also exceedingly abundant in pasture, and well adapted to cultivation. The high road from Madrid to Andalusia cuts this chain in its narrowest and most elevated part, called Despeña Perros, or the Precipice of the Dogs. Another communication is open in this chain, which connects Andalusia with Estremadura by the Puerto of Monasterio. These are the only roads in the Sierra Morena: there are other communications through it, which, if not impracticable, are at least very insecure.

The Guadalquivir is the largest river in Andalusia. Bory de St. Vincent says that its real source is the Guadarmena, a river which, springing in the north-eastern extremity of La Mancha, flows in a direction south-west, cutting as it were the Sierra de Alcaraz, and with an inclination to the south, after having received the waters of the Guadalimar, falls into the Guadalquivir in the plains of Ubeda. The Spanish geographers place the sources of this river in two fountains, distant about seventeen miles from each other, on the Sierra de Cazorla 38° N. lat., and 3° W. long. The windings of this mountain force it at first to follow an irregular course. After having received the Guadiana-Menor, near Jodar, it flows towards the west as far as Montoro, and then to S.W., gathering all the torrents which descend from the Sierra Morena on the northern bank, and on the southern, the streams that flow from the Sierra de Bedmar, Jaen, and Cabra. The Guadajoz, which crosses the high road from Madrid to Cadiz not far from Cordoba, is one of its greatest affluents on the southern bank. At Palma del Rio it receives the Genil, and continues a W.S.W. and S.S.W. course nearly to Seville. Beyond that city it flows almost due south without any obstacle, through a level country with a winding course, and dividing itself into several branches, forms two islands, called *Isla Mayor* and *Isla Menor*, or *Great* and *Small Island*. At the southern extremity of the Isla Mayor these different branches rejoin, and the river enters the sea near San Lucar de Barrameda.

The extent of country which this river traverses from the Sierra de Cazorla, lat. 38°, to the Punta de Chipiona, situated, according to the Derrotero de Tofiño, in 36° 44′ 18″, is about 276 miles; but the course of the river, following all its windings, is at least 350 miles. The Guadalquivir is navigable as far as Seville; and a company has undertaken to remove the obstacles which impede the navigation to Cordoba. The affluents of the Guadalquivir, besides those mentioned, are the Guadiel, the Escobar, the Jandula, the Yeguas, Arenales, Guadalmellato, Guadabarbo, Bembezar, Guadalbacar, Galapagar, and Viar, which flow into it on the northern bank; and on the southern Jandulilla, Ninchez, Torres, Guadalbullon, Salados de Arjona, or salt streams of Arjona, Corbones, Guadaira, and Tagerete.

The plains of Andalusia, notwithstanding their being situated in one of the warmest climates of Europe, are still generally speaking of a moderate temperature. It never freezes in them, and the snow never remains long upon the ground. The unhealthy and scorching winds, which come from Africa, are cooled and purified by the snowy summits of the Sierra Nevada, and rarely produce those pernicious effects observable in the country from which they blow.

On arriving at Despeña Perros, on the route from Castile to Andalusia, the most inattentive observer will immediately perceive that the productions of nature are changed. On the northern side, the Marianic range presents nothing but rosemary, cistus, and other plants indicating a parallel of latitude equal to the south of France; the southern side presents itself at once covered with mastic-trees, kermes-oak, bean-trefoil, myrtles, and other plants of warmer climates; as he descends, the lower parts are covered with the species of umbelliferous, papilionaceous, and other plants properly belonging to the Flora of Africa. From Carolina, the first of the colonies of the Sierra Morena, long and strong hedges of the American aloe form the common enclosures of the grounds. At a distance the stately palm-tree rears its lofty head above the olive, pointing out the house of the farmer or the garden of some convent. The mesembryanthemum, or fig-marigold, ornaments the dwelling of the humble inhabitant of the village, with its brilliant scarlet flower. At Seville the banana plant is found in many gardens; and exotics, which even at Montpelier require to be kept in a green-house, are here common in the open air. As we approach the sea-shore the European vegetation almost disappears, and is replaced by plants properly belonging to the Flora of Arabia, Egypt, and Barbary: the chamærops or dwarf-palm, which never rises to the elevation of a tree, occupies all the space that the husbandman has left uncultivated: the caper plant occupies all the wild and gravelly spots. The *acebuche* or wild olive-tree, and the woody astragalus, take possession of all the space abandoned by man. The sage, the gum cistus, various species of thymes, the rosemary, the myrtle, and other aromatic plants, cover the uncultivated heights. The orange and lemon trees, particularly around convents and monasteries, form groves of considerable extent, which in the time of blossoming fill the air with a delicious perfume. At that season the inhaling of so many odours, in which the balsamic perfume of the cistus is distinctly perceived, especially before and after sunset, gives a delightful sensation of the salubrity of the air. Within fifteen or twenty miles from the coast, the plants of America are so adapted to the soil as to have become almost naturalized: the nopal, on which the cochineal insect is fed, is very successfully cultivated near Cadiz; and the same plant forms the hedges of the vineyards of the Hoya de Malaga. The sugar-cane and the cotton-tree occupy the plains of Velez-Malaga, Torroj, and Motril: the pomegranate is a very common tree in all that part. With so great a variety of productions, the season of blossoming must necessarily be very long; it begins about the end of January, with the almond-tree, and ends in June with the olive. The harvests also of fruit and grain succeed one another throughout the whole circle of the year, beginning in February or March with the sugar-cane, and ending in March or April with the orange, on which tree it is not an unfrequent occurrence to find the fruit and blossom together. Even when the heat of the sun has dried up the smaller rivers, their banks are covered with the rosy flower of the adelfa, or rose-bay tree. The soil is so productive, particularly in the plains, that the husbandman with very little trouble may obtain an abundant harvest. Besides all the species of corn and fruit, wine and oil make the bulk of the productions of the soil. Among the wines, the Jerez or sherry, the Pajarete, Malaga, Montilla, Espera, Bornos, and Tintilla, are the most celebrated. The rich pastures of the mountains and valleys feed innumerable herds of cattle, among which the bulls have been renowned from the fabulous times of King Geryon. The woods of oak of the Serrania de Ronda, of Cordoba, and Granada, afford nourishment to a multitude of hogs; and the Loma de Ubeda, the Dehesa of Cordoba, and the Cartuja of Jerez, produce the finest breed of horses in the Peninsula. The seas and rivers abound in fish, and the mountains in every species of game. The wolf and the boar are the only ferocious animals; among the reptiles and insects, the scorpion, the tarantula spider, the chameleon, and some snakes, though none of the worst kind, are found. The riches of the mineral kingdom are no less abundant. Sixty-six mines are known, which produce gold, silver, copper, iron, lead, loadstone, coals, vitriol, and sulphur.

Andalusia, under the Mohammedans, included four kingdoms, viz., Seville, Cordoba, Granada, and Jaen, but at present it is divided into six provinces; Seville, Cadiz, Cordoba, Jaen, Granada, and Malaga, containing a population of 1,904,276 inhabitants; two archbishoprics, six bishoprics, fourteen collegiate churches, the same number of military commandaries, 980 parishes, 760 convents of both sexes, with 18,063 monks, and 5,624 nuns, the whole comprised in 41 cities, 458 towns, 314 villages and boroughs. Andalusia is divided into two military departments, having each a captain-general, and a *Chancilleria*, or high civil and criminal court, one at Seville, and another at Granada.

The people of Andalusia appear to be a mixture of five different nations, which successively have had the dominion of that region,—the Carthaginians, the Romans, the Vandals, and the Goths, mixed with the original race, very probably of African origin. The Moors invaded it in 711, and it was not until 1491 that they were expelled from Granada, their last hold. Notwithstanding their expulsion, many traces of their character are still discernible. The complexion and features of the inhabitants, their dances, music, and musical instruments, many names of persons and places, the most trivial phrases, their prejudices, their system of agriculture, their hospitality, and part of the dress, especially among the women of some villages, and even their harsh mode of aspirating the Castilian language,—everything reminds the attentive observer of their Arabian ancestors. The Andalusian, inhabiting one of the finest climates in the world, where nature so liberally yields its riches, lives contented with what he possesses, is never anxious about the future, and is a stranger to sorrow. This sort of indifference and improvident disposition has caused him to be accused of indolence. The inhabitants of the plains of Seville may perhaps deserve that character; but the labourer of the Serrania de Ronda, of the Hoya de Malaga, of the Alpujarras, and in general all the people inhabiting the highlands, whom the sun when it rises always finds busied in their occupations, which they never quit until after its setting, cannot justly be taxed with indolence. In those districts the women are seen working in the fields, while the men are employed in reaping the harvest in the plains of Seville; and, when men and women work together, the former are observed to stop in their work now and then to smoke their paper cigars, while the latter, who do not enjoy that luxury, proceed in their task; which circumstance may probably have led inattentive travellers to make erroneous statements about the supposed idleness of the Andalusian people, and the miserable condition to which the women are reduced in that province. The same amount of credit is due to all the accounts and wonderful tales about the jealousy of the Andalusian men, and of the confinement in which they keep their wives. Possessing a powerful and lively imagination, the Andalusian express the most simple ideas in a figurative and energetic language, which may perhaps entitle them to the epithet of the Gascons of Spain. The *Sal Andaluza*, or Andalusian wit, though not so pungent, is not less celebrated in Spain, than the Attic wit was in Greece. The Andalusian women are remarkable for the gracefulness of their forms, for their expressive, large, and black eyes, and for their small, delicate feet. It is not, however, a rare occurrence to find among them some with blue eyes, a fair complexion, and light, flaxen hair. Andalusia has at all times produced eminent men. The great Trajan, the two Senecas, the poet Silius Italicus, and the agriculturist Columella, did honour to the Andalusian name under the Romans. The list of the eminent Arabs, who were born and educated in that province, is still more numerous; and, in modern times, the Granadas, Leones, Morillos, Cespedes, Herreras, Riojas, and also the best lyric poets in the Peninsula, were Andalusians by birth. If ever a rational and enlightened system of government should secure the property and allow the free development of the intellectual faculties of this people,—if the fixed rule of the law should ever be substituted for the caprice of man,—Andalusia will become the finest province in Spain. At present, though there are universities at Seville, Granada, and Cordoba, besides several colleges at Cadiz and other principal towns, education is not in the most flourishing condition. The unequal division of the land,—the best and largest portion of which is in the hands of the grandees, who never visit their possessions, and of monks, who care little about improving them,—keeps agriculture in a very backward state; and an oppressive and injudicious fiscal system prevents the advancement of trade and industry. (See Miñano, *Recueil de Voyages de la Société de Géographie de Paris*, vol. iii., pp. 8, 9. Antillon; Malte Brun's *Geography*, viii., book 138. Bory de St. Vincent's *Résumé Géographique de la Péninsule Ibérique*, section i., chap. 3, section ii., p. 472—502.

For the subdivisions of Andalusia, and the chief towns, see the names mentioned in this article.

ANDAMAN ISLANDS, a group in the bay of Bengal consisting of four islands with several islets, in 92° 30′ E. longitude, and occupying a space which extends from 10° 32′ to 13° 40′ N. latitude. Three of these islands are so contiguous, being only separated by very narrow straits, that they are usually considered as one island, under the name of the Great Andaman, and are generally so laid down in maps. Another of these islands, which is known as the Little Andaman, is the most southern of the group. Rutland Islet lies between the two Andamans, and Great Sentinel Islet is on the western side of Great Andaman, in 11° 45′ N. lat., and 92° 3′ E. long. The remaining islets are not known by any distinctive names. The most northern of the Nicobar islands is within 30 leagues of the south of Little Andaman.

Great Andaman is about 140 miles long and 20 miles broad. In the centre is a high mountain called the Saddle Peak, which is about 2400 feet above the level of the sea. The island does not contain any considerable river. It is tolerably clothed with trees, several of which afford timber of sufficient size for ship-building; among them are the poplar, ebony, a tree resembling satin-wood, red-wood, the cotton-tree, and almond-tree, besides bamboos, ground-rattans, and numerous shrubs.

Very few animals are found on the islands; the principal of them is a species of small hog, which is scarce; the inhabitants use it for food. Besides these hogs, the Andamaners eat rats, guanas, and snakes, but their principal food consists of fish, of which there are many varieties, and, during the north-east monsoon, they are very abundant. The shores abound in shell-fish, and oysters of good quality are found in some situations. The edible birds'-nests, so highly prized in China, are sometimes seen in these islands, and a variety of beautiful shells—gorgonias, madrepores, and couries—may be gathered on the shores.

The fruit of the mangrove is almost the only vegetable substance in the islands that is fit for food. Cocoa-nut trees,—which are so plentiful and so prolific, both on the continent and the neighbouring islands,—have never been planted in the Andaman islands.

The inhabitants are among the very lowest in the scale of civilization of any people with which we are acquainted; they show determined hostility to Europeans, and repugnance to come into communication with them. They are small of stature, seldom exceeding five feet in height, and ill-formed, with large heads and very slender limbs. In colour, hair, and features they resemble the race of African negroes. They are wholly unaccustomed to the use of clothing; their implements are but few in number, and of a very rude description. They have no vessel that can resist the action of fire, their only mode of cooking consists in throwing their food upon burning wood. Their principal weapons of offence are bows and arrows. The former are usually from four to five feet long, and for strings they use fibres drawn from the leaf of a tree, or slips of bamboo; their arrows are formed of reeds, with heads of wood hardened in the fire, or of fish-bones. They also carry spears of heavy wood, with sharpened points, and are provided with a shield made of bark. They use both their arrows and their spears for killing fish, and show considerable dexterity in this occupation; they likewise make use of a hand-net formed of bark.

It is worthy of remark, that every people with whom we have become acquainted, however small their acquaintance with other arts, are possessed of the art of making nets of one kind or other, and thus forming articles of some utility.

The dwellings of the natives are rude in the extreme: they are formed by fixing four poles in the ground and binding their tops together, filling up the spaces between them with branches of trees, and leaving a vacancy on one side just large enough to allow of ingress and egress. In their disposition, they are described as cunning and treacherous; their disinclination to the intercourse of strangers amounts with them to a passion. They make no attempt to cultivate the soil, and are obliged to reside in the immediate neighbourhood of the sea, from which they derive the principal part of their food. The population of the Great Andaman, it is conjectured, does not exceed 2500 persons; they unite in small societies, and move about from one part of the coast to another in search of food. These people are superstitious, and are believed to worship the sun; but our imperfect acquaintance with their customs does not allow us to express any decided opinions on this subject. On awaking in the morning, their first care is to plaster their bodies with mud, which hardens in the sun, and serves as a protection against the attacks of insects which swarm in the air, and would otherwise be a constant torment to them. This plastering, and the custom of painting their woolly heads with red ochre, does not tend to improve their naturally hideous appearance.

The origin of this race of people,—so different in their appearance and state of civilization from any of the races on the continent, or the neighbouring islands,—is an object of some curiosity. The people to whom they bear the greatest resemblance in their persons and dispositions are the mop-headed Papuas of New Guinea; but how they should have found their way to so great a distance, in their frail canoes, it is difficult to imagine. The language used by the Andamaners, as far as there are means for judging, appears to be wholly dissimilar to any spoken in other parts of the east.

A settlement was attempted by the English in 1791, on the south part of the largest island, which settlement was, two years afterwards, removed to Port Cornwallis, near the northern end, in 13° 28′ N. lat., and 92° 54′ E. long. One object for making this establishment was the possession of a commodious harbour on the east side of the Bay of Bengal, which might be a place of shelter during the prevalence of the north-east monsoon. The place was abandoned in 1796, in consequence of its proving extremely prejudicial to the health of the settlers. It is probable that this disadvantage might have been remedied by clearing the adjacent district, which consists of lofty hills covered with trees and jungle.

In 1814, when Port Cornwallis was visited by an English ship, very few vestiges remained of the British settlement. Subsequently (in April, 1824) the British force under Sir Archibald Campbell, despatched against the Burmese, assembled in the harbour, where some of the ships remained about a month; but it was not found possible on that occasion to establish any intercourse with the natives, who omitted no opportunity of showing their hostile feelings by discharging their arrows at all the Europeans who came within their reach.

The Little Andaman was visited, in November, 1825, by the Earl Kellie transport, for the purpose of procuring water for the troops which she was conveying to Rangoon, when the inhabitants showed an equally fierce disposition, and endeavoured as much as possible to obstruct our people while filling their water-casks. This smaller island does not possess any harbour, but has tolerable anchorage near the shore. It is twenty-eight miles long with an average breadth of seventeen miles. (Symes's *Embassy to Ava*, and MS. documents at the India Board, as quoted in Hamilton's *East India Gazetteer*.)

ANDANTE, in music, (participle of the Italian verb, *andare*, to go, *going*,) is the third in order of the five classes into which musical movement is divided, (see ALLEGRO,) and the medium between the extremes of slow and quick.

The music of former days, of Corelli, Handel, &c., which we agree to call antient music, was generally much slower than that which prevails at present, and *andante* was then used to denote a moderate degree of quickness; now it indicates a steady, calm motion, rather inclining to slowness than the reverse. It also enjoins a more than ordinary attention to the measure, to the equality of time given to each bar. It must be added, however, that composers often differ from each other in the meaning they annex to this word, a want of agreement which can only be remedied by invariably marking the commencing time of all movements by the metronome, or some kind of pendulum.

This term is also used substantively: thus we say, *an andante of Haydn*, &c.

ANDANTINO, in music, the diminutive of *andante*, but whether less slow or less quick, is still a question at issue. Rousseau, Türk, Clementi, and many others, are on the slow side; Koch, Burney, and Lichtenthal, espouse the other.

When the word *andante* is used, as by the old masters, to denote a degree of quickness, its diminutive abates its motion: when employed to indicate a movement rather slow than quick, as in the present day, the diminutive increases its motion. For want of adverting to this fact, much misapprehension and some disputes have arisen. It, however, seems to be agreed, that *andantino* now shall signify a movement quicker than *andante*—that it shall be the medium between the latter and *allegretto*.

ANDELYS (LES), a town in France on the right bank of the Seine, in the department of Eure. It properly consists of two towns, Grand (great) Andely, and Petit (little) Andely; though they are usually considered as one. It is a busy place, and contains a population of 5000 (Balbi), who are engaged in the manufacture of ratteen, a coarse woollen stuff. Many apples are grown in the neighbourhood for cider. Nicholas Poussin was born in an adjoining hamlet, or in the town itself: at Little Andely there is a monument to his memory. A castle in the vicinity is said to have been built by Richard Cœur de Lion. It is now in ruins.

The arrondissement of which Les Andelys is the capital comprehends 147 communes, and contains above 63,000 inhabitants.

ANDERNACH, a small town in a pleasant country on the left bank of the Rhine, in the district of Coblenz and the province of the Lower Rhine, 50° 27′ N. lat., 7° 25′ E. long., and about ten miles W.N.W. from Coblenz. It has some trade, chiefly in millstones, which are cut in the neighbouring villages of Ober and Nieder-Mendig, in bricks, clay for tobacco-pipes, and in trass, which is sent to Holland. This trass (see next page) is an earth, which is pulverized and mixed with lime to make a mortar suitable for constructions under water. Trass is a corruption of the Dutch word *tiras*, which signifies cement.

In Andernach numerous pieces of columnar basalt are employed as posts at the corners of streets, &c. The door-posts and side-pieces of almost all the windows are made of the porous lava of which the famous millstones are formed. This material is also used for paving courts and kitchen floors, and has been employed in the construction of some of the oldest buildings in this town, as well as in Coblenz. There are several mineral sources near the town. The place has about 3000 inhabitants, and a gymnasium. The vine is cultivated in the neighbourhood.

Andernach was a Roman station under the name of Antunacum. It was also once an imperial town, till the year 1496, when the elector of Cologne reduced it to the rank of a municipal town.

Physical structure of the surrounding country.—Andernach lies on the border of the mountainous region called the Eifel, which stretches between the Ardennes and the Rhine, and has been the seat at one time of many active volcanoes; but all have been extinct since a period long antecedent to the historical æra. The fundamental rock of the country is grauwacke, which may be seen in many places around Andernach; the volcanic products lie upon that, all the secondary strata being wanting. Between five and six miles west of Andernach is the Laacher See, or Lake of Laach, a spot celebrated for the beauty of its scenery. It is of a circular form, and is surrounded with woods which rise from the water's edge to the summit of the high sloping banks; a man at an ordinary pace requires about two hours and a half to walk round it. The surface of the water is 670 feet above the Rhine at Andernach, and the depth is about 200 feet. It has been commonly considered as the crater of a volcano, and the circular form and igneous products scattered around lead one very naturally to view it as such; but great weight is due to the observations of the Baron Van der Wyck in his *Uebersicht der Rheinischen und Eifeler erlöschenen Vulkane*, who considers the lake to be a depression in the grauwacke, and that the igneous products were ejected from five volcanoes in the immediate neighbourhood. There is no stream of lava, nor any walls of solid lava immediately adjoining the lake; the volcanic products on its shores are scoriæ or cinders, pumice and ashes, with numberless volcanic balls or bombs in the ashes; but solid lavas, basalts, and tuffs, are met with in all the hills and valleys around. Immediately in the neighbourhood of Andernach, and between it and the town of Mayen, there are great tracts covered with pumice stone, gravel, and ashes, often to a considerable depth; these substances are in many places covered by a yellow marly sand, containing land shells, called *loess*, and in some situations this loess is covered again with pumice stone, gravel, and ashes. Not far from the Laacher Sea are the celebrated millstone quarries of Nieder Mendig, which have been worked, it is believed, for at least 2000 years, and from which millstones are sent to every part of Europe and to America. The rock is a very hard porous lava, which in all probability was a stream from one o the neighbouring volcanoes. It is covered with the pumic stone, gravel, and ashes, in many parts, but it is supposed to be not less than five miles in length, and nearly three miles in breadth. The quarries are all underground, and are well worth visiting from the great extent of the excavations, and the forms of the lava, which separates into gigantic columns from fifteen to forty feet in height. Five miles north of Andernach is the Brohl valley, celebrated not only for its beautiful scenery, but on account of its containing vast accumulations of an indurated volcanic mud, which by subsequent denudations has been broken into detached masses, presenting great vertical precipices and many varied picturesque forms, clothed with a luxuriant vegetation. The substance is called *trass*, and has been long extensively quarried; it is pounded and used in making mortar for buildings under water, like the volcanic substance called *puzzolana* in the neighbourhood of Naples, and the artificial imitation of it, Roman cement. Vast quantities of it are exported to Holland, where it is used in the construction of the dikes.

The volcanic district of the Lower Eifel, which is immediately adjoining to Andernach, is very accessible to those who visit the Rhine. It is extremely interesting, not only to the geologist, but to all who take pleasure in looking upon beautiful natural scenery. There is a short account of it in Dr. Daubeny's work on *Volcanoes*, and a much more detailed description in Dr. Hibbert's more recent publication on the *Basin of Neuwied;* a book, however, that will not be very intelligible either to the general reader or to any one who is not tolerably familiar with geology. The best works on the subject are in German, of which there are several. The work of Baron Von der Wyck, above quoted, is excellent, and Steininger's *Geschichte der Rheinischen Vulkane* is very full; but the best we have seen is a compilation from other writers, together with valuable additions from personal observation, by Messrs. Von Oeynhausen and Von Dechen, in the *Geographical Journal*, *Hertha*, for the year 1828.

ANDERSON (ADAM), was born in Scotland in 1692. Having come to London, he obtained the situation of clerk in the South Sea House, with which establishment he continued to be connected for forty years, having risen at last to be chief clerk of the Stock and New Annuities. In the charter, granted in 1732, for the establishment of the colony of Georgia in America, Mr. Anderson was appointed one of the trustees to carry that object into execution; and he also held a seat in the court of assistants of the Scotch Corporation in London. He died, at his house in Red Lion Street, Clerkenwell, on the 10th of January 1765. The chief occupation of many years of Mr. Anderson's life was the composition of his voluminous and well known work, the *Historical and Chronological Deduction of Trade and Commerce*, which was first published in 2 vols. folio, in 1762. A second edition of the same size appeared in 1764; and a third, in 4 vols. quarto, (the fourth volume being new and by a different compiler,) in 1782-9, after the death of the author. This work contains a large collection of facts; but from the author's imperfect scholarship, or his limited command of books, he has taken many of them at second-hand, from translations, or books of little authority; and in the earlier portion of his book, especially, he has nearly neglected all the best sources of information. This defect has been to a great extent remedied in what may be considered a fourth edition of Mr. Anderson's work, the *Annals of Commerce, Manufactures, Fisheries, and Navigation*, by Mr. David Macpherson, 4 vols. quarto, 1805. The last three volumes of this publication are nearly a reprint of Anderson's *Historical Deduction;* but the first, which comprehends the history of commerce down to the fifteenth century, is entirely re-written. Mr. Anderson's style, we may add, is very prolix, and singularly antiquated for the period in which he wrote; but in many of his opinions upon commercial subjects he was in advance of his age.—James Anderson, D.D., a brother of the subject of this notice, was the author of a work entitled *Royal Genealogies, or the Genealogical Tables of Emperors, Kings, and Princes, from Adam to these Times*, published in 1732; of a *Genealogical History of the House of Ivery*, in 2 vols. 8vo., Lond., 1742 (the last volume having been prepared for the press after his death, and a third being promised, which, we believe, has never appeared); of a volume entitled the *Constitutions of Free Masons;* and also, we believe, of several single sermons. He was minister of the Scottish church, Swallow Street, London; and used to be known among his acquaintances by the name of Bishop Anderson. (See Chalmers's *Biograph. Dict.*)

ANDERSON (ALEXANDER), a native of Aberdeen, in Scotland, who in the beginning of the seventeenth century, while yet a young man, appears to have settled as a private teacher of the mathematics in Paris. Neither the year of his birth, nor that of his death, is known. He is the author of the following works: *Supplementum Apollonii Redivivi*, quarto, Paris, 1612; *'Αἰτιολογία, pro Zetetico Apolloniani Problematis a se jampridem edito in Supplemento Apollonii Redivivi*, quarto, Paris, 1615; *Ad Angularium Sectionum Analyticen Theoremata* Καθολικώτερα, *a Francisco Vieta Fontenæensi primum excogitata, at absque ulla demonstratione ad nos transmissa, jam tandem demonstrationibus confirmata*, quarto, Paris, 1615; *Vindiciæ Archimedis*, quarto, Paris, 1616; *Exercitationum Mathematicarum Dicas Prima*, quarto, Paris, 1619. All these works are very scarce. Mr. Anderson also appears to have been selected by the executors of the eminent Vieta, who died in 1603, to superintend the publication of his unprinted manuscripts. Two treatises of Vieta, accordingly, entitled *De Æquationum Recognitione et Emendatione*, appeared at Paris, in quarto, 1615, with a dedication, preface, and appendix, by Anderson. Mr. David Anderson of Finshaugh, a brother (other authorities say, a cousin) of this Alexander Anderson, was the father of Mrs. Gregory, the wife of the Rev. John Gregory, minister of Drumoak, in Aberdeenshire, whose son was the celebrated James Gregory, the inventor of the reflecting telescope. James Gregory is said to have been initiated in mathematical science by his mother. Of the same family, probably, was an Alexander Anderson, a native of Aberdeen, who graduated Doctor of Medicine at Leyden, in 1717. His inaugural discourse, which is entitled *De Morbis Acutis Puerperarum*, is remarkably thick sown with scriptural and classical quotations. (See Chalmers's *Biog. Dict.*, and Brewster's *Edin. Encyclop.*) In the Supplement to the *Encyclopædia Britannica*, there is a notice of Alexander Anderson by the late Professor Leslie, in which warm praise is bestowed upon the ingenuity, cleverness, and classic elegance of his works.

ANDERSON (SIR EDMUND), an eminent lawyer of the sixteenth century, in the early part of which he was born at Broughton, or, as other authorities state, at Hixborough, in Lincolnshire. His father, Thomas Anderson, Esq., was a gentleman of good estate; and the family was of Scotch descent. Edmund, who was a younger son, was educated at Lincoln College, Oxford, after leaving which he entered of the Inner Temple, and, having in due course been called to the bar, passed through the usual promotions, until, in 1582, he was made chief justice of the Common Pleas. This high office he held till his death, on the 1st of August, 1605. Chief Justice Anderson was one of the ablest and most learned of Queen Elizabeth's judges; but he was also one of the most rigid of the high prerogative lawyers of that time. He particularly distinguished himself by the zeal which he showed in favour of the established church, and the unwise harshness with which he endeavoured to put down dissent. We should scarcely, indeed, be going too far in saying of him that he was accustomed to regard law more than reason, and the will of the sovereign more than either. He seems, by his severity, to have made himself unpopular and odious with all parties. His printed works are *Reports of Cases argued and adjudged in the time of Queen Elizabeth, in the Common Bench*, folio, Lon. 1644; and *Resolutions and Judgments on the Cases and Matters agitated in all the Courts of Westminster, in the latter end of the reign of Queen Elizabeth*, quarto, Lond. 1653. Both books are reckoned of great authority. Three families, descended from this chief justice, through two of his sons, received baronetcies in the reigns of Charles I. and II.; and by his four daughters, who lived to be married, he became the ancestor of the earls of Pontefract, the Sheffields, dukes of Buckinghamshire, the earls of Warrington, and the lords Monson. (*Biograph. Brit.*)

ANDERSON (GEORGE), was born at Tunstern, in the duchy of Sleswick, in Germany, about the beginning of the seventeenth century. He appears to have been in a great degree self-educated. In 1644 he left his native country to travel in the East, from which he returned in 1650, after having visited Arabia, Persia, India, China, Japan, Tartary, Mesopotamia, Syria, and Palestine. He was then taken into the service of the Duke of Holstein-Gottorp, who often pressed him, but without success, to publish an account of his travels. At last the stratagem was resorted to of placing Adam Olearius behind the tapestry of a room in the palace, while Anderson, who was very communicative in conversation, was led to relate his adventures to the duke; and in this way the whole story was from time to time got out of him and committed to writing. He was afterwards prevailed upon to revise the manuscript, after which it was published in folio, at Sleswick, in 1669, under the care of Olearius. Anderson's travels, we believe, have never been translated into English. (See *Biog. Univ.*)

ANDERSON (JAMES) was born at Edinburgh on the 5th of August, 1662; his father, the reverend Patrick Anderson, was one of the ministers of that city. Having been educated for the law, he was admitted a writer to the signet in 1690. In 1705 he made his first appearance as an author by the publication of *An Essay showing that the Crown of Scotland is Imperial and Independent;* being an answer to W. Atwood's tract, entitled the *Superiority and direct Dominion of the Imperial Crown and Kingdom of England over the Crown and Kingdom of Scotland*, which had appeared the preceding year. As the subject discussed was one in which the people of Scotland at that moment took a very warm interest, the parliament, besides bestowing upon Anderson a pecuniary reward for his performance, ordered its thanks to be publicly returned to him by the lord chancellor, in the presence of her majesty's high commissioner and the estates; Atwood's book being at the same time ordered to be burnt by the common hangman. Anderson was further honoured by the commands of the parliament to collect and publish such antient documents as he might deem to be illustrative of the national independence; and an assurance was given that the cost of the undertaking would be defrayed from the public treasury. He therefore relinquished his profession, and in 1707 came to London to superintend the engraving of the plates for his intended work. Before it issued from the press, however, he was carried off by a stroke of apoplexy, on the 3d of April, 1728. The editing of the work was then entrusted to Thomas Ruddiman, the learned grammarian; and it at length appeared at Edinburgh in 1739, in the form of a magnificent folio, with the title of *Selectus Diplomatum et Numismatum Scotiæ Thesaurus.* An elaborate preface was prefixed by Ruddiman. Anderson held the situation of postmaster-general for Scotland from 1715 to 1717. He also published at Edinburgh, in 1727, *Collections relating to the History of Mary Queen of Scotland*, in 4 volumes, quarto. Although Anderson's name is prefixed to the *Diplomata* as the author of the publication, the credit to which he is entitled is very inconsiderable. The plates, which are well executed, are of course the work of the engraver, with the exception of those which contain explanations of the abbreviated characters; and all the rest of the book, comprising the valuable preface of 85 pages, the chronology of Scottish history, the explanations of the plates, the tables of geographical, and other proper names, is by Ruddiman. (See Chalmers's *Biograph. Dict.*, and Geo. Chalmers's *Life of Ruddiman*, p. 151, &c.)

ANDERSON (JAMES, LL.D.) was born, in 1739, at the village of Hermiston, near Edinburgh, where his forefathers had been farmers for several generations. He very early showed a great love of reading, and having, in consequence of the loss of both his parents, taken the management of the family farm into his own hands at the age of fifteen, he soon after began to apply himself to the study of chemistry, with the view of availing himself of that science in his agricultural pursuits. His adoption of various improvements in husbandry, which had never before been introduced into the district where he lived, afforded other evidences of his superior intelligence. In 1763 he left his native place, and settled in Aberdeenshire, on a farm called Monkshill, consisting of 1300 acres of land almost wholly in a wild state. It was while residing here that he made his first attempt as a public writer in a series of essays on Planting, which he contributed, in 1771, to the *Edinburgh Weekly Magazine*, under the signature of Agricola. These essays he collected and published together in 1777. From this time both his communications to periodical works and his separate publications were very frequent. In 1780 the degree of Doctor of Laws was bestowed upon him by the university of Aberdeen. Three years after he left Monkshill, and came to reside in Edinburgh. In 1784, in consequence of a pamphlet which he had printed on the Encouragement of the National Fisheries, a subject which he had some years before discussed at greater length in a quarto volume, he was employed by government to make a survey of the western coast of Scotland, with a reference especially to that object. In 1791 he commenced the publication of a periodical miscellany under the name of the *Bee*, which had great success. In consequence, however, of a disagreement with the publishers, it was dropped in 1794. In 1797 Dr. Anderson came to take up his residence in the neighbourhood of London; and, in April 1799, he established here a new periodical under the title of *Recreations in Agriculture*. It was continued till March, 1802, when it ceased with the completion of the sixth volume. Dr. Anderson died on the 15th of October, 1808, having been for some years before much broken down through the effects of the intense literary labour of many years. The list of his numerous publications attests the extraordinary activity of his mind; and most of his writings evince great fulness of thought, extensive and varied information, and some of them no slight degree of ingenuity and originality. Dr. Anderson is now acknowledged to have been the first who propounded the theory of the origin and progressive increase of rent, which was almost simultaneously reproduced in our own day by Mr. Malthus and Sir Gilbert (then Mr.) West, and is commonly distinguished by the name of the late Mr. Ricardo, who is known to have been in possession of it two years before the publications of these writers appeared, and by whom also it was afterwards elaborately illustrated. Anderson's statement of the doctrine is to be found at p. 401 of the eighth volume of his *Recreations in Agriculture*, published in 1801. It is as perspicuous, accurate, and complete an exposition of this view of the question as any that has been since given. There can be no question also that to the zeal and labours of Dr. Anderson, much more than to any other individual, is owing the greatly increased attention to the subject of agriculture which, in Scotland especially, has grown up since he began to write. In this way he has been a distinguished benefactor to his country. A complete catalogue of his writings may be found in the authorities quoted below. They consist of between twenty and thirty separate works, besides numerous contributions to the *Encyclopædia Britannica*, the *Monthly Review*, and various other periodicals. To the first edition of the *Encyclopædia Britannica* he contributed the articles Language, Monsoons, and Sound. Among his other works are, a *Practical Treatise on Chimneys*, duodecimo, 1776.—*Free Thoughts on the American Contest*, octavo, 1776.—*Essays relating to Agriculture and Rural Affairs*, octavo, 1777.—*Observations on Slavery*, quarto, 1789.—*Two Letters on a Universal Character*, octavo, 1795.—*Selections from Correspondence with General Washington*, octavo, 1800.

ANDERSONIAN INSTITUTION. [See GLASGOW.]

ANDES, the general name given to the great range of mountains which runs along the western side of the continent of South America. In the languages of the Incas, these mountains are called *Antis*, and as they abound in copper and other metals, Humboldt is of opinion that the name is derived from the Peruvian word *anta*, which signifies copper, and metal in general. We apply, in Europe, the term Andes to the whole range, but it is unknown to the inhabitants of the countries north of the equator. These mountains are called by the Spaniards, Cordilleras de los Andes, or the Chains of the Andes, whence the word Cordilleras alone is sometimes applied to them.

In considering these mountains as a great feature in the physical structure of the earth, we may fix their southern extremity in the rocky islands of Diego Ramirez, off Cape Horn, in lat. 56° 30′ south, and their northern termination in the 69th of north latitude, at the mouth of the Mackenzie River. There is probably an almost unbroken chain throughout the whole of that vast space, which is more than one-third of the circumference of the globe. It is difficult to say where the real chain of the Andes commences. It continues, however, when once formed, without a break, to the mouth of the river Atrato, or the isthmus of Darien, which pours its waters into the Caribbean Sea, in lat. 8° 15′ north, a distance, reckoning the whole line, from Diego Ramirez, of 64° 15′ of latitude.

The Andes of South America, although, in our maps, they look like one long, single ridge, are by no means so, but are composed of a series of chains of mountains, more or less parallel, inclosing vast elevated plains, or table-lands, and of several great groups, like knots or articulations, at distant intervals. The average width of their base is extremely narrow, considering their great length, in comparison with that of most other extensive systems of mountains; for, except where the groups just mentioned occur, the breadth varies only from sixty to seventy miles. The greatest extension, from east to west, is between the parallels of 15° and 18° south, in one of the groups, where a base line perpendicular to the axis of the chain would be nearly 400 miles in length.

The whole surface of South America is broken by four great systems of mountains, viz., the Andes; the mountains of Venezuela, running nearly at right angles to the Andes, and parallel with the Caribbean Sea; the mountains of Parime or Guiana, on the eastern side of the continent, between the rivers Orinoco and Amazon; and the mountains of Brazil, between the Amazon and the Rio de la Plata. The proportion, however, of mountain to plain is not greater than as one to four. The Andes contain 58,900 square leagues, and rise like a vast wall along the western side of the continent, separating the plains drained by the Orinoco, Amazon, and Rio de la Plata, which occupy a space of 424,600 square leagues, from the narrow country between their western base and the Pacific Ocean, which does not contain more than 20,000 square leagues. For the convenience of description, we shall divide the range of the Andes into four parts, marked by the political divisions of the continent, and shall call them the Andes of Patagonia, of Chili, of Peru, and of Colombia.

The *Andes of Patagonia* extend from the fifty-sixth to the forty-second degree of south latitude, or about 970 miles. Cape Horn, which may be seen distinctly at sixty miles' distance, is estimated to be about 3000 feet high. The greatest heights in the largest of the three chief islands (King Charles's South land), composing the Tierra del Fuego, lie about the centre of the strait of Magalhaens: Mount Sarmiento is covered with snow all the year. According to Captain King, the line of perpetual snow in the straits is about 3500 or 4000 feet above the sea. Between Chiloe and the strait of Magalhaens the average height of the mountains does not exceed 3000 feet, though, according to Captain King, there are some which may be five or six thousand feet high.

South of the parallel of 40°, the Andes, instead of leaving a belt of land between their base and the sea, press close on the ocean, and thus assume a new character which they retain to the very extremity of the continent, when we consider, as we ought to do, that their line of continuity must be looked for in the islands of the south-west coast. North of 40°, we find a 'long unbroken shore, affording neither shelter for vessels nor landing for boats; but to the southward of that parallel, the waters reach to the very base of the great chain of the Andes, and flowing, as it were, into the deep ravines that wind through its ramifications, form numerous channels, sounds and gulfs, and, in many instances, insulate large portions of land.' (Capt. King.) The charts of the Tierra del Fuego, and of the south-west coast of America, made during the late survey under Captain King, enable us to form a more correct notion of the Patagonian Mountains, and somewhat to rectify former delineations and descriptions of them. Without entering at present on a particular consideration of the mountains of Tierra del Fuego, which require a separate examination, we may trace from the bottom of Admiralty Sound (in King Charles's Land), rugged and snow-covered mountains, running in a general westerly direction, till we come to Mount Sarmiento (54° 25′ S. lat.) on the east side of Magdalen Sound, rising to the height of 6800 feet, and covered with perpetual snow. Mount Sarmiento belongs to the mountains that skirt the south side of the Gabriel channel; the whole are supposed to be the most elevated land in the Tierra del Fuego. An extensive glacier surmounts this range that runs along the Gabriel channel.

The extreme point of the South American *continent*, Cape Froward, (53° 53′ 43″ S. lat., 71° 14′ 31″ W. long.,) rises abruptly from the sea and terminates Brunswick Peninsula, which is a mass of high mountainous land, attached to the continent by a narrow neck of low country. It appears that the Strait of Magalhaens, from Cape Virgins westward to the isthmus of the Brunswick Peninsula, following the northern shore of the mainland, exhibits undulating hills, plains with level-topped land rising from them, and extensive levels frequented by the guanaco and the ostrich, but no mountains. Thus we see that the Pampas extend to the very verge of the strait. No rivers enter this part of the strait from the mainland. If we cross the isthmus of Brunswick Peninsula westward into the Otway, and then into the Skyring water, we find both these waters bounded on the north by low land, and no mountains visible. The Cordillera of the Andes, therefore, does not terminate in the mainland; we must look for it in that strange assemblage of large and small islands, intersected by almost countless channels, which run northward from the Tierra del Fuego, and form a broad belt in front of the Patagonian coast as far as the Peninsula of the Three Mountains. We must trace them also in the deep indentations and fjords, by which the sea enters far into the mainland, and gives to this part of the South American coast a character resembling that of the coast of Norway.

From Mount Sarmiento, a line drawn about N.W. by W. over numberless inlets, snow-topped mountains and glaciers, brings us to the southern part of Queen Adelaide's Archipelago. Ascending to Smyth's channel, between this Archipelago on the west, and King William IV.'s Land on the east, we find Mount Burney (52° 20′ S. lat.) on the right side of the channel, rising to the height of 5800 feet. The slope from the base northward towards the Ancon sin Salida of Sarmiento, appears as an extensive glacier. Mount Burney is near the southern entrance of the opening called by Sarmiento 'Ancon sin Salida,' which forms the inlet to those numerous sounds and canals, by which the sea runs into the mainland, behind the Archipelago and islands that line the western coast. The first great channel which runs nearly due north, called the Canal of the Mountains is, in fact, a longitudinal valley of the Cordilleras. It is forty miles long, with an average breadth of one mile and a half, bounded on each side by the lofty snow-capped Cordilleras. The western side is much the higher, and has a glacier twenty miles long running parallel to the canal. The southern part of the glacier commences about 52° S. lat.

Due east of the Canal of the Mountains, and separated from it by intervening sounds and highlands, we find the east shore of Disappointment Bay, to which also access is obtained by the Ancon sin Salida. The *east* coast of this bay is flat and low, and the land runs eastward in extensive plains covered with herds of deer. Thus we see that the Cordillera in the lat. of 52° does not appear, strictly speaking, on the mainland. To trace with accuracy the course of the mountains farther north is impossible, for want of more precise information; but we must remark that the extreme *western* shore of the islands which cover this coast is often rocky and mountainous. Cape Isabel (51° 51′ S. lat.), Cape Santiago, the S.W. entrance of the Madre di Dios Archipelago, and Cape Three Points, the N.W. point of the island of Madre di Dios, are bold projecting masses. Cape Three Points (50° 12′ S. lat.) is a lofty rocky mountain, with an elevation of near 2000 feet, rising into peaked summits. Cape Primero (49° 50′) is the S. point of the mountainous island of Corso, the land of which in clear weather may be seen for ten leagues from the southward. All these points are remarkable projections of the western Patagonian coast; for we must consider the parts that face the ocean as the real coast line, which is of a bold and rocky character, and broken up into an infinite number of fragments by the waters that penetrate deep into the interior and insulate large masses of the higher lands.

As we advance north from Disappointment Bay, it appears that the Cordilleras begin to get a footing on the mainland, which is shown by the high land observed on the east side of the gulfs and sounds, and by the numerous glaciers that sometimes run along their *east* sides, and sometimes are found at the *termination* of the long creeks and inlets. These glaciers are marked in the charts as occurring at numerous points along the eastern shores of the deep inlets, from the great Canal of the Mountains as far as Kelly Harbour (47° S. lat.), a little south of the San Tadeo River in the Gulf of Peñas. We may form some idea how close the Andes still press on the ocean even here, by the fact that Kelly Harbour is surrounded by lofty mountains, from 1400 to 1800 feet high, and by ice-filled valleys and ravines. A few birds and hair seals, but no trace of man or any other animal, was seen in this dreary place. A little north of Kelly Harbour is the San Tadeo river, which, though only navigable for eleven miles, is the largest river of the coast, *south* of the archipelago of Chiloe. The glaciers, no doubt, pour into the creeks and inlets abundance of fresh water, but are not far enough removed into the interior to give birth to rivers.

From the southern extremity of Wellington Island (50° 5′ S. lat.), which is the largest island that lines this coast, being about 138 miles long, a range of high land runs northward into the island. The highest point, called Cathedral Mount, from its resemblance to the spire and body of a church, may be seen at the distance of twenty leagues. It appears probable, then, that the Cordilleras here, as well as in their more northern course, consist of various parallel chains, running generally north, and forming, by the depressions and channels between them, a series of low lands, valleys, and channels into which the sea has penetrated.

Those who have not the opportunity of seeing Captain King's charts, and his book of sailing directions, will find a good general description of this coast by the same officer, in the *London Geographical Journal*, Vol. I.

The circumstance of mountains in this part of the Andes being covered with perpetual snow does not afford any certain guide for determining their height, if compared with mountains within the same latitudes in Europe, such as the Pyrenees and the Alps; because the limit of perpetual snow descends as we approach the pole much more rapidly than it does in the northern hemisphere. Thus, in the island of Georgia in the Southern Ocean, which is situated between the fifty-third and fifty-fourth parallels of latitude, corresponding to the latitude of central England, the line of perpetual snow comes down to the sea-shore, rendering the island, which is ninety miles long and thirty broad, wholly uninhabitable.

The *Andes of Chili* lie between the forty-second and twenty-fourth degrees of latitude, an extent of about 1200 miles. No accurate measurements have been made of the loftier summits, and all we know on this subject is very vague. Tupungato, in lat. 33° 24′, is considered the highest point of this part of the Andes, and no snow can be seen on its summit during certain periods of the year. Now Humboldt estimates the limit of perpetual snow in latitude 33° at 12,780 feet; and if this be correct, Tupungato cannot be the highest point in the Andes of Chili, for the pass of El Portillo, by the barometrical measurement of the author of the article Chili, in the *Encyclopædia Britannica*, is 14,360 feet above the sea. That same author supposes this part of the Andes to rise as high as 17,000 feet. South of Tupungato, in latitude 35°, there is another lofty mountain called El Descabezado, which probably got its Spanish name (signifying *beheaded*) from its truncated summit, on which there is a plain six miles in diameter.

There are several passes across the ridge, the most important of which are those on the great line of road between the city of Buenos Ayres and the port of Valparaiso on the Pacific. These mountain-passes lie between the city of Mendoza in the eastern plain, and Santiago, the capital of Chili. From Mendoza, which, according to the measurements of Bauza and Espinosa, quoted by Humboldt, is 700 toises or 4486 English feet above the level of the sea, to La Cumbre, (that is, the summit,) the road ascends to the height of 12,700 feet, and from thence there is a gradual descent to the city of Santiago, which is 2614 feet above the Pacific.

Between the thirty-third and twenty fourth degrees of latitude, two great mountain-chains form as it were buttresses on the eastern side of the range, being the most southerly of those articulations we have spoken of. The one, called the Sierra de Cordova, lies between the thirty-third and thirty-first degrees of latitude, advancing like a promontory into the pampas (plains) of the Rio de la Plata, as far as the sixty-fifth degree of longitude; the other, called the Sierra de Salta, which has a general direction parallel to the other, lies between the twenty-eighth and twenty-fourth degrees of latitude, and extends eastward to the sixty-fourth degree of longitude, or about 400 miles from the axis of the Andes. In neither of these offsets do the mountains rise to any considerable elevation.

In the Chilian Andes the steep face is on the eastern side, to which there is not a progressive ascent, as on the western side from the Pacific.

Between the western foot of the Andes of Chili and the sea, the face of the country is diversified with several low ridges of hills, gradually diminishing in height as they come nearer the coast, and intersected by the numerous streams which flow from the mountains. Some of these are branches from the central ridge, others run parallel to it, but the highest do not exceed 2500 feet above the sea. The breadth of the Andes in this part of their course is very various; the broadest part is between Mendoza and Santiago, and it is probably not less than 140 miles.

The *Andes of Peru* comprehend that part of the range between the twenty-fourth and sixth degrees of south latitude, a space of about 1250 miles. Their southern extremity is situated in the modern republic of Bolivia, which includes the antient provinces of Upper Peru. The great mountain-system, from the straits of Magalhaens to the parallel of Arica, in 18° 28′ S. lat., has a uniform direction from south to north, never deviating more than five degrees east; but from that point it turns suddenly to the N.W. and continues in the same direction until it reaches the fifth degree of latitude, when it again suddenly changes to N.E., the line of coast following the inflections of the mountains; thus the northern extremity of the Andes of Peru lies two degrees of longitude west of the southern termination. Between the nineteenth and twentieth degrees of latitude, not far from the city of Potosi, the range separates into two great branches, now called the Eastern and Western Cordilleras of Bolivia. The eastern Cordillera continues in a northerly course, with an inclination to the west, for about 500 hundred miles, terminating in a plain watered by the Paro, one of the great feeders of the Amazon; and in this Cordillera the Andes attain their greatest elevation. Chimborazo, about 80 miles south of the city of Quito, was long considered to be the loftiest point in the whole range, being, according to Humboldt, 3350 toises, or 21,436 feet above the level of the sea; but if the trigonometrical measurements of Mr. Pentland are to be relied on, there are two mountains in the eastern cordillera of Bolivia which are considerably higher, viz. the Cerro Nevada de Illimani, eastward of the city of La Paz, which is 24,350, and the Cerro Nevada de Sorata, which is 25,250 feet above the sea.

We have mentioned the two great buttresses of the Andes of Chili, the Sierra de Cordova and the Sierra de Salta; a third, and one of far greater extent, occurs between the twenty-second and seventeenth degrees of latitude, called the Sierra Nevada de Cochabamba. It constitutes a great lateral branch, which separates from the main range of the Andes, between the cities of La Paz and Oruro. The general direction of the mountains composing this vast group is from west to east, and they form on this part the water-shed of rivers which run on one side into the Amazon, on the other into the Rio de la Plata. Their eastern slope is very rapid, and their most lofty summits exceed the limit of perpetual snow, which is here 14,700 feet above the sea, and these are situated in the northern part of the group. Between the fourteenth and fifteenth degrees of latitude the eastern and western Cordilleras of Bolivia unite, and form the great mountain-group of Cuzco. By the bifurcation and this subsequent reunion of the range, a vast table-land is inclosed at an elevation of 12,700 feet above the sea, containing an area of 3500 square leagues, covered with fruitful fields and populous towns. It contains the great Lake of Titicaca, the surface of which extends over 448 square leagues, and, according to Humboldt, is more than twenty times as large as the Lake of Geneva. This table-land or basin is inclosed on every side, and there being no outlet, the waters which flow down from the surrounding mountains into the lake must be carried off solely by evaporation from its widely-extended surface.

The group of Cuzco, so called from the city of that name, on its eastern boundary, is by far the most extensive of those lateral assemblages of mountains which occur at intervals along the eastern side of the Andes, having an extent of surface three times as large as the whole of Switzerland, and with a mean height of 8300 feet. Proceeding N.W. from this group, a second bifurcation of the range takes place, near the thirteenth degree of latitude, the eastern chain extending eastward of the city of Guanta, the western holding a course to the west of Guancavelica. They unite again between the tenth and eleventh degrees of latitude, to form the group of Pasco, inclosing another basin, or rather table-land, having an elevation of nearly 11,000 feet above the sea, but not one-half so large as the table-land of Titicaca. In the western chain there are two mountains covered with perpetual snow, called Toldo de la Nieve, (tent of snow,) which are seen from the city of Lima. North of the group of Pasco, the Andes divide into three parallel branches, or subordinate chains, which continue to the frontiers of Colombia, where they unite again in the group of Loxa, about the fifth degree of latitude. The eastern and central chains are of comparatively low elevation, for in no part of their course do they attain the limit of perpetual snow; but the western chain, which runs along the coast, has the three snow-clad summits of Pelegatos, Moyopata, and Huaylillas. Between this last mountain, situated near Guamachuco, in latitude 7° 55′, and Chimborazo, a distance of more than 400 miles, the Andes rise in no part to the height of the perpetual snow limit. Between the mountain-range and the western ocean, the low country of Peru is very narrow, rarely exceeding 50 miles.

The *Andes of Colombia.*—At the northern limit of the group of Loxa, between the third and fourth degrees of south latitude, the main range divides into two subordinate chains, or cordilleras, which inclose the longitudinal valley of Cuença by their uniting in latitude 2° 27′ to form the group of Assuay, which last contains a table-land, or plateau, at an elevation of 15,520 feet, almost within the region of perpetual snow. Beyond this group another bifurcation takes place, the eastern cordillera containing the great mountains of Chimborazo (21,415 feet) and Yliniza (17,386); the western cordillera containing the mountains of Sangay and of Cotopaxi (18,858). The chains unite in the narrow ridge of Chisinche for a short distance, but spread out again shortly afterwards to form the vast table-land of Quito, which is bounded by stupendous mountains on the east side, and is inclosed by the reunion of the chains at the volcano of Imbabura, in latitude 0° 20′ N., near Villa de Ibarra. In the eastern cordillera are the mountains of Antisana (19,126 feet) and Cayambe (19,625); in the western, are Pichincha (15,924) and Cotochache (16,428). These chains inclose a table-land, which is divided longitudinally by low hills, and on the east of these are the plateaus of Puembo and Chillo; on the west, those of Quito, Iñaquito, and Turubamba. The equator passes through a village in the valley of Quito. In no part of the Andes are there so many colossal mountains brought together as on the east and west of this vast table-land of the province of Quito, one degree and a half to the south, and a quarter of a degree to the north of the equator.

The reunion of the cordilleras near Villa de Ibarra forms the group of Los Pastos, north of the table-land of Quito, in which are situated the volcanos of Cumbal, Chiles, and Pasto. The general direction of the Andes from the northern extremity of the table-land of Quito to the neighbourhood of the city of Popayan, changes from N. 5° E. to N. 36° E., following the direction of the coasts of Esmeraldas and Barbacoas. North-east of the city of Almaguer, the great range again divides, and the subordinate chains do not unite again. The eastern branch spreads out to form the group called Paramo (desert) de las Papas, in which are situated the sources of the Magdalena, and its tributary the Cauca; and in latitude 2° 5′, this group sends off two branches, by which we have the Andes now divided into three subordinate chains, viz., the eastern and central cordilleras of New Granada, springing from the Paramo de las Papas, and the western cordillera of New Granada, which has continued in an unbroken ridge from the bifurcation of the main range near the city of Almaguer. The eastern cordillera extends towards Santa Fe de Bogota and the Sierra Nevada de Merida, east of the Magdalena river: the central cordillera runs parallel with the eastern to the fifth degree of latitude, forming with it the sides of the valley of the Magdalena, and it continues to divide that river from the Cauca until their junction in latitude 9° 23′. The western cordillera separates the valley of the Cauca from the low country of Choco, which last forms the eastern shores of the gulf of Panama. In the central cordillera is the celebrated pass of Quindiu, between the cities of Santa Fe de Bogota and Popayan. Between the second and fifth degrees of latitude there are many places where the mountains rise above the region of perpetual snow; the most elevated are the Pic de Tolima, in latitude 4° 46′, which is 18,314 feet, and is the highest point in the range of the Andes north of the equator. But, in no part of the eastern cordillera, within the same degrees of latitude, is there any height which exceeds 12,700 feet; in latitude 5° 50′, however, there are the snowy summits of Chita, and in latitude 8° 12′ those of Muchuchies, and it is only in this eastern cordillera that any mountains rise to the perpetual snow limit beyond the fifth degree of latitude. The slope of this cordillera is extremely rapid to the east, where it bounds the basin of the Meta and Orinoco, but on the western side there are several abutments, in the form of great plateaus, or table-lands, and on these are situated the cities of Santa Fe de Bogota, Tunja, Sogamoso, and Leira. They have an elevation of from 8300 to 9000 feet. The western cordillera of New Granada is low, compared with the eastern and central,—the highest point, the Pic de Torra, situated S.E. of the city of Novita, not rising to the limit of perpetual snow. There is a gradual fall of the chain to the mouth of the Atrato on the Caribbean Sea, where there is a complete termination of the great mountain-range of South America; between Cupica, a small sea-port in the province of Biruquete, on the Pacific, and the Rio Naipi, which falls into the Atrato 45 miles above its mouth, there is nearly a dead flat, at least the plain is unbroken by any perceptible ridge.

The range of the mountain-system of the Andes may be said to terminate towards the east, where the eastern cordillera of New Granada, or what has been called the Andes of Cundinamarca, form the Sierra Nevada de Merida; but they are united to the mountains, which run from west to east along the coast of Caracas, or Venezuela, by the four Paramos of Timotes, Niquitao, Boconô, and Las Rosas, which are from 8000 to 10,000 feet high. The mountain-system of Venezuela extends 500 miles, from the Andes of Cundinamarca to the gulf of Paria, and, like the great range of the Andes, is composed of a series of parallel chains inclosing longitudinal valleys, or table-lands, at great elevations. The Silla de Caraccas is the loftiest point, and rises 8630 feet above the sea. [See America.]

North of the central cordillera of New Granada, and in the midst of a great plain which extends from the delta of the Rio Grande de la Magdalena to the sea lake of Maracaybo, there rises a vast insulated group of mountains called the Sierra Nevada de Santa Marta. They extend about 45 miles from west to east, and their highest summits—El Picacho and La Horqueta—rise beyond the limit of perpetual snow. No exact measurements of these heights have been made, but Humboldt estimates the most elevated to be 19,000 feet above the level of the sea.

The higher regions of the Andes present themselves under three different forms:—the active volcanos, such as Cotopaxi, which have only one crater of vast dimensions, are conical mountains, with summits more or less truncated. Those which have been torn by a long succession of eruptions have a jagged outline, being composed of numerous sharp points, like what are called needles in the Alps. The third is the rounded form, like Chimborazo, the most majestic of all, which, when seen from the Pacific, in a clear state of the atmosphere, stands prominently out from all the surrounding mountains, and towers proudly on the coast of the Andes, like the dome of St. Peter's looking down upon the antient monuments of the Capitol. The Andes appear as a chain only when seen from a distance. When we are placed within the range, as in the table-land of Quito, we see an assemblage of insulated mountains rising from the plateau. Thus all those volcanic peaks, such as Pichincha, Cayambe, and Cotopaxi, although they have separate names, constitute, for more than half their height, one mass, but they appear to the inhabitants of the table-land of Quito as distinct mountains rising out of a plain. The great elevation of such table-lands makes it difficult to believe the height of the mountains to be so considerable. Thus Chimborazo is 273 feet less in elevation above the plateau from which it rises than the summit of Mont Blanc is above the valley of Chamouni, and mountains, which would astonish us by their height if they rose at once from the sea shore, look like low hills on the Cordilleras. Humboldt and Bonpland endeavoured, but without success, to reach the summit of Chimborazo; they ascended, however, to the height of 19,280 feet,—a greater elevation than had ever been trod by man in any part of the world, and 3546 feet higher than the top of Mont Blanc.

Among the majestic and varied scenes which the Cordilleras present, says Humboldt, the valleys produce the most striking effects upon the imagination of the European traveller. The enormous height of the mountains cannot be seen as a whole except at a considerable distance, and when we are in the plains which extend from the coast to the foot of the central chain. The table-lands which surround the summits covered with perpetual snow are, for the most part, elevated from 8000 to 10,000 feet above the level of the ocean. That circumstance diminishes to a certain extent the impression of grandeur produced by the colossal masses of Chimborazo, Cotopaxi, and Antisana, when seen from the table-lands of Riobamba and Quito. But it is not with the valleys as with the mountains: deeper and narrower than those of the Alps and Pyrenees, the valleys of the Cordilleras present situations so wild as to fill the mind with fear and admiration. They are formed by vast rents, clothed with a vigorous vegetation, and of such a depth that Vesuvius might be placed in them without overtopping the nearest heights. Thus, the sides of the celebrated valleys of Chota and Cutaco are 4875 and 4225 feet in perpendicular heights; their breadth does not exceed 2600 feet. The deepest valley in Europe is that of Ordesa in the Pyrenees, a part of Mont Perdu; but this, according to Ramond, is not more than 3200 feet deep.

The Andes contain the sources of the greatest rivers of the world, the Amazon, and the La Plata, besides many others of considerable extent, such as the Magdalena and Orinoco; but on the western side of the continent, owing to the proximity of the mountains to the sea, there is no river of any magnitude.

GEOLOGICAL STRUCTURE.—We are indebted for nearly all the information we possess on this subject to the Baron Alexander Von Humboldt, but, for reasons which we shall presently show, what he has told us conveys little more than a general knowledge of the existence of certain classes of rocks and minerals. When that illustrious traveller left Europe to visit South America, geology was in a very different state from that in which it now is. He had been educated at Freyberg under Werner, in a school where mineralogical characters were too exclusively dwelt upon as a principal test for determining the ages of rocks, and where theoretical opinions, founded on extremely limited observations, prevailed too much. The organic remains contained in the strata were treated as of subordinate importance, the determination of species among these had scarcely been attempted, and thus the great principle now acted upon of determining the order of succession of the stratified deposits, not by the mineral composition of the rock, but by the species of the organic remains which it contains, was almost unknown; and the grand division of the stratified formations termed Tertiary, has been established by the discoveries of geologists since the period when Humboldt returned from South America. We have therefore to regret that many of the observations of that accomplished traveller are unavailable in the present more advanced state of geological science on account of their being described in the theoretical language of the Freyberg school, and having reference to doctrines of Werner, which later observations have proved to be untenable. When, in describing the unstratified rocks, he speaks of *old* and *new* granites, of primitive and transition syenites and porphyries, the terms are scarcely intelligible to a modern geologist, or at least convey to him no facts upon which general reasonings with regard to the rocks themselves, or the strata with which they are associated, can safely be founded. But the zoological characters of strata spread over so vast an extent of country could only be adequately described by the united labours, during a long period of observation, of many geologists, previously well instructed in all the knowledge of modern times respecting organic remains, and it is therefore no reproach to Baron Humboldt if he has left that field unexplored. Geology formed also but a part of the many objects which engaged his attention; and when we trace the line of his route, and compare his opportunities of personal observation with the extent of country which he never saw, we discover at once that all he could tell us is but a small portion of the geological phænomena of that vast region. If it has required years of the exertions of many labourers to arrive at our present knowledge of the geology of Europe; if a single volcano, like Ætna, has occupied the attention of naturalists for half a century, the observations of the latest inquirers bringing to light important facts unnoticed by their predecessors, what could be expected from the single visit of a single individual, however great his powers, to a whole continent of volcanoes, many of which greatly surpass Ætna itself in magnitude? Of this Humboldt was himself fully aware, for he says, (*Vues des Cordillères*, p. 4) 'Ages would not suffice to observe the beauties and discover the wonders which nature has lavished over an extent of two thousand five hundred miles,* from the strait of Magellan to the coast bordering on eastern Asia. I shall believe that I have attained my object, if the feeble sketches contained in this work shall excite other travellers to visit the regions I have traversed.' He is here speaking, it is true, of natural scenery, but we may reasonably suppose that he would say the same regarding all the other natural objects of his research. In everything which relates to the exact determination of the ages of the sedimentary deposits; the changes of position which they have undergone; the organic remains which they contain; the alluvial accumulations of every period; the relative ages of the unstratified and volcanic rocks to each other, and to the strata with which they are associated, in short, with regard to almost all the most important phænomena upon which the general principles of the science of geology depend, the Andes, and, indeed, the whole continent of South America, may be considered as remaining still an unexplored field. We are far from undervaluing the labours of Humboldt; on the contrary, we have always looked with admiration and astonishment at what he accomplished, both by his own observation and by the skilful manner in which he has made use of materials obtained from others. But it is important for the cause of science that too ready an assent should not be given to the sweeping generalizations which have sometimes been attempted to be drawn from his observations; for a more deliberate investigation will show that all we learn from the perusal of his works, respecting the geology of South America, does not amount to much more than a knowledge of the existence of certain great classes of rocks, in the northern half of the continent, in so far as their mineral composition is concerned, and a broad outline of their relative positions; together with some interesting particulars concerning the great features of volcanic action on a stupendous scale. Humboldt, by those researches, must ever be considered as having made a most important contribution to geological science. From the materials scattered through his various works, and from a few hints supplied by others, we have been enabled to draw up the following brief sketch of the geology of the Andes, as well as most of that which we have said upon the general forms and bearing of the mountain-range. Such of our readers as wish to investigate the subject more fully than we are able to do in this place, consistently with the plan of the work, must go to the original sources, especially to the volumes of Humboldt, where they will find an abundance of matter the most varied, instructive, and entertaining.

The researches of Humboldt did not extend beyond the provinces of Upper Peru, so that our knowledge of the structure of the Andes of Chili and Patagonia is extremely scanty. Travellers speak of meeting in their routes across the mountains with granite and mica-slate, and clay-slate, porphyry, sandstone, and so forth; and the low countries between the shores of the Pacific and the base of the Andes is said to be composed of secondary rocks, including beds of coal. How little geological information such notices convey it is unnecessary for us to point out. Thus two thousand miles of this vast mountain-range, containing, no doubt, the most curious and important geological phænomena, may be said to be almost wholly unknown to us. Tierra del Fuego, or the 'land of fire,' may naturally be supposed to have taken its name from volcanoes having been seen on it; but, except that which Captain Hall saw at a distance in a state of activity, in 1822, no other is known. This volcano is placed near the Beagle Channel, (54° 48′ S. lat., 68° W. long.) and still rests on the sole authority of Captain Hall. The range of the Andes, as we have remarked, if we consider the mountains of Tierra del Fuego to belong to them, must be looked for in the western part of the largest island forming the group of Tierra del Fuego, called King Charles's South Land, and in the adjoining westerly islands of Clarence and Desolation. Magdalen Sound, which divides King Charles's Land from Clarence Island, separates also the clay-slate from the more crystalline rocks of Clarence Island, which are greenstone; and, on the east side of Clarence Island, mica-slate. The clay-slate contains Mount Sarmiento, already referred to, and east of it, Mount Buckland, which is described 'as a pyramidal block of slate, with a sharp-pointed apex, and entirely covered with perpetual snow.' Its height is stated at about 4000 feet. This slate formation, which occupies the centre of the strait, contains long valleys, often furnished with a rich mould, and producing trees of considerable dimensions. The region east of the clay slate, at least along the north shore of the strait, produces nothing but grass; and that west of it, only stunted trees. It is also remarkable, that the innumerable small islands which characterize the western parts of the strait are not found in the slate formation. This formation extends from Cape Famine in Brunswick Peninsula, across the strait, and along the Gabriel Channel and Admiralty Sound, in a direction E. S. E., and possibly continues to Cape Success, at the strait Le Maire. The east shore of Tierra del Fuego partakes of the character of the Patagonian Pampas. The south shores of Hoste and Navarin islands, which also belong to the Tierra del Fuego group, are hornblende, which is also the chief component part of Cape Horn.

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* German miles.

Clarence Island is of a more rugged form than King Charles's Land, and tolerably verdant; in the Barbara channel, which separates it from Desolation Island, the fragments of rocks which compose the small islands are thickly strewed, and form the transition to the rough granitic mountains of the western part of Magalhaen's strait. The highest mountains, as we have observed, are in the slate formation, on the western side of King Charles's South Land. (See the articles STRAITS of MAGALHAENS and TIERRA DEL FUEGO; and Captain King's *Charts*.)

Volcanos are said to exist in the Andes of Patagonia; and of these there are mentioned San Clemente in lat. 46°, Medialara in lat. 44° 30′, and Minchimavidar in lat. 43°. The most remarkable feature in the physical constitution of the Andes of Chili is the great extent of volcanic action that has existed in past ages and is still in operation. No less than nineteen points of eruption, situated in a continuous line from south to north, that is, in the direction of the range, which have heaped up their ejected matter so as to form lofty mountains, have received distinct names, and there are probably many more of no inconsiderable importance which are still unknown. The most remarkable of the volcanoes of Chili are Villarica in lat 39° 8′, Maypu in lat. 34° 10′, and Peteroa in lat. 35° 15′. Villarica is always in a state of activity, and may be seen, it is said, at a distance of 150 miles. Our more detailed geological description is, from want of materials, confined to the Andes of Peru and Colombia, and especially the latter.

The Stratified Rocks.

GNEISS is found at intervals throughout the greater part of the range, often associated with granite, and often passing into mica-slate. It frequently contains large quantities of garnet.

MICA-SLATE is, next to porphyry, the rock of most frequent occurrence in the Andes, and more especially north of the equator. In the Nevada de Quindiu of New Granada, it attains a thickness of more than 3800 feet; it contains, in some places, beds of granular limestone, occasionally resembling the finest Carrara marble; but limestone, subordinate to gneiss and mica-slate, is a much more rare occurrence than in the Alps and Pyrenees. Not far from Popayan, it contains beds of quartz and beds of gypsum, sulphur being found in the quartz, and in one place Humboldt observed a bed of lamellar graphite. It often passes by insensible gradations into clay-slate.

CLAY-SLATE occupies a space of small extent in the Andes. North of the equator, it is found immediately under secondary formations in the table-land of Santa Fe de Bogota, and south of the equator it serves as a basis to the porphyry in the Andes of Quito. It is found immediately beneath a secondary limestone at the height of 12,800 feet in the ridge of the Andes of Peru, and rests on granite on the western declivity of the same part of the range: but Humboldt is of opinion that the chief mass of the slate-rocks of South America belongs to the transition series of the Wernerian school, rather than to primary strata.

QUARTZ ROCK. South of Chimborazo, near Hecatacumba, in the Andes of Quito, there occur enormous masses of quartz rock mixed with mica. The primitive quartz observed in the mountains of Europe cannot be compared in thickness nor extent to that of South America: on the western declivity of the Andes of Peru, it attains the enormous thickness of 6000 feet, and there and elsewhere it covers many leagues. It contains gold, mercury, and specular iron in many places, and in the celebrated sulphur mountain of Tiscan, in latitude 2° 13′ S., the sulphur is contained in a bed of quartz 1300 feet thick, subordinate to mica-slate, at an elevation of 8000 feet. Gold and sulphur are also found in a quartz rock in the Andes of Peru near Caxamarca, and the celebrated quicksilver mines of Guancavelica in Peru are also in the same rock.

RED SANDSTONE. A red sandstone occurs to a vast extent in the Andes of Peru, and over a great part of Colombia, not only in the Andes, but in the country east of that range, and to the shores of the Atlantic. It is often a coarse conglomerate, and passes through all gradations of structure to that of a fine-grained sandstone. From Humboldt's description of its occurrence at different places, it appears to belong to different ages, to the old red sandstone, or newer beds of the grauwacke series, and to the lower beds of the new red sandstone, the *rothe todte liegende* of the Germans. A red sandstone covers an extent of country 25 leagues in length, forming the whole table-land of Tarqui and Cuença in the Andes of Quito, at an elevation of from 8300 to 9600 feet, and it rises in the Paramo de Saar to the height of 12,150 feet, the thickness of the whole mass exceeding 5100 feet. The formation of red sandstone in the province of Quito is generally very argillaceous, sometimes slaty, and alternates with a conglomerate containing fragments of porphyry, and Humboldt found in it trunks of monocotyledonous trees four feet long and fourteen inches in diameter. It also contains there beds of an opaque limestone, and of a saccharoid limestone, like the marble of Carrara. In the llanos (plains) of Venezuela, these immense steppes, or mountain-plains, uniform like the surface of the sea over an area of 10,000 leagues, which stretch from the Sierra Nevada de Merida to the mouths of the Orinoco, are composed of a series of secondary rocks, the lowest of which is a red sandstone, or conglomerate of rounded fragments of quartz and flinty slate united by an argillaceous cement, sometimes of as vivid a red as cinnabar. This sandstone appears at the surface over the greater part of the llanos, but towards the east it is covered by beds of limestone and gypsum. In New Granada, the slaty fine-grained sandstone occurs to a greater extent than the coarse conglomerate. The latter disappears almost entirely when the formation rises to 5000 feet above the level of the sea; the sandstone of the table-land of Santa Fe de Bogota, at an elevation of 10,780 feet, is composed of small quartzose grains, sometimes so closely united as to give the rock the appearance of a granular quartz; it nowhere displays variegated colours, and animal remains are extremely rare in it. A similar red sandstone occurs in the great table-land of Caxamarca in Peru, at the height of 9350 feet. In the red sandstone of Santa Fe de Bogota, beds of coal are found, and in the great tract of red sandstone, between the lower part of the river Magdalena and Santa Fe, coal occurs in several places. Coal is also found at Huanuco in Peru, at an elevation of 14,750 feet,—the greatest elevation probably at which coal has yet been discovered. It occurs there in a compact limestone, but whether that is a subordinate formation in the red sandstone does not appear. Humboldt observed, between the seventh and eighth degrees of south latitude, a great formation, which he has called a secondary quartz rock, as it seems to replace the red sandstone on the western declivity of the Andes, and is covered immediately by magnesian limestone. It is a granular and compact quartz, stratified, without organic remains, and attains a thickness of several thousand feet.

The red sandstone of New Granada is covered by lamellar gypsum and by fetid limestone. In the basin of the Cauca and the plateau of Santa Fe, the former being 5750 feet lower than the other, the three formations of sandstone with coal, gypsum, and compact limestone succeed each other very regularly, and at Zipaquira, in the table-land of Santa Fe, rock-salt associated with this same gypsum and limestone has been worked for ages. The saliferous deposit is not less than 830 feet thick, and is covered by great masses of granular gypsum, the red sandstone appearing beneath the saliferous clay. Deposits of rock-salt and brine-springs are of frequent occurrence in traversing the eastern cordillera of New Granada from S.W. to N.E. for a distance of more than 50 leagues. Rock-salt is also found in the Peruvian provinces of Chachapoyas, on the eastern declivity of the Andes, and, what is remarkable, contains there masses of galena or sulphuret of lead. At Huara, on the coast of Peru, between Lima and Santa, rock-salt is worked like marble in a quarry, and at the same place rocks of porphyry pierce through beds of the purest rock-salt. The red sandstone of the llanos of Venezuela is covered by a whitish-grey compact limestone, and above the limestone there occurs gypsum alternating with beds of marl. This limestone, according to Humboldt, is an equivalent of the zechstein of the Germans, the magnesian limestone of English geologists. It is met with in various parts of the Andes of Peru, at elevations from 9000 to 14,000 feet, and it contain beds of bituminous marl slate, with impressions of fish, (as at Mansfeld, in Germany,) near Pasco, in the Andes of Peru, at the height of 12,800 feet. In the mine Santa Barbara, near Guancavelica, an immense bed of sandstone, containing a deposit of mercury, is met with in this same limestone.

It does not appear, from the observations of Humboldt, that any of the secondary strata later than the magnesian limestone occur in any part of the Andes, or the adjoining country, which was visited by him, and he expressly says that he never met with either oolite or chalk. The only tertiary formation he speaks of is one in the table-land of Santa Fe de Bogota, which appears to have been a lacustrine deposit, and in which he found enormous bones of the extinct species called the mastodon. That the whole series of the secondary strata above the magnesian limestone should be wanting, and that there should be a total absence of all tertiary marine beds in one-half of the continent of South America is very extraordinary, and scarcely probable. But notwithstanding this imperfect state of our knowledge respecting that vast country, an eminent French geologist, M. Elie de Beaumont, in his eagerness to generalize a favourite theory,—a theory intended to show a connexion between the elevation of mountain-chains and the extinction of species of organic remains in the successive sedimentary deposits,—has, of late, not hesitated to declare his belief, that the whole line of the Andes must have been upheaved by a single and instantaneous convulsion; that that convulsion was the last which has taken place in the solid covering of the earth; and that, by the agitation which it produced in the ocean, it was the immediate cause of the general deluge. So great a departure from the rules by which philosophical inquiries ought to be guided is a remarkable proof how dangerous, in a progressive science, an attachment to a particular theory may prove;—how very readily arguments with a mere semblance of plausibility will be admitted, even by a man who has worked assiduously in the field of observation, and knows full well how extensive and accurate our observations must be, before any general conclusions can safely be deduced from them.

The Unstratified Rocks.

The most elevated summits of the Andes—the composition of which is known—are either volcanic, or are composed of porphyry. Granite, which, in the old continent, rises to elevations of 15,000 feet, is never found at great heights in the Andes, and, indeed, forms but a small part of their external surface. Humboldt says, that one might pass years in travelling through the Andes of Quito and Peru, almost without seeing it; and he never met with it at a greater elevation than 11,500 feet. It is seen at the foot of the range in the plains of the Orinoco and Amazon, and on the shore of the Pacific between Lima and Truxillo. But Humboldt distinguishes three different kinds of granite, one which he calls primitive, and considers as the foundation upon which all other rocks were deposited, in accordance with the Wernerian hypothesis; another, which he makes of posterior formation to gneiss, but anterior to mica-slate; and a third, older than clay-slate, but of a formation subsequent to that of mica-slate. Modern discoveries have shown that granites, undistinguishable from one another in their mineralogical characters, are associated with some of the most modern of the secondary strata; and these distinctions of Humboldt are founded upon erroneous theoretical views, because the granite that lies under the gneiss may have been protruded to the surface later than that which is associated with the mica-slate. The same observations apply to his old and new syenites,—a variety of granite containing a mixture of hornblende, which is found in several parts of the Andes of Peru and Colombia. Porphyry is, by far, the most widely-extended of all the unstratified rocks of the Andes, and Humboldt distinguishes two kinds,—one which, he says, reposes immediately upon primitive rocks, and is not metalliferous; and another, which is often rich in metals and appears to belong to the transition period. The primitive porphyry is of rare occurrence; it is found on the western declivity of the Andes of Peru, at an elevation of about 3800 feet, and rests immediately upon granite. In the Andes of Peru, Quito, and New Granada, among an innumerable variety of porphyritic rocks, the masses of which are from 16,000 to 19,000 feet in thickness, there is not one which Humboldt considers as belonging to the primitive porphyries. They often exhibit superb columns, as at Pisoje, at the western declivity of the volcano of Purace, where there is a magnificent colonnade, the pillars of which are eighteen feet long, and formed of regular prisms of five, six, and seven sides. They have also very often a globular structure, as if the mass were composed of an aggregation of balls, which separate by decomposition into concentric layers. This globular structure is extremely common in the unstratified rocks of the Andes. To describe the various kinds of porphyries, or even their chief localities, would be both tedious and unprofitable; it is enough to say, that they occur throughout the whole range of the Andes, at all elevations, and that the highest summits are frequently composed of them.

Next in importance to porphyry among the rocks of igneous origin is that called TRACHYTE, (from τραχύς, *trachus*,) rough, because it has a harsh, rough feel. There are many varieties of it, but its most characteristic form is a hard rock with a granular basis of glassy felspar, and including separate crystals of glassy felspar usually with a mixture of hornblende, and often mica; and these materials are united in so many different proportions as to produce rocks of very different aspects. Trachytes occur throughout the whole range of the Andes of Chili, Peru, and Colombia; the porphyries are often covered by them, and it is not easy to define the limits between trachytes which pass into porphyry and those which are produced by active volcanos. Like porphyry and basalt, trachyte is often found in columns of great regularity, as in Chimborazo, where it is met with in slender prisms of 50 feet long. It occurs in enormous masses, for Humboldt says that in Chimborazo and Pichincha it undoubtedly attains a thickness of from 14,000 to 18,000 feet, and in continuous masses. The trachytes are most frequently not covered by any other formations except recent volcanic products, and this is also, in general, the case with the porphyries; but these are sometimes covered by the older sedimentary deposits, showing that there are porphyries of very different ages in the Andes; and there is every reason to suppose that trachytes have also been formed at various periods.

The Andes are often throughout a great extent wholly destitute of the trap-rocks: neither in Chimborazo, Antisana, nor Pichincha are there any rocks of this class; but basalt characterised by olivine, and regularly columnar, is found in the table-land of Quito, near Popayan, and on the western banks of the Cauca. The basalt, or trap-formation, in the vicinity of Popayan, as well as in other situations in the Andes, is accompanied by clay of great thickness, which renders the passage of the cordilleras from Popayan to Quito extremely difficult during the rainy season.

Volcanos.

No part of the world has been subjected to greater revolutions from volcanic fires than the range of the Andes. The igneous action has been confined to this western side of the continent; for, east of the Andes, throughout the whole country from the base of the mountain-range to the Atlantic, a space of more than 500,000 square leagues, neither porphyry, basalt, trachyte, nor any active volcanos have yet been discovered, either in the plains, or in the mountains of Guiana and Brazil. In the range of the Andes, where their products do not cover the whole surface, they are found in insulated masses on the ridges and on the sides of the mountains rising in the form of pyramids, or of cones, amidst the stratified rocks of different ages. All the volcanos, whether extinct or active, have burst forth amidst porphyries, basalts, and trachytes; all the loftiest summits of the range are composed of trachyte, and the opening is usually in the latter rock. It may be considered as a general rule, that when the mountains rise much above the limit of perpetual snow, that is, from 14,700 to 15,800 feet in the equatorial regions, the rocks commonly called primitive, such as granite, gneiss, and mica-slate, disappear, and are replaced by porphyries and trachytes. That these last substances are often granite, gneiss, and slates, altered by the action of heat, is rendered probable by many circumstances connected with them, and the trachytes of the Andes frequently include fragments of those primary rocks. It is very difficult to draw the line of separation between the various kinds of unstratified rocks, all of which are now admitted by most geologists to be of igneous origin. Granites and porphyries change into traps and trachytes; these last into the lavas of active volcanos; and thus any conclusions as to the ages of the unstratified rocks, drawn from mere mineralogical differences, are open to many sources of error. The glassy lava, called obsidian, is often met with in the Andes, and exhibits many shades of colour, from deep black to a clear, colourless glass. Beds of it, 16 inches thick, occur in the trachyte of Quinché, in the table-land of Quito. Fragments of rock, including nodules or lumps of obsidian are thrown out by Cotopaxi, and obsidian in the form of balls, and in those elongated pear-shaped forms called tears, is ejected by the volcano of Sotara near

Popayan, to the distance of several leagues, and scattered about like fragments of flint on the chalk-downs. Pumice-stone, which is nothing more than obsidian frothed up by the admission of air or watery vapour to it when it was in a fluid-state, is found to a great extent in many of the volcanos of the Andes; there are immense subterranean quarries of it at the foot of Cotopaxi, and for more than 40 leagues westward of the volcano, the ground is covered with fragments of pumice and cinders of trachytes. Volcanic-tuff, which is a stone more or less compact, made up of fragments of hard lava, cinders, and ashes, agglutinated together, covers immense tracks on the flanks of the Andes and on the table-lands. It is often very friable, and in many places contains blocks of pumice, which are sometimes from 25 to 30 feet long. In a region where almost all the burning volcanos rise above the limit of perpetual snow, deluges of water are often produced by the melting of the snow, and by the bursting of cavities in which water had accumulated by infiltration, and these carry along with them the loose stones, and give rise in lower regions to depositions of this tuff, of a magnitude in proportion to the volume of water and the loose materials it meets with in its descent. A liquid mud sometimes issues from the sides of the volcanos of the Andes, as when, in 1698, the peak of Carguairazo sunk down, and more than four square leagues were covered with mud; and, what is very remarkable, small fish which inhabit the streams of the province of Quito were seen in thousands, enveloped in the muddy eruption. These fish live in subterraneous lakes; at the time of great eruptions the sides of these lakes are burst, the fish are carried with the water through the crevices and are enveloped in the mud formed as the water rushes through the loose ashes and soil. The almost extinguished volcano of Imbaburu ejected in 1691 so great a quantity of fish, that fevers which prevailed at the period were attributed to the effluvia from the putrid animal matter.

The most considerable volcanos of the Andes are situated not far from each other in the province of Quito. These are, Cayambe, Cotopaxi, Pichincha, Antisana, L'Altar, and Tunguragua. Of all the summits of the Andes the height of which has been determined with any degree of precision, the volcano of Cayambe is the most lofty after Chimborazo—being 19,625 feet. Its form, like the volcano called the Nevada de Tolima, is that of a truncated cone, and it is one of the most beautiful and majestic of all those which surround the city of Quito. Its summit is crossed by the line of the equator, and it stands, says Humboldt, like one of the colossal and eternal monuments placed by the hand of nature to mark the grand divisions of the globe. According to a very probable tradition of the Indians of Lican, the mountain called L'Altar, or in the Quichoa tongue, Capa-Urcu, was once higher than Chimborazo, but in the reign of Ouainia Abomatha a prodigious eruption took place, which lasted eight years, and broke it down. The summit of this remarkable mountain presents a series of sharp pinnacles and needles, and when the rays of the setting sun strike upon these ice-clad ruins, the most magnificent play of colours is produced. The volcano of Antisana, which is 19,120 feet high, appears never to have had its summit pierced, the lava having burst forth from an opening in the side. Pichincha, which is 15,920 feet high, has a crater, the edges of which are covered with pumice, but it does not appear to have ejected a current of lava since the formation of the adjoining vallies. The volcano of Cotopaxi is the most lofty of all the volcanos of the Andes which have been in a state of activity in modern times. Its height is such (18,858 feet) that it would exceed by 2600 feet the summit of Vesuvius if that volcano were placed on the top of the peak of Teneriffe. It is the most dreaded of all the volcanos of Quito, because its eruptions have been the most frequent and the most devastating in their effects. In 1738 the flames rose nearly three thousand feet above the edge of the crater. In 1744 the sound of the explosions was so great as to be heard at a distance of five hundred and fifty miles. On the 4th of April, 1768, the quantity of ashes thrown out was so great that in the towns of Hambato and Tacunga such a degree of darkness was produced as to oblige the inhabitants to go about with lanterns for many hours in the day-time. The eruption of January, 1803, was preceded by sudden melting of the snow which covers the mountain. For twenty years no smoke nor visible vapour had issued from the crater, but in a single night the internal fires became so active, that at sunrise the external walls of the cone were observed to be black and bare, their mantle of snow having been dissolved by the heat. The form of Cotopaxi is the most regular and beautiful of all the colossal summits of the Andes. It is a perfect cone, which, covered with an enormous bed of snow, shines with a dazzling lustre at sunset, against the azure vault of heaven. The crater is surrounded with a wall of scoriæ, but it was only seen by Humboldt by means of a telescope, for the cone being surrounded with deep rents and fissures, cannot be approached.

A region so underlaid by volcanic fires could not fail to be subject to repeated earthquakes, and accordingly, no part of the world has suffered more from their dreadful effects. Sometimes the shocks come without giving any warning at all, and ruin and devastation are spread over a district which, an instant before, had been in a state of peaceful repose; in general, however, the inhabitants are forewarned of the approach of the convulsion, but the interval between the announcement and the arrival of the destroying force is too short to admit of any precautions against the loss of property; it is well if there be time enough to escape from death. Such is the frequency of the occurrence, that the inhabitants construct their dwellings so as to diminish the risk of damage to the building, and to facilitate their own escape. But no precautions can give confidence in such a case, and the terror which takes possession of the people extends to the brute creation, for the animals howl piteously when they feel the ground rocking under them. The effects are often produced far from the supposed centre of the volcanic action, for even the towns on the sea-shore are often destroyed. The whole of Chili is particularly subject to earthquakes. The city of Copiapo was entirely destroyed in the year 1819, not a house being left standing; and the city of Conception has been twice destroyed, viz., in 1730 and 1751. An earthquake of tremendous force occurred on the 19th of November, 1822, which shook not only the whole of the low country of Chili, but was felt in the mountains, and even at Mendoza and San Luis, on the eastern side of the chain. The towns of Valparaiso, Mellipilla, Quillota, and Casa Blanca, were almost destroyed, and the capital, Santiago, was considerably damaged. It was felt on the same day at Lima, in latitude 12°, and at Conception, in latitude 37°, a distance of more than 1700 miles. One of the most remarkable effects of this earthquake was the elevation of the land on the coast; above a hundred miles of it was permanently upraised to the height of three or four feet, a portion of the bed of the sea being converted into dry land, covered with oysters, mussels, and other shell-fish. A circumstantial account of the phænomena which occurred near Valparaiso, by Mrs. Graham, who was then living in the country, will be found in her *Journal of a Residence in Chili*, and in the first volume of the *Second Series of the Transactions of the Geological Society*. The volcano of Maypu, situated about 170 miles E.S.E. of Valparaiso, which had been dormant for several years, has had frequent eruptions since the great earthquakes of 1822, for it was not one shock only which took place; many succeeded at very short intervals, even to the end of the following September.

Mines.—No mountains in any part of the globe abound so much in the precious metals as the Andes, both in South America and in the prolongation of the chain northward into Mexico. For three centuries their riches have been spread over every part of the globe to which civilization has extended, and it is probable, that if improved systems of working the mines were introduced, where there are no natural obstacles to their adoption, the produce would be immensely increased.

GOLD is seldom found, like other metals, in the solid rock, through which its veins must be followed by extensive subterraneous excavations, nor is it met with in ores, in combination with foreign substances, which can only be separated from the pure metal by long and expensive operations. It is always found in the metallic state, and in a great degree of purity; by far the largest quantity is collected in the form of grains and small rounded lumps, scattered through alluvial soils, which have been derived from the disintegration of rocks containing the metal, and most probably in the form of slender veins. The water-courses of rivers are usually composed of alluvial soil to a great depth, and that soil frequently extends a great way on both sides of the river, the deposits of a long succession of ages; the grains of gold are disseminated through the whole of this alluvium. The places chosen for digging into that auriferous soil are called *lavaderos*, because the grave sand, and earth undergo repeated *washings* to separate the heavy particles of gold. The most considerable gold mines of Chili are in the district of Petorea, N.E. of Valparaiso, and farther to the north in the districts of Coquimbo and Copiapo. In Peru, the provinces the most rich in gold are those of Pataz and Huailas, between the seventh and ninth degrees of latitude, and situated in the ridge of the Andes. The Incas obtained vast quantities of gold from the plains of Curimayo, N.E. of the city of Caxamarca, at an elevation of more than 11,000 feet above the sea; and in the Cerro de San José, at a height of 13,000 feet, considerable quantities of gold have been found in veins of an ore of silver. Very extensive and productive lavaderos are situated on the banks of the river Tipuani, not far from the town of Zorata, eastward of the great lake of Titicaca, and which appear to have been worked by the early inhabitants of the country, for antient Peruvian tools are sometimes found in the soil. There are veins of gold in mica-slate in the province of Antioquia in Colombia, but there are no mines worked there, on account of the inaccessible nature of the country. All the gold of New Granada is obtained from the alluvial soils, and the richest lavaderos are in the provinces of Antioquia and Choco, in the valley of the river Cauca, and on the coasts of the Pacific in the district of Barbacoas; but the auriferous alluvium extends over the whole country from the western Cordillera of New Granada to the sea-shore. In some parts of the district the gold is almost perfectly pure, in others it is alloyed with silver in various proportions, even as much as 50 per cent., but this last has been found only in one place. The largest piece of gold known to have been met with in the province of Choco weighed twenty-five pounds; but one is said to have been found near La Paz, in Peru, of nearly forty-five pounds weight. The annual produce of the gold mines and lavaderos of Chili, Buenos Ayres, Peru, and New Granada is stated by Humboldt to have amounted at the beginning of the nineteenth century to 8809 kilogrammes, or 283,429 troy ounces, equal, at 4*l.* per ounce, to the sum of 1,133,716*l.* sterling.

Silver is found in Chili, but the mines are in general not productive, except in the Cerro de Uspallata, twenty-four miles N.W. of the city of Mendoza, on the eastern side of the Andes, where an ore is worked which yields about fifty marcs of silver in every hundred pounds of ore. In Peru there are silver mines along the whole range of the Andes from Caxamarca to the confines of the desert of Atacama; but the richest are those of Pasco, in the eleventh degree of latitude, which have been worked since the year 1630. Here, as well as in other situations in Peru, the greatest part of the silver is obtained from an ore called in the country *pacos*, which, according to the analysis of Klaproth, is an intimate mixture of minute particles of native silver with brown oxide of iron. To form a just idea of the enormous quantity of silver in some of these mountains, it is only necessary to state, that in the mines of Pasco the ore has been worked without intermission since the beginning of the seventeenth century, and that in twenty years preceding 1803 no less than 5,000,000 marcs of silver had been obtained from them, and that too without in any case sinking deeper than about seventy fathoms, while most of the mines do not exceed fifteen fathoms in depth. The stratum of limestone in which the ore is contained lies exposed at the surface over an area of three miles by a mile and a half. The mines of Chota are also very productive. They are situated in the mountain of Gualgayoc, at an elevation of 13,300 feet, where the thermometer in summer descends every night to the freezing point. The ore lies quite at the surface, so that in removing the turf almost in any place, over an extent of half a square league, portions of sulphuret of silver and filaments of native silver may be met with adhering to the roots of the grass. The ore is richer than that of Pasco, and yielded on an average of twenty-eight years prior to 1803, 67,193 marcs of silver annually. In the district of Arica, on the very borders of the Pacific, at Huantajaya, there are mines of silver which are celebrated on account of the very large masses of pure solid silver sometimes found there, one of which weighed eight hundred pounds. The most renowned of all the silver mines of South America are those of Potosi in Upper Peru. They are situated in a lofty mountain called the Cerro del Potosi, composed of clay-slate covered by porphyry, and rising to the height of 16,000 feet above the sea, the town of Potosi itself being 2700 feet below the summit. The mountain is perforated in all directions, and it is said that there are not less than five thousand excavations in it, some of them within 120 feet of the top; indeed the works have hitherto been almost confined to the higher parts of the mountain for the sake of more easily getting rid of the water, but an adit or drain more than a mile and a quarter long and fourteen feet square, has been constructed in order to carry off the water from the lower mines. There are rich veins of silver in several parts of New Granada, but no mines have yet been found sufficiently productive to pay the expense of working them. The annual produce of silver from the mines of Chili, Peru, Buenos Ayres, and New Granada, is stated by Humboldt to have been at the commencement of the present century, 258,069 kilogrammes, which is equal to 691,492 lbs. troy, and if we take the silver at only five shillings the ounce, it gives a sum of 2,074,476*l.* sterling. The produce of the mines of Potosi are included in the returns from Buenos Ayres.

Mercury, or **Quicksilver**, is found in many parts of the Andes, not in a pure and fluid state, but in combination with sulphur, forming that particular red ore of mercury called cinnabar. Near the village of Azogué, (the name of which means quicksilver,) north-west of Cuença, the ore is found in a quartzose sandstone, 4600 feet thick, containing fossil wood, and asphaltum or mineral pitch. It is found in many parts of Peru, but the most celebrated quicksilver mines of South America were those situated in the mountain Santa Barbara, near the town of Guancavelica, until they were accidentally destroyed. The mountain is 12,300 feet above the level of the sea: the cinnabar occurs in the form of layers and of veins in a sandstone, almost as compact as pure quartz, thirteen feet thick, forming a subordinate bed in a calcareous breccia, that is, a rock composed of fragments of limestone cemented together, resting upon, or rather being a part of the extensive formation of magnesian limestone, which, in this place, abounds in pectens and cardiums. These mines were worked by the Spaniards as far back as the year 1570, and from documents which have been regularly kept, it appears that they had in general yielded annually from 400,000 to 600,000 lbs. of quicksilver, and in some years as much as 1,050,000 lbs. But in 1789, an ignorant superintendant, wishing to increase the produce, caused the miners to work the masses which had been left to support the roof, as is usually done in coal-mines; the consequence of this was, that when these pillars were taken away the roof sunk down to the floor of the mine, and closed it.

Platina is met with only in the provinces of Choco and Barbacoas, in the north-western part of Colombia, west of the sandstone mountains on the left bank of the Cauca, in the same alluvium from which the chief part of the gold of New Granada is obtained, but only in the form of grains, for it has not been found united with any matrix. The grains are usually small, lumps being very rare; the largest of those hitherto found, which is in the Royal Museum at Madrid, weighs no more than twenty-one ounces.

Copper is found in Peru, and is by far the most valuable of all the metallic productions of Chili. The mines are chiefly in the northern provinces of Coquimbo and Copiapo, but there are also some of great value in the southern provinces, or rather in what is usually termed the country of the Araucanos. The average annual produce of Chili in copper is estimated at 14,000,000 lbs., and it is exported to the United States, China, the East Indies, and many parts of Europe.

Tin is also found in Chili, and forms an article of export.

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THE PENNY CYCLOPÆDIA

OF

THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

ANDO'CIDES, the son of Leogoras, of a noble Athenian family, was born about B.C. 468. We find him, during the war of the Corcyræans and Corinthians, commanding, jointly with Glaucon, an Athenian squadron which was sent to aid the Corcyræans (Thucyd. i. 51). After this he appears to have been employed as ambassador on numerous foreign missions. During the Peloponnesian war (about B.C. 415) Andocides was involved in the charge of mutilating the Hermæ, (see ALCIBIADES,) and, according to Plutarch, he saved himself by accusing his real or imaginary accomplices, and among them his own father, whom however he succeeded in rescuing from capital punishment. But the history of all this transaction is obscure. After this event Andocides went abroad and visited Sicily, Italy, the Peloponnesus, and Thessaly: he also visited Asia Minor and the island of Cyprus, where he became on good terms with the king of Citium, to whom he is accused of delivering up his own cousin, a female, whom he had carried off from Athens. The story rests on doubtful authority; but the king and the Athenian adventurer appear to have quarrelled, and Andocides made his way back to Athens. The Four Hundred at this time (B.C. 411) directed the administration of affairs, and Andocides, who was always in trouble, was accused apparently on frivolous grounds, and thrown into prison. On being released he set out again to Cyprus, and attached himself to Evagoras, king of Salamis. But he quarrelled with this new acquaintance also, and again returning to Athens after the restoration of the popular government, he was once more compelled to quit the place and to retire to Elis. On the overthrow of the Thirty Tyrants by Thrasybulus, (B.C. 403,) Andocides returned to Athens, and recovered all the influence which talents and eloquence naturally gave an unprincipled man in the Athenian democracy. The remainder of his life is obscure. The life of Andocides, attributed to Plutarch, speaks of his being sent to Lacedæmon on the subject of *the* peace (τῆς εἰρήνης), in which affair he conducted himself in such a way as not to venture back to Athens. This peace has been conjectured to be that of Antalcidas, B.C. 387, but at this time Andocides was eighty-one years of age, if the date of his birth is correctly given, and not likely to have been employed on such a mission.

It is unfortunate that the events of this orator's rambling life are not better known. The times during which he lived were full of important occurrences, and a minute account of his life and adventures would have thrown great light on the internal history of Athens and that of other states also. There is little doubt that he was a man of ability, but without any principle.

Four extant orations are attributed to Andocides: *On the Mysteries: On his* (second) *Return to Athens: On the Peace with the Lacedæmonians;* and that *Against Alcibiades.* The authenticity of the third and fourth are disputed, that of the third at least, perhaps, with good reason.

The orations of Andocides are found in the collections of the Athenian orators, by H. Stephens (1575), in that by Reiske, and in the later edition of Bekker. They are also in Dobson's collection (1828), with the *Lectiones Andocideæ* of Sluiter, &c. They were translated into French by the Abbé Auger, 1792. The oration on the Mysteries was pronounced when Andocides was about seventy years of age, in reply to an accusation brought against him by Callias of violating a law respecting the temple of Ceres at Eleusis. The oration contains, besides the immediate subject of the defence, much information on other parts of the orator's life. It is an admirable specimen of simple and perspicuous language, and equally remarkable for the skill with which the defence is conducted.

ANDORRA, a valley on the southern side of the central Pyrenees, situated between two of the highest mountains, the Maladeta and the Moncal, the former 3808 and the latter 3570 yards above the sea. The extent of this valley is forty miles in length, and twenty-four in breadth; it is bounded on the east and south by the territory of Puigcerdá, by Talarn on the west, and on the north by the Pyrenees and the county of Foix, in France. The rivers Balira, Odino, and Os irrigate its grounds, and flow into the main stream, the Segre, which is a branch of the Ebro. The territory is mountainous, but abundant in pasturage. At Caldes, as its name imports, are abundant thermal springs. Its forests produce a great quantity of timber, which is carried down the rivers Balira and Segre into the Ebro, and thence to Tortosa. The mountains abound in bears, wolves, wild boars, goats, and other species of game. Besides Andorra it contains five other villages; Encampo, Masano, Ordino, San Julian, and Camillo, the latter remarkable for its iron mines. The capital, Andorra, is situated on the river Balira, and contains 2000 inhabitants.

Andorra is an independent republic, and though double in extent, is less known than that of San Marino, in Italy. It is governed by a syndic, who presides in the council of the valley, and by two *Viguiers*, one appointed by the king of France and the other by the bishop of Urgel. Lewis le Debonnaire gave the sovereignty of this valley to Sisebertus, the first bishop of Urgel, in 819, and from that time it has maintained its independence between France and Spain. Andorra, the chief town, on the Balira, has about 2000 inhabitants. The people of the territory speak a Catalan dialect.

See Miñano; Malte Brun, *Universal Geography*, vol. viii. p. 124. Balbi, *Abrégé de Géographie*, p. 370.

A'NDOVER, a borough and parish in the N.W. part of the county of Hants, and on the border of the downs which stretch into Wiltshire. It is on the left bank of the river Anton, (a branch of the Tese, or Test, which falls into Southampton water,) and from its situation, gets the name of Andover, (Saxon, Andeafaran,) *i. e.*, ferry, or passage over the river Ande. It is 63 or 64 miles W.S.W. from London; 51° 12′ 30″ N. lat., 1° 28′ W. long. from Greenwich.

The three principal streets are well paved, but not lighted; the houses are well built, and the town is well supplied with water. The church is near the north end of it, and is a spacious structure, of very great antiquity, having existed as far back as the time of the Conqueror. At the west end is a fine semicircular, arched doorway, with zigzag mouldings. The living, a vicarage, with the chapelry of Foxcote annexed, is in the patronage of Winchester College. There are meeting-houses for Baptists, Quakers, Independents, and Methodists; a free grammar school, with a school-house built and kept in repair by the corporation; and an almshouse for six poor men, erected and endowed by John Pollen, Esq., one of the members for the borough in the time of William III. Another almshouse, for six poor women, was built with funds bequeathed by Catherine Hanson, but not endowed. There is also a school-house erected and endowed by John Pollen, Esq., for educating twenty poor children. This establishment is now incorporated with the National School, supported by additional subscriptions, in which 250 children are educated.

The town-hall is a handsome stone building with a Grecian front, supported by arches; the under part is used as a market-house. It was erected within these few years. The corporation is said to be as ancient as the time of John; but the present charter was granted by Queen Elizabeth.

Andover first returned members to Parliament in the time of Edward I.; but the right was lost, or disused, from the first year of Edward II., to the twenty-seventh year of Queen Elizabeth, when they were again sent, and have since been regularly returned. Before the passing of the Reform Bill, the right of election was in the corporation, which was considered to be under the influence of the Earl of Portsmouth. By the Boundary Act connected with the Reform Bill, the tything of Foxcote was added to the Borough, which had previously included the parishes of Andover and Knight's Enham. The population of the whole was, in 1831, 4966.

The chief business of the town consists in malting, and in the manufacture of silk, which has lately superseded that of shalloon, the former staple. A considerable quantity of timber is forwarded from Harewood forest to Portsmouth, by means of the canal from this town, through Stockbridge, to Southampton water. The market is on Saturday; and there are three fairs in the year.

About three miles west of the town, at the village of Weyhill, is held one of the largest fairs in England. This fair begins on the 10th of October, and continues for six days. It is thus described in '*Magna Britannia Hibernia*,' a survey of Great Britain, published in 1720. 'This fair is reckoned to be as great an one as any in England, for many commodities, and for sheep, indisputably the biggest, the farmers coming out of the south, north, and east to buy the Dorsetshire ewes here. It is also a great hop and cheese fair, the former being brought out of Sussex and Kent, and the latter out of Wiltshire, Gloucestershire, and Somersetshire.' The above account of the chief articles of trade, will apply with little alteration to the present day. The sale of sheep, though the favourite breed may be different, is still great: more than 140,000 have been sold on the first day. The Farnham hops, the choicest of any grown in England, are chiefly sold here, and a place appropriated to their sale, bears the name of Farnham Row. Many horses, particularly cart colts, are also sold.

During this fair, assemblies are held in the town-hall at Andover.

Near Andover, there are the remains of some Roman encampments, especially one on the summit of Bury Hill, a mile or two south-west of the town; and some beautiful specimens of Roman pavement have been found in the neighbourhood. (Warner's *Hampshire; Beauties of England and Wales.*)

ANDOVER, a town in the state of Massachusetts, United States, about twenty miles direct distance N. by W. of Boston, and about two miles from the southern bank of the Merrimack river. It is also watered by the Shawsheen. Andover is divided into three parishes, and has some inconsiderable manufactures. The north parish contains the Franklin Academy, and the south parish the Theological Seminary, and Phillips's Academy. The Theological Seminary opened in 1808; it has four professors and (in 1831) 139 students, with a library of 10,000 volumes. The whole number that has been educated here was (in 1831) 514. This establishment has acquired some celebrity from the impulse it has given to the study of Hebrew in the United States. The population of Andover in 1820, was 3889. (*Encyclop. American.; Journal of Education*, Nos. x., xi.)

ANDRE′ (ST), or **ST. ENDRE′**, the capital of a lordship in Hungary, in the circle called the Hither Danube, and in the department of Pesth; the number of its inhabitants scarcely exceeds 3000. Their chief support is derived from the cultivation of the vine. The eastern Christians, who are in number about 1000, have seven churches in the town; which gives an average of scarcely more than 157 persons to each church. This singular circumstance originated in the immigration of the Servians under Leopold I., each sect of whom founded their own place of worship.

ANDRE′ (JOHN), appears to have been a native of Lichfield, and to have been born there in 1751. In 1769 he met at Buxton a Miss Honoria S———, and the consequence was an immediate attachment, which became one of remarkable devotedness on his part, and which would seem to have been also returned by the lady. Her friends, however, interfered, and she was induced not only to discontinue her correspondence with André, but some years after to give her hand to another. Meanwhile André had become a clerk in a commercial house in London. But on receiving intelligence of Miss S.'s marriage he determined to quit both his profession and his country, and having procured a commission in the army, he proceeded with his regiment to North America, then the seat of war between Great Britain and her colonies. In this new field of enterprise his talents and accomplishments soon raised him to distinction; and he attained the rank of major, with the appointment of adjutant-general to the North American army. In the summer of 1780 Major André was with the troops which occupied the town of New York under the command of General Sir Henry Clinton, when the infamous Arnold, who had been entrusted by Washington with the important position of West Point on the Hudson, about 60 miles above New York, sent over to the British commander his proposals for delivering that fortress into his hands—a scheme which, if it had succeeded, might not improbably have put an end to the war. On Arnold's overtures being accepted, André was appointed to conduct the negotiation with him. After some correspondence under feigned names, André and Arnold met on the banks of the Hudson on Friday the 22d of September, when everything was arranged for the execution of the plot on the following Monday, and the necessary information in writing was put into André's hands to be delivered to General Clinton. Unfortunately for André, the boatmen who had brought him on shore from the English sloop of war in which he had come up the river, having had their suspicions or fears awakened, refused, although he bore a flag of truce from General Arnold, to convey him back, and he was obliged to determine upon attempting to make his way to New York by land. Arnold, to whom he returned, insisted, in these circumstances, that he should exchange his military uniform for a plain coat; and to this André reluctantly consented. A person of the name of Smith was then sent away with him as his guide, and they set out together; but when they reached the next post, they found themselves obliged, in order to prevent suspicion, to follow the advice of the commanding officer, and to remain there for the night. Next morning they proceeded on their journey, and Smith having conducted his charge till they had come within view of the English lines, left him a little below Pine's Bridge, a village on the Croton. André rode on alone for about four leagues farther, when as he was entering the village of Jarrytown, his horse was suddenly taken hold of by three men, who turned out to belong to the New York militia. With unaccountable imprudence, André assumed that they were of the English party, and instead of producing his passport desired them not to detain him, as he was a British officer. When he found his mistake, he endeavoured to induce them to let him go by the offer of his watch and the most tempting promises; but the men were not to be bribed, and having found the important papers of which he was the bearer concealed in his boots, they immediately conducted him to the nearest station. His first anxiety now was for the safety of Arnold; and he contrived to prevail upon the officer in command, who must have been a person of very little perspicacity, to forward a notice of his capture to that general, by which the traitor obtained the opportunity of escaping with his life. Having secured this point André now stated who he was, on which he was conducted to the presence of General Washington at Tappan or Orange Town. On the 25th, his case was submitted by the American general to the consideration of a board of fourteen general officers, among whom were Rochambeau and Lafayette, who had recently arrived with the troops from France. Before this tribunal, André urged that he had come on shore under the sanction of a passport, or flag of truce, transmitted to him by Arnold, who was, at the time of granting it, a major-general in the American army, and of course had sufficient authority so to act. But the circumstance of his having been found disguised and bearing a false name was considered as taking from him the benefit of this plea, although he proved that in both these points he had acted in obedience to the commands of Arnold, under whose orders he was while he bore his flag of truce. The decision of the court-martial, though the members do not appear to have been unanimous, as has sometimes been asserted, was that the prisoner ought to be considered as a spy; and he was accordingly sentenced to be executed. Both entreaties and remonstrances were employed in vain by General Clinton to avert his fate; but as retaliation was not taken by the execution of any American prisoner, it may be inferred that it was felt even by the English that his sentence was according to the rules of martial-law. He himself exhibited the most perfect resignation to his fate, and does not after his condemnation appear to have disputed the justice of the decision under which he was to suffer. He only begged that his death might be that of a soldier. He was kept in ignorance of the determination of the court-martial upon this point: but when upon being brought to the fatal spot, on the morning of the 2d of October, he perceived that he was to perish on a gibbet, he exclaimed, 'It is but a momentary pang,' and gave no further expression to his feelings. He died with the respect even of those who had found themselves obliged to execute him. 'André,' said Washington, in a letter to a friend, 'has met his fate, and with that fortitude which was expected from an accomplished man and a gallant officer.' A monument was erected to his memory, at the public expense, in Westminster Abbey.

Whatever the books which are considered the standard authorities upon international law may say in reference to such a case as that of André, there is no good apology for his conduct. To say that he acted under the orders of an officer whom he knew to be playing the part of a traitor, cannot be considered as any exculpation. There would be no security for an army or a government if it were not to be at liberty, when it had them in its power, to punish persons detected in devising such plots as this of Arnold and André, under whatever subterfuge they might attempt to shelter themselves. The having recourse to the use of a flag of truce, in such circumstances, must be regarded as a mere trick. General Clinton and Arnold were the great culprits, of whom the latter only has received his due share of opprobrium.

To his last moment André had cherished the hopeless passion which had driven him from his country and his early pursuits. In a letter written after his capture, which has been printed, he states that when he was stript of everything, he had concealed the picture of Honoria S—— in his mouth. This lady, although it does not appear that he had been informed of the event, had died of consumption only a few months before.

This unfortunate officer was a person of cultivated mind and elegant accomplishments. He excelled in painting and music, and was also no despicable writer of verse. His humorous poem, entitled the *Cow-chase*, which appeared in three successive portions at New York, in 1780, the last being published on the very day on which its author was taken prisoner, is a production of decided talent. It is in the style of Cowper's *John Gilpin*, which celebrated poem was not written till some years later. For further particulars respecting the subject of this notice, see Miss Seward's *Monody on the Death of Major André*, 4to., London, 1781, from the notes and letters attached to which we have taken most of the facts of his private history; a publication by Joshua Hett Smith, Esq., (the person who acted as his guide on his return to New York,) entitled *An Authentic Narrative of the Causes which led to the Death of Major André*, 8vo., London, 1808; and an elaborate article in the *Encyclopædia Americana*, under the head of 'Arnold, Benedict.'

ANDREA VANNUCHI, called DEL SARTO, from the occupation of his father, a tailor at Florence, was born in that city, in the year 1488. He was initiated in the principles of design by Giovanni Barile, and he studied subsequently in the school of Pietro Cosimo. He learned little more from these masters than the mechanical practice of his art, but in the frescoes of Masaccio and Ghirlandaijo, and in the cartoons of Michel Angelo and Leonardo da Vinci he found the principal elements of whatever excellence he afterwards attained. His powers were first developed in some works executed in conjunction with a friend and fellow-student, called Francesco Bigio, for the churches and convents of Florence; but the great picture of St. John preaching, entirely by his own hand, established his claim to independent reputation, and it was considered that the work which immediately followed, the life of Filippo Benizi in ten compartments, for the church of the Servi, entitle him to rank with any competitor in his native city. Stimulated by this success, Andrea felt anxious to try his strength with his great contemporaries at Rome, and accordingly made a visit to that city. Vasari relates, that, on seeing the paintings of Raffaelle, he felt so humiliated, that he returned immediately to Florence, without staying to investigate the great works which had impressed him with so painful a sense of inferiority. Other authorities affirm that he remained in the imperial city a considerable time, dividing his attention between the study of Michel Angelo, Raffaelle, and the Antique; this account is by far the more probable, especially as the first works which he executed after his return to Florence manifest an obvious improvement in style. Among these, the most conspicuous were the Descent of the Holy Ghost, the Birth of the Virgin, and the Last Supper, painted for the monastery of the Salvi. Of the last picture Lanzi relates, that during the siege of Florence, in 1529, the soldiers having got possession of the suburbs, and having demolished the church and part of the monastery, on entering the refectory were struck with such reverence at the sight of the painting, that they remained awhile motionless, and then returned, without committing any further injury.

The increasing reputation of Andrea del Sarto procured him an invitation from Francis I. to visit the court of France, and that monarch expressed a wish to retain him altogether in his service. The political troubles of his own country, which rendered the pursuit of art a precarious and unprofitable employment, induced Andrea to embrace with eagerness the proposal of the French monarch, and he set out for his court, where he was received with the most flattering demonstrations of kindness and respect. His first performance was a portrait of the Dauphin, for which he was paid the sum of 300 gold crowns; he painted also for the king the superb picture of the Charity, which is now in the French museum. A multitude of commissions poured in upon him from the principal nobility, and every circumstance seemed to conspire for his honour and advantage. He was engaged on a picture of St. Jerome for the queen-mother, when in an evil hour he was induced by earnest solicitations, sent by his wife and friends from Florence, to return to that city. He obtained permission from Francis I. to depart, on the assurance that the sole purpose of his journey was to transport his family to France; and the king, being desirous to avail himself of Andrea's taste and judgment in the acquisition of works of art, intrusted him with large sums for the purchase of pictures and statues. Andrea was perhaps, originally, neither profligate nor unprincipled; but his character was impaired by that want of moral firmness, which, beginning in weakness, too often ends in vice. His wife was improvident, and he was surrounded by dissipated acquaintances; and he expended in a round of expensive pleasures, not only the money with which Francis I. had liberally rewarded his services, but that also which the monarch had consigned to him for the purpose of selecting objects for his museum. Of course, he never returned to France. Indigence came upon him, and the remorse with which he was continually tormented from the consciousness of ingratitude towards his royal benefactor, was aggravated, not only by the desertion of his gay friends, but by that of his wife also, who fled from him, leaving him a prey to despondency and distress. His afflictions were terminated by the plague which visited Florence in 1530, and carried him off in his forty-second year.

The genuine productions of Andrea del Sarto are not frequently seen out of Florence, but they abound in the churches, convents, and palaces of that city. His style is so various that it is difficult to say what was the natural bent of his mind. He was not incapable, when the subject demanded it, of impressing his works with an air of stern grandeur, whether in relation to the style of design, or to the effect of *chiar' oscuro*; but his more general characteristics are those of harmony and suavity; his colouring is sometimes most delicately tender. He was so expert in mechanical practice, that a copy made by him of a portrait of Leo X., by Raffaelle, deceived even Giulio Romano, although he had inspected the progress of the original, and had even assisted in the execution of it. One of the most pleasing of Andrea del Sarto's pictures, although by no means an example of his general style, is that of the Holy Family, now in the Louvre at Paris, in which St. Joseph reposes on a sack of corn. The panegyrists of Andrea have asserted that if he had studied longer in Rome, he would probably have rivalled the great works of Raffaelle and Michel Angelo; but without conceding such extravagant praise, it is quite enough for his reputation that he established it while those great artists were still practising, and that his name has kept its place amidst all the revolutions of taste, during a lapse of three hundred years.

ANDREASBERG, (Mount of St. Andrew,) the second in importance of the mountain-towns of the Upper-Harz, is situated in the province of Grubenhagen, in the kingdom of Hanover, and crowns an eminence which stands at an elevation of 1936 feet above the level of the sea. The neighbourhood is rich in mines, yielding silver, copper, iron, cobalt, and arsenic; and these, as well as the spinning of yarn, lace-making, and the rearing of cattle, afford profitable employment to its inhabitants, who are above 4000 in number. It has a public school for the middling classes. In 1728 a piece of silver ore, weighing eighty pounds, was found in one of the mines near the town, and presented to the Cabinet of Natural History in Göttingen, from which it was, however, stolen in 1783. Andreasberg lies about fifteen miles north of Goslar. The mountain of this name is the highest point in the Harz at which slate is found.

ANDREEWA, (also called Endery or Endri,) is a principality of the Kumükian Tartars, lying along the Kasma, between the river Aksai and the Caspian; about 25 miles west of the last-mentioned sea. It forms at present one of the districts composing the government of Caucasia in Russia in Asia, and embraces the peninsula and gulf of Agraschanskoi. Its surface presents an intermixture of fertile plains and arid wastes of sand; produces grain, and abounds in mineral waters and springs of naphtha. Andreewa is likewise the name given to its capital, and is the mart to which the Lesghian tribes resort for the purpose of disposing of the produce of their depredations. It is an open town situated on the Aktash, at the foot of Mount Tshumlu, and contains upwards of 3000 houses, with a population, which is stated by some writers at 12,000, and by others at 15,000 souls. Andreewa was, not long since, an avowed asylum for all the vagabonds and freebooters in the Caucasian regions, and is to this day a thriving market for the sale of slaves. In this last respect it runs a miserable race of competition with the town of Aksai, on the river of that name and in the same principality. It is the seat of some Mohammedan schools, to which the Circassian Mollahs are sent for education. Though little deserving the name of education, yet the smattering of reading and writing which they here acquire, is sufficient to furnish them, upon their return amongst their fellow-countrymen, with the means of keeping the tenets and prejudices of Mohammedanism alive in their bosoms, and thus maintaining a wall of separation between the native and his heretic fellow-subject of the Greek faith.

ANDREOSSI, Count, was born at Castelnaudary in the province of Languedoc, in March, 1761. His family was of Italian descent. At the age of twenty he was made lieutenant of artillery. In the beginning of the French revolution he shared in the general enthusiasm for the new order of things, and he afterwards served under Bonaparte in the early Italian campaigns, where he distinguished himself at the siege of Mantua, in 1796. He next followed Bonaparte to Egypt, where he took a conspicuous part both in the military and the scientific labours of that celebrated expedition. He was appointed a member of the Institute of Cairo, and wrote several memoirs, *On the Lake Menzaleh*, *On the Valley of the Natron Lake*, *On the Waterless River*, &c. When Bonaparte returned secretly to France, Andreossi was one of the few officers who accompanied him, and he ever after proved devoted to the fortunes of his great commander. Andreossi served in the so-called Gallo-Batavian army under Augereau on the banks of the Mayne. After the peace of Amiens he was sent as ambassador to England. When Napoleon assumed the imperial crown, Andreossi was made inspector-general of artillery, and a count of the new empire. He went afterwards as ambassador to Vienna, and having quitted his post when the war broke out again between Austria and France in 1809, he was present in the campaign of that year, and was appointed governor of Vienna after the taking of that city. He was next sent as ambassador to the Ottoman Porte, in which important situation he won the general esteem of both Franks and Turks. After the abdication of Napoleon in 1814, Louis XVIII. recalled Andreossi from Constantinople, and sent him at the same time the cross of St. Louis. Andreossi was living in retirement when Napoleon landed from Elba, but he then appeared again on the political stage to assist his old master in his last struggle. He was created a peer during the hundred days. After the battle of Waterloo he withdrew again to private life, and busied himself in revising and publishing several interesting memoirs which he had written during his residence in Turkey. His work on *Constantinople et le Bosphore de Thrace* is deservedly esteemed. His memoir *On the Springs and Conduits by which Constantinople is supplied with Water*, contains much curious information on the art of hydraulics as practised by the Turks. Andreossi had written also in 1810 a *History of the Canal of Languedoc*, in which he claimed for one of his ancestors, François Andreossi, the principal merit in the planning of that great work, which had till then been ascribed to the engineer Riquet. This book was the occasion of much controversy with Riquet's descendants, in which the astronomer, De la Lande, sided with the latter. Count Andreossi died in September, 1828, at Montauban.

ANDREW, kings of Hungary. [See Hungary.]

ANDREW, SAINT, one of the apostles, the brother of St. Peter. His father's name was Janus. From the first chapter of St. John's Gospel, he appears to have been one of the followers of John the Baptist, whom he left at the call of Jesus, being the first disciple whom the Saviour is recorded to have received. Andrew introduced Peter to Jesus. According to St. Matthew and St. Mark, Jesus found Peter and Andrew together, following their occupation of fishermen, as he was walking by the sea of Galilee, and called them, when they immediately left their nets and followed him; but this is supposed to have happened some time after the first interview recorded by St. John. That evangelist mentions Andrew as the disciple who intimated the presence of the lad with the few loaves and fishes, when the miracle of feeding the five thousand was performed. Such is nearly all that is stated respecting this apostle in Scripture.

The ecclesiastical historians, however, have professed to give us accounts in considerable detail of the latter part of his life. According to Theodoret, he employed himself for some years in journeying and preaching the faith throughout Greece; but Eusebius, and other writers, speak of Scythia as the province of his missionary labours. The common statement, however, is, that he suffered martyrdom at Patræ, now Patras, in Achaia, having been put to death by order of Egeus, the pro-consul of that province. The year in which this event took place is not mentioned; but both in the Greek and in the Latin church the festival commemorative of it is held on the 30th of November. The notion that St. Andrew suffered on a cross of the form of the letter X, appears to be of considerable antiquity; but the oldest writers say that he was nailed to an olive-tree. They used to keep, in the church of St. Victor, at Marseilles, what was affirmed to be the very cross on which he had been suspended; it was enclosed in a silver shrine, and was of the common form, that is, with one limb perpendicular, and the other horizontal.

The Scottish historian, Fordun, delivers a legend respecting the relics of St. Andrew, which several of his countrymen have copied. In the middle of the fourth century, it seems, the bones of the saint, which still remained at Patræ, were in the custody of Regulus, an abbot, or, as other accounts style him, a bishop, of the Greek church. In the year 345, the Emperor Constantius II. gave orders that these precious remains should be brought to Constantinople; but on the third night before they were removed, an angel appeared in a vision to Regulus, and ordered him to abstract from the chest in which they were kept the upper bone of one of the arms, three of the fingers of the right hand, and the pan of one of the knees. Some accounts add a tooth to the list of items. Regulus having done as he was commanded, was, some years after, directed by another vision to take his departure, with the relics, from Patræ; and, having accordingly set out, he was, after a long voyage, shipwrecked with his companions in the bay of St. Andrews, in Fifeshire, then forming part of the territory of the Picts. Hungus, the Pictish king, received the strangers with great hospitality; and by their instrumentality, he and his subjects were soon after converted, when a Christian church was erected at the place where the missionaries had been driven on shore, and was dedicated to the apostle, the fragments of whose skeleton they had brought with them. Such is said to have been the origin of the city of St. Andrews, and of the assumption of St. Andrew by the Scotch as their patron saint.

Several of the fathers, but none earlier than the seventh century, cite a book called the *Acts of St. Andrew*, professing to be written by that apostle, but which they condemn as a forgery of the Manicheans, or other heretics. There is still extant a narrative bearing this title, but professing to be written by the priests of the Church of Achaia, and entirely different from the former. It may be found in the sixth volume of Surius's *Vitæ Sanctorum*, and in other collections indicated by J. A. Fabricius in his *Codex Apocryphus Novi Testamenti*. Mention is also made in a decree of Pope Gelasius II., who flourished in the beginning of the twelfth century, of a Gospel of St. Andrew. His holiness condemns it as spurious; but it does not now exist.

ANDREW, (ST.) [See ISLE OF BOURBON.]

ANDREWS, (ST.) an ancient city of Scotland, on the coast of Fifeshire, and on the small bay of St. Andrews. The direction of the side of the bay on which the city stands is W.N.W. and E.S.E., and St. Andrews is open to the N.E. winds, which prevail greatly in April and May, and bring with them cold, unpleasant vapours, which load the air and check vegetation. The climate is, however, in general healthy, except for persons who are liable to rheumatism, or have weak lungs. Since the establishment of hot baths, the city has been much frequented as a favourite watering quarter.

The town stands on a lofty cliff or rock, and on a sort of peninsula, formed by the bay and the 'burn of Kinness,' or the 'Nether Burn,' a small stream which, skirting the town on the southern and eastern sides, forms, at its mouth, a harbour, guarded by piers, and capable of receiving vessels of 300 tons at spring-tides. On the N.W. of the town, 'the Links,' uneven downs formed by the sea, stretch away for nearly two miles to the mouth of the river Eden, and are used for the game of golf, which is much practised. There are similar downs S.E. of the town. The extremity of the peninsula on which the town stands is occupied by the ruins of the cathedral and by some other interesting remains of antiquity. From this part, the three main streets, North Street, Market Street, and South Street or Shoegate, diverge; the principal and most southern of them, South Street, runs nearly east and west. These three streets are intersected at right angles by the Lanes or Wynds. There was once a fourth street, called Swallow Street, running to the north of the others and inhabited chiefly by the merchants, but this has disappeared, and the site of it is occupied by a public walk called the 'Scores.'

Before the Reformation, St. Andrews was an opulent and commercial city. To its annual fair, which commenced in the month of April, and lasted several weeks, from 200 to 300 vessels from all parts of the commercial world resorted. When the town was in its most flourishing state, in the fifteenth and beginning of the sixteenth centuries, there were in it sixty or seventy bakers, and as many brewers. After the Reformation, it gradually decayed, and moreover suffered in the great civil war: so that Dr. Johnson, who visited it in 1773, thus spoke of it, 'One of its streets is now lost; and in those that remain, there is the silence and solitude of inactive indigence and gloomy depopulation.'

By the exertions of individuals, however, a considerable revival has been effected, and many additional improvements are in progress. The principal street is well built, straight and broad; and in this, as in the other two, the houses, which are of stone, are commonly three stories high; while the lightness of the numerous modern edifices diminishes the sombre appearance resulting from the general antiquity of the buildings.

The parish Church of St. Andrews is in South Street, and is a spacious structure, first erected in 1112, and repaired, or rather rebuilt in 1797. It is 162 feet long, and 63 broad, and will accommodate 2500 persons: on the wall inside, is a monument to the memory of Archbishop Sharp, erected by his son, exhibiting, in rude sculpture, the murder of the unfortunate prelate, and setting forth his praises in a long inscription. There is a spire to the church. The chapel of St. Salvator's college is a handsome edifice with a Gothic front, situated in North Street. Within is the handsome monument of Bishop Kennedy, founder of the college. It is the place of worship for the parish of St. Leonard, which comprises a few districts in the town and neighbourhood; and the ministry of which was for a long period held by the principal of the United College, but this is not the case now. There are three dissenting places of worship, one Episcopal, the others belonging to the Burghers and Independents. The town house, or tolbooth, is in the centre of Market Street; and contains one or two antiquities of local interest, but little else worthy of notice. St. Andrews was made a Royal Burgh in 1140: the magistracy consists of a provost, a dean of guild and four baillies. The town, conjointly with Cupar, Anstruther Easter, Anstruther Wester, Crail, Kilrenny, and Pittenween, sends one member to parliament. The trade of St. Andrews is small. In 1792, a factory for sewing and tambouring muslin was established, which gave employment to above 100 girls as apprentices; but as this branch of industry is unnoticed in later authorities, it is probably extinct. The manufacture of sail-cloth was established about a year after, and promised to become considerable; but this has also been given up. A great number of golf balls are made. About 4000 annually are used in the town and neighbourhood, and about 9000 are sent to Edinburgh, Glasgow, and other places. Some ten or eleven vessels belong to the port, and are chiefly employed in the coasting trade; and eight or ten boats are engaged in fishing. The population of the parish of St. Andrews, which extends about nine miles in length, was in 1831, 5621. There are five fairs in the year.

The university of St. Andrews consists at present of two colleges; viz. the United College of St. Salvator and St. Leonard (formerly distinct), in which the several branches of general literature and science are taught; and the New College, or St. Mary's, which is appropriated to the study of divinity, or of kindred subjects, and is attended solely by theological students. There is no medical or legal school connected with either college.

This university, the most ancient in Scotland, was founded in the year 1411, by Henry Wardlaw, then Bishop of St. Andrews, who granted a charter with the immunities and powers usually granted to universities, to an association of certain men of learning, who had about a year before commenced a course of public lectures on divinity, the civil and canon laws, logic, and philosophy; and had attracted a considerable concourse of students. The charter of Bishop Wardlaw was confirmed by the pope; and in 1431, further immunities were granted by King James I. of Scotland, and ratified by succeeding sovereigns. The seat of the university at this period was the spot where St. Mary's College now stands, and was called the Pædagogy.[*]

St. Salvator's College was founded in 1455, or 1458,[†] by James Kennedy, nephew of James I., and successor of Wardlaw in the see of St. Andrews, and endowed with sufficient revenues for the maintenance of a principal, six fellows, and six poor scholars. The buildings of this college in North Street, form a quadrangle of 230 feet long by 180 broad, into which quadrangle you enter from the south by a gateway, over which is a steeple 156 feet high, and a clock: to the right of the gateway is the chapel already mentioned. The buildings of this college having gone very much to decay, a grant has been made by government, and a new structure has been erected on the east side of the quadrangle. St. Salvator's College is the seat of the United College.

St. Leonard's College was founded in 1512, by Prior Hepburn, and endowed by him from the revenues of an hospital for pilgrims, from the funds of the parish of St. Leonards,[‡] and from property of his own. The before-mentioned hospital was made the seat of the college.

In 1747, it was found expedient to unite the two colleges. The joint establishment was accordingly transferred to

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[*] A school had been taught on this spot even before the foundation of the university, but it was superseded by that institution.

[†] Bishop Kennedy seems to have set apart the revenues destined for the college, and to have granted the first charter in 1455: the second charter is dated in 1458. This last is very long, and contains all the statutes of the college.

[‡] Authorities vary here:—in Sinclair's *Statistical Account* it is stated, that the parish was probably formed about the time of the erection of the college.

St. Salvator's, and the buildings of St. Leonard's were sold, and converted into dwelling-houses.

St. Mary's College was formed out of the original seminary or pædagogy of Bishop Wardlaw, by James Beaton, Archbishop of St. Andrews (for the see had been made archiepiscopal in the time of Bishop Kennedy's successor); and his designs were further carried on by Cardinal Beaton, the archbishop's nephew and successor in the see, and by Archbishop Hamilton, who succeeded the cardinal. The enlargement of the pædagogy by Archbishop Beaton appears to have been begun in 1538. In 1579, the college was remodelled under the direction of the celebrated George Buchanan. The buildings occupy two sides of a quadrangle, on the south side of South Street; and have lately been substantially and tastefully repaired.

The curriculum, or course of study in the arts, extends over four sessions. These studies are pursued at the United College, and the session lasts from the end of October to the beginning of May. St. Mary's College has three professors, viz., of divinity, church history, and oriental languages, besides a principal, who also reads lectures on divinity; and the complete course of a student includes four years, but the session is only of four months. The study of mathematics has always formed a principal branch of instruction at St. Andrews.

In each of the colleges are lodging-rooms for the students, which have been now for some time unoccupied; and there are bursaries or endowments, entitling the holders to a certain income for so many years. Fifty-five belong to the United College, and seventeen to St. Mary's. (*Journ. of Educ.* vol. iv., p. 36.) The students of St. Mary's pay no fees. The emoluments of the professors arise from their salaries, or, at the United College, from these with their fees in addition. The number of students at the university was, in 1826-27, 320. (*Journ. of Educ.*) Those who belong to the United College are required to attend divine service twice in the Sunday at the college chapel; except in the case of Dissenters, who are allowed to attend their own places of worship.

The revenues of the United College are somewhat more than 3000*l.* per annum, including the sums received on account of the bursaries; the disbursements in 1823 (the latest statement given in the report of the commissioners appointed by royal authority, some years ago, to visit the Scotch universities) rather exceeded the income; and there is besides a considerable debt. The revenue of St. Mary's, on the average for seven years before 1826, was rather greater than the expenditure, and amounted to above £1000. The university has little property distinct from that possessed by the colleges individually, except the library, which is entitled to a copy of every work entered at Stationer's Hall, and contained upwards of 40,000 volumes in 1830. The officer of highest dignity is the chancellor, but his office is merely honorary: the rector (who is appointed by the principals, the professors, and by the students of theology, and of moral and natural philosophy) is the acting head. He is appointed annually, and one of the principals, or of the professors of divinity or church history, must be elected. He is præses of the senatus academicus, by which body, consisting of the principal and professors of each college, all the academical degrees are conferred. The flourishing trade once carried on in medical degrees has been given up. A grammar-school, and a school for English writing and arithmetic, are under the patronage of the corporation. Dr. Bell, the founder of the Madras system of education, has given a splendid donation of 45,000*l.*, 3 per cent. stock, for the establishment of a comprehensive seminary of education in this his native city, to be called the Madras College. The buildings for this school, forming a large and handsome edifice on the south side of South Street, some distance west from St. Mary's College, are nearly completed.

The antiquities of St. Andrews are numerous and interesting. Those which are ecclesiastical stand near together just by the harbour. The most antient is the chapel, (situated about forty yards S.E. of the cathedral,) the foundation of which the legend ascribes to St. Regulus, (commonly called St. Rule,) the traditionary founder of the place, but which is probably 1000 years old at least. The story is, that a holy person, the abbot of a monastery at Patræ, (Patras,) in Achaia, having been warned in a dream to depart without delay to an island called Albion, situated in the farthest extremity of the Western world, set sail with seventeen monks and three nuns, carrying with him some of the relics of St. Andrew; and was wrecked in the bay now called St. Andrews, (the shores of which were then covered with wood, and infested with huge wild boars,) and lost all except his companions and the precious relics. He succeeded in converting the King of the Picts, who then governed this part of the country, (near the end of the fourth century;) and the grateful prince erected for the saint the chapel of which the ruins still remain. They consist of the walls of the chapel, inclosing an area of thirty-one and a half feet by twenty-five. The greatest dimension is from east to west. At the west-end is the tower, a square building with a base of twenty feet each way, (measured outside of the walls,) and 108 feet high. There is no trace of the Gothic architecture in these ruins, which are doubtless very antient. Adjoining the west side of the tower was another chapel of which no part remains.

The cathedral of St. Andrews was nearly 160 years in building, (A.D. 1159, or 1161 to 1318,) and was demolished in one day, in June 1559, by a mob excited by a sermon of the celebrated John Knox. The eastern gable with its two towers is, however, still standing; and there remains also one of the towers of the western gable, part of the south wall from the western gable to the south transept, and the west wall of the south transept. The towers are each 100 feet high from the ground to the summit; they rose considerably above the roof of the church. The architecture varies, Saxon and Gothic (or late Norman and early English) being intermixed. The western end was of later erection, and in a much richer and more ornamented style than the other; and exceeded it in width by ten or twelve feet. The length of the cathedral, as nearly as can be measured from the unevenness of the ground, was 350 feet, (Sinclair's *Statistical Account of Scotland*,) or 370 feet, (*Grierson*, and *Beauties of Scotland*,) and the breadth of the transept from north to south was 160 feet, (Sinclair's *Statistical Account of Scotland*,) or 180 feet, (*Grierson*.) The stone is by no means of so durable a nature as that with which St. Regulus's chapel is built; and the dilapidation has been further increased by the use of the materials for later erections. The ruined church of St. Leonard's adjoins the college of that name.

An extensive wall about 870 yards in length, twenty-two feet high, and four feet thick, with sixteen round or square turrets at different distances, was erected by Prior Hepburn (the founder of St. Leonard's College) in the beginning of the sixteenth century, to enclose for nearly the whole of their circuit the grounds of the great priory of St. Andrews, which had been erected about A.D. 1120. The enclosure is about eighteen acres, and contains the ruins of the cathedral and St. Rule's chapel, besides the relics of some other buildings belonging to the priory. This wall having been constructed of durable stone is tolerably entire, and has three gates still standing; one, a stately gothic arch, fronts the end of South Street.

There are some relics of two monasteries, one of the Dominicans, founded by Bishop Wishart in 1274, and the other of the Observantines (a species of Franciscans), founded by Bishop Kennedy at least 150 years later. Part of one of these edifices, though it is not decided to which of the orders it belonged, is used for the grammar-school, and stands in South Street, about 200 yards from the west port; it has, however, been entirely modernised. Another fragment of the same convent with an arched roof is, perhaps, the most beautiful specimen of pointed architecture in St. Andrews. The other convent was about 100 yards from the west port of North Street outside of the town. Both were demolished in consequence of Knox's preaching in June, 1559, when the cathedral was destroyed.

On the shore of St. Andrew's Bay, on a ridge or cliff, washed on the N. and E. sides by the sea are the ruins of the castle, which serve as a land-mark to seamen. There are some parts of the walls standing on the N. and E., but others have fallen from the encroachment of the sea, which has here gained considerably on the land, while a little way N.W. of the castle, (on 'the Links,') as we have seen, it has thrown up earthy matter. The keep or donjon at the north-west corner is entire. This castle was built by Bishop Roger about A.D. 1200, and subsequently enlarged. In 1336, it was taken and garrisoned by Edward III. of England; re-taken the following year, and nearly demolished Bishop Trail repaired it towards the end of the fourteenth century, and it became the episcopal residence. It was further repaired and beautified, and new works were erected by Cardinal Beaton in 1546; but it was demolished by an act of council in or about 1547, and though it was again partially repaired by Archbishop Hamilton, it never recovered from this overthrow.

In the cliff between the harbour and the castle is a singular cave, consisting of two apartments.

St. Andrews was the scene of several remarkable events, during the progress of the Reformation in Scotland. The fires of persecution were repeatedly kindled, for the town was the ecclesiastical metropolis of the kingdom, and the stronghold of the Catholics. Here in 1527 Patrick Hamilton, the first Protestant martyr in Scotland, was burned; and in 1545, Wishart, one of the most eminent of the Scotch reformers, suffered; Cardinal Beaton, the then archbishop, looking on from a window of the castle. The martyr, with his dying breath, foretold the downfall of his persecutor, and his prophecy was remarkably verified about a year after. Norman Leslie, son of the Earl of Rothes, with fifteen associates, proceeded to the castle, and with great address and resolution cleared it of the cardinal's retinue, and of the workmen employed in the repairs or new erections, amounting altogether to 150 persons, and proceeding to the cardinal's chamber, deliberately murdered him. The conspirators with their friends held out in the castle for several months against the troops of the government aided by a body of French; but were at last obliged to surrender upon terms. It was upon this surrender that the act of council for the demolition of the castle was issued. The murder of Archbishop Sharp, in 1679, took place on Magus Moor, about three miles S.W. of St. Andrews, and within sight of the town.

St. Andrews is thirty-nine miles N.N.E. of Edinburgh; and in lat. 56° 19′ 33″ N., long. 2° 50′ W. from Greenwich.

It is said that the name of the district where St. Regulus arrived was Mucross; and the promontory on which the city stands was called Kilrymont till the middle of the ninth century. The navigation of the bay is dangerous. (Grierson's *Delineations of St. Andrews; Beauties of Scotland*, and Sinclair's *Statistical Account of Scotland.*)

ANDREWS (LANCELOT), an eminent English prelate, was descended from an antient Suffolk family, and was born in the parish of All-Hallows Barking, London, in 1565. His father, Collier says, was a merchant of good repute;—according to the *Biographia Britannica*, he had spent the most part of his life at sea. Young Andrews was educated first at the Coopers' Free School at Ratcliff, and then at Merchant Taylors' School, from which he was sent to Pembroke Hall, Cambridge, by Archdeacon Watts, on one of the exhibitions founded by the latter in that College. He greatly distinguished himself at the University by his studious habits and extensive acquirements; and also in certain lectures which he read as catechist displayed the first promise of that talent for pulpit oratory for which he was afterwards celebrated. Having taken orders, he soon became known as a preacher. His first patron was the Earl of Huntingdon, who took him with him to the north of England; but he had not been long there before he obtained the notice of Walsingham, the Secretary of State, who gave him first the lease of the parsonage of Alton in Hampshire, and soon after obtained for him the vicarage of St. Giles's Cripplegate, London. To this preferment were afterwards added the dignities of prebendary and canon residentiary of St. Paul's, and prebendary of the collegiate church of Southwell. The mastership of Pembroke Hall, and the appointment of chaplain in ordinary to the queen followed; and so greatly was her majesty delighted with his manner of preaching, that she was not long in giving him a stall in Westminster Abbey, a place which he soon exchanged for the deanery of that church. He held this situation when James I. came to the throne. With that monarch he immediately became a great favourite, and the bishopric of Chichester having become vacant, he was presented to it, and was consecrated on the 3d of November, 1605. The king at the same time made him his lord almoner. In 1609 he was translated to the see of Ely; and was soon after made a privy-councillor both for England and Scotland. When James, in 1617, visited the latter kingdom, Bishop Andrews was one of the persons by whom he was accompanied. In 1618, he was advanced to the bishopric of Winchester, and was at the same time made dean of the chapel royal. These were his last preferments. He died at Winchester-house, in Southwark, on the 25th of September, 1626, and was buried in the church of St. Saviour's, where a handsome marble monument, bearing a long Latin inscription, was erected over his remains. His tomb was opened, and his coffin discovered, in the course of the recent reparation of the church.

The principal work which Bishop Andrews published during his life was a thick quarto volume, printed in 1609, with the title *Tortura Torti;* being an answer to a treatise in which Cardinal Bellarmin, under the name of Matthew Tortus, had attacked the doctrine laid down by King James in his *Defence of the Rights of Kings*, respecting the authority of Christian princes over persons and causes ecclesiastical. Andrews undertook his performance on the command of his majesty; and was considered to have executed his task with great ability. He is also the author of a *Manual of Private Devotions and Meditations for every Day in the Week*, and a *Manual of Directions for the Visitation of the Sick.* After his death, a volume, containing ninety-six of his sermons, was, by the direction of Charles I., printed under the care of Bishops Laud and Buckeridge; and another volume, consisting of a collection of his tracts and speeches, also appeared in 1629. His work, entitled *The Moral Law Expounded*, or *Lectures on the Ten Commandments*, was first published in 1642. His 'Αποσπασμάτια *Sacra*, or *Collection of Posthumous and Orphan Lectures delivered at St. Paul's, and St. Giles's Cripplegate*, appeared in a folio volume, in 1657. Bishop Andrews was, also, one of the authors of the common translation of the *Bible*. The portions in which he was concerned were the Pentateuch, and the historical books from the Book of Judges to the Books of Kings inclusive.

All the writings of Bishop Andrews display abundant learning; but his eloquence, notwithstanding the delight it appears to have afforded his contemporaries, is but little calculated to please the present age. Overspread as it is with verbal conceits and far-fetched allusions, and exhibiting in this way a perpetual labour of ingenuity, it altogether wants that simplicity and directness of effect which is the soul of good writing. Not that there is not a great deal of excellent sense wrapt up in its tinsel tropes, and other puerile and grotesque decorations; but the whole life and spirit of every thought is most commonly suffocated under a load of dead verbiage. The bishop's style, however, would seem to have wonderfully fascinated every body in his own times. Fuller who is greatly taken with it, and who affirms that Dr. Andrews was 'an inimitable preacher in his way,' in an anecdote which he tells with the view of showing how difficult or impossible it was for those who attempted to copy him to match their model, unconsciously records a severe and, at the same time, well-deserved condemnation of the manner of writing which he so much admires. 'Pious and pleasant Bishop Felton,' he says, 'his contemporary and colleague, endeavoured in vain in his sermons to assimilate his style, and therefore said merrily of himself, I had almost marred my own natural trot by endeavouring to imitate his artificial amble.'

Bishop Andrews was all his life a hard student, and is stated to have made himself conversant with all the learning of his age. After he had been three years at the university, we are told, it was his custom to come up to London for a month every year; and during that space, which he spent in the house of his father and mother, he always put himself into the hands of a master, and studied some language or branch of science with which he was before unacquainted. Casaubon, Cluverius, Grotius, Vossius, and other eminent scholars of the time, have all highly eulogized his extensive erudition, which was wont, it appears, to overflow in his conversation, as well as in his writings. He was also celebrated for his talent at repartee, of which the following instance is told by the writer of a life of Waller, the poet, prefixed to his works. Waller having one day gone to see James I. at dinner, saw the Bishop of Winchester and Dr. Neale, Bishop of Durham, standing behind the king's chair, and overheard the following conversation: 'His majesty asked the bishops,—My lords, cannot I take my subjects' money when I want it, without all this formality in parliament? The Bishop of Durham readily answered, God forbid, sir, but you should; you are the breath of our nostrils. Whereupon, the king turned, and said to the Bishop of Winchester, Well, my lord, what say you? Sir, replied the bishop, I have no skill to judge of parliamentary cases. The king answered, No put offs, my lord; answer me presently. Then, sir, said he, I think it lawful for you to take my brother Neale's money, for he offers it.'

Bishop Andrews, we ought to add, adorned his learning and shining talents by the highest reputation for piety, hospitality, charity, and munificence. One of Milton's early Latin poems is an elegy on the death of this distinguished prelate, in which he is bewailed in a strain of the most impassioned regret and admiration.

ANDRISCUS. [See PHILIPPUS.]

ANDRO'MACHE, the wife of HECTOR. It is also the title of one of the extant tragedies of Euripides.

ANDRO'MACHUS, a native of Crete, and physician to the Emperor Nero. He was the inventor of a celebrated compound medicine called Theriake (θηριακή), the preparation of which he described in a poem which has been preserved in the collection of Galen's works.

ANDRO'MEDA, a constellation, so called by the Greeks from Andromeda, the mythological daughter of Cepheus and Cassiopeia, who was bound to a rock and thus exposed to a sea-monster, from whom she was delivered by Perseus. This constellation occupies a considerable region of the heavens below Cassiopeia, by which it may be thus found. A line drawn through the brightest star of the five in Cassiopeia, marked β, and the pole star, passes through a star of the first magnitude in the head of Andromeda, marked α, and called Alpherat. A line drawn through ε Cassiopeiæ, at the other corner, and the pole star, passes through Almach in the foot of Andromeda, marked γ, while in the line between the two stars thus found, lies Mirach, marked β, in the girdle of Andromeda. The following list, taken from the *Mem. R. Astron. Soc.* vol. v. shows the references to the different stars of this constellation in different catalogues. The first column contains the letter, by which the star is denoted; the second its number in Flamsteed's catalogue; the third that in the Astronomical Society's catalogue, and the fourth the magnitude of the star.

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed.	Astron. Society.			Flamsteed.	Astron. Society.	
ο	1	2751	4	ζ	34	76	4
υ	7	2771	5	ν	35	83	4
	8	2780	5		36	88	6
λ	16	2819	4·5	μ	37	94	4
κ	19	2824	5	η	38	96	5
ψ	20	2837	5	φ	42	117	5
α	21	2881	1	β	43	119	2
B	22	8	5	ξ	46	143	5
θ	24	18	5	υ	50	174	5
	28	35	6	R^2	51	176	3·4
π	29	53	4·5		54	185	5
c	30	58	4	γ	57	220	3·4
δ	31	59	3				

ANDRONI'CUS was the advocate of the Jews under the reign of Ptolemæus Philometor in their proceedings against the Samaritans in Egypt, who, by asserting the authority of the temple on Mount Garizim, or Gerision, against the temple at Jerusalem, occasioned a controversy which terminated in bloodshed. The Egyptian Jews (although they had built, about the year 150 B.C., an heretical temple of their own, in the province of Heliopolis) zealously defended the authority of the temple at Jerusalem. After the arguments were exhausted, both parties took up arms, and having found that blows could not decide the matter, they appealed to the King, Ptolemæus Philometor, who appointed a solemn day of judgment. In full court it was agreed, that those who were found in error should be killed for the bloodshed already committed. The Samaritan advocates, Sabbai (Sabbæus) and Theodosius, lost their cause against Andronicus, and were put to death. The arbitrary administration of justice in those times, and the character of Ptolemæus Philometor, render this account not quite incredible. (See Josephus's *Antiquities*, lib. xiii. cap. 7, ed. Aureliæ Allobrog., p. 434; and Jost's *Geschichte der Juden*, vol. ii. pp. 308, 309.)

ANDRONI'CUS COMNE'NUS, emperor of Constantinople, was grandson of Alexis I. In his youth he distinguished himself in the army under his cousin, the Emperor Manuel, against the Turks and Armenians, but having entered into a treasonable correspondence with the King of Hungary, he was arrested and confined in a tower of the palace, where he remained twelve years. He contrived to escape, and after several romantic adventures arrived at Kiew, in Russia, where he won the favour of the Grand Duke Jeroslaus. Like Alcibiades, Andronicus could assume the manners of every country, and his athletic constitution could support the vicissitudes of all climates; he could pass suddenly from the fatigues and privations of the camp to a life of luxury and debauch. He was a great favourite with the fair sex, and he won the affections of no less than four royal princesses in succession, beginning with Eudocia, the emperor's niece, who for him forsook the palace, and accompanied her lover in his early campaigns. Andronicus, in his exile at Kiew, became instrumental in forming an alliance between the Russian prince and the Emperor Manuel, and thus obtained his pardon from the latter. He led a body of Russian cavalry from the banks of the Borysthenes to the Danube, and assisted the emperor against the Hungarians at the siege of Semlin. After the peace, having returned to Constantinople, he protested against the adoption of Bela, Prince of Hungary, who had married the only daughter of the emperor, as presumptive heir to the throne. Andronicus was himself next in the order of succession. The Emperor Manuel however having married a second wife, Maria, daughter of Raymund of Poitou, Prince of Antioch, had by her a son, who was afterwards Alexis II. Meantime, Andronicus, who held a command in Cilicia, fell in love with Philippa, Maria's sister, who gave herself up to him, as Eudocia had done before. The emperor, although himself dissolute in conduct, reproved this connexion of Andronicus with his own sister-in-law; and Andronicus, being obliged to leave Philippa, undertook, accompanied by a band of adventurers, a pilgrimage to Jerusalem, where he won the favour of Almeric, the Christian king of that country, and one of the successors of Godefroy de Bouillon. Andronicus received from him the principality of Beroot, (Berytus,) on the coast of Syria. There he fell in love with a third princess, Theodora, the young widow of Baldwin III., King of Jerusalem, who was herself of the Comnenian line and a distant relation to Andronicus. She lived openly with him as his concubine, and had two children by him. Andronicus being no longer safe in Palestine from the hostility of the Emperor Manuel, repaired, accompanied by Theodora, to Damascus, where the Sultan Noureddin received him hospitably. From thence he travelled to Bagdad, and other parts of the east, and at last settled among the Turks in Asia Minor, whence he made frequent incursions into the Greek territories. For this he was excommunicated by the church and outlawed by the emperor. The governor of Trebizond having found means to seize Theodora and her two children, and send them to Constantinople, Andronicus, in despair, made his submission to the emperor, and repairing to Constantinople, sued for pardon in the most abject manner. He was banished to Oenoe, a town of Pontus, on the coast of the Euxine, between Cape Heracleum and Cape Jasonium, where he remained till the death of Manuel, in 1180, and the disorders of a disputed succession, induced the patriarch and the principal patricians to recall Andronicus, as the only man who could restore peace to the empire. He arrived in the capital in the midst of acclamations, acknowledged the young Alexis as emperor, but arrested the empress-mother, who had been in some measure the cause of the troubles. Andronicus was associated in the empire as colleague and guardian to Alexis. He then developed his ambitious views. He first caused the empress-mother to be tried on a false charge of treasonable correspondence. She was condemned unheard, and was strangled, and her body thrown into the sea. He next murdered young Alexis himself, and then assumed the undivided authority as emperor in 1183. He married Agnes, Alexis's widow and sister to Philippe Auguste of France, who was still almost a child. 'Andronicus's short reign,' says Gibbon, 'exhibited a singular contrast of vice and virtue: when he listened to his passions, he was the scourge; when he consulted his reason, the father of his people. In the exercise of private justice he was equitable and rigorous; he repressed venality, and filled the offices with the most deserving candidates. The provinces, so long the objects of oppression or neglect, revived in prosperity and plenty, and millions applauded the distant blessings of his reign, while he was cursed by the witnesses of his daily cruelties. The antient proverb, that bloodthirsty is the man who returns from banishment to power, was verified again in Andronicus.' (*Decline and Fall of the Roman Empire.*) He put to death, or mutilated in a cruel manner, all those who, during his long exile, had traduced him, opposed his views, or insulted his misfortunes, as well as those who were the friends of the murdered empress and of her son. A wretch of the name of Aaron, who had been secretary to the Emperor Manuel, and had his eyes put out on account of treason, suggested to Andronicus not to content himself with blinding those he suspected, but to cut out their tongues also, by means of which they might still have injured him. Many of Andronicus's intended victims escaped to Nicæa and Prusa, where they made a stand, but were overpowered, and those unfortunate towns were treated with the greatest barbarity. At last, so many terrors drove the people of Constantinople to revolt; Isaac Angelus, one of the proscribed and a descendant in the female line from Alexis I., took refuge in the church of St. Sophia. A crowd assembled and proclaimed him emperor. Andronicus was then, with his young wife, in one of the islands of the Propontis; he rushed to Constantinople, but was overpowered, taken prisoner, and dragged to the presence of Isaac Angelus, who, without any form of trial, gave him up to the personal revenge of his enemies. He was insulted and tormented in every possible manner; his teeth, eyes, and hair were torn from him, and lastly, he was hung by the feet between two pillars. In his painful agony he was heard to appeal to heavenly mercy, entreating it 'not to bruise a broken reed.' At last some one ran a sword through his body, and put an end to his sufferings. This dreadful catastrophe happened in September, 1185; Andronicus was then past sixty years of age.

ANDRONI'CUS CYRRHESTES, an architect who constructed, or, at least, a person whose name is attached to, one of the existing remains of antient Athens, commonly called the Tower of the Winds; the building takes this name from the figures of the eight winds being cut in relief on the exterior wall of the building, with their names above them on the frieze. (See Spon, ii., p. 135, Amsterdam, 1679.) This monument stands to the north of the Acropolis, and is thus described by Vitruvius:—'Those who have paid most attention to the winds make them eight in number, and particularly Andronicus Cyrrhestes, who built at Athens an octagonal marble tower, and cut on each face the figure of the several winds, each being turned to the quarter from which that wind blows; on the tower he erected a marble column (meta), on which he placed a Triton of bronze, holding out a rod in his right hand; and he so contrived it, that the figure moved round with the wind, and constantly stood opposite to it; the rod, which was above the figure, showed in what direction the wind blew.'

This building was intended for a sun-dial, and it also contained a water-clock, which was supplied with water from the spring under the cave of Pan on the north-west corner of the Acropolis. Colonel Leake is disposed to assign the date of this building to about B.C. 159. (See Leake's *Topog. of Athens; British Museum, Elgin Marbles*, vol. i., p. 29.)

ANDRONI'CUS, LIVIUS. [See LIVIUS.]

ANDRONI'CUS PALÆO'LOGUS, the elder, son of Michael, emperor of Constantinople, was raised by his father as his colleague to the throne in 1273, and after Michael's death in 1282, he reigned forty-six years more. The reign of Andronicus, like that of most Byzantine emperors, was continually disturbed by religious controversies, civil wars, and foreign attacks. In 1301, Othman first invaded the territory of Nicomedia, the passes of Mount Olympus having been left unguarded by the neglect or parsimony of the Byzantine court. A formidable host of Catalonian and other adventurers came to Constantinople in 1303, to give Andronicus their assistance against the Turks, but in fact to live at the expense of the empire, and to plunder both sides of the Channel. They defeated the Turks in Asia, but they ravaged the country, sacked Philadelphia, besieged Magnesia, which had a Greek garrison, seized Gallipoli on the Hellespont, and behaved, in short, worse than the Turks themselves. Andronicus, partly by force and partly through bribes, succeeded at last in getting rid of these troublesome allies, at an enormous cost. In 1320, Michael, son of Andronicus, having died, Michael's son, Andronicus, distinguished by the historians by the appellation of 'the younger,' revolted against his grandfather; and after several years of a ruinous war, was crowned as colleague to the old emperor in 1325. Another sedition broke out in 1328, which ended in the abdication of the elder Andronicus, who retired to a convent under the name of the monk Anthony. He died in his cell four years after his abdication, and in the seventy-fourth year of his age. He was a weak and bigoted, though not unlearned, prince. It was during these disastrous wars between the two Andronici that the Ottomans effected almost without resistance the conquest of all Bithynia and advanced within sight of Constantinople, while other Turkish emirs took possession of Lydia and Ionia and the adjacent islands. The ruin of the seven churches of Asia was then consummated. Andronicus, the younger, attempted bravely to stem the torrent, but was defeated and wounded by Orchan, the son of Othman, who took Prusa, Nicæa, and Nicomedia. He was, however, spared the mortification of seeing the Ottomans on the European coast. He died in 1341, in the forty-fifth year of his age, leaving by his wife Jane or Anne of Savoy, a boy, John Palæologus, who was put under the guardianship of John Cantacuzenus. (Gibbon's *Decline and Fall;* the Byzantine historians Gregoras, Pachymer, and Cantacuzenus; and Hammer, *Geschichte des Osmanischen Reiches.*)

ANDRONI'CUS, RHO'DIUS, or the Rhodian. It appears from Plutarch, Strabo, Galen, Aulus Gellius, Ammonius, Simplicius, and other antient writers, that there resided at Rome, about a century before the birth of Christ, an eminent Peripatetic of this name, who had previously taught philosophy at Athens. He is said to have first arranged, indexed, and published the works of Aristotle, after they had been brought to Rome in the library of Apellicon of Teos, by Sylla; the manuscripts had been communicated to Andronicus by Tyrannion, the grammarian, who seems to have been originally employed to put them in order. Some of the authorities also refer expressly to the Commentaries of this Andronicus on certain of Aristotle's works. The first work, however, supposed to be by this writer, which was recovered in modern times, was a short treatise, published by David Hoeschelius, in 12mo., at Augsburg, in 1594, under the title of *Andronici Rhodii Peripatetici Philosophi Libellus* Περὶ Παθῶν. In his preface, Hoeschelius referred shortly to the different antient authors who had mentioned Andronicus. In 1607, Daniel Heinsius published, in a quarto volume, at Leyden, from a MS. which had fallen into his hands, a Greek Commentary, or Paraphrase, on Aristotle's *Nicomachean Ethics*, probably so named from having been originally addressed to his son Nicomachus. Heinsius accompanied the text of his author with a Latin translation; but although in the manuscript the work was attributed to Andronicus, the Rhodian, he did not consider himself warranted to insert that name in the title-page. The inscription on the manuscript, he says in his preface, was evidently by an illiterate hand; and he insinuates that there is no proof that Andronicus, although he arranged and indexed the writings of Aristotle, ever wrote a commentary on any of them. In 1617, however, he published a second edition of the Paraphrase at Leyden, in octavo, in which he entitles it *Andronici Rhodii Ethicorum Nicomacheorum Paraphrasis, &c.* In this edition the former preface is withdrawn, and another is substituted, in which he refers to the other antient authors, besides Plutarch and Strabo, who have spoken of Andronicus, and expresses his conviction that the work is really by him. He was well acquainted, he says, with the several passages in his newly-adduced authorities, which tend to render this not improbable, although they had escaped his recollection when he published his former edition. It is most likely that his attention was called to them by having, in the interim, met with the preface by Hoeschelius to the treatise Περὶ Παθῶν; especially as we find him now reprinting that treatise at the end of the Commentary. The next edition of the Commentary appeared at Cambridge in 1679. It professes to be an exact reprint from the text of Heinsius, but of which edition is not said, although Heinsius himself, in his

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second preface, speaks of his first edition as being full of blunders. This second preface the Cambridge editor suppresses, and prints instead of it the other, which Heinsius had withdrawn. To that he adds another of his own, an inspection of which may possibly explain his curious selection from the two written at different times by his predecessor. It consists chiefly of an elaborate display, at full length, of passages respecting Andronicus from the writers previously indicated by Heinsius and Hoeschelius. All this learning the worthy editor evidently wishes to pass off as his own. Heinsius, accordingly, he gravely tells us, preserves a deep silence respecting his author; and to bear out this assertion he prints, as we have said, the original preface only of that eminent scholar. If Heinsius, however, is defrauded of some glory by this clever management, it must be confessed that he is only foiled at his own weapons, and receives no more than the treatment he had himself practised on Hoeschelius. The facts, we think, are worth recording as another illustration of the common saying, that there are tricks in all trades. It may be added, that in 1809 the curators of the Clarendon press at Oxford produced a fourth edition of the *Paraphrase of Andronicus*, in which with amusing scrupulosity they have followed the previous edition of the sister university in all particulars, the ingenious selection from the prefaces of Heinsius included.

After all, great doubts have been entertained by several critics as to the work being really the production of Andronicus the Rhodian. The different opinions upon the subject may be found in Bayle. Gabriel Naudé conceives Olympiodorus, who lived in the sixth century after Christ, to be the author. Saumaise (Salmasius) also is decidedly of opinion that it is not the work of the Rhodian peripatetic. Others have even attributed it to an Andronicus Callistus, a native of Thessalonica, who lived in the fifteenth century, and came to Italy after the taking of Constantinople. He gave lessons in Greek in different cities of Italy, Angelo Politian being one of his scholars; after which he came to Paris, and was the first who taught the language in the university there. He died in 1478. There is as much diversity of conjecture about the authorship of the short tract Περὶ Παθῶν; it is generally believed at any rate not to be by the author of the Paraphrase. It is stated in the *Biographie Universelle*, that a manuscript in the Imperial Library of France (now the Bibliothèque du Roi) cited by M. Sainte Croix, in his *Examen des Historiens d'Alexandre*, p. 524, attributes the Paraphrase to a Heliodorus of Prusse, that is, Brusa in Bithynia, we suppose.

An English translation of the Paraphrase on the *Nicomachea* appeared in a quarto volume at London, in 1807, with the following title: *The Paraphrase of an anonymous Greek Writer, hitherto published under the name of Andronicus Rhodius, on the Nicomachean Ethics of Aristotle*, translated from the Greek by William Bridgman, F.L.S.

ANDROS. [See BAHAMAS.]

ANDROS, an island of the Grecian Archipelago, lying off the S.E. end of Eubœa, from which it is distant six miles. It lies in a N.W. and S.E. direction, is twenty-one miles long and eight broad, with a population of about 18,000. The island is very high and mountainous, and the highest summits retain the snow during many months in the year. The town called Andros, or Castro, is on the eastern coast, besides which there are sixty-six villages scattered over the island. The soil is very fertile; and the numerous gardens, which are well laid out, produce excellent lemons, oranges, and pomegranates. Much wine is made, but all consumed by the inhabitants, who are great drinkers. Silk, to the amount of about 3000 pounds on an average, is exported annually. It is the practice to sow wheat and barley together, of which they make their bread, but there is not sufficient grown for the consumption of the island; the deficiency is easily made up from the neighbouring island of Eubœa. On the west shore, there is a port called Gabriel, partially sheltered by small islands from the S.W., but on this side of Andros there are no inhabitants, the coast being so very steep and rocky. The N.W. point, called Point Guardia, is in 37° 57′ N. lat., 24° 42′ E. long.

ANDROSCOGGIN, or **AMARISCOGGIN**, a river of North America, which rises in about 45° 12′ N. lat., 71° 15′ W. long., on the east side of the highlands of New Hampshire and Maine. The Chaudière, which enters the St. Lawrence opposite Quebec, has its sources near those of the Androscoggin, on the north and west side of the same highlands. The Androscoggin flows by numerous branches for about twenty-five miles south into a number of lakes, the chief and most western of which is Umbagog. The united waters forming a large stream flow from this lake in a western direction, which soon becomes a southern one, for thirty miles, under the name of Amariscoggin. The river having reached the northern base of the nucleus of the White mountains, turns due east, and piercing the mountain-chain flows in this direction for fifty miles. Here it makes another bend at right angles, and runs south for thirty miles, to the latitude of 44°. Below this point, by a curving course of twenty miles south-east, then east, and finally north-east, it joins the Kennebec at Merry-meeting Bay, about six miles above the town of Bath, in the state of Maine. The entire course, measured along the windings, as given by the maps, is not less than 200 miles. Below the mountains, the river is called the Androscoggin; it has no large tributaries, but is increased by numerous rivulets, and, like the other rivers of Maine, is, for its length, a very large one. The tide ascends the Androscoggin to near Durham, about thirty-five miles from the open ocean. Though obstructed by falls and shoals, like the Kennebec, both these rivers afford great facility for inland navigation: the chief article transported down them is timber. (See Darby's *Geographical View of the United States.*)

ANDUJAR, a town of Spain, in Andalusia, 38° N. lat., 4° W. long., 40 miles E.N.E. of Cordova, and 19 N.W. of Jaen, situated on an elevated plain at the foot of Sierra Morena. The river Guadalquivir embraces it on the east and south. The confined situation of Andujar renders it very sultry in summer, and subjects the inhabitants to bilious and putrid inflammatory fevers. The soil is very fertile, and produces wheat, barley, oil, wine, honey, and silkworms. The wines of Andujar are of a sharp taste, from their containing a large portion of tartar, but are rendered palatable by a particular process called by the Spaniards *arropar*, or sweetening. At Andujar the coolers, called alcarrazas, are manufactured of clay. The inhabitants are principally employed in agriculture, but there are also at Andujar some tanneries, and manufactories of soap and earthenware. There is a very ancient bridge of fifteen arches over the Guadalquivir, which is in a very bad state of repair. In January, 1823, the river overflowed, and damaged one of the piers; in consequence of which, two of the arches fell down. The general post and coach-offices for all Andalusia are at this town.

The population of Andujar amounts to 13,662 souls within the city, but a greater number of persons live in the numerous *cortijos*, farms, of the neighbourhood. Andujar contains five parish churches, six convents of monks, four of nuns, one hospital, one school, and two alms-houses, one for twelve old men and another for the same number of aged females. (See Miñano; Ponz, *carta* v., n. 6—26, tom. xvi.)

ANDUZE, a town in France in the department of Gard. The town itself is ill built, but it is in a pleasant country, on the right or S.W. bank of one of the streams called Gardon, and which is distinguished as the 'Gardon d'Anduze.' The inhabitants, who amount to more than 6000, are mostly protestants, and are engaged in the manufacture of hats, cloth, serge, silk stockings, pottery, and glue, which find a sale at the great fair of Beaucaire, in the same department. [See BEAUCAIRE.] It is about 22 miles N.W. of Nismes, the departmental capital.

ANEGADA, or the **DROWNED ISLAND**, one of the lesser Antilles, and the most northern of the group known as the Virgin Islands. The surface of Anegada is the production of lithophytæ, based on a submarine foundation. The island is for the most part a dead level. On the south-east, there is a gradual rising of the ground from north to south to the elevation of sixty feet, and this is the highest point of the island. The south side is a continued mass of shelves, loosely covered with vegetable mould, mixed with sand. This mould is the result of sea-weed, which has lost its saline properties through exposure to the sun; it is light, and of a dark brown colour, and in many places covers the ground only to the depth of a few inches. Where the shelves are intersected by openings which occur continually and of various widths, larger quantities of sea-weed have been detained, and a considerable amount of vegetable mould has been accumulated, in which plants grow of a healthy and vigorous appearance. The few trees found on the island grow in these situations. The northern, western, and eastern sides of the island are less favoured, being covered with sandy deposits thrown forward by the surf. The sand is frequently formed into hillocks forty feet high, and where they do not occur, detached masses of limestone and coral may be seen, many of which are upwards of thirty feet high. Behind these rocky hillocks some patches of productive soil are found, and these are cultivated as garden-ground by the inhabitants. Several ponds are met with on the surface of the island, from some of which considerable quantities of salt are gathered.

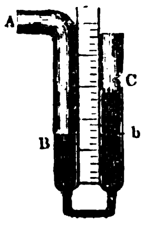
There is abundance of fresh-water on almost every part of the island, even in the immediate vicinity of the sea and of the salt-ponds. The water, by filtering through the surface soil, is very speedily deprived of its saline particles.

The vegetable productions of Anegada are not numerous, but it is singular that several of them are not observed in any of the other Virgin Islands. It appears probable that the seeds of these must have been carried there by currents, or conveyed by birds from the Spanish main.

Anegada is chiefly noted for the numerous wrecks which have happened on the reef by which its windward or eastern side is bordered, and which continues, under the name of the Horseshoe, about four leagues to the south-east, terminating seven miles from the east end of Virgin Gorda. The chief profit of the inhabitants comes from these shipwrecks; and, except on such occasions, the only labours in which they engage are those of raising provisions for their subsistence, and cultivating some small patches of cotton, the produce of which is taken for sale to the neighbouring island of Tortola.

The length of the island, in a direction east-south-east, is ten miles, and its greatest breadth four miles and a quarter. The south-east point of the island is in 18° 44′ N. lat., and 64° 16′ W. long. The population consists of eleven white and twenty-one coloured and black families. (See Purdy's *Colombian Navigator*, and *Journal of the Royal Geographical Society*, vol. ii.)

ANEMO'METER, from the Greek language, signifying *wind-measurer*, is an instrument for measuring the force of the wind, by finding what mechanical effect the wind to be measured will produce upon the apparatus. The first anemometer was invented by Wolf, and is described by him in his *Elementa Matheseos*, vol. ii. p. 319 (Geneva edition, 1746). It consists of four sails, similar to those of a windmill, but smaller, turning on an axis. On the axis is a perpetual screw, which turns a vertical cog-wheel round a second axis, placed transversely to the former. To the second axis is attached a bar, on which a weight is fixed, so that the sails cannot turn without moving round the bar in a vertical circle. When the wind acts upon the sails the bar rises, and this continues until the increased leverage of the weight furnishes a counterpoise to the moving force of the wind. The number of degrees through which the bar is moved to produce this effect is measured on a dial, the hand of which turns on the axis of the cog-wheel.



The principle of Dr. Lind's anemometer is as follows:— A, a curved tube of glass, as represented in the figure, is partially filled with water. The bore of the tube is diminished at the bottom, as a check on the oscillations to which the water is subject from slight variations in the force of the wind. The wind acts upon the open end A, and depresses the water to B, until the column of water b C, the difference between the levels b and C, is a counterpoise to the force of the wind on B. This difference can be ascertained by the graduated scale. Hence, when the area of the bore at B is known, and the height of b C observed, the column of water is found the weight of which is equivalent to the force of the wind. The velocity may thence be found by observing (see Aerodynamics) that the velocities are nearly as the square roots of the resistances, and that the moving force of a wind of 20 feet per second on a square foot is 12 ounces.

The following table, calculated by Dr. Hutton, who made some experiments with Dr. Lind's anemometer, at Woolwich (which is given in his *Mathematical Dictionary*), may be used with that instrument, and indicates what velocity of wind corresponds to various differences between the levels.

Difference of Levels in inches.	Force of Wind in pounds.	Velocity per hour in miles.
¼	1·3	18·0
½	2·6	25·6
1	5·2	36·0
2	10·4	50·8
3	15·6	62·0
4	20·8	76·0
5	26·0	80·4
6	31·3	88·0
7	36·5	95·2
8	41·7	101·6
9	46·9	108·0
10	52·1	113·6
11	57·3	119·2
12	62·5	124·0

In Regnier's anemometer, a bar, carrying a flat wooden surface at right angles to it, protrudes from a box, through a hole in the front of which it slides. This bar is met by a spring, which resists its further entry, until force is applied against the wooden surface. In the interior of the box, the under side of the bar carries rackwork, which plays on a cog wheel, the axis of which, passing through a side of the box, carries a hand round a dial-plate. The flat surface of wood is presented to the wind, which presses upon it and forces back the bar, carrying the cog wheel and hand through an angle, greater or less, according to the greater or less impulse of the wind.

Various other contrivances have been proposed; but those which we have described contain their main principles. For a table of the force of winds, see Aerodynamics.

ANE'MONE is a genus of the natural order *Ranunculaceæ*, in which are comprehended many beautiful flowers. It consists of lowly herbs, usually perennials, with white or purple, or scarlet, or even yellow blossoms, in which there is no distinct calyx, and which are succeeded by a cluster of grains, each terminated by a long silky feathery tail. As the species generally grow on open plains or in high exposed situations, their feathery grains produce a singular shining appearance when waved by the breeze, whence has been derived their name (from the Greek ἀνεμώνη), which literally signifies Wind-flower, the appellation actually bestowed by the English.

All the anemonies possess, in common with other Ranunculaceæ, the property of extreme acridity. The leaves of *A. pulsatilla* will raise blisters on the skin; if chewed, they produce irritation of the throat and tongue; and their roots, as well as those of *A. pratensis*, nearly related species, produce nausea and vomiting if administered in very small doses, on which account they have been strongly recommended by some medical men, in various complaints. The bruised leaves and flowers of *A. nemorosa* have been found to cure the tinea in the head of children. The following are the most remarkable species:—

1. *A. pulsatilla* or pasque flower; this grows wild upon exposed downs in various parts of England, as on the Gogmagog Hills near Cambridge, the heath at Newmarket, &c. It has large purple flowers and finely cut hairy leaves; and is very nearly the same as the *A. pratensis*, the use of which, in diseases of the eye, has been so strongly recommended by Baron Stoerck and others.

2. *A. nemorosa*, the wood anemone; found abundantly in woods all over England, covering the ground with its neat white flowers under the shelter of bushes as early as March and April. It is a perennial plant with knobby roots, and a short stem having one or two smooth, bright green, deeply cut leaves. It is poisonous to cattle.

3. *A. pavonina*, the Peacock anemone; a native of the vineyards in Provence, about Nice, and in other parts of the south of Europe. This is not very uncommon in gardens, where it is usually, but improperly, named *A. stellata*. It is known by its scarlet or scarlet and white flowers, which are usually double, and have their divisions very sharp-pointed. In habit it is like *A. coronaria*, for a variety of which it is often mistaken. It is one of the handsomest of the cultivated species.

4. *A. coronaria*, the common garden anemone. Found in a wild state in moist meadows in the south of France, Italy, and Greece, and different parts of Asia Minor; Dr. Russell speaks of it as abundant near Aleppo. In these places it is seen only in a single state, but even then sporting into a

variety of colours, the principal of which are white, scarlet, and purple in different shades. In the gardens it is too well known to require description: the single varieties are usually called *poppy anemonies;* the double kinds owe their peculiar state either to a multiplication of the petals, or to a conversion of the stamens and pistilla into petals; these have been procured by patient cultivation for some hundred years, and are still improving. The method pursued has been to save seeds only from the kinds that have the greatest vigour, or the greatest tendency to a multiplication of their parts, and wherever a double flower is accidentally capable of producing seed, to prefer it to all others. By this means habits that were originally accidental become fixed, and capable of being further acted upon by the persevering gardener. A course of this sort patiently followed up, has enabled the Dutch to improve the race of anemonies so much as to obtain them within a few years with stems nearly half a yard high, and with blossoms six inches across.

5. *A. stellata;* a native of various parts of Germany, France, and the Levant, is also often seen in our gardens, where it is called *A. hortensis.* It differs from the last in having smaller and narrower petals, very rarely double flowers, a greater tendency to purple in their colours, and much broader leaves. It is not so liable to vary as the last species.

Gardening books are filled with directions for the management of these plants; all of which, in this as in most other cases, may be reduced to a few simple rules, resulting, indeed, from experience, but which might have been just as well deduced from the consideration of the natural habits of the species. 1. They grow wild in rich and moist pastures; the soil for them should therefore be fresh loam, with as great a proportion of stimulating manure as they can be made to bear. 2. They are natives of the hottest parts of Europe, where the winter's cold is not more than the olive will bear; they should therefore never be exposed to the severest frosts of England, but should be protected by a covering of some kind, either in the shape of frames or a mulching of decayed tan. It is true that they are hardy enough to exist and flower without this care, but the beauty of plants protected is infinitely greater than that of such as are left exposed in the open border. 3. They commence their growth during the mild winters of their native countries, and are ready as soon as the spring is sufficiently advanced to start up into flower. As the summer advances, and the heat and drought increase, they perfect their seeds and lose their leaves, when they fall into a state of rest; summer and autumn are, therefore, their real winter, and, consequently, it is at this time they should be taken up and prepared for the succeeding season. 4. When they are in a growing state in their native countries, the sun's rays have but little force, and they are consequently not prepared to bear much exposure; for this reason, florists find it necessary to shade them, when they flower during the hot weather of our English summers.

Like all other rules in gardening, the above directions may be modified and departed from without any great evil; but if the object is to cultivate this class of flowers in the greatest perfection, and to improve their race, these rules will be found too important to be materially neglected.

For *A. Hepatica*, see Hepatica.

ANE'MOSCOPE, an instrument for determining the direction of the wind; usually constructed by connecting with the spindle of a weathercock the hand of a dial on which the points of the compass are marked.

ANE'THUM. [See Fœniculum and Pimpinella.]

A'NEURISM, is a Greek word (*ἀνευρυσμός*), literally signifying, 'a widening, or extension:' it is now used to signify a tumour, consisting of a preternatural enlargement of an artery. The artery is the only seat of this disease; and any artery of the body may be the subject of it, but it is much more common in some arteries than in others. The corresponding disease in a vein is termed Varix.

An Artery is composed of three membranes which are firmly united, and form the walls of a strong, elastic, and extensible tube. These membranes are called tunics or coats. In the healthy state of the artery these tunics yield only to a certain extent to the impulse of the blood, so that the tube possesses only a certain diameter; but in a state of disease the impulse of the blood distends these tunics to a preternatural extent, causing that part of the artery which is diseased to swell out into a tumour or bag. The distension of the coats of the artery progressively increasing, they are at last capable of no farther stretching, and consequently are torn asunder and burst. But the inner and middle coats of the artery are not as extensible as the external coat; the two former coats are therefore ruptured a considerable time before the latter gives way, in which case the only proper coat of the artery forming the wall of the aneurismal tumour is the external. This coat in its turn getting progressively thinner and thinner as the dilatation goes on, at length bursts like the former; the blood escapes, and life is suddenly extinguished. But sometimes the tumour does not burst even after the rupture of the external coat of the artery; for there is placed around the artery a dense and strong membranous sheath consisting of what is termed cellular membrane, which sheath is far more extensible than any of the coats of the artery, and it is found that sometimes the aneurismal sac or the bag-like tumour which the dilated artery forms, consists only of this condensed cellular membrane, all the proper coats of the artery having been rent and destroyed by the progressively distending force. Thus an aneurism may consist simply of the dilatation of the coats of an artery without the rupture of any; or of the dilatation of some with the rupture of others; or of the rupture of all, the bag of the tumour being formed solely by the cellular sheath of the artery.

When the coats of the artery have burst and this portion of the tube is dilated into a sac, it is evident that this sac is beyond the direct current of the circulation, and that the larger the bag, the farther its contents will be from the influence of the direct current of the blood. The consequence is, that the blood contained in the aneurismal sac undergoes a peculiar change, a modification of the process of coagulation [see Blood]; the thinner part of the blood being removed, while a portion of the thicker part, or the fibrin, remains. In this manner there is left upon the internal surface of the sac a stratum of the thicker or fibrous part of the blood. Successive depositions are made of this fibrous part of the blood by which the cavity of the tumour is gradually diminished. At length the sac becomes entirely filled with this substance, which forms for it a firm plug. The deposition of this fibrin is not confined to the aneurismal sac, but is continued into the artery itself, both above and below its dilatation, until it reaches the next important ramification which is given off from the artery, where it stops. In this manner the circulation through the aneurismal portion of the vessel is prevented; the blood is determined into other channels; this portion of the vessel, being no longer of any service in carrying on the circulation, is blocked up, and in this manner is effected a spontaneous cure of the disease.

But this beautiful curative process, though it occasionally happen, is not the usual course. When the external coat or the cellular sheath of the artery are stretched beyond a certain point, it would seem that its vitality is diminished; at length a part of it mortifies or dies; an eschar is formed; the eschar sloughs away; an opening is thus formed in the tumour; the blood rushes out, and the patient dies. This is the mode in which the aneurismal sac bursts when the aneurism is situated on the external part of the body. But if the aneurism be internal the process is different. The tumour becoming thinner and thinner by successive distention, bursts suddenly by a crack or fissure, through which the blood is discharged.

The first symptom which denotes the formation of an aneurism, is the perception of an unusual throbbing in the diseased artery. If the situation of the artery be such that it can be seen or felt, a small tumour is manifest. This tumour, when carefully observed, is found to have a pulsatory motion, the pulsatory motion, as well as the tumor itself, disappearing when the part is compressed, but instantly reappearing on the removal of the pressure. Commonly, the tumour is without pain, and without any discoloration of the skin. The magnitude of the tumour, whatever its size when first discovered, is steadily progressive; in proportion as it grows larger the pulsatory motion diminishes, and when it has attained a very considerable size the pulsation is no longer perceptible. The tumour continually enlarging, produces a variety of effects on the parts with which it comes in contact. Some it pushes aside, others it carries with it, and others it destroys. The adjacent muscles, for example, whether they are situated directly over the aneurism, or are at one side of it, are usually stretched, displaced, dwindled, and sometimes entirely confounded with the contiguous parts. The nerves, too, are frequently pushed out of their natural situation, or, if they adhere to the sides of the sac, as they often do, they are necessarily stretched as the tumor enlarges, and this distension of the nervous cords sometimes occasions intense pain. The cartilages and bones, pressed upon by the advancing tumor, gradually disappear, and at length are so completely destroyed that not the slightest vestige of them remains. In general, as long as the tumor is small, it is unattended with pain, but the changes which it produces in other parts, such as the stretching of the nerves and the absorption of the bones, is sometimes attended with intolerable pain, capable of being mitigated by no means hitherto discovered. Death at last puts an end to the pain and the patient together; the approach of the fatal event being clearly indicated by the increasing thinness, softness, and darkness of the tumor.

The importance in practice of discriminating between this most dangerous disease and all other tumors is manifest; but the distinction is not always easy, or at any rate is not always made. Many a fatal accident has happened in consequence of incisions having been made into aneurisms which were mistaken for abscesses. Vesalius was consulted about a tumor of the back, which he pronounced to be an aneurism: soon afterwards an imprudent practitioner made an opening in the swelling and the patient bled to death. Ruysch relates that a friend of his opened a tumor near the heel, not suspecting it to be an aneurism, and the hæmorrhage, though suppressed at last, placed the life of the patient in the utmost jeopardy. A person consulted Boerhaave about a swelling at his knee, who cautioned him against allowing it to be opened; it was opened, and the man died on the spot. Even Ferrand, head surgeon of the Hôtel Dieu, mistook an axillary aneurism for an abscess, plunged his bistoury into the swelling and killed the patient. The characters by which the aneurismal swelling may be distinguished from all other diseases are given at great length in surgical books.

There is something in the structure of the larger arteries which predisposes to this disease. Their coats are thinner in relation to the magnitude of the column of blood with which they are filled than the coats of the smaller arteries. The internal are much more subject to aneurism than the external arteries. The curvatures of the arteries are another predisposing cause. The period of life at which aneurism is most frequent is between the ages of thirty and fifty. Sir Astley Cooper, however, states that he has seen the disease in a child only eleven years old, and that he has operated for it with success in a man of eighty-five. It is much more common among males than females. Out of 63 cases of this disease, 56 were males, and only 7 females. Aneurism so often follows a sudden violent shock sustained either by the whole body or by a limb, and more especially by the sudden violent extension of a limb, as apparently to justify the common opinion that external violence is among the most frequent exciting causes of the malady.

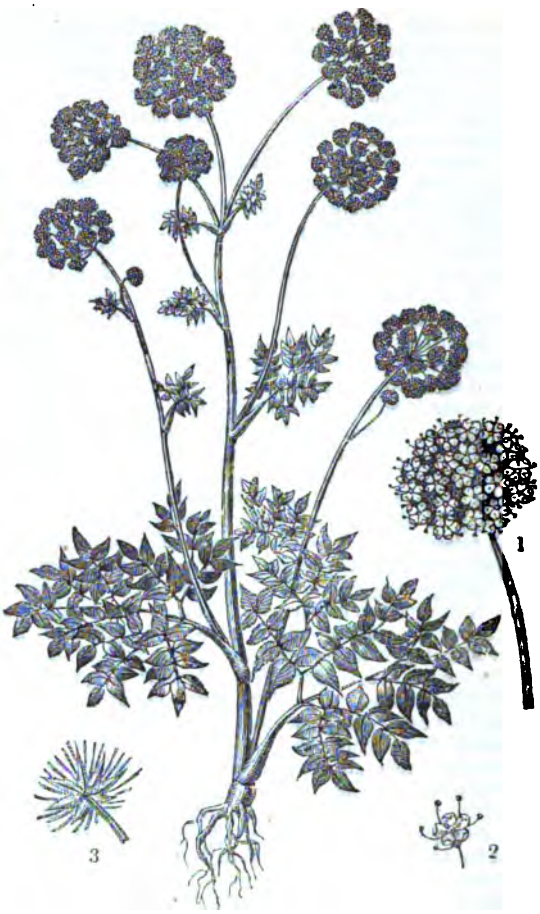
Excepting in the exceedingly rare case in which the spontaneous cure, already explained, is effected, this disease, when left to itself, uniformly proves fatal by the ultimate rupture of the tumor, in consequence of which the patient expires either instantaneously from the great and sudden loss of blood, or by degrees from repeated losses of it. And yet anterior to the time of Galen, who lived about the middle of the second century, there is to be found no record whatever of this terrible malady. The older practitioners, indeed, who believed that the arteries were air-tubes, could have had no conception of the existence of an aneurism. It has been justly observed, that were the number of individuals in Europe who are now annually cured of aneurism by the interference of art, to be assumed as the basis of a calculation of the number of persons who must have perished by this disease, from the beginning of the world to the time of Galen, it would help to convey some conception of the extent to which anatomical knowledge is the means of saving human life.

The cure of aneurism consists in the obliteration of the preternatural cavity of the artery. The obliteration of this cavity is the sole object of the operation, which is found to be the only sure and effectual mode of curing the disease. This operation consists in cutting down upon the artery and passing a ligature around it above its dilatation. The immediate effect of the ligature of course is to stop the flow of blood into the sac; its ultimate effect is to excite inflammation in the coats of the vessel, by which its sides, brought into close contact by the ligature, permanently adhere together, thus inducing an obliteration of the cavity of the vessel. The success of the operation depends entirely on the completeness of the adhesion of the sides of the vessel, and the consequent obliteration of its cavity. But this adhesion will not take place unless the portion of the artery to which the ligature is applied be in a sound state. If it be diseased, as it almost always is, near the seat of the aneurism, when the process is completed by which the ligature is removed [see INFLAMMATION], hæmorrhage takes place, and the patient dies just as if the aneurism had been left to itself. For a long time, surgeons were in the habit of applying the ligature as close as possible to the seat of the aneurism: they laid open the aneurismal sac in its whole extent, and scooped out the blood contained in it. The consequence was that a large deep-seated sore, consisting of parts in an unhealthy state, was formed; and it was necessary to the cure that this sore should suppurate, granulate, and heal,—a process which the constitution was frequently unable to support. Moreover, there was a constant danger that the patient would perish from hæmorrhage, through the want of adhesion of the sides of the artery. The profound knowledge of healthy and of diseased structure, and of the laws of the animal economy by which both are regulated, which John Hunter had acquired from anatomy, suggested to this eminent man a mode of operating, the effect of which, in preserving human life, has placed him high in the rank of the benefactors of his race. This consummate anatomist saw that the reason why death so often followed the common operation, was because a process essential to its success was prevented by the diseased condition of the artery. He observed that while the vessel close to the aneurism was always diseased, at some distance from the aneurism it was in a sound state: it occurred to him, that if the ligature were applied to this distant part, that is, to a sound instead of a diseased portion of the artery, the process necessary to the success of the operation would not be counteracted. But to this there was one capital objection, namely, that it would often be necessary to apply the ligature around the main trunk of an artery, before it gives off its branches, in consequence of which the parts below the ligature would be deprived of their supply of blood, and must therefore mortify. He was well acquainted, however, with that arrangement of the blood vessels which has been explained under the term ANASTOMOSIS. Reflecting on the number and freedom of the communications of the arterial tubes, he conceived it possible that a limb might receive a sufficient supply of blood to maintain its vitality through the medium of its collateral branches only. For an aneurism in the ham, he, therefore, boldly cut down upon the main trunk of the artery which supplies the lower extremity, and applied a ligature around it, where it is seated near the middle of the thigh, in the confident expectation that, though he thus deprived the limb of the supply of blood which it received through its direct channel, it would not perish. His knowledge of the processes of the animal economy led him to expect that the force of the circulation being thus taken off from the aneurismal sac, the progress of the disease would be stopped; that the sac itself, with all its contents, would be absorbed; that by this means the whole tumor would be spontaneously removed, and that an opening into it would be unnecessary. The most complete success followed this noble experiment; and the sensations which this philosopher experienced on witnessing the event constituted an appropriate reward for the application of profound knowledge to the mitigation of human suffering. After Hunter followed Abernethy, who, treading in the footsteps of his master, for an aneurism of the femoral, placed a ligature around the external iliac artery; lately the internal iliac itself has been taken up, and surgeons have tied arteries of such importance, that they have been themselves astonished at the extent of their success. Every individual on whom an operation of this kind has been successfully performed is snatched by it from certain and inevitable death. (See Cooper's *Surgery*; Hodgson on the *Diseases of Arteries and Veins*; Bell's *Surgery*; Abernethy's *Surgical Works*; *Use of the Dead to the Living*, &c., &c.)

ANGEL (COIN.) Dr. Johnson defines it as 'a piece of money anciently coined and impressed with an angel, in memory of an observation of Pope Gregory, that the pagan Angli, or English, were so beautiful, that, if they were Christians, they would be Angeli, or Angels.' But we must remark, that Pope Gregory's observation was made in the seventh century; and the coin called the angel was not struck in England till the middle of the fifteenth century. The angel was originally a gold coin of France, where it was first coined, at least by that name, in 1340. (See Ducange, *v.* Moneta, and Le Blanc, *Traité Hist. des Monnoyes de France*, 4to. Amst. 1692, p. 207.) In France, where it was soon followed by the half and quarter angel, it was always of fine gold, but not always of the same weight. It appears to have been introduced with its minor divisions, into England, by Edward IV., in 1465, (see Leake, pp. 150—164,) and was continued as a coin by King Henry VI. when he returned to the throne. Angels and half-angels are the only gold coins known of Richard III. (Leake, p. 170.) When first introduced, the angel was rated in value at 6*s.* 8*d.*, and being of the same value as the noble, was sometimes called the noble angel. This value was continued at Henry VIII.'s first coinage of gold. In the coinage of that king's latter time, the value was raised to 8*s.*, and so continued through the reign of Edward VI. Queen Mary's angel went for 10*s.*, which value continued to the end of the reign of Charles I., the last of our kings who coined the angel. So base was Henry VIII.'s gold coinage of this money, that Stow, in his *History of London*, says, 'I have seen twenty-one shillings given for *an old angel* to gild withal.' Queen Elizabeth, (according to Nicolson's *Historical Library*, p. 267, from Fynes Moryson's *Itin.* Part i. li. 3 c. 6.) in the 43rd year of her reign, (1600-1601) contracted not only for the coining of angels, and their usual divisions, but for pieces of an *angel and a half* and *three angels*, of the finest angel gold; but it is presumed that the contract for these larger pieces was never completed, as no such coins have been seen by our collectors. The usual device upon the obverse of the angel, was the figure of St. Michael standing upon the dragon, and piercing him through the mouth with a spear, the upper end of which terminated in a cross, or cross-crosslet. The reverse of the earlier ones had a ship, with a large cross for a mast, with the royal arms in front. The angels of James I. and Charles I. have the mast of the ship with a main-top, and no cross. The obverse had the king's titles surrounding the device. The reverse, from Edward IV. to Edward VI., bore the inscription 'PER CRVCEM TVAM SALVA NOS CHRISTE REDEMPTOR.' The reverses of the angels of Philip and Mary, Elizabeth, and James I., bore, partly at length, and partly abridged, the sentence, 'A DOMINO FACTUM EST ISTVD ET EST MIRABILE [IN OCVLIS NOSTRIS.'] Charles I.'s angel had on the reverse, AMOR POPVLI PRÆSIDIVM REGIS. Foikes (pl. xiii. of his *Gold Coins*) has engraved a piece in silver, struck from the reverse only of a die, intended for an angel by King Charles II., but never coined; with the same inscription on the reverse as his father's angel. The only distinction by which the angels of Henry VI. are known from those of Henry VII. is, that in the former, the archangel Michael stands with his left foot upon the dragon; in the latter, the angel stands with both feet upon the dragon. In the collection of Lord Pembroke there is a six-angel piece; but it is not certain that it was intended for a coin. The Angelets of Edward IV., and to Henry VIII., have on the reverse, O CRVX AVE SPES UNICA. The angelets of Edward VI. have the same inscription on the reverse as the angel.

ANGE'LICA, a genus of plants belonging to the natural order *umbelliferæ;* it comprehends several species, the principal part of which are to be met with in botanic gardens, and one that was formerly very much cultivated as an esculent plant, on account of which we admit the genus here. This, the *Angelica archangelica*, or *Archangelica officinalis*, as it is now sometimes called, is a native of the banks of rivers and of wet ditches in all the northern parts of Europe; in this country it grows abundantly on the banks of the Thames below Woolwich, and in several other places. It is a biennial plant, with a large fleshy aromatic root, blackish externally, but white within; and a stout furrowed branched stem as high as a man. Its leaves are of a clear bright green, shining, and divided into a very large number of heart-shaped finely serrated lobes. The flowers are white, and disposed in round, very compact umbels: they are succeeded by large broad-winged grains of a pale yellowish-brown colour. Each partial umbel is surrounded at its base by seven or eight pointed undivided bracteæ.

For the sake of its agreeable aromatic odour, this plant has been much cultivated, and is so still on the continent. Its blanched stems, candied with sugar, form a very agreeable sweetmeat, possessing tonic and stomachic qualities. Its roots contain a pungent, aromatic, stimulating principle, which has caused them to be employed in scrofulous diseases; they have been administered in the form of infusion and of powder, as diuretics and sudorifics; but in this country they are no longer employed as curative agents.



[Angelica archangelica, a diminished figure.]
1. A partial umbel of the natural size. 2. A separate flower.
3. The back of one of the partial umbels, showing the bracteæ.

A very common wild species, the *Angelica sylvestris*, or wild angelica, which is found all over the meadows near the Thames above London, possesses similar properties, but they are weaker, and therefore less important.

ANGELO (BUONAROTTI, MICHEL), the father of epic painting, and scarcely less distinguished as a sculptor and architect, was descended from the noble family of Canossa in Tuscany. He was born in the year 1474, a period peculiarly favourable to genius, when the states of Italy emulated each other in the cultivation of the liberal arts. Michel Angelo, the bent of whose powers manifested itself in his earliest childhood, learned the elements of design in the school of Domenico Ghirlandaio, a celebrated professor in Florence. While he pursued his studies with this master, a seminary was established for the promotion of sculpture by Lorenzo de' Medici, and Michel Angelo was invited among other youths to study from the collection of antique statues arranged in the Medicean gardens. It is said that the sight of these splendid works determined him to devote himself entirely to sculpture; he began, not merely by copying, but by investigating the principles on which the Greek artists had wrought, and having found a head of a laughing faun, considerably mutilated, he imitated that part of it which was perfect, and restored what was wanting. Lorenzo, who frequently visited the garden, was struck by this demonstration of vigorous capacity; and being pleased no less with the simple manners of the youth, and his evident devotion to his art, he invited him to reside entirely in his house, where he remained three years, treated with paternal kindness, and having the advantage of associating with the first literary characters of the age. At the suggestion of Politian, who also resided with Lorenzo, he executed for this illustrious patron a basso-rilievo in marble, the subject of which was the Battle of the Centaurs; he resumed the pencil also during this period, and made many studies from the works of Masaccio. Lorenzo died in 1492. His brother Pietro continued to patronize Michel Angelo, but in a different spirit. Treating art as a toy, he employed him, during a severe winter, to make a statue of snow; and manifesting in all things the same frivolous spirit, he precipitated, by his bad government, the downfall of his family, which was driven from Florence in 1494. On this event, Michel Angelo retired to Bologna, where he contributed two statues to the church of the Dominicans, and after a year's residence in that city, returned to Florence. During this time he made the celebrated statue of a Sleeping Cupid, which was sent to Rome, where it was shown as a piece of sculpture which had been dug up from a vineyard, and was pronounced by various connoisseurs to be a genuine antique, and superior to anything which contemporary art was capable of producing. This statue having been purchased at a high price by the Cardinal S. Giorgio, the trick became known, and Michel Angelo's reputation was so much augmented by it, that the cardinal, though vexed at the deception, invited him to Rome. He devoted himself during this his first residence in the imperial city, to intense study, and executed several works, particularly a Virgin weeping over the dead body of Christ, for St. Peter's church, which excited astonishment, not only by its excellence, but by the apparent facility with which the greatest difficulties of art were surmounted.

Several great works in art having at this time been projected by the government of Florence, Michel Angelo, at the earnest advice of his friends, returned to that city, and the first undertaking on which he exercised his talents was a gigantic statue of David, hewn from a solid block of marble. This work had been commenced some years previously by one Simon da Fiesole, who, finding that he had undertaken a task wholly beyond his capacity, had abandoned it in despair. The misshapen mass which had been thus left, Michel Angelo accommodated to a new design, and produced from it the sublime statue which ornaments the great square at Florence. The Gonfaloniere, Pietro Soderini, was now anxious to enrich the city with some grand production of Michel Angelo's pencil. Leonardo da Vinci had been commissioned to paint an historical picture for one end of the hall of the Ducal palace, and Michel Angelo was engaged to execute another at the opposite extremity. He selected a subject from the wars of Pisa, in which a number of men, while bathing in the Arno, are surprised by a sudden attack on the city, and start up to repulse the enemy. Trumpets are sounding; some of the warriors endeavour, with gestures of furious impatience, to draw their garments over their wet limbs; others rush half-clad into the combat; horse and foot are intermingled, and the whole scene breathes fierceness and slaughter. This cartoon, with the exception of a few dismembered fragments, has perished, but as long as it existed, it was studied by artists from all countries, and Benvenuto Cellini, a scholar and admirer of Michel Angelo, affirms, that he never equalled it in any of his subsequent productions. Michel Angelo had at this time attained only his twenty-ninth year, and had not only established his reputation as the greatest artist of his day, but had created by the novelty and grandeur of his style a new æra in the arts. Julius II., a pontiff who, in the energetic cast of his character, bore a strong resemblance to Michel Angelo himself, having now succeeded to the papal chair, called him immediately to Rome, and commissioned him to make his monument, a work conceived on a scale which Michel Angelo felt to be commensurate to his powers. He made a design, which, had it been finished according to his original intention, would have surpassed in grandeur, beauty, and richness of ornament every ancient and imperial sepulchre. It was to have had four fronts of marble, embellished with forty statues, besides several mezzo-rilievi in bronze. To this design Rome and the world are indebted for the magnificent church of St. Peter's; for Michel Angelo having suggested to the pope that the interior of the old edifice would not allow sufficient space for the monument to be properly seen, the pontiff determined to rebuild the church on a larger scale. While the monument was in progress, the pope delighted to come and inspect it; but the work was interrupted by an accident which strongly marks the character of the artist. Having occasion to make some communication to his holiness, and not having found admission on two applications, in the latter of which he felt himself somewhat superciliously treated by one of the officers in attendance, he gave directions to his servants to sell his goods to the Jews, and immediately set off for Florence. He had scarcely reached Poggiobonzi before five couriers had arrived from Julius commanding his immediate return, but Michel Angelo was inflexible, and continued his journey. On arriving at Florence, he set about finishing the cartoon of Pisa, but three briefs were dispatched to Soderini the Gonfaloniere, requiring that he should be sent back. Michel Angelo excused himself, alleging that he had accepted a commission from the Grand Sultan to go to Constantinople for the purpose of building a bridge. The pope, in the mean time, had gone on political affairs to Bologna, and Soderini, fearing he should himself incur the papal displeasure through Michel Angelo's contumacy, persuaded him to go to that city. Immediately on his arrival, and before he had had time to adjust himself, he was conducted by the pope's officers before his holiness, who, looking at him with an angry glance, said, 'What, then! instead of coming to seek us, thou wast determined that we should come to seek thee?' Michel Angelo excused himself, saying, 'that he had quitted Rome, being unable, after his faithful services to his holiness, to endure the indignity of being denied admission to him.' A bishop in attendance, intending to say something in extenuation, observed to the pope, that such persons, however expert in their professions, were usually ignorant of everything else: 'Who told thee to interfere?' exclaimed Julius, bestowing at the same time a hearty blow with his staff on the shoulders of the ecclesiastic; and commanding Michel Angelo to kneel, he gave him his benediction, and received him into full favour, giving him directions at the same time to make his statue in bronze. Michel Angelo soon completed the clay model; the statue was the personification of majesty, but the face had so terrible an expression, that the pope demanded, 'Am I uttering a blessing or a curse?' Michel Angelo replied, 'that he had intended to represent him admonishing the people of Bologna, and inquired if his holiness would have a book placed in one of the hands: 'Give me a sword,' answered the warlike pontiff, 'I know nothing of books.'

On his return to Rome, Julius was induced by the advice of his architect, Bramante, to suspend the execution of the monument, and he gave orders to Michel Angelo to paint the vault of the Sistine Chapel. It is said, that Bramante was instigated by unworthy motives in giving this counsel to the pope, either imagining that the large sums which his holiness was expending in sculpture would leave less at his command for the purposes of architecture; or that Michel Angelo, who preferred the practice of sculpture to that of painting, would incense the Pope by refusing to perform his commission; or finally, that, should he attempt it, he would expose his inferiority as a painter to Raffaelle d'Urbino, who was Bramante's nephew. Such are the motives ascribed to Bramante, although, it would appear, on no very rational grounds. If, however, Bramante was really actuated by any unworthy motive, never did an evil intention more completely defeat itself. Michel Angelo, indeed, who was absorbed in the execution of the monument, most earnestly endeavoured to decline the task of painting the chapel, and even alleged that he thought Raffaelle better qualified to perform it; but Pope Julius allowed no impediment to stand in the way of his will, and Michel Angelo, finding himself without an alternative, and impressed with a sense of the vastness and grandeur of the task, commenced his cartoons. He invited from Florence several artists distinguished as painters in fresco, a mode of practice in which he was then inexperienced, and the roof of the chapel was commenced by these assistants, under his direction; their execution, however, fell short of his expectations, and entering the chapel one morning, he dismissed them all, threw their work from the walls, and determined on executing the whole himself. Having advanced to the third compartment, he had the mortification to find his labour frustrated by the bad quality of his materials, in which fermentation had taken place, and in utter disappointment he renounced the undertaking. The pope, being made acquainted with this misfortune, sent to him his architect, San Gallo, who investigated the cause of the failure, and taught him how to correct it. Thus reassured, he proceeded, and the pontiff hearing at length that the cieling was half completed, could control his impatience no longer, and ordered the chapel to be opened for his inspection. Many other persons found admission, and among the rest Raffaelle d'Urbino, who then first became acquainted with Michel Angelo's powers as a painter. Struck with admiration, he immediately changed his own style, and with the candour natural to a great mind, thanked God that he had been born in the same age with so great an artist. The work was now carried forward without interruption, and the whole was completed within one year and eight months from the time of its commencement; an achievement which, whether we consider the magnitude and sublimity of the performance, or the almost incredibly short time in which it was executed, is unparalleled in the history of art. The chapel was opened on All Saints' day, with a solemn mass, at which the pope assisted in person. The roof is divided into twelve compartments, in which is painted the history of the antediluvian world. In three of the first compartments Michel Angelo has personified the Supreme Being, dividing the light from the darkness—creating the sun and moon—and giving life to Adam. The attempt to pourtray the Deity by visible representation is repugnant to our present ideas, but it was at that time sanctioned by the church, and is almost atoned for by those images of divine power and majesty which Michel Angelo has here embodied. The eleventh subject of the series on the roof is the Deluge, and the twelfth is from the story of Noah, showing the remnant of the human race preserved after that awful event. On the sides of the chapel is a series of designs representing the persons who compose the genealogy of Christ, and between these compartments are the colossal figures of the Prophets and Sibyls, seated in solemn meditation. The effect of the whole work is adapted with admirable accuracy to the vast height at which it is seen, and it is impossible to contemplate it without reverence and astonishment. The reign of Julius terminated in 1513, when Leo X. succeeded.

It might have been expected that Leo X., whose name is associated with the ideas of taste and munificence, and who affected fully to appreciate the powers of Michel Angelo, would have engaged him on some work worthy of his talents. There is, however, in his whole conduct towards this great artist a display of injustice not easily explained. He obtruded on him the task of building the façade of the church of S. Lorenzo at Florence—a commission against which the artist most strenuously protested; but the pope overruled all objections, and compelled him to go to Carrara, in order to excavate marble for the purpose. He was afterwards directed to procure it from the quarries of Pietra Santa: the difficulties of conveying it hence were found almost insurmountable, and we cannot read without surprise and indignation, that during the whole pontificate of Leo, a period of eight years, this extraordinary man was employed in hewing rocks and excavating a road. The short reign of Adrian VI. which followed, although generally unfavourable to the arts, was less injurious to Michel Angelo, as it allowed him leisure to proceed with the monument of Julius II.; but on the accession of Clement VII. that work was again interrupted, and he was called on by the new pontiff to build a library and sacristy for the church of S. Lorenzo. The civil wars of Florence ensued soon after, and we find Michel Angelo acting in the capacity of engineer. On the expulsion of the Medici he was appointed superintendent of the fortifications by the local government, and he evinced extraordinary skill in fortifying the important post of San Miniato. Having continued his services until he felt that they could no longer be effectual, and considering the fall of the city inevitable he withdrew to Venice, and during his residence there, it is affirmed by some authorities, that he gave the design for the bridge of the Rialto. He returned to Florence at the earnest entreaty of his fellow-citizens, who seemed to attach more importance than himself to his services, but, as he had foreseen, the city was soon after compelled to surrender, and he judged it prudent to conceal himself, as did several of the citizens who had distinguished themselves in its defence. Michel Angelo has been reproached with ingratitude to the Medici for the part he took in those transactions, but he is, perhaps, to be praised rather than condemned for having sacrificed his private feelings to the duty he owed his country. As soon as the tumult consequent on the sack of the city had subsided, Clement VI. ordered strict search to be made for Michel Angelo, received him kindly, consulted him on various works, and the great picture of the Last Judgment was then projected. The death of Clement, in 1533, suspended these intentions, and Michel Angelo now hoped that he should be enabled to complete the monument of Julius II. This work had been the favourite employment of his life, and he had devoted to it all his powers, but it had proved to him, almost from its commencement, a source of inquietude. Each pontiff, since the death of Julius, had on his accession demanded the services of Michel Angelo, and compelled him, in spite of his earnest remonstrances, to discontinue his labours on the monument; in the meantime, the heirs of Julius, being impatient for its completion, harassed him with threats and complaints, large sums of money having been paid him during the progress of the work. Clement VI. insisted that Michel Angelo had a right to consider himself rather the creditor than the debtor; but Paul III., when Michel Angelo urged his obligation to the heirs of Julius, as a reason for declining the commissions he offered him, threatened to tear the contract with his own hands. He came, however, attended by ten cardinals, to see the work which had occasioned so much litigation, and pronounced it to be miraculous. Being shown, at the same time, the cartoons which had been prepared for the Last Judgment, he determined that nothing should impede the immediate execution of that work, and undertook to arbitrate himself between Michel Angelo and the heirs of Julius. The monument was at length finished, by mutual agreement, on a smaller scale than had been originally projected, and placed in the church of San Pietro in Vinculo. Michel Angelo now found himself at liberty to proceed with the picture of the Last Judgment; he devoted to that immense work the labour of eight years, and it was finished in 1541. We are accustomed to connect with this performance an impression of everything which is great in art; nevertheless, whoever expects to find in it that which is usually attached to our ideas of painting, an effect agreeable to the eye, will be utterly disappointed. Art, indeed, was not at that time considered a medium of amusement merely, but a vehicle for religious impressions; and as the leading feeling associated with the awful idea of the last judgment is that of terror, so Michel Angelo has made terror the predominating sentiment of his picture. In the Messiah we see rather the inexorable judge than the merciful Redeemer; he turns to the left, and fulminates his sentence on the wicked, who fall thunderstruck. These groups, precipitated through the air, are seized by dæmons who spring from the abyss beneath. This is the finest part of the picture, for there is little among the groups of the righteous, who on the opposite side are ascending into heaven, which expresses the happiness of the blessed. That part of the picture in which the dead are seen rising from their graves is admirable. The excellence of the work consists in the unparalleled powers of invention displayed in the various groups, and in the profound knowledge of the human figure by which the artist was enabled so effectually to embody his conceptions; but considering the composition as a whole, it must be acknowledged, that, without impairing the solemn impression proper to the subject, a more picturesque arrangement might have been admitted, and that even the sentiment would have been augmented by more powerful combinations of light and shadow. It was pronounced by contemporary criticism that Michel Angelo had in that work excelled all his former productions; but the deliberate judgment of time, we believe, inclines to decide that his great name as a painter is better sustained by the compartments in the roof, and on the sides of the Sistine chapel, than by the picture of the Last Judgment. The career of Michel Angelo is an example of the splendid results produced by great powers in conjunction with great opportunities. We next find him engaged in constructing the magnificent fabric of St. Peter's church. He began by substituting for the Saracenic design of San Gallo, a more Christian and superb model in the shape of a Greek cross. 'This fabric,' to use the language of Fuseli, 'scattered into infinity of jarring parts by his predecessors, he concentrated; suspended the cupola, and to the most complex, gave the air of the most simple of edifices.' On this work he was occupied during the whole remainder of his life. He found opportunities, however, to direct fortifications, to adorn the Capitol with magnificent buildings, to finish the Farnese palace, and give designs for other works of architecture. But circumstances connected with the building of the church embittered his latter years with serious causes of trouble. As he had occasion, among the number of persons employed in the undertaking, to promote some and dismiss others, he was beset by cabals, and harassed by opposition; and machinations were even employed to deprive him of his office: but he was uniformly supported by the pontiffs, especially by Julius III., who regarded him with profound respect and veneration. Old age came upon him not unaccompanied with the physical infirmities which belong to it, but he retained the vigour and alacrity of his mental faculties to the close of his long life. He died on the 17th February, 1563, having nearly attained his 89th year. His last words were, 'In your passage through this life, remember the sufferings of Jesus Christ.' He was buried with due honours in the church of the Apostoli at Rome; but his remains were afterwards removed to the church of Santa Croce, at Florence.

Considered either in relation to the degree or the variety of his talents, Michel Angelo holds a foremost place among the great men of an age which has left the most durable impressions upon the arts and literature of Europe. As a painter and sculptor he created his own style, which, as it owed nothing to his predecessors, so it has remained unapproachable either by rivalry or imitation. As an architect, he converted the fabric of St. Peter's from an incongruous structure into the noblest temple which was ever erected to the honour of the Deity. The few poetic compositions which Michel Angelo has left can add little to his vast reputation, except as an evidence of his versatility; it may be observed, however, that they are by no means unworthy of such a mind, and that, even in point of versification, they rank among the best in Italian literature. His talents in engineering need no other attestation than the fact, that Vauban, the celebrated French engineer, in passing through Florence, was so impressed with the skill evinced in the fortifications of San Miniato, that he ordered plans and models of them to be made for his own especial study. The moral qualities also of Michel Angelo are entitled to our respect. He was benevolent, temperate, and pious; and although he felt the dignity of his own character, and knew how to enforce respect from the arrogant and the supercilious, in his general deportment he was mild and unassuming. He had acquired considerable wealth by the exercise of his various talents, and he employed it liberally; he assisted his friends, provided for his servants, and during the siege of Florence, he supplied the government with sums by no means inconsiderable, considered as the contribution of an individual. For the labour of building St. Peter's church, continued through many years, he refused all remuneration, declaring that he dedicated that service to the glory of God. Although no man was ever more entitled to the claim of intuitive talent than Michel Angelo, no man ever trusted to it less: his practice was incessant, he continued his studies to the last, and so untiring was his energy, that even while engaged in the military operations of Florence, he proceeded with his works in statuary and painting. His predilections were decidedly in favour of sculpture, in preference to the other arts: yet it may be doubted whether his reputation is not more permanently based on his paintings in the Sistine chapel. Beauty, so essential an element in sculpture, was certainly not the branch of art in which he excelled: nevertheless, in subjects wherein that quality is not indispensable, he sometimes reaches a point of unimagined excellence; nor can there be found perhaps, in the whole range of Greek sculpture, any thing approximating to the profound sentiment and terrible energy exhibited in the statues of Lorenzo and of Moses. As a painter, he has no competitor in the highest qualities of art, except Raffaelle, to whom, it appears to us, he stands in the same relation which, in our literature, Milton bears to Shakspeare. In depth of pathos, in discriminated expression, in varieties of character, and the power of telling his story, Raffaelle is certainly superior to Michel Angelo; but if the truth of that axiom be admitted, that sublimity, in its highest degree, is more than an equivalent for all other qualities, then is Michel Angelo, without doubt, the greatest painter that ever existed.

ANGELO CARAVAGGIO. [See CARAVAGGIO.]

ANGELN is that part of Schleswig which is enclosed by the bay of Flensburg, the Baltic, and the Schlei. The largest diameter of this district, from N. to S. and from E. to W., is about twenty English miles. Its surface comprehends about 230 square miles, of which the population amounts to 30,000. Among their neighbours the inhabitants are distinguished for bodily strength, an independent spirit, and love of liberty; they are industrious, and in a country where the criminal calendar is insignificant, they contribute towards it the smallest number: in this district prosperity is general. The eastern part of it is very fertile; the western is more sandy: of late great progress has been made in agriculture; but the roads are so indifferent, that they are a subject of general complaint. *Angeln* has not, like other parts of Schleswig, a peculiar political constitution. Fifteen of its northern parishes belong to the *Amt* (the government or county) of *Flensburg*, and the eighteen southern ones to that of *Gottorf*.

ANGER, (according to Aristotle, *Rhetor.* b. ii., c. 2.) *is a desire of revenge, accompanied with pain, on account of an apparent slight improperly offered to a person or some one connected with him.* From this definition it appears, first, that in order to excite the passion of anger it is necessary that a slight should be offered; and secondly, that the slight produces a desire of revenge, which is painful until it is either gratified or assuaged. A slight is an act or forbearance by which a man appears to indicate his opinion that another person is not worthy of notice; and it may be shown both in active and passive conduct; actively, as when a person insults, reviles, ridicules and banters, or annoys, vexes and teazes another: passively, as when a person omits the marks of attention and respect which an inferior owes to a superior, or an equal to an equal, or when he treats another with contempt. In the cases of abuse, insult, and unseemly or misplaced ridicule, as well as where there is a scornful indifference or a want of respectful behaviour, the pain is caused by the undue assumption by which an equal appears to make himself a superior, and an inferior an equal. Hence it is (as an antient historian has remarked) that men care more for insult than injury; as the one seems to be the aggression of an equal, for his own profit; the other to be the insolence of a superior, arising from spite or mere wantonness[*]. In the cases of annoyance and vexation, the pain of the person angered is caused by the feeling that the object of the other party is purely to give pain, without any advantage accruing to himself.

The pain excited by the slight is instantly followed by a desire of *revenge*. The desire of revenge is not a general desire that ill may come to the person offering the slight, but a desire of personally paining him, so that he may know by whom the pain is inflicted, and the person angered may have the gratification of being himself the executioner of his own retribution. The satisfaction of the desire of vengeance is always pleasurable, and in brutal and uncultivated minds is attended with all the marks of the most triumphant exultation. So strong indeed is the temptation of gratifying this craving after retaliation, when the means of indulging it are in our power, and so great the difficulty of foregoing the pleasure which it affords, that Shakspeare enumerates among the rare instances of female perfection—

> 'She who being angered, her revenge being nigh,
> Bids her wrong stop, and her displeasure fly.'

No angry person, however, would feel his desire of revenge satisfied by learning that the object of his anger has suffered some grievous calamity, as that he has lost a near relation or a large sum of money: he wishes that the pain should be inflicted *in return* for the slight shown to him, and by *his own* agency. Anger, therefore, is different from hatred; the one is a passion which is commonly extinguished by the lapse of time, even if the desire of vengeance is not satisfied; the other is a settled habit of the mind which never varies: the one is attended with pain, the other is without pain. Anger is always personal, and is felt only towards individuals: hatred is often general, and embraces not only individuals, but whole classes, as murderers, tyrants, heretics &c. There are even *national* hatreds, and misanthropy is a natred of the *whole human race*. Anger is often satisfied with a slight infliction of pain, whereas hatred desires nothing less than the extinction of the persons hated; hence pity is consistent with anger, but never with hatred. Anger seeks to inflict pain; hatred desires to do harm. Anger requires a personal retaliation, hatred is pleased that harm should come to the person hated, from whatever quarter, and by whatever means. (See Aristot. *Rhet.*, b. 2. c. 4.)

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[*] On a similar reason was founded the advice of Bernadotte to Louis XVIII., that France was to be governed with an *iron hand*, and a *velvet glove*: a remark capable of a much wider extension.

As anger is a bad passion, the object of which is the infliction of pain, it ought to be restrained; and one of the most important parts of moral discipline is the proper regulation of the desire of revenge which characterises it. The proper government of this passion consists not in altogether suppressing it, which is indeed impossible, as every person must feel pained at an undeserved slight, but in repressing the desire of vengeance to which that pain gives rise. It is a rule, to which every exception should be questioned with the utmost jealousy, that in a political society all vengeance for vengeance sake is immoral. This, however, does not prevent a person from shewing *his displeasure* at an improper slight: so that the reproof be given without animosity, and arise from a desire of preventing future affronts or vexation, not of satiating a thirst for revenge.

Although anger is a bad passion, and in a state of civil society its effects are much oftener hurtful than beneficial, its *use*, (or, as it is sometimes said, its *final cause*) is not the less obvious. In a state of nature, before the institution of government, if instead of men being prompted by the constant and violent influence of a passion to retaliate harm for harm, the retribution of wrongs had been left to the irregular operation of cool reason, it may be doubted whether the collision of interest and the mutual resistance which arose from each man being the avenger of his own cause, and which were the origin of political government, would ever have existed.[*] Hence revenge (as Lord Bacon has said) is a sort of wild justice; that is, in a society where there is no administration of law, it takes the place of legal justice: and it is better that wrongs should be avenged than that they should be done with entire impunity.[†] In the barbarous states of society which have prevailed at different times in Arabia, Greece, Germany, Scotland, and other countries, the imperfect security of person which existed was owing chiefly to the duty of revenge imposed by traditionary feelings and opinions on the family of a murdered person. But when the exercise of sovereign political power is once firmly established, together with an efficient administration of law by regular judicatories, the use of revenge, as an instrument for the suppression of wrongs, has ceased, and it must give place to a far better substitute. The good, says the French proverb, is the enemy of the better; and on this principle, a political society, both in its legal and moral code, must discard that instrument to which it may, indeed, in great measure, owe its *existence*, but which is incompatible with its *continuance* in a state of happiness and tranquillity. The private retaliation of wrongs is the scaffolding by means of which the structure of civil society was erected, but which disfigures its beauty and impairs its utility when completed. [See PUNISHMENT.]

ANGERBURG, one of the circles of the government of Gumbinnen, in the province of eastern Prussia, containing a surface of 360 square miles, and about 26,000 inhabitants. Angerburg is the name also of a small town, with a castle, lying on the Gross-Mauer Lake, in this province. It makes linens and woollens; has a manufactory of salt, and a fishery; and some trade in timber. The population is about 2900. It is in 54° 8′ N. lat., 22° 15′ E. long; seventy miles S.E. of Königsberg.

ANGERMANLAND is a province of Sweden on the Baltic Sea, or rather on that narrow part of it, called the Gulf of Bothnia. It is now comprehended under the political division of Angermanland-Län or Hernösand-Län, of which it forms the northern, most extensive, and important part; the southern, and smaller, is the antient province of Medelpad. The political union of these provinces obliges us to treat of them together, which may be done the more easily, as they resemble one another in almost every respect.

Angermanland-Län extends from 62° 10′ to 64° 20′ N. lat., and from 15° 40′ to 19° 20′ E. long. Its greatest length lies along the coast, and may amount to between 140 and 150 miles. Its breadth varies from about 20 to 100 miles. On the north it is bounded by Umea-Län or Western Bothnia, on the west by Ostersund-Län or Yämtland, on the south by Gefle-Län or Helsingland, and on the east by the Gulf of Bothnia. Its area is calculated to amount to 216 Swedish or 9508 English square miles, so that this province is somewhat larger than the counties of Northumberland, Durham, and York taken together.

The surface of this extensive country varies extremely. On the coast, hills succeed hills without interruption, they are steep and rise sometimes to nearly a thousand feet above the level of the sea. They are divided from one another by steep valleys several hundred feet deep, the bottom of which is occupied by winding rivers, or fine mountain-lakes, on the banks of which meadows and woods are intermingled in the most pleasant manner; the woods commonly clothe the slopes of the hills and sometimes their summits. If to this picture we add the inlets of the sea, which often pass through the narrow openings between the hills, and the large, rapid rivers, expanding at intervals like lakes, we shall acknowledge the justness of the opinion of Dr. Clarke, who compares this province with the country about the Lago Maggiore in Italy, and affirms that all this part of Sweden is as much worth seeing, and would as amply repay the trouble of a journey thither, as any part of Europe. But this description only applies to the coast and to the country extending about twenty or twenty-five miles from it. Farther westward, no insulated mountains are seen, the whole country, for a distance of about ten miles and upwards, rising higher and higher to more than a thousand feet above the level of the sea, and on this height it runs on almost like a plain through Jamtland till it reaches the foot of the Scandinavian mountains, and the boundary of Norway. From these heights the rivers descend in long, and sometimes narrow valleys, and in their descent frequently form cataracts.

The coast of this country, though high, rarely rises to 200 feet, and is very much intersected by bays, some of which run several miles into the land, especially Hämmarsunds-Fiard, Deger-Fiard, and Ullangers-Fiard, all three situated to the north of the mouth of the Angerman-Elf. An uninterrupted series of islands extends along the coast; most of which are small, uninhabited rocks, called *skär* (pronounced *share*), only visited in summer by fishermen. Some, however, are several miles in length, as Bröman, to the south of the mouth of the Ljungan-Elf, Alnön, opposite to the Sundswall, and Hernö and Hamsö, in the embouchure of the Angerman-Elf.

The rivers which traverse Angermanland-Län are the largest in Sweden, but they do not rise in the province. Their sources are in the Scandinavian mountains, to which this province does not extend. The most important is the Angerman-Elf, which rises in an alpine lake, called Kults-Tön, near the boundary of Norway, in that part of Umea-Län called Asele Lapmark. Running for nearly half its course in a south-eastern direction, it receives all the waters descending from the Styelling Föttll, and the great chain in Asele Lapmark; it then enters, by a southern course, Angermanland, where its waters are increased by two large rivers, coming down from Jamtland. Its general course is still directed to the south or south-south-east. No river of Sweden is, in its natural state, navigable, so far as the Angerman-Elf. It may be ascended by vessels of every description upwards of forty-five miles, and by merchant-vessels to Sollefta, nearly sixty miles. At the last place the navigation is interrupted by a cataract, and higher up, other water-falls likewise impede the transport of goods. But, of late years, the Swedish government has paid much attention to rendering it navigable. Not far from its mouth Dr. Clarke found the breadth of the river from one and a half to two miles, and he adds, that the Rhine exhibits nothing grander, and that the banks of the latter are at no place more beautifully adorned, than those of the Angerman-Elf. The whole course of the river amounts to upward of 240 miles. The Indals-Elf, which traverses the southern part of Angermanland-Lan, or Medelpad, is properly only the channel by which the lake called Storsyön (the great lake) discharges its waters. This lake is situated in Jamtland, surrounded by an elevated country, which exhibits high, and even snow-covered mountains on the west and south. From these mountains numerous rapid rivers descend to the lake, which discharges these collected waters by one outlet, the river Indals-Elf. It issues from the lake on its northern side, and flows for some distance to the north; it then turns to the east, and descends from the high-lands to the coast, and in this descent still receives some considerable rivers. The latter part of its course is to the south-east. It is one of the swiftest rivers of Sweden, full of rapids and cataracts, and only navigable for boats and craft, for a short distance. Its inundations are much dreaded; one of them, in 1796, laid waste all the valleys through which it flows, and changed the course of the river in many places. Since that time its water has been turbid, and the salmon and other fish, which formerly abounded, have left it; only a kind of whiting (*salmo lavaretus*) is occasionally taken. It runs about 140 miles. The third and most southern river is the Ljungan-Elf. It rises in that part of Ostersunds-Lan which bears the name of Heryedalan, in the most elevated part of the Scandinavian peninsula, from which it descends with a rapid course through a narrow valley; but as it approaches the boundary of Angermanland-Lan the valley widens and the course of the river becomes less rapid. After its entry into this province it receives its only great tributary, the Giman, and falls into the sea to the south of Sundswall. Twenty years ago this river was not navigable; but since the cession of Finnland to Russia it has been rendered navigable in many parts of its course in order that Stockholm may not be under the necessity of deriving its firewood from a foreign country. By examination it was ascertained that two-thirds of this river may be rendered fit at least for floating down the wood and timber which abound on its banks. Its course can hardly be less than 200 miles.

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[*] It is remarked by Soame Jenyns, that those effects which were required to be constantly produced by mankind, such as the nourishment of the body by eating and drinking, its preservation from physical harm, the propagation of the species, &c., have been entrusted by Providence to our appetites or passions, and never to our reason: the operation of the former being regular and unintermitted, of the latter capricious and uncertain. See the admirable review of his metaphysical work by Dr. Johnson.

[†] See Bishop Butler's Sermon on Resentment.

The lakes though small are very numerous, and, according to the calculation of Forsell in his statistical tables, occupy more than one-tenth of the whole surface, or, more exactly, 22·22 Swedish or 977·68 English square miles.

The climate, though very healthy, is also very severe, as might be expected in such a latitude. The winter commonly lasts seven or even eight months, and people often travel in sledges in May. Then follows a spring of two or three weeks, and the summer begins in the middle of June. The heat increases rapidly, and the vegetation is so vigorous, that in a couple of days the grass attains the length of a finger, and commonly more; rarely eleven or twelve weeks pass between the sowing and the reaping of the corn. The sky is generally serene and clear, and rain is not frequent, and very rarely continues half a day. But the valleys are covered in the morning by a dense fog, rising from the lakes and rivers, which imparts the necessary moisture to the fields, and hinders the night frosts in August and September from damaging the crop. The summer ends in the beginning of September, a short autumn follows, rarely longer than the spring, and then comes the winter with all its severity.

Travellers commonly speak with rapture of the fertility of this province, and assert that it surpasses all the other parts of Sweden. But this remark can only apply to tracts of very small extent, especially to the valleys along the large rivers, and to the low land about the lakes. By far the greatest part is steril; and all the broad and long ridges of the high country contribute little or nothing to the maintenance of the inhabitants. In Forsell's table the arable land is calculated to occupy only 1·28 Swedish, or little more than 56 English square miles, consequently not much more than one-fourth of the surface of the smallest of our counties, Rutlandshire. The meadows extend over a space equal to 6·40 Swedish, or 281 English square miles, nearly the extent of Middlesex. The remainder is covered with mountains, heath, and forests, which only furnish abundant pasture in summer.

Bears, wolves, and foxes, are numerous, but the two former only in those parts which are distant from the coast. Deer was formerly found in greater numbers, but has much decreased, except roe-deer, which is still frequent in many parts. The elk is only met with in some forests of Medelpad. The smaller animals whose skin is used as fur, as hermelins, martens, &c., are found everywhere, but not in any great numbers.

Blackbirds of a large size, woodcocks, heathcocks, and partridges exist in the forests in such numbers, as can hardly be conceived. Many thousands are annually killed, and brought in winter to Stockholm and even to Gothenburg, from which latter place some are brought to England. Eagles of considerable size inhabit the solitary places.

Fish abound in the sea, the rivers, and the lakes. The sea-fishery affords a livelihood to many families by the immense number of strömlings, a smaller kind of herrings, which in summer-time are caught along the coast. This fish is found along the whole eastern coast of Sweden, but is nowhere so numerous as here, which brings the fishermen from more southern places, especially from Gefle, to pass the summer on the islands along the coast. The produce of this fishery is not exported, but it forms an important branch of internal commerce. In the rivers the salmon-fishery is important, especially in the Angerman-Elf and Ljungan-Elf; trout also abound in some of them.

The forests which cover the greatest part of the country, the upper part of the slopes, and even sometimes the tops of the hills and mountains, consist chiefly of pine, fir, and birch. The oak does not succeed, on account of the severity and length of the winters. These forests not only afford the necessary firewood to the inhabitants, but also some articles of exportation. In some of the higher parts of the country, where the crops are scanty and subject to be destroyed by the early night-frost in September, the inner bark of the pine is mingled with flour in making bread.

The metallic riches of this province are not important. Iron, indeed, is found in some places towards the boundary of Jamtland, but is not much worked.

Fruit-trees do not succeed to the north of 62° 30′, and the last apple-trees which produce ripe fruits grow at Sundswall. At Hernösand apple-trees are planted, but the fruit does not ripen. Nature, however, has supplied this deficiency by numerous kinds of wild-growing berries. Besides different sorts of vaccinium and rubus, which are common in some other parts of Europe, there are two species of delicious berries, which are peculiar to the north of Sweden, the *rubus arcticus*, and the *rubus chamæmorus*, or cranberry, of which the first is by far the more delicate, and very extensively used: all trials to transplant it to the south of 62° have been unavailing. Cranberries are exported to England.

Though only a very small portion of the whole surface is allotted to agriculture, it cannot be said that this most important branch of industry is neglected; not only are the fields cultivated with great care and attention, but continual efforts are made to extend the dominion of agriculture more and more. The inducement is great, as the produce of agriculture is by no means sufficient for home consumption, and a considerable quantity of corn is imported from Wasa and other towns of Finnland. Rye, barley, and oats succeed pretty well, whenever they are not destroyed by early night-frost. Wheat does not succeed every year, and therefore its culture has been almost entirely abandoned. The culture of flax and potatoes is extensive, though the former does not ripen to seed. Hemp is, likewise, cultivated. The kitchen-gardens are commonly only planted with cabbages and turnips.

The uncultivated ground in the woods, and on the long and broad backs of the mountains, affords pasture in abundance, and, consequently, the rearing of cattle is an important branch of industry. But as these pastures are very distant from the villages to which they belong, a custom has been introduced which also prevails in the Alps of Switzerland; the cattle are sent in June to the pasture, accompanied only by one or two girls, who pass the whole summer in a cottage rudely constructed of wood and branches of trees, take care of the cattle, defend it from the bears, and perform the labours of the dairy. As the summer pasture is so abundant, the inhabitants are much more intent on extending their meadows than their corn-fields; that they may be able to increase their stock of cattle, and not want the necessary fodder for the winter. Many persons, therefore, who are obliged to buy corn, bring considerable quantities of butter to the market, and even some cheese of indifferent quality. Their cattle is of a middling, or rather small size, but well adapted for their pasture. Horses are bred in numbers; they are also of a middling size, but larger than those of the southern provinces of Sweden, swift and hardy. Sheep too are numerous, but the wool is coarse, and only employed by the country people for their own use. The pig is not much attended to, because this animal encroaches on the food of man, which here is rather scarce. In many places in the higher valleys goats are kept in great numbers.

The scanty population of this country might lead us to suppose that no kind of manufacturing industry could be maintained, but this is not the case. The manufacture of linen is very extensive. Great quantities of it are made, especially in the country along the coast to the north of Hernösand. The finer sorts are said not to be inferior to those of Holland, but many think that this assertion is somewhat too favourable to the Swedish peasant women who make it. At all events, the manufacture is considerable, as in the year 1825 not less than 595,870 ells (of nearly two English feet) were exported to Stockholm. The legislature of Sweden has encouraged this branch of industry by premiums, and since that time not only all the flax grown in the province, but also a considerable quantity brought from Russia, is worked up. No other branch of manufacturing industry is carried to any extent, because the peasants, living at great distances from one another, have been accustomed to satisfy all their necessities by their own labour.

Since government has rendered the rivers more navigable than they were twenty years ago, great quantities of timber are floated down the Angerman-Elf and the Ljungan-Elf. The timber is sawed and sent to England. The exportation in 1825 amounted to 16,379 dozen planks and boards, and since that period it has much increased. Tar is also made, but much less than in the more northern province of Umea-Län.

The coasting trade to and from Stockholm, and some places in Finnland, gives occupation to some people who live in the lower valley of the Angerman-Elf.

To maintain internal commerce, some annual fares are established in the more inland parts of the country. That of Sollefta, up to which place the Angerman-Elf is navigable for merchant-vessels, as we have already observed, is known over all the north of Sweden, and visited by Laplanders, Norwegians, and even by merchants of Stockholm. Here are sold horses, fish, butter, hides, tallow, rein-deer, meat, &c., to a large amount. Another fair is held at Hammar, likewise on the banks of the Angerman-Elf, but it is not so considerable; planks and boards, and coarse linen, are the chief articles sold here. But such fairs are a poor substitute for a town, well provided with shops and every kind of merchandise. This has induced some peasants to become travelling merchants, and these people go on business as far as Stockholm and Drontheim in Norway, whence they import many fine horses.

The two towns of Angermanland-Lan are Hernösand and Sundswall. The former, the capital of the province, and the seat of the provincial government, is situated on the island of Hernö, at the mouth of the Angerman-Elf, and joined to the continent by a bridge. The bays between the island and the continent form the spacious harbour of the town, which itself consists of well-looking houses, mostly built of wood. Its streets are large, and, for the most part, paved. The principal articles shipped here are planks and deals, and the linen made by the country people. The first go to England, the latter to Stockholm. But the greatest part of the inhabitants, whose number in 1825 amounted only to 1840, gain their livelihood by the fishery of the strömlings. A few vessels are built. This town has an excellent grammar-school, a society for the improvement of agriculture, an hospital, and a poor-house.

Sundswall is situated in the southern part of Angermanland-Län, or in Medelpad, in a very fine, pleasant valley, much admired by Dr. Clarke and other travellers, and on a bay, into which the Ljungan-Elf discharges its waters, opposite the island of Alnön. The houses are neat, though mostly of wood, but the streets not paved. It has some commerce, especially in planks and deals; but the greater part of the inhabitants, who, in 1825, amounted to upwards of 1600, are engaged in the fishery of the strömling.

At Wifsta, a small place, with a good and safe harbour, five miles to the north of Sundswall, a few vessels are built. There are besides two other places, from which great quantities of planks are shipped, Nyland, on the Angerman-Elf, about twenty-four miles from its mouth, and Swartwick, at the embouchure of the Ljungan-Elf. The property of the latter harbour has been acquired by an English mercantile house, Peter Dixon and Company.

The whole population of this country was, about the middle of the last century, estimated at about 42,000; but the census of 1825 gives it 72,237; and for the year 1830, it was calculated by Forsell, to amount to 78,821; so that every English square mile, at present, is inhabited by only eight or nine persons. The inhabitants are nearly all of Swedish origin. A few Finlanders, who settled among them two centuries ago, have lost their peculiar habits and customs, and nearly their language. The Laplanders, and their herds of rein-deer, pass the winter in the higher parts of the province, but in the summer they leave it, and go to the mountains. No part of this country rises to 2200 feet above the level of the sea, which, according to Von Buch, is the height on which these animals find, in summer, the climate and pasture adapted to them.

The inhabitants of Angermanland are of a middling size, and do not attain the large stature of the Dalecarlians; but they are stout, vigorous, and, at the same time, quick in their motions and work. They are gifted with great talent, and show it in some arts, especially in architecture and carving. Many churches are built by simple peasants, and the rules of acoustics exactly observed. Their manners are frank, courteous, and graceful, more than those of the other inhabitants of Sweden. They are of a cheerful temper, good-natured, and hospitable. Their houses have the appearance of neatness and prosperity, and this appearance is by no means fallacious; for the people are actually more prosperous and wealthy than other Swedes, inasmuch as they are also more laborious and industrious.

The town of Hernösand is the seat of a bishop, whose diocese extends over the whole north of Sweden: besides Hernösands-Län, he has the inspection of the clergy in Ostersunds-Län, Umea-Län, and Pitea-Län.

(See Von Buch's *Travels through Norway and Lapland;* Dr. Clarke's *Travels in various parts of Europe, Asia, and Africa;* Schubert's *Travels through Sweden, Lapland, Norway, Finnland, and Ingermanland;* and Forsell's *Statistical Tables; Map* of Forsell.)

ANGERMUENDE, a circle in the Prussian province of Brandenburg, containing 25,000 inhabitants. Also the capital of the preceding circle, built on the shore of a small lake; it has a population of 3000 souls, produces woollens and linens, and raises some tobacco: it lies forty miles north of Berlin.

ANGERS, an important town in France, in the department of Maine and Loire, of which it is the capital now, as it once was of the province of Anjou. It is on the banks of the Mayenne, (chiefly on a gentle declivity rising from the east or left bank,) a little below its junction with the Sarthe, and a very few miles above its influx into the Loire. In the antient parts of the town the streets are narrow, and many of the houses are built of wood, though in some the wood is concealed by a thin covering of slate; several have open galleries in front and deep projecting roofs, which appear calculated to afford the shelter required by the climate; the galleries are light and carved in stone, and the vine, which grows luxuriantly in the district, is frequently seen entwined round their Gothic mouldings, or running across the street from house to house. The more modern quarters are regularly and well built. Among the principal edifices are the castle and the cathedral. The former on a steep rock, at the base of which the Mayenne flows, has walls of great height and thickness, flanked by eighteen massive circular towers, the work of early ages; the chapel and palace within the castle, built by René of Anjou, in the fifteenth century, are of much later date than the rest of the building. It is defended on the side of the town by a deep moat. The town itself is surrounded by antient and extensive walls, of dark brown stone, and strengthened by towers. The cathedral, dedicated to St. Maurice, stands on an eminence in the centre of the town; it has two lofty spires. The architecture of the interior exhibits exquisite work, and there is fine painted glass and tapestry of great antiquity. The tomb which contained the remains of René, king of Sicily (above mentioned), and of his daughter, Margaret of Anjou, queen of our Henry VI., was destroyed at the revolution, during which many convents (they were numerous in Angers) were destroyed, the ruins of which still remain. There are the fragments of a Gothic bridge over the Mayenne, which once served to connect the town with some fortifications on the opposite bank; and a church, remarkable for its curious and antient architecture, is in the state in which it was left by our King John, who committed great devastation in this place. There are several public walks, as the 'Turcie,' the 'Champ de Mars,' and 'Le Bout du Monde,' (the world's end,) &c.

The manufactures of Angers are of sail-cloth, camblet serge, handkerchiefs, hosiery, &c.; and there are establishments for bleaching wax, and refining sugar. Besides the articles from their own factories, the inhabitants carry on a trade in the agricultural produce of the surrounding district, corn, wine and brandy, flax, hemp, wax, honey, and dried fruits. In the neighbourhood are extensive slate-quarries, which give employment to 3000 workmen, and furnish annually 80,000,000 slates. The population of the town is about 30,000, which is rather less than that given in the *Encyclopédie Méthodique*, (Paris, 1782,) viz., 34,000, showing a diminution within the last half century. In 1670, before the revocation of the edict of Nantes, it is said to have been 50,000.

Angers is the see of a bishop, and the seat of a '*cour royale*' (assize court). It has an '*académie*,'* '*collège royal*,' (high school,) a school for the deaf and dumb, and a *séminaire*,' (place of education for the priesthood,) a public library of 26,000 volumes, a museum of natural history, a fine collection of French paintings, a botanic garden, an agricultural society, and a royal school of arts and trades. The hospital of St. John, said to have been erected by our Henry II., has an extensive Gothic hall, used as a chamber for the sick, of great width and height, with a double row of light columns supporting the roof. There are two theatres.

The traveller Bernier, and the poet and philologist Menage, were natives of Angers. In the time of its subjection to the Romans, the town was called Juliomagus and subsequently Andecavi. It is 178 miles S.W. of Paris; latitude 47° 28′ N., longitude 0° 33′ W.

The arrondissement of Angers contains 59 communes and 92,810 inhabitants. Its extent is equal to 436 square miles, or 279,040 acres.

ANGERSTEIN GALLERY. [See National Gallery.]

ANGI'NA PE'CTORIS, literally, 'a contraction or tightening of the chest,' a disease so named from the anguish felt in the chest. This disease is characterized by a sudden attack of severe pain in the lower part of the chest, commonly inclining to the left side; the pain is sometimes so severe, that the patient feels as though he must die: the pain generally extends to the left arm, and occasionally also to the right; it is often attended with a sensation of fainting or of suffocation, and with palpitation of the heart, but frequently these latter symptoms are absent; the pulse is commonly quick, weak, irregular, or intermittent, though sometimes it is little affected; the countenance is commonly pallid, and the expression anxious and depressed. This attack comes on in paroxysms, which last from a few minutes to half an hour and more. There is no regular interval between the paroxysms, and no distinct warning of their return. They usually come quite suddenly, from slight causes, and often when no cause can be assigned. The health at first is tolerably good during the intervals, but in the progress of the disease a great variety of uneasy sensations distress the patient even when the paroxysm is absent, chiefly those which indicate a disordered state of the digestive and respiratory organs.

Much investigation has been instituted to ascertain the seat and nature of this disease; and although physicians are not yet unanimous in their opinion in regard to either, yet sufficient evidence has been accumulated to determine both with a high degree of probability. It seems upon the whole to be established that it is primitively a nervous affection, and that the nerves in fault are those which supply the lungs and heart—the lungs in consequence of the disease of its nerves being unable perfectly to decarbonize the blood, and the heart, in consequence of the disease of its nerves, not being duly nourished, and consequently not being able to carry on the circulation with the requisite energy and regularity. On inspection of the organs after death of those who perish by this disease, in the immense majority of cases appreciable disease is discoverable both in the lungs and in the heart, but more especially in the latter. The most frequent morbid appearances in the heart are ossification of the coronary arteries (the nutrient arteries of the organ); ossification of the valves of the heart; preternatural accumulation of fat on its external surface; enlargement of its cavities; and, above all, change of structure in its muscular substance, which becomes pallid, soft, flabby, thin, and easily torn. This change in the muscular substance of the heart is by far the most constant morbid appearance; but even this, as well as the other organic changes, must be considered as the effect rather than the cause of the disease, in whatever degree these organic changes may be the cause of death.

Angina pectoris is most frequent at the meridian of life and beyond it; it may occur in adolescence, but it is very rare at that period. It is much more frequent in the male than in the female. Out of one hundred cases, seventy were upwards of fifty years of age, and seventy-nine were males. It is remarkably under the influence of mental causes, if it be not in the first instance induced by them. When it has once occurred, a paroxysm is readily produced by any emotion, whether of a pleasurable or a painful nature, but more especially by the latter. Anxiety of mind, any depressing passion, or anger, places a person subject to this disease in the most imminent danger. Many persons have died suddenly, instantaneously, under the influence of such emotions. There is conceived to be a close connexion between this disease and gout. Without doubt it is very often found in persons who are subject to gout, and the less the gout affects the extremities, in its regular and decided form, the more frequently and severely such persons suffer from angina pectoris.

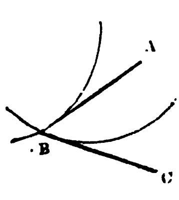
It is of the nature of this disease to proceed progressively from bad to worse. At first it is a temporary evil of short duration, recurring, perhaps, only at distant intervals; but if it be neglected, the intervals become shorter and shorter, and the paroxysms more and more severe. Complete success often attends the early, active, and judicious treatment of it. This, therefore, is eminently one of those diseases, the first accession of which should excite serious alarm, and induce every one to adopt without delay, and with the greatest regularity, the means best fitted to prevent the recurrence of it.

Those means are, in the paroxysm, absolute rest. The paroxysm often comes on in walking or during some bodily exertion: the patient has the feeling that the continuance of such exertion would prove instantaneously fatal; and it is really highly dangerous. Unless in very severe cases, the paroxysm usually goes off spontaneously, in a few minutes, on sitting perfectly still, or, which is often better, on lying down. If the pain do not quietly subside, vigorous friction with a stimulating liniment should be applied over the whole chest, and the patient should instantly take some warm antispasmodic and stimulant medicine, such as two ounces of the camphor julep, with a dram of ether or of the aromatic spirit of ammonia. But much more active measures may be necessary; and this is a disease so serious in its nature, and requiring so much delicacy and skill in the management of it, that the patient ought to place himself under the best medical guidance he can procure as quickly as possible. It is during the interval that the most effectual treatment must be employed. It is impossible to discuss here the remedies which the physician should resort to, the reasons which should determine his choice, and the different states which should modify the treatment in adaptation to individual cases. But it is very important to state, that angina pectoris is one of those diseases in which the concurrence of the patient with the efforts of the physician is indispensable. Unless the patient resolve and firmly adhere to his resolution strictly to conform to the plan prescribed in diet, in exercise, in every locomotive movement, in sleep, temperature, and medicine, but above all in the regulation of the mind, the physician can do but very little for him.

ANGIOSPERMIA. [See Didynamia.]

ANGLE OF CONTINGENCE, or CONTACT, the opening made by a curve and its tangent. [See Curvature.]

ANGLE (CURVILINEAR), the rectilinear angle made by the tangents of two curves at the point where they meet, as A B C.



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[*] Although there is only one institution in France designated 'university,' yet that term will convey to the English reader the best idea of what the French term an '*académie*.'

ANGLE (HORARY), the angle formed with the meridian of any place by a great circle, which passes through a star and the pole.

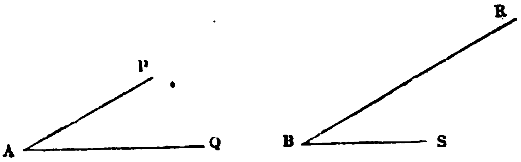
ANGLE OF INCIDENCE, REFLECTION, REFRACTION, ELONGATION, ELEVATION, THE VERTICAL,—see these several terms.

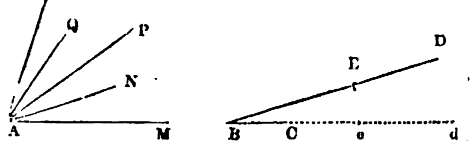
ANGLE, PLANE, SPHERICAL, SOLID, PARALLACTIC,—see these terms.

ANGLE OF POSITION, usually the curvilinear angle made by two great circles drawn through a star to the poles of the ecliptic and equator. It may be used to signify the angle made by lines drawn from any point under consideration to any two points which are used in determining the *position* of others.

ANGLE (RECTILINEAR), from the Latin word *angulus*, of the same signification. The notion (for it can hardly be called definition) is the *opening* made by two straight lines which cut one another. The term *inclination* is also used synonymously with angle; thus, the angle or opening of two lines is called their inclination to one another.

To investigate a more precise definition for this word, we must recollect that any species of relation is entitled to the term *magnitude*, and becomes the object of arithmetic or geometry, so soon as it can be shown that the notion implied in one or other of the words equal, greater, or less, is always derivable from the consideration of two such relations. Take the two angles or openings made at the points A and B by the straight lines A P and A Q at A, and by B R and B S at B, and transfer the first figure to the second, so that the point A shall fall upon B, and the straight line A Q upon B S; or rather, let as much of A Q as is equal to B S fall upon B S, and let the remainder of A Q form a continuation of B S: also let A P and B R be made to lie upon the same side of B S. We have now no longer any control over the position of A P with respect to A Q, since the first figure is not to undergo any change except that of simple removal into another position. If, after A Q has been placed upon B S, A P then fall upon B R, the two openings or angles at A and B are the same. If A P, in its new position, fall between B S and B R, the opening or angle at A is less than that at B; and if A P fall further from B S than B R does, the angle at A is greater than that at B. The angle at A is called the angle P A Q, and that at B, the angle R B S. Hence the notion of one angle being twice or three times, &c., as great as another may be fixed.—For example, the angle M A P being made up of the two M A N and N A P, each of which is equal to the angle D B C, is twice D B C; the angle Q A M is three times D B C; R A M is four times D B C; and so on. Similarly, the angle D B C is one-half of P A M, one-third of Q A M, &c. The angle made by two lines does not depend upon the length of these lines; if a part D E be cut off from B D, the angle is not altered, that is, the angle E B C is the same as D B C. If B e and B d be respectively equal to B E and B D, and if B C e d turn round B, the same *quantity of turning* which brings Be into the position BE, will bring Bd into that of BD.





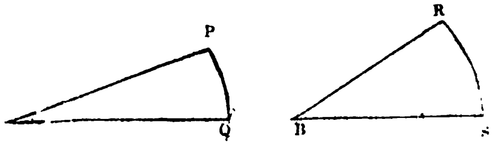
When we cast our eyes on two angles, the sides containing which are nearly equal in both, we judge of their comparative magnitude by the spaces which are included between the lines. But this is not a notion capable of being rendered rigorous, because one boundary of the space is indefinite. Nevertheless we may correct this method of judging, and produce a precise idea of an angle, *if* we admit the propriety of comparing with one another spaces which are absolutely infinite in extent. The longer the lines are, the more nearly is the preceding notion absolutely correct, because the space at and near the mouth of the angle; which for want of a definite boundary is doubtful as to whether it is or is not to be considered a part of the angular opening, becomes less and less with respect to that about which there is no doubt. If then we suppose the lines which contain the angle to be produced without end, the infinite spaces so imagined will be correctly in the same proportion to one another as the angles. The objection to introducing this into geometry is the real or supposed want of rigour in the comparison of unbounded spaces. [See **Infinite**.] It must be remarked, however, that the disputed theory of parallels follows immediately and rigorously from the preceding, (see ***Library of Useful Knowledge, Study of Mathematics***, pp. 77, 78; and Lacroix, ***Elémens de Géométrie***, p. 23, note,) and it is therefore in the choice of every person to decide for himself whether he will *add* the words in italics to the first of the two following axioms, and *prove* the second, or *omit* the words in italics, and *assume* the second.

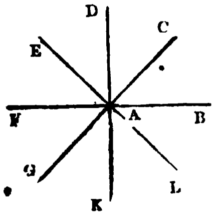
1. Two spaces, ***whether of finite or infinite extent***, are equal when the one can be placed upon the other, so that the two shall coincide in all their parts.

2. Through a given point, not more than one parallel can be drawn to a given straight line.

In order to bound the preceding spaces, and compare angles by means of spaces or lines, it is necessary to draw arcs of circles having equal radii through the two points.

Let P Q and R S be arcs of circles having the equal radii A Q, B S. Then the angles P A Q and R B S are in the same proportion as the spaces (called *sectors*) P A Q, and R B S, and also as the lengths of the arcs P Q and R S. This proposition, which is Euclid, vi. 33, is not so far from first principles as its position would appear to indicate. For the fifth book, on proportion, is entirely independent of, and might be considered as antecedent to, the first four books; if this were supposed, the preceding proposition might be easily made to follow book i. 23, or even i. 8. We might even place it immediately after the doctrine of proportion, by a proof founded on simple superposition, provided we assume (what is tacitly assumed in various parts of the first book of the elements, i. 4, for example) that an angle may be conceived equal to another angle before we know how to construct equal angles.





If a line setting out from A B be conceived to revolve round the point A, it will in every position form two openings or angles with its original position A B. For example, in the position A C, A B and A C will form the smaller angle B A C, and the larger angle made up of the angles C A F, F A K, and K A B. Only the former of these is usually considered in geometry, but the latter is frequently used in analysis. When half a revolution has been made, and A B has come to A F, at first sight we might say there was no angle formed; but on looking at the preceding position A E, we see that the opening of B A and A F is greater than that of B A and A E. The half of this opening B A F, that is, B A D, is called a right angle. A whole revolution makes A B pass through four right angles, and, in analysis, if we wish to point out that the line A C is supposed to have made a complete revolution, and to have come into the position B A C for the second time, the angle made with A B is said to be

4 right angles + B A C.

An angle is said to be *obtuse* when it is greater than one right angle, and less than two, and *acute* when it is less than one right angle.

For the most important properties of angles see **Triangle**, **Parallel**, **Polygon**, **Trigonometry**.

The methods of measuring an angle, of which we think it necessary to take notice, are three in number. The first is the one universally employed in *theoretical* investigations, and is as follows:—in the last figure but one, the number which expresses what proportion the arc P Q is of the radius, is the number chosen to represent the angle. It is shown in geometry that if any number of arcs be drawn with the centre A, subtending the same angle P A Q, what part soever any one of them is of its radius, the same part is any other of *its* radius. That is, whatever circle may be chosen, the preceding measure gives the same number for the same angle. For example, if the arc P Q be equal to the radius, the angle P A Q is the angle 1. If P Q be two-thirds of the radius the angle P A Q is the angle ⅔. The unit of this measure is therefore the angle whose arc is equal in length to its radius. It is customary to say that an angle or arc (for the terms are frequently confounded) thus measured, is given in parts of the radius: but this expression does not convey much meaning, and we cannot propose any better, unless it might be judged proper to say it is measured in *theoretical* units, meaning thereby in the units which are always employed in pure theory. The *theoretical* unit would then be the angle subtended by the arc which is equal to its radius.

The semi-circumference of a circle contains its radius

3·14159, 26535, 89793, 23846

times, very nearly. This is then the number of theoretical units contained in two right angles. The right angle is therefore

1·57079, 63267, 94896, 61923

and the following are the angles of one degree, one minute and one second, to which we shall presently come:

·01745, 32925, 19943, 29577 degree
·00029, 08882, 08665, 72160 minute
·00000, 48481, 36811, 09536 second.

In the second measure, in which angles are said to be measured in *space*, (the word space being here opposed to *time*, as we shall see, and not to *length*,) the whole angle traced out in one revolution, equal to four right angles, is divided into 360 equal parts, each of which is called one *degree* and marked thus (°). Each degree is divided into 60 equal parts, each called one *minute* (′), and each minute into 60 equal parts, each called one *second* (1″). Formerly, the second was divided into 60 equal parts called *thirds*, and so on, but it is now usual to use the tenths, hundredths, &c., of seconds. The present table therefore stands thus:

A whole revolution = 360° = 21600′ = 1296,000″
A right angle = 90° = 5400′ = 324,000″

Degrees.	Minutes.	Seconds.
1	60	3600
	1	60

To convert an angle from *theoretical units* into *degrees &c. of space*, observe that the last mentioned unit is

206264″·806247096355 in seconds
3437′·746770784939 in minutes
57°·295779513082 in degrees

and multiply the number which expresses the angle in theoretical units by the one among the preceding numbers which has the same denomination as that to which the angle is to be reduced. As many decimals may be taken as shall be considered necessary. The following table, however, will be found more convenient.

	Degrees.	Minutes.	Seconds.
1	·05729578	·03437747	·020626481
2	·11459156	·06875494	·041252961
3	·17188734	·10313240	·061879442
4	·22918312	·13750987	·082505922
5	·28647890	·17188734	·103132403
6	·34377468	·20626481	·123758884
7	·40107046	·24064227	·144385364
8	·45836624	·27501974	·165011845
9	·51566202	·30939721	·185638325

Example. What number of minutes and decimals of minutes does the angle contain which expressed in theoretical units is 1·7906?

From the minutes column take out the rows opposite to 1, 7, 9, and 6; write them so that the first figure of each shall fall under its corresponding figure in 1·7906, and add, but take only so many out of each row as will serve to fill up the places under the first row, increasing the last figure of each broken row by 1, when the first neglected figure is 5 or upwards.

```
 ·7906
 ────────
03437747
 2406423
  309397
    2063
 ────────
06155630
```

Place the decimal point *three* places off the unit's column for *degrees*, *five* for *minutes*, and *seven* for *seconds*. This gives 6155′·630, since the present calculation is made for minutes. Further to illustrate the placing of the decimal point, let the angle theoretically expressed be ·096, to be turned into degrees and decimals of degrees, and afterwards to seconds and decimals of seconds.

```
0·  096
⋮   ⋮51566202
⋮   ⋮ 3437747
─────────────
0   055003949
```

Bring down the preliminary ciphers, and *then* cut off three places, which gives 5°·5003949. Again, for the seconds

```
0·  096
⋮   ⋮185638325
⋮   ⋮ 12375882
──────────────
0   0198014213
```

Cut off *seven* places, which gives 19801″·4213

Given an arc of a circle and the radius to determine the degrees, minutes, or seconds in the angle at the centre, divide the arc by the radius, and proceed with the quotient as above.

For the converse problem, given the degrees, minutes, and seconds in an angle, to express the same in theoretical units, the following table is given:—

	Degrees.	Minutes.	Seconds.
1	·01745329	·00029089	·00000485
2	·03490659	·00058178	·00000970
3	·05235988	·00087266	·00001454
4	·06981317	·00116355	·00001939
5	·08726646	·00145444	·00002424
6	·10471976	·00174533	·00002909
7	·12217305	·00203622	·00003393
8	·13962634	·00232710	·00003879
9	·15707963	·00261799	·00004363

Example.—It is required to express in theoretical units the angle 89° 52′ 34″. Take out the row corresponding to each figure from the column having the same denomination, taking seven places only for a unit's figure, and the whole eight places for the tens, increasing the last figure when necessary, as before: add and make seven decimal places.

```
For 80°   1·3962634
 ..  9°    ·1570796
 .. 50′   0·0145444
 ..  2′    ·0005818
 .. 30″   0·0001454
 ..  4″    ·0000194
          ─────────
          1·5686340
```

and the answer is 1·5686340.

Given any angle, and a radius, required the circular arc subtended by that angle; proceed as above and then multiply by the radius. Thus to a radius of 100 feet, the arc which subtends an angle of 89° 52′ 34″ is

1·5686340 × 100 or 156·86340 feet.

In the attempt to effect a universal change of weights and measures, which followed the French Revolution, the circle was divided into 400 degrees, each degree into 100 minutes, each minute into 100 seconds, and so on. This innovation obtained only a partial introduction, and is now almost entirely abandoned. When used, it is customary in this country to distinguish the French degrees by the name of GRADES, and to denote one grade by 1^g or 1^{gr}. The convenience of this method, from its close affinity with the decimal system, is certainly great: for example, grades and decimals of grades, such as 12^{gr}·1329 are converted into grades, minutes, and seconds, by mere separation of the figures: thus, 12^{gr} 13′ 29″.

It is not necessary to give complete tables of reduction from the new French to the antient system, as they would so seldom be useful; the following is all that is necessary—

1^{gr}	is	$0^{\circ}\cdot 9$	or	$54'$	or	$3240''$
$1'$	,,	$0\ \cdot 009$	,,	$0'\cdot 54$	,,	$32''\cdot 4$
$1''$	,,	$0\ \cdot 00009$	,,	$0'\cdot 0054$	,,	$0''\cdot 324$

The third method of measuring angles, in which they are said to be measured in *time*, is confined to astronomy, and is derived from the complete apparent revolution of the heavens which takes place in 24 hours. That is, if a line revolve round a point at the rate of a whole revolution in 24 hours, or a right angle in 6 hours, the times of moving through different angles are made the measures of their comparative magnitudes. Thus $4^h\ 32^m\ 60^s$ is the angle moved through in 4 hours, 32 minutes, and 60 seconds. The following tables are useful in turning angles measured in degrees, &c., of space into the corresponding measures in time, and the converse.

TIME INTO SPACE.					SPACE INTO TIME.				
Hours.	°	Min. Sec.	° ′	′ ″	° ′	h. m.	m. s.	″	s.
1	15	1	0	15	1	0	4	1	0·067
2	30	2	0	30	2	0	8	2	0·133
3	45	3	0	45	3	0	12	3	0·200
4	60	4	1	0	4	0	16	4	0·267
5	75	5	1	15	5	0	20	5	0·333
6	90	6	1	30	6	0	24	6	0·400
7	105	7	1	45	7	0	28	7	0·467
8	120	8	2	0	8	0	32	8	0·533
9	135	9	2	15	9	0	36	9	0·600
10	150	10	2	30	10	0	40	10	0·667
11	165	20	5	0	20	1	20	20	1·333
12	180	30	7	30	30	2	0	30	2·000
13	195	40	10	0	40	2	40	40	2·667
&c.	&c.	50	12	30	50	3	20	50	3·333
					60	4	0		
					70	4	40		
					80	5	20		
					90	6	0		
					100	6	40		
					200	13	20		
					300	20	0		

In these tables, where there are two headings, either the upper or under of both must be used. The following are examples.

To turn $18^h\ 11^m\ 35^s\cdot 3$ into degrees, &c., of space. From the first table,

10^h	is	150°	$0'$	$0''$
8^h	,,	120	0	0
10^m	,,	2	30	0
1^m	,,		15	0
30^s	,,		7	30
5	,,		1	15
$0^s\cdot 3$	,,			4·5
$18^h\ 11^m\ 35^s\cdot 3$	is	272°	$53'$	$49''\cdot 5$

To turn $97^{\circ}\ 54'\ 23''$ into hours, &c. From the second table,

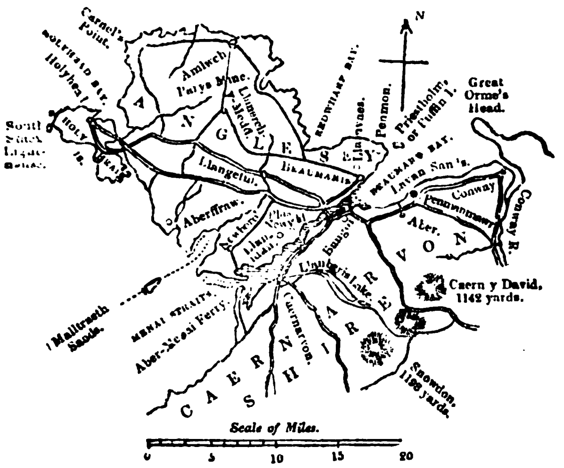
90°	is	6^h	0^m	0^s
7°	,,		28	0
$50'$	,,		3	20
$4'$	,,			16
$20''$	,,			1·333
$3''$	,,			0·200
$97^{\circ}\ 54'\ 23''$	is	6^h	31^m	$37^s\cdot 533$

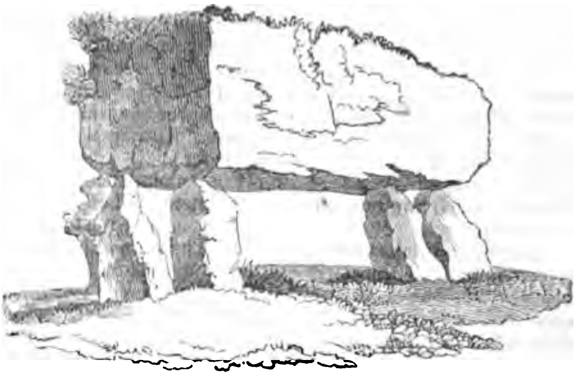
In astronomy 30° is sometimes called a sign, in allusion to the arc of the ecliptic, through which one of the signs of the zodiac extends: Thus $2^s\ 3^{\circ}\ 4'\ 12''$ means $63^{\circ}\ 4'\ 12''$.

ANGLE (TRISECTION OF). [See TRISECTION.]

ANGLES, or ANGLI. The earliest record of this people we find in Tacitus' book on the Germans (chap. xl.); but this author only mentions their name, states a few particulars relative to their religions, and intimates that they were a branch of the Suevi. Having spoken of the Semnones as the most antient and illustrious tribe of the Suevi, he thus continues: 'But the Langobards are ennobled by their small number; being surrounded by a multitude of the most valiant nations, they live in a state of security, not by submitting to them, but by fighting battles and braving dangers. After them follow' (in this description he is proceeding north-westward) 'the Reudigni, the Aviones, the *Angli*, the Varini, the Eudoses, the Suardones, and the Nuithones; all these are protected by woods and rivers. Singly, these nations present nothing that is remarkable, except that they in common worship *Hertha*, that is, Mother Earth, believe that she interferes with human affairs, and journeys in a chariot among the nations. In an island in the ocean there is a holy grove where a consecrated vehicle is kept, covered with a vest: nobody but the priest is permitted to touch it. He knows when the goddess is present in this sanctuary, and putting cows to the vehicle he honours her with great devotion. These are days of rejoicing, and festivals are kept in whatever place the goddess visits, and honours with her presence. During these days they do not go to war, nor take arms in hand; hostile weapons are laid aside: peace and quietness only prevail, and are cultivated till the priest brings back to her temple the goddess satiated with the converse of mortals: immediately thereafter the chariot and the vests, and if we choose to believe it, the goddess herself are washed in a secret lake. Slaves perform this service, who are instantly swallowed up by the lake. From this a mysterious fear arises, and a holy wonderment at what that can be which is beheld only by men who must lose their lives. This portion of the Suevi extends into those parts of Germany which are *less known*.' This description at all events will convince most readers that Tacitus knew very little about these nations. Lindenbrog and Leibnitz (*Scriptor. Rerum Brunsuicens.* tom. i. p. 81) have preserved fragments of the antient laws used in common by the Angli and the Varini. D'Anville has in his map assigned to them the same district which they occupied in the fifth century before their emigration to England, and parts of which the modern Angles still occupy. He allots to them the greatest portion of modern Schleswig and some part of Holstein, making the German ocean their western boundary, the Saxons their nearest neighbours on the south, the Varini on the south-east, and the Jutes on the north. It is impossible to fix with accuracy any boundaries for the Angli from the account given by Tacitus, but his statement appears perfectly reconcilable with D'Anville's map and the Saxon Chronicle; and it is remarkable that D'Anville in every respect agrees with the last-mentioned record, although it may be doubted whether he knew it, or paid any attention to it. The difficulties raised by German critics and historians, such as Haus and Dörfer, that the Angles, if inhabiting only the district of modern *Angeln*, were too insignificant a nation to occupy Great Britain, are indeed idle: for 1st. it has never been asserted that their domain did not extend beyond the boundaries of modern *Angeln*; 2d. the numbers which Hengist and Horsa first led over to England to the assistance of Vyrtgeorn against the Pihts were not so great, as to render it impossible even for a small tract of land, inhabited by a warlike race of men, to produce them; 3d. it was never asserted that the Angles *alone* occupied England, but that soon after their first attempt the Saxons and the Jutes joined them, or co-operated with them; 4th. these critics do not sufficiently attend to the circumstance, that the occupation of England was effected as much by circumvention as by open force, and that the Angles obtained new allies in the Pihts whom they at first came to expel. It is, therefore, needless to extend the boundaries of the Angli to the Elbe and Travemünde; or even to spread them over the whole of the Cimbrian Chersonesus (Modern Jutland). [See SAXONS.]

ANGLESEY, or ANGLESEA, an island in the Irish sea, on the north-west coast of Wales, in which principality it is included, and from the main land of which it is separated by the narrow strait, (or, as it is sometimes, though incorrectly, termed, river,) Menai. This strait has a direction very nearly north-east and south-west, with little variation throughout its course. It is thought that Anglesey was once united with the main by an isthmus, at a place called Pwll Ceris, where may still be traced a line of small rocks crossing the channel. It appears also that the Menai is wider than formerly, lines of stones having been observed below the present high-water mark, which seem to have been once boundaries or fences between the sea and the land. (Rowlands's *Mona Restaurata.*) From the south-west end of this channel, the coast runs in a north-west direction to the farthest point of Holyhead Island, which is separated from the rest of Anglesey by a sandy strait, across which the Holyhead road is carried by a long embankment or causeway, in the centre of which is an opening for the water, arched over. The general direction of the coast on the north-east side of Anglesey is similar to that on the south-west side, (viz., north-west and south-east,) except near Beaumaris, where the land juts out into the sea. The remaining part of the coast from the extremity of Holyhead Island first curves inward, forming Holyhead bay, and then runs east to beyond Amlwch. The length of a line drawn from south-west to north-east, along the shore of the Menai from Aber-Menai Ferry to Trwyndû Point, opposite the little island of Priestholm, is 17 miles: a line drawn at right angles to the above from Cafnel's Point, in the north-west, to the Menai, is about 20 miles long; and these may be taken as the breadth and length of the island. A much longer line may, however, be drawn, running nearly east and west, from the extremity of Holyhead Island to Point Trwyndû, mentioned above; this distance is about 27 miles. (Evans's large *Map of North Wales*, Llwynygroes, 1795.) The number of square miles of surface is variously given. The population, in 1831, was 48,300. There are several smaller islands round the coast. Holyhead, the largest of these, is at the western extremity; Priestholm, or Puffin Island*, at the eastern; the others are insignificant. This island had, in early times, the names of Ynys-Dowell, (the shady or dark island,) Ynys-Fon, (the farthermost island,) and Ynys-y-Cedeirn (the island of heroes). By the Latin historians it is called Mona (which name it shared with the Isle of Man); the name of Anglesey, (Angle's ey, Englishman's Island), it received from the Saxons. It was a great seat of Druidical superstition. Suetonius Paulinus, the Roman commander, landed here (A.D. 61) in spite of the resistance of the natives, and the terrors which the Druids sought to strike into the hearts of the invaders: he cut down the sacred groves, and gave a blow to the Druidical superstition, from which it never recovered. The island was abandoned by the Romans for a time in consequence of the great revolt under Boadicea, and again conquered by Agricola A.D. 76. Several Druidical remains still exist, cromlechs (flat stones resting upon others) and carnedds (heaps of stones) of two cromlechs in the park of Plas Newydd, the seat of the Marquis of Anglesey, the larger has its upper stone 12 feet 7 inches long, 12 feet broad, and 4 feet thick, supported by five tall stones. There is at Tre'r Dryw, in the parish of Llanidan, a large circular inclosure 180 feet in diameter, surrounded by a mound of earth and stones evidently brought from other parts, for the bottom of the bank, within and without, is level with the ground on which it is raised (Rowlands). It is supposed to have been the seat of a Druidical consistory. Near are the remains of a cromlech and a Gorseddau, or heap of stones, now dispersed, and of a large circle of stones. Rowlands supposes the whole to have been surrounded by an oak grove. In the neighbourhood are the remains of a square entrenchment with a double rampart and moat, called Caer-leb, and some other relics of Druidical structures. Caer-leb is supposed to have been the residence of the archdruid.





[Cromlech in the Park of Plas Newydd.]

Egbert, monarch of the West Saxons, conquered the island in the former part of the ninth century, but the princes of North Wales having recovered it, Aberfraw, one of its towns, became the seat of government, and continued to be so till the final subjugation of Wales. During the reign of our William II., (Rufus,) near the close of the eleventh century, Anglesey was again attacked and ravaged by the English, in retaliation for some depredations committed by the Welsh borderers. It was laid waste in the following century during the civil contests of the Welsh themselves, unsuccessfully invaded by the Irish in the time of Henry III. A.D. 1245; and finally subdued by Edward I., a detachment of whose army was cut off by an unexpected onset from the inhabitants after they had appeared to submit. It was again made the scene of contest in the struggle between Charles I. and his parliament. [See BEAUMARIS.]

The climate of Anglesey is rendered by the sea breezes milder than that of the adjoining part of Wales; snow seldom lies long, even in the depth of winter; but the air is, from the same cause, loaded with frequent mists in autumn, at which season intermittent fevers prevail. The surface of the island is comparatively flat, and the absence of wood, as well as of quickset hedges, gives it a barren appearance. The air is so unfavourable to the growth of trees, that in most parts the gentry can with difficulty raise a plantation around their own houses. There are, however, considerable woods in the neighbourhood of Beaumaris, and at Plas Newydd, the seat of the Marquis of Anglesey, on the Menai Strait. The limited extent of the island does not admit the formation of any considerable stream. Many rivulets descend from the interior, but none of them have any claim to notice. The coast forms several harbours, the principal of which are Beaumaris and Holyhead. That of Amlwch has been formed by excavating the rock. Anglesey was formerly a place of considerable trade, and the names of ports and havens yet remain, the use of which has long been given up.

The soil of the island is various: the lands on the sea-coast, especially on the western side, are sandy: the low grounds are chiefly covered with a black soil, approximating to peat earth, from which the peasantry dig turf for fuel, and in which they frequently find large trunks of trees, hard and black as ebony, buried several feet under ground. The more prevalent soil is, however, a stiffish loam, which, when manured with sand, produces abundant crops. The sand chiefly used as manure is that from the western side of Redwharf Bay, on the east coast; it has a large intermixture, amounting to two-thirds, or from that to four-fifths, of sea shells. Various kinds of marl are found in the island, but the use of these as manures has declined: lime is used abundantly. The chief agricultural productions are oats and barley; of wheat the proportion is small, and of rye still smaller. Potatoes are grown in greater quantity than in any other part of North Wales, and the cultivation of the turnip is on the increase. Pasturage is, however, the great object of the farmers' attention, for only one-eleventh of the enclosed lands is estimated to be under tillage. Cattle form one of the staple productions of the island, and numerous herds are exported. These, before the erection of the bridge, were compelled to swim over the Menai strait. The yearly export is estimated at about 8000 head, but such numbers are of course liable to change. The dairy is so little regarded, that the produce of it is hardly sufficient for the consumption of the island. The Anglesey sheep are the largest native breed in North Wales; they have white faces and legs, and are generally without horns. The export is from 5000 to 7000 head annually. The export of hogs used to be considerable, but the quantity of Irish pigs brought to England has, in a great degree, caused it to be given up. The horses are in no repute. (Davies's *General View of the Agriculture of North Wales.*)

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* This island takes its name from the number of the puffins which frequent it. During part of the summer it swarms with these and other birds of passage.

The coasts of Anglesey supply an abundance of fish; some of which are not common elsewhere. Shell-fish are abundant.

The mineral riches are also great. The Mona and Parys copper mines, on the north-east coast, began to be worked about 1762, but at first with little success; they have since produced immense wealth to the proprietors. (See AMLWCH.) Mr. Pennant supposes these mines to have been worked by the Romans, and traces of the antient operations were perceived by him. Lead ore, rich in silver, has been found also in Parys Mountain. Limestone ranges traverse the island; marbles, both white and variegated, are procured; mill-stones are quarried at Redwharf and Penmon; and there are coal-mines at Malltraeth, but they do not appear to have been worked with much success. They are, however, remarkable in a geological point of view, because they afford the only known instance in this country of a coal formation in the slate. The coal-field is irregular and uncertain. Several unprofitable trials have been made, and occasionally coal has been worked to a considerable extent. In one pit a vein three feet and a half thick was found at a depth of only twenty-five yards. A singular phenomenon occurs in this formation: large alluvial bolders of coal, some of which weigh a ton or upwards, are found scattered upon the surface. (See COAL FIELDS.) It may be observed, that Anglesey is the only part of the whole principality of Wales in which granite has been observed, and there only in a small spot near the centre. The inhabitants do not carry on any great manufacture: they buy wool at Caernarvon and Bangor fairs, and make coarse blue cloths, blankets, flannels, &c., just sufficient for their own use.

The main road to Holyhead, the usual place of embarkation for Dublin, runs through the island. It crosses the Menai Strait over a magnificent suspension-bridge, the under side of the roadway of which is about 100 feet above high-water mark, so as to admit the passage of the largest vessels which navigate the strait; and the distance from centre to centre of the pyramids of masonry from which the bridge is suspended is 580 feet, rather more than the width of the strait at low water, but considerably less than the width when the tide is up. (Provis's *Historical and Descriptive Account of the Menai Bridge.*)

The communication between the island and the main was formerly entirely by ferries, of which there were five or six; that of Porthaethwy, or Bangor, now superseded by the Menai Bridge, being the principal.

The county of Anglesey is divided into three cantrefs, a division which originated at a very early period; and these cantrefs are subdivided each into two comots (cwmwds). Of the period when the subdivision was made, there appears to be some doubt. For civil purposes, these comots are equivalent to hundreds. It is in the diocese of Bangor and in the province of Canterbury, and in the North Wales circuit.

The market towns are Beaumaris, (population in 1831, 2497,) the county town, on the south-east coast (see BEAUMARIS); Holyhead (population 4282), the great place of embarkation for Ireland, situated on an island of the same name, on the west coast (see HOLYHEAD); Llannerch-y-Medd, on the road to Amlwch, with a market, once the most considerable in Anglesey, but of less extent since the opening of that at Llangefni; Llangefni, a few miles from the Menai Bridge, on the road to Holyhead (population 1753); Aberfraw, on the south-west coast, once the residence of the Welsh princes (population 1367); and Newborough, not far south east of Aberfraw (population 804); but the markets of the last two seem to have come into disuse, while a customary one has grown up at Amlwch (population 6285),[*] a place of greater importance than either. (See AMLWCH.) Holyhead, Amlwch, and Llangefni, are now united with Beaumaris in the privilege of returning a member to parliament; and the county returns another. The county election and that for the united boroughs are both held at Beaumaris; and the poll for the county is taken at Beaumaris, Holyhead, and Llangefni.

The chief gentlemen's seats are Plas Newydd, on the Menai, the seat of the Marquis of Anglesea; and Baron Hill, near Beaumaris, the seat of Sir R. B. Williams Bulkley, Bart. There are few antiquities except Druidical, the chief of which have been noticed above. Beaumaris castle will be noticed in the article BEAUMARIS; there are also the remains of a priory at Llanvaes, and of another at Penmon, both in the same neighbourhood. The conventual church of the latter is used as the parish church. An agricultural society was established in the island in 1808. The measures in use here differ from the common ones; the acre of land is about two-thirds of the statute acre, and the yard of cloth contains forty inches. (Rowlands's *Mona Antiqua Restaurata;* Pennant's and Bingley's *Tours in North Wales;* Davies's *Gen. View of the Agric. of North Wales.*)

ANGLO-SAXONS. [See SAXONS.]

ANGO'LA, a country on the west coast of Africa. According to M. Degrandpré, a French officer of marine, whose *Voyage à la Côte Occidentale d'Afrique, fait dans les années* 1786 *et* 1787, appeared at Paris in two volumes, 8vo., in 1801, the name is often used to comprehend the whole extent of coast from Cape Lopez Gonsalvo in lat. 0° 44′ S. to S. Felipe de Benguela, in 12° 14 S. The whole of this space appears to be considered as one country by the natives; but by them it is called, not Angola, but Congo, and is divided into the separate districts of Loango, Congo Proper, Angola, and Benguela. The country properly called Angola commences only about lat. 8° 20′ S., where it is divided by the river Danda from Congo, and is bounded on the south by the river Coanza, in lat. 9° 20′ S. The country immediately to the south of the Coanza is commonly considered to be part of Benguela, although that name appears to be sometimes used as applicable only to the country to the south of the river Catumbela, immediately above S. Felipe de Benguela, at most to that south from the river Longa in lat. 11°. Anciently, Benguela, which afterwards became a separate kingdom, is said to have formed one of the provinces of Angola, and to have extended as far south as to Cape Negro, in lat. 16° S. This is the account given by Father J. A. Cavazzi de Monte Cuculo, a Jesuit, who resided in Angola for many years as a missionary, and whose description of the country may be found in Labat's *Relation Historique de l'Ethiopie Occidentale*, 5 vols., 12mo., Paris, 1732. The proper name of Angola is said to be Dongo-Angola; and Dongo is the abbreviation most in use among the natives, or at least among those on the coast.

The coast of Angola was first discovered by the Portuguese navigator, Diego Cam, in 1486. Very soon after this the Portuguese began to form settlements both along the banks of the Zaire, and at various points of the coast to the south of that river. It was not, however, till 1578 that the town of Loando San Paolo, commonly called St. Paul de Loando, the capital of Angola, was begun to be built. Since then, the Portuguese governor has resided here, and has been called governor of Angola, instead of governor of Congo, as formerly.[*] In 1640, the Portuguese were driven from St. Paul by the Dutch, who retained possession of the place till 1648, when it was recovered by its former masters. It has ever since remained in the hands of Portugal.

Mr. Bowdich, in his *Account of the Discoveries of the Portuguese in the Interior of Angola and Mozambique*, states, on information derived from Count Saldanha de Gama, who had been governor-general of Angola, that the Portuguese settlements extend into the interior for about seven hundred miles from that coast. It is not to be understood, however, that the whole of this territory is, in any sense, under the dominion of the crown of Portugal. It only possesses a few forts, and some commercial establishments, called *Feiras*, or Fairs, at great distances from each other. Two of the fairs are seven hundred miles inland, and are under the superintendence of a Portuguese resident. The Portuguese colonists and the natives meet at these stations for the purposes of exchange. In one of Mr. Bowdich's maps, Cahenda, which is called the most distant of these fairs, is placed between the 18th and 19th meridians; but in another, two fairs are set down near each other, in about long. 23° E. Cahenda is on the south bank of the river Manibella, which appears to be the origin of the Benga. There is, or was, a capuchin mission here. Lower down the river is Bangoa Quitamba, in long. 17°, where a carmelite mission is stated to have been established. The forts in the interior of Angola, laid down in Mr. Bowdich's map,—which was constructed in 1790, partly from personal inspection, by Lieutenant-colonel Furtado, an officer of engineers,—are Fort Massangano, at the junction of the river Lucala with the Coanza, about long. 16′ 15° E. from Greenwich; Fort Cambambe, higher up the Coanza; Pungo Andongo, at the junction of the Gango, or Mocunga, which flows from the south, with the Coanza, a little beyond the 18th meridian; Fort Pedras, in the same vicinity, but not on the river; and Fort Ambaca on the Lucala, about long. 17° 35′. At Massangrano there is a garrison of a hundred infantry, and one of sixty at each of the other forts, formed of natives, but commanded by Portuguese officers.

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[*] The population given is that of the parishes. These are often more extensive than the towns; that of Amlwch contains part of the town of Llannerch-y-medd, which is in different parishes.

The force kept up at Loando, according to Count Saldanha, is always composed of one regiment of the line, a thousand strong, three hundred cavalry, and two hundred artillery. Descriptions of this town may be found in a *Voyage to Congo made in the Years* 1666 *and* 1667, by the fathers Angelo and Carli, and in Merolla's *Voyage to Congo in* 1682. Translations of both are printed in the 16th volume of Pinkerton's *Voyages*, and also in Churchill's *Collection*. The city, which in Mr. Bowdich's map is placed in lat. 8° 45′ S., is built partly on the mainland, and partly on the Island of Loando, which lies about a mile from the shore, and according to Merolla is ten leagues in length. Bowdich says, that it varies from one hundred to three hundred yards in breadth. St. Paul de Loando was formerly celebrated for the magnificence of its churches and other ecclesiastical buildings. Cavazzi speaks of it as being surrounded, instead of bastions, by temples and monasteries. Besides a cathedral, it contained in those days a convent, an hospital, and a Jesuit's college of great extent. It was formerly the seat of a bishoprick; but the bishop, Count Saldanha thought, had taken up his residence in one of the Azores. Both Captain Owen, in H. M. S. the Leven, and Captain Vidal, in the Barracouta, touched here in 1825, in the course of their survey of the African coast. Captain Vidal, sailing towards the north, arrived off St. Paul, on the afternoon of the 8th of November, when guns were fired at the ship from a large battery hewn in a rocky cliff, and presenting a double tier of artillery. The Leven arrived on the 6th of December, and both ships remained till the 19th of that month. The present town is described as situated considerably to the north of the antient town and port, the former of which is in ruins, and the latter blocked up. The churches and other public buildings were found to be in a state of great decay, and the garrison is stated to consist of only six hundred men. The soldiers are said to be mostly convicts. Mention is made, however, in another place, of a respectable corps of cavalry, which, perhaps, is not included in the number just quoted. The principal part of the city stands on an eminence, which juts out towards the island, and on the extremity of which the largest citadel is placed. There are two other batteries besides this. The low-lying part of the town, however, is the most crowded. It is inhabited, for the most part, by the negroes of the country, and consists merely of a crowd of mean hovels. Bowdich states the whole population of St. Paul at 8000. The entire length of the town is described, in Captain Owen's Voyage, as extending for about a mile and three-quarters along the shore. The new harbour is three miles and a half long, and deep and commodious. The market was found to be well supplied with fruit and vegetables, and bullocks and goats were also in great plenty. The country around is described as dusty and parched; but the town is well supplied with excellent water brought daily in tank-boats from the river Benga, which flows into the sea some miles to the north of St. Paul. The old accounts say that plenty of good water is found by digging in the Isle of Loando. This vicinity, according to the account in Captain Owen's Voyage, is the only part of the west coast of Africa, to the south of the Gambia, where horses will thrive.

The most detailed account that has been given of the geography of Angola is that furnished in Labat's book, principally from the work of Father Cavazzi. But of the seventeen provinces, into which he describes the country as having been antiently divided, only the following seven belong to what is properly called Angola:—Loando, that in which the capital is situated; Danda, adjacent to the river of the same name, described as abounding in corn, fruit, and venison; Benga, on the banks of the Benga, (otherwise called the Zenza,) and altogether inland; Moseche, between the Lucala and the Coanza, being the province in which the two forts of Massangano and Cambambe are situated; Illamba, between the Danda and the Benga, divided into the lower province next the sea, and the higher, called otherwise Lumbo, farther inland; Oarii, to the east of the former, and Embacca, or Membacca, comprehending the upper region of the Lucala, being the province in which the fort called Ambaca by Mr. Bowdich is situated. Various additional particulars may also be collected from Mr. Bowdich's book. Nearly five hundred miles beyond the most distant Portuguese fair is Cassange, where it is stated that, during the government of Count Saldanha, a respectable merchant of the name of Da Costa, who had at one time commanded the militia in the interior, established himself, and lived many years in perfect harmony with the natives. To the north of the Cassanges are the Cachingas, and to the east of them are the Domges, with whom they are always at war, and who are said to maintain a trading connexion with the Portuguese settlement of Mombaca, on the opposite coast of the continent. The natives say, that the Congo and the Coanza have both their source in a great lake, which lies on the eastern limits of Cassange; and also, that there is in that region a third river larger than either of these, which they call the Casati. The Coanza, it appears, has been actually traced by the people of the country to the distance of fifteen days' journey beyond the Quindonga islands, in long. 20° 30′, through the territories of the Moganguelas and Somghos, two dependencies of Cassange. The islands of Quindonga in the river were taken possession of by a Portuguese force during the government of Count Saldanha. The district in which they lie is called Mattemba, and is to the east of Upper Illamba, already mentioned. In this neighbourhood, according to some authorities, are the Giagas, or Jagas, whose atrocities make a great figure in all the old accounts. But Mr. Bowdich says that Jaga is an epithet which is borne by the Cassanges, and that it denotes a race who were originally nomadic warriors, in contradistinction to Jova, which means a stationary people. The Giagas mentioned by the old writers certainly resided far to the west of Cassange. To the north of Mattemba, and separated from it by the Lunini, a branch of the Congo, is the district of Ginga, the ancient capital of which, Cabasa, is reported by the natives to be four days' journey north of the Coanza, and three days' journey south of the Congo. It is placed in Mr. Bowdich's map, nearly in 8° S. lat., and on the same meridian with the Quindonga islands. It is necessary to observe, however, that very little dependence is to be placed upon these notices, the very vagueness of which indicates that they have been in great part derived from nothing better than the loosest rumours, while a comparison of the accounts given by different authorities would show them to abound in contradictions and inconsistencies. Both Cavazzi and Father Cannecattim, who resided for some time in Angola as a missionary, and wrote a Grammar and Dictionary of the language of the country, published at Lisbon in 1804 and 1805, make the Giagas to be the people of Mattempa, or Matamba, and to have been so called from one of their queens, Gingha, or Anne Zingha, or Gongo Amena, the history of whose wars with the Portuguese, in the seventeenth century, occupies a large space in Cavazzi's narrative.

The language spoken throughout the whole of Angola Proper is the Bunda, which appears to be merely a dialect of the Congoese, or that spoken as far north as Cape Catherine. It is reported by tradition to have originated in Cassange, and to have been introduced into the parts nearer the coast by conquest. A Grammar and Dictionary of this tongue have been compiled, as we have mentioned above, by Father Cannecattim; and some account of its peculiarities is given by Mr. Bowdich from these works. The most important which he notices are that the singular and plural of the nouns, the voices, tenses, and persons o the verbs are distinguished by prefixes, and the artic varies in case and number with the noun. A langua nearly the same appears to be spoken as far east and south as Moolooa, in 13° S. lat. and 32° E. long.; and it is probably not so entirely different from that used in Benguela as Mr. Bowdich asserts. In the account which he gives of the journey made through that country by Gregorio Mendez in 1785, it is stated that at Bumbo, in 14° 40′ S. lat. and 14° 45′ E. long. the jargon spoken by the natives was found to be easily intelligible to those who understood the Bunda language.

The government, laws, and religion prevailing among the natives of Angola are, in their general features, the same with those of the other negro tribes of Africa. The supreme authority in each district is in the hands of a single ruler, who is subject to no regular control. A tax is levied by the Portuguese from the inhabitants of Loando, and of the other small districts where they have erected forts. Ample details respecting the native superstitions may be found in Labat's volumes. In the course of the sixteenth century various missions were sent out by successive popes with the object of diffusing the knowledge of Christianity among the inhabitants of this part of Africa; and by dint of force as well as of persuasion, a good many converts were made. There is reason to believe, however, that the number of negro Christians in Angola is now very inconsiderable. The most enduring labours of the pious and intrepid missionaries are the accounts which several of them have given to the world of the country which their zeal induced them to visit.

The writer who, in recent times, has professed to give the fullest account of the climate and natural productions of Angola, is M. Degrandpré. But his statements really do not refer to Angola, properly so called, at all, but to Congo; the most southerly port which he had visited being Ambriz, which is only in 7° 20′ S. lat., about a whole degree distant from the confines of Angola. This, he says, was the nearest port to St. Paul at which the Portuguese would suffer foreign ships to touch. From other authorities it appears that the country, though hilly, is not so much so as a great part of Benguela. Cavazzi describes the confines next Congo as defended by high mountains and sandy deserts. There are no considerable mountains, however, in the space between the Danda and the Coanza until you proceed up the country as far as to the higher Illamba. The hills then rise beyond each other in successive terraces. The rivers, with the exception of the principal branch of the Coanza, all appear to originate in this district, or in those farther to the east. Most of them have been already mentioned, and they all fall into the sea either by the Danda, the Benga, or the Coanza. In the higher Illamba, Cavazzi states, are iron-mines, being the same, we suppose, which are mentioned by Mr. Bowdich as having first begun to be wrought in 1770, but as having been soon after abandoned, on account of the inconvenience occasioned by the frequent inundations of the river Lucala. The attempt to work them, however, was resumed, under the direction of Count Saldanha, with more success, a hundred and fifty bars of iron being brought monthly from these mines to St. Paul, besides what was disposed of in the interior. In other parts gold dust is said to have been formerly found; but Mr. Bowdich states that there is none now. Mines of copper are said to exist somewhere in the interior; but what the Cassanges sell to the Portuguese comes from Moolooa, which, as already mentioned, is far to the south of Angola. Petroleum is found in abundance in the province of Danda.

The rains are stated to be so irregular, that sometimes there are none for three years. On the other hand, there is occasionally a heavy rain which lasts for many days.

The principal commerce of Angola is carried on with Brazil, to which country many thousands of slaves have for a long period been annually exported. Mr. Bowdich has printed some accounts relating to the trade between Angola and Lisbon during the years 1803 and 1804, from which it appears that the only imports into Lisbon from Angola were, in the former year, 289 quintals of ivory, valued at 2,336,000 reis, and in the latter 750¾ quintals, valued at 4,779,000 reis. The exports to Angola from Lisbon are stated as consisting of wine, brandy, oil, pork, and other provisions; silks, linens, cottons, flannels and other woollens; hats, glass, gold and silver ornaments, earthenware, hardware, muskets, drugs, paper, and sundry other articles, such as might be supposed to be required for the use of the colonists, to the amount (including some imports from Asia) of 480,789,312 reis in 1803, and of 586,978,145 reis in 1804. These two sums would amount severally in English money to about 130,000*l.* and 160,000*l.* Such a consumption of foreign commodities would not indicate either a large population of European colonists, or an extensive demand for such foreign productions by the natives; but it is probable that there were also some imports from Brazil.

The physical geography of this portion of Africa, and of the adjacent regions, will be treated of under the head of CONGO.

ANGO′RA. [See ANCYRA.]

ANGOSTU′RA, a town in South America, on the banks of the Orinoco, in the Republic of Colombia, at a distance of about 240 miles from the mouth of the river, in 8° 8′ 11″ N. lat., and 68° 55′ 21″ W. long. The town is built on the southern bank at a place where the bed of the river is narrowed on both sides by rocks, and to this circumstance it owes its usual name, signifying the *Strait;* its proper name is *Santo Tomé de la Nueva Guayana.*

The town lies between the foot of a hill and the river, and the houses stand partly on the bare rock; they are, in general, lofty, agreeable, and the greater part built of stone. On the tops are terraces, where people sleep in the season of the greatest heat, without receiving from the dew any injury to their health or sight. The streets are regular, and for the most part parallel to the course of the river. In 1807, Angostura had a population of about 8500 persons, among whom were 300 negroes. At present it is said not to exceed 3000.

Opposite to the town, on the left bank of the river, there is a fort, called *San Rafell,* which is surrounded by a number of houses. This place connects the parts of South America north of the river with Angostura. In the middle of the river, between both places, is a rocky island, called from its situation *Del Medio,* (the middle,) which sometimes, though rarely, is under water during floods. To the southwest of the town, but contiguous to it, is another fort, called *San Gabriel.* The narrowest part of the river lies between the two forts, and here its breadth was found by Baron Humboldt to be 2430 English feet; opposite the town it was 3134 feet. When the waters are high, the river inundates the keys, and it has happened that careless people have become the prey of alligators even in the streets.

Though at so great a distance from the ocean, the town is only about 191 feet above the level of the sea. To the east of it as far as the mouth of the river, a level plain extends; but still more extensive are the plains on the west, which stretch up to the base of the Cordilleras, near Pamplona and Santa Fe de Bogotá. The western plains are known by the name of *Llanos* (levels). In the rainy season, from April till November, these plains are mostly inundated. Notwithstanding its trifling elevation above the level of the sea, and its tropical situation, Angostura enjoys a mild and equal temperature. It seldom happens that Fahrenheit's thermometer rises above 86° in the hottest time of the year; and from the beginning of November to the end of April, it rarely attains 77° during the day, and generally descends only to 69° or 70° at night. This is, in part, to be attributed to the trade-winds, which, according to Depons, blow very regularly from the month of November to the month of May; this, we believe, is a single instance where these winds extend to such a distance from the sea, and are not broken when they reach the land. The low coast at the outlet of the river, and the level plain between the sea and the town is, doubtless, the cause of this phenomenon. In the remainder of the year, the tradewinds are interrupted by calms, more or less frequent and long. Earthquakes have not occurred; sometimes a wind blows with the violence of a hurricane, but it does not last long, and terminates in rain.

The trade of Angostura, though at present nearly annihilated by the disturbed state of the country, will probably revive and become very great; before the beginning of the civil wars it was considerable. In this respect it is very advantageously situated. The channel between the town and the island Del Medio has 200 feet of water, when low, and on the increase of the river 50 or 60 feet more. But large vessels cannot sail up to the town on account of the shoals, which are very frequent in the lower part of the Orinoco. only such as do not draw more than eight feet can navigate it with ease. The best vessels require fifteen days to sail from its mouths to Angostura; but otherwise the mouths of the Orinoco have an advantage over every other part of Colombia. A voyage from Europe to *Punta Barima* (at southern embouchure) is performed sometimes in eighteen or twenty days, and the return to Europe takes from thirty to thirty-six days; besides, as the mouths of the river are placed to the windward of all the islands, the vessels of Angostura can maintain a more advantageous intercourse with the West Indies, and especially with Trinidad, than either La Guayra or Porto Cabello.

The inland trade of Angostura extends to a great distance to the west: the numerous large rivers which run from the eastern declivity of the Cordilleras to the Orinoco are navigable up to the foot of the mountain-range, and facilitate the transport of every sort of commodities: thus, the produce of the rich country about Varinas is not conveyed to the northern coast, which, though not very distant, is separated by a high range of mountains, but it descends the Orinoco and its tributaries, though the sea in this direction is more than four times as distant. The trade of Angostura with the country round Varinas was very active, and the town received from it considerable quantities of cacao, indigo, cotton, and sugar. It sent back the produce of the manufacturing industry of Europe. Humboldt saw long-boats depart from Angostura for Varinas, the cargoes of which were valued at eight or ten thousand Spanish dollars. These boats went first up the Orinoco to Cabruta at the mouth of the river Apure; then along the latter river to San Vincente and hence on the river Rio Santo Domingo as far as Torunos, which is the port of Varinas Nuevas. The little town of San Fernando de Apure is the magazine of this river trade, which doubtless will become very considerable as soon as tranquillity is completely established in the republic. Many of the other rivers falling into the Orinoco will in future send similar commodities to Angostura, but the country on their banks is as yet uncultivated, and occupied only by savage nations. The Llanos themselves, though they are not cultivated, nor probably fit for cultivation, afford some very valuable articles of commerce. For the greatest part of the year they are covered with a fine rich grass, and innumerable herds of cattle, horses, and mules pasture on them. Great numbers of them were annually exported from Angostura to Trinidad and the other islands of the West Indies. The hides, also, and jerked meat form a considerable article of commerce. (*Travels* of Baron Humboldt and Depons.)

ANGOULEME, a city of France, on the left bank of the river Charente, and on the road from Paris to Bordeaux, 287 miles from the capital. It rises on a hill projecting into the valley of the Charente, from the heights which bound it. The air is pure, and the prospect from the ramparts, which have been changed into public walks, is extensive and fine.

The houses in the older parts are ill-built and the streets narrow; but the '*Quartier Neuf*' is much better in these respects. Among the principal buildings are the cathedral, the bridge over the Charente, and the obelisk raised by the late (Bourbon) government to the Dauphiness, whose husband took the title of duke from the town.

The chief manufactures are of paper, which is in good repute, woollen stuffs, and earthenware, coarse and fine: there are also distilleries and sugar works. To these productions of industry, some authorities add linens, copper utensils, and white wax.

It was formerly the capital of the province of Angoumois, but now of the department of Charente. It is also the seat of a bishop, whose see includes the department in which the town is situated, and who is a suffragan of the archbishop of Bordeaux. Before the revolution, it contained ten convents and two abbeys: in one of the last was the burial place of the former counts of Angoulême. It now has a royal naval school, a high school, a library, and a museum of natural history. Population 15,306.

An English traveller, Colonel Keatinge, who visited Angoulême in 1814, describes it as the Chester of France: the ancient houses on the banks of the Charente, a smoothly-flowing river, form a picturesque mass of buildings. Its beauty, however, appears to diminish on a nearer approach, when the bad construction of the place becomes more obvious.

It is a town of great and, indeed, unknown antiquity. It was the Iculisma of the Romans, and its ancient designation may be readily traced in its present one. In the ninth century, it was ruined by the Normans, and twice taken by the Huguenots in the sixteenth century.

Among the more eminent natives of Angoulême were Balzac, and Montalembert, the engineer. Two others have acquired celebrity by crimes arising from the fierce religious contentions which agitated France in the sixteenth century;—Poltrot and Ravaillac, the assassins of the Duke of Guise and of Henry IV., respectively. (Malte Brun; Balbi; *Dictionaire Universelle de la France.*)

The arrondissement of Angoulême contains 114 communes, and about 119,000 inhabitants.

ANGOT, a province of Abyssinia. [See AMHARA, ALVAREZ, and the travels of Alvarez.]

ANGOULEME (CHARLES DE VALOIS, DUKE OF), the natural son of Charles IX. of France and Marie Touchet, was born on the 28th of April, 1573, about a year before the death of his father. Being educated for the church, he was, at the age of fourteen, made abbot of Chaise Dieu, and two years after grand prior of France, that is, head of the order of the Hospitallers of St. John of Jerusalem, or Knights of Malta, in that kingdom. This same year, however, having received by the bequest of Catherine de' Medicis the earldoms of Auvergne and Lauraguais, he relinquished his ecclesiastical condition; and henceforth he appears chiefly in a military character. He was one of the first to give in his allegiance to Henry IV., in whose cause he fought with distinguished gallantry, at Arques, at Ivry, and at Fontaine Françoise. After the termination of the war, however, he is charged with having been concerned both in the conspiracy of the Marshal de Biron in 1602, and in that fomented in 1604 by the Marchioness de Verneuil, Henry's mistress, who was Angoulême's half-sister, being a daughter of Marie Touchet. For his share in the first of these attempts he was sent to the Bastille, but was soon set at liberty; on the next occasion sentence of death was passed on him, but the punishment was commuted by his royal master into perpetual imprisonment. In 1606, the possessions which had been left him by Catherine de' Medicis were taken from him by a decree of the parliament, and bestowed upon the Dauphin, afterwards Louis XIII. In 1616, however, he was released by that king from his long imprisonment; and in 1619 he was made Duke of Angoulême, having till then borne the title of Count of Auvergne. He was also appointed general of the light dragoons of France, and in 1620 was sent on a special embassy to the court of the Emperor Ferdinand II. He afterwards resumed his military career. It was he who in August, 1628, commenced the famous siege of Rochelle, where the Huguenots held out against the royal forces, till they were obliged to surrender after an obstinate defence of nine months. After this he served for some years in Languedoc, Germany, and Flanders, in the war against the house of Austria which occupied the last years of Louis XIII. and the commencement of the reign of his successor. He died at Paris on the 24th of September, 1650. The following works by the Duke of Angoulême were published during his life: *Les Harangues prononcées en l'Assemblée des MM. les Princes Protestants d'Allemagne*, par le Duc d'Angoulême, octavo, 1620; *La Générale et Fidèle Relation de tout ce qui c'est passé en l'île de Ré, envoyée par le roi à la reyne sa mère*, octavo, 1627; and *Relation de l'Origine et Succès des Scherifs, et de l'état des royaumes de Maroc, de Fez, et Tamdunt, écrit en Espagnol par Diego de Torrès, et traduit par M. C. D. V. D'A.* (M. Charles de Valois d'Angoulême,) quarto, Paris, 1636. The last is reprinted in the third volume of Ablancourt's translation of Marmol Caravajal's *Description of Africa*, three volumes, quarto, Paris, 1667. The *Mémoires très particuliers du Duc d'Angoulême* were published at Paris in duodecimo, in 1667, by Jacques Bineau, along with some other narratives relating to the same period of French history. The volume was reprinted in 1696; and the Duke's memoirs are also to be found both in the first volume of the *Mémoires particuliers pour servir à l'Histoire de France*, four volumes, duodecimo, 1756, and in the third volume of the *Pièces Fugitives*, published by the Marquis d'Aubais and M. Menard, in three volumes quarto, in 1759. In 1667 an account of the Duke's embassy to Ferdinand II. was published at Paris in a folio volume, by Henry Comte de Béthune, grandson of Philip Comte de Béthune, who was associated with Angoulême on that occasion, and who took indeed the chief management of the negotiation. The Duke of Angoulême was married, first, on the 6th of March, 1591, to Charlotte, daughter of the constable Henry de Montmorenci; and, secondly, on the 25th of February, 1644, to Françoise de Nargonne, who survived him many years, dying on the 10th of August, 1715, at the age of ninety-two. He left two sons by his first wife, the eldest of whom, Henry, was in 1618 consigned to a lunatic asylum, when the other, Louis Emanuel, who had been educated as an ecclesiastic, like his father, relinquished the church for the camp. He succeeded his father as Duke of Angoulême, but at his death, in 1663, left only a daughter, who died in 1696 without issue. It is said that at the beginning of the last century, Bouthillier, bishop of Troyes, was in possession of a collection of manuscript letters by the elder Duke of Angoulême, from the 19th October, 1633, to the 20th December, 1643, and also of a collection of those of his son. (*Biog. Univ.*)

ANGOUMOIS, a district in France, which was united with that of Saintonge, in one province or military government, until that mode of division was superseded at the revolution by the division into departments; it coincided, though not exactly, with the department of Charente. It is watered by the river Charente, which rises within its limits, and pursues a very winding course through it; and by several tributaries of that stream, among which are the Tardoire and the Baudiat, and the Touvre. The Tardoire comes from the province of Limousin, and its waters, after heavy rains, unite with those of the Baudiat; but at other times, both these streams, before their junction, are swallowed up and lost in pits (either open or filled with a sand, through which the water filters) which lie in their course. The water thus accumulated in subterranean reservoirs, is supposed to supply the stream of the Touvre. The Vienne, a feeder of the Loire, just passes through the eastern extremity of this province.

The surface of Angoumois is far from level; but its hills, which are of nearly a uniform height, rise to no great elevation. The climate is healthy, great heat and cold prevailing only for a short time; and the vegetable productions arrive at great perfection: but the soil is so variable in its fertility, and so large a portion of it is barren, that the district cannot be designated as productive, and the coolness of the spring is often very injurious to the vines, the cultivation of which is carried to a great extent. The white wines are delicate; and the brandy (designated from the town of Cognac, in this province) is highly esteemed. Grain of all sorts is raised; wheat, rye, oats, barley, maize: and the most fertile of the arable lands have yielded abundant harvests for ten or twelve years without requiring any manure; some are not even allowed to remain fallow. The fruits are of the finest quality, especially the peaches and pears; walnuts and chestnuts are abundant. The cultivation of the mulberry-tree has been attended to, in order to raise the silk-worm; flax is grown for the sake of the linseed; and to these productions we may add saffron.

Angoumois is a district of considerable interest to the geologist, and rich in mineral treasures. Stone, proper for building, is found in many places, and mill-stones are dug in the hills which border the valley of the Anguienne, a branch of the Charente. Iron mines are abundant; there is a mine of antimony at Menet, and extensive quarries of gypsum (*platrières*), in the neighbourhood of Cognac. See article 'Angoumois' in the volumes 'Geographie Physique' of the *Encyclopédie Méthodique*.

The province was anciently governed by counts, but having fallen to the kings of France, was ceded by John*, after the battle of Poitiers, to Edward III. of England. The inhabitants, however, drove out the English, and put themselves again under the French dominion a few years afterwards, namely, in 1371 or 1372. (*Encyclopédie Méthodique, Dictionaire Universelle de la France.*) [See Charente, Angouleme.]

ANGRA, the capital of Terceira, one of the Azores, is on the south coast of the island, 38° 38′ N. lat., 27° 15′ W. long. Angra stands on an inlet, from which it derives its name; *angra* being a Portuguese word, signifying a small bay or inlet. Angra has always been the residence of the governor: it is also an episcopal town, and contains a cathedral, five parish churches, four monasteries and four convents, and an arsenal. It is fortified and defended by a castle. The old accounts describe Angra as well built, with broad and straight streets: from about 1533, it became a city. It is the residence of French, English, and Dutch consuls, and carries on some trade. The population is probably 15,000 or 16,000.

From the 15th March, 1830, till the recent events in Portugal, Angra was the residence of the regency which governed in the name of Donna Maria. During this time, its fortifications were strengthened. [See Terceira.]

ANGRAB, a branch of the river Tacazze, in Abyssinia.

ANGUILLA, or Snake Island, so called from its figure, is one of the Antilles, situated in 18° 8′ N. lat. and 63° 12 W. long.

This island was first settled by the English, in 1650, and has since continued in their possession. It is so low and flat, that it cannot be seen at a greater distance than four or five leagues. The soil is sandy and unproductive, and the place is deficient both in wood and water. It produces a little sugar and cotton, some tobacco and maize. The town is on the east side, near the north-east end; it is a small place, with very little commerce. The bay in which it stands is so shut in by reefs, as to be of little value as a harbour. Anguilla is very near the north side of the island of Saint Martin: the channel between the two, which in some parts is not more than four miles wide, affords good anchoring ground, in from seven to twenty fathoms water. Several small, low islets lie to the west of Anguilla; the largest of these, Dog Island, has a few inhabitants.

Anguilla is about twenty miles long, and six broad, and contains between 700 and 800 inhabitants. (Purdy's *Colombian Navigator*; Livingston's *Derrotero de las Antillas.*)

ANGULAR SECTIONS. [See Trisection, Trigonometry, (Theorem, de Moivre's).]

ANGULAR VELOCITY. [See Velocity.]

ANGUS. [See Forfarshire.]

ANHALT is an ancient principality in the north of Germany, the name of which is derived by some from 'Burg *an der Halde*' (castle on the steep), and by others, from 'Burg von Stein *ohne Holt*,' or castle of stone *without wood*. It lies between 51° 35′ and 52° 6′ of N. lat., and 11° 38′ and 12° 34′ of E. long.; it is inclosed almost on every side by the Prussian territories, viz., by Brandenburg on the north, Prussian Saxony on the east and south, the earldom of Mansfeld on the south-west, and the territories of Brunswick, and the Prussian circle of Magdeburg, on the north-west. It is watered by the Elbe, which flows through it from east to west, and by its tributaries, the Mulde and Saale: it produces corn, fruit, flax, hemp, tobacco, timber, silver, copper, iron and coals, rears a considerable quantity of cattle and sheep; and contains a population of 133,000 souls, of whom upwards of 130,000 are Protestants both prince and people having embraced the Reformation, and dissolved their monastic institutions, at so early a period of its propagation as between the years 1521 and 1532. Occupying an elongated tract, the largest portion of which lies on the right bank of the Elbe, and of which the greatest length is sixty miles, with a breadth varying from twelve to sixteen, this triple duchy contains nineteen towns, four villages with markets, and 249 other villages. Of the towns, four possess a population exceeding 5000 souls: viz., Dessau about 10,000; Zerbst 8000; Coethen 6500; and Bernburg 5800. The form of government is monarchical, and the sanction of its diets is required to the imposition of taxes, though the fundamental laws rest on the various ordinances promulgated by its princes. This principality, which is exceeded in fertility by no state in Germany, and forms a richly-cultivated plain, excepting where the acclivities of the Hartz Mountains project in the direction of *Bernburg*, was formerly a compact territory, and its rulers derived their origin from Ascanius, grandson of Japhet, the son of Noah, whose descendants are reputed to have migrated from the marshes of Ascania, in Bithynia, and, at last, to have settled among the forests of Germany. Hence, the princes of Anhalt to this day designate themselves 'Counts of Ascania.' Their ancestral seat was the stronghold of Anhalt, lying on the Hartz, which is said to have been built by Esico of Ballenstaedt, in 940. Its only remains, at the present day, are the crumbling fragments of some of its vaults, and a noble ash, rising from the midst of them, over which floats a red and white banner. There is an inscription to the following effect against its trunk:—'Among ruins and shady foliage,—in memory of a noble ancestry and their atchievements, prowess, and piety—with mourning, at the evanescence of earthly things,—and with joyfulness, at the imperishable existence of justice, virtue, faith, hope, and love,—posterity lifts up its regards to a higher sphere.' In fact, there is no family in Germany which has produced a

* At the peace of Bretigny A.D. 1360, four years after the battle of Poitiers.

greater number of brave and skilful warriors than the House of Anhalt; beginning with Bernhard, who declined the imperial sceptre in 1198, because he deemed himself 'too corpulent' for such a dignity; or from Wolfgang, one of the staunchest soldiers of the Reformation, who, on being reinstated in his possessions after he had been expelled from them by its opponents, exclaimed, 'Though old and poor, I would give a thousand florins could I but gibbet—a Pope,' down to Leopold, ('biter of bulls,' as he was christened by Prince Eugene, on account of his detestation of the papacy,) who led the Brandenburg troops to victory in the Low Countries and Italy, created the Prussian infantry, and invented the iron ramrod. He stood foremost of five field-marshals who distinguished themselves in the Prussian service in the first half of the last century. Upon the death of Joachim, which happened in 1586, (the inheritance of the several branches of the House of Anhalt having been united in his person,) his four sons divided the principality between them; and thence arose the respective sovereignties of *Dessau*, *Bernburg*, *Zerbst*, and *Coethen*.

The third of these became extinct in 1793, and was shared in equal portions among the three surviving branches. Their erection into duchies is of recent date; the prince of Bernburg having been created duke in 1806, and the princes of Dessau and Coethen having been raised to the same dignity in the following year. The three duchies possess, in conjunction with Oldenburg and Schwartzburg, a single vote in the minor assembly of the diet of the Germanic Confederation, but each of them a distinct vote in its plenary assemblies; they furnish a contingent of 1024 men to the army of the Confederation. Their united revenues (according to Malchus) amount to 149,600*l.*, and their public debt to 292,000. (See BERNBURG, COETHEN, and DESSAU.)

ANHOLT is a small Danish island, with a lighthouse, between the shores of Jutland in Denmark and Helmstad in Sweden, in the Kattegat, 56° 38′ N. lat., 11° 35′ E. long. It was taken by the English during the last war, and an ineffectual attempt to recapture it was made by the Danes in 1811. Its inhabitants do not exceed 100 in number, and subsist by catching seals and fish.—Also, the name of a small town on the old Yssel, in Westphalia, nine miles north-east of Nimeguen, with a handsome palace, the residence of the prince of Salm-Salm. Population 1700. By the treaty of Vienna, it was placed under the sovereignty of Prussia.

ANIELLO, TOMMASO, called by corruption Masaniello, a young fisherman, and a native of Amalfi, lived at Naples towards the middle of the seventeenth century, under the government of the Duke d'Arcos, Viceroy of Philip IV. of Spain. Naples was then suffering all the evils of delegated absolute power; its treasures went to Spain, its youth were sent to fill up the ranks of the Spanish army, and both were wasted in ruinous wars for the ambition and selfish views of a distant court. The people were oppressed with taxes, and suffered from the injustice and wanton tyranny of the officers and other agents of a foreign power. Besides the taxes which were laid upon every possible object of necessity or luxury, besides the sale of the crown lands as well as of the communal ones, and the adulteration of the currency, every new viceroy that came was instructed to demand a *gratuitous gift*, for the service of his master. The nobility assembled in their *sedili*, which were the only shadow remaining of the antient representation of the country, were applied to by the viceroy to vote the amount, and distribute the quota of the gift among the various districts and families. In this manner alone more than one hundred millions of ducats had been paid by Naples into the Spanish treasury from the reign of Charles V., that is to say, in the course of a century. In the year 1647, the Duke d'Arcos, in order to defray the expenses of a war against France, thought, as a last expedient, to levy a tax on fruit and vegetables, the common articles of food of the Neapolitan people. The edict which announced this fresh impost occasioned the greatest ferment, especially among the poor classes of inhabitants. An old priest of the name of Genoino, who had been in prison for some former offence, contributed to inflame the general discontent. Masaniello, who was then about twenty-five years of age, and who, by his humour and natural quickness, was a great favourite among the people of the *mercato*, the great market-place of Naples, spoke loud among his friends against the new tax. His wife had been arrested some time before at the gates of the city, as she was trying to smuggle in some flour, which, like everything else, was a taxed article. She was kept in prison several days, and her husband had to pay in order to obtain her release. Masaniello had, accordingly, as we might expect, conceived a violent hatred against the Spanish government.

Masaniello was at the head of a troop of young men who were preparing for the great festival of our Lady of the Carmel, by exhibiting sham combats, and a mock attack on a wooden castle. On the 7th of July, 1647, he and his juvenile troop were standing in the market-place, where, in consequence of the obnoxious tax, but few countrymen had come with the produce of their gardens; the people looked sullen and dissatisfied. A dispute arose between a countryman and a customer who had bought some figs as to which of the two was to bear the burden of the tax. The *eletto*, a municipal magistrate, acting as provost of the trade, being appealed to, decided against the countryman; upon which the latter, in a rage, upset the basket of figs on the pavement. A crowd soon collected round the man, who was cursing the tax and the tax-gatherers. Masaniello ran to the spot, crying out 'No taxes, no more taxes!' The cry was caught and repeated by a thousand voices. The *eletto* tried to speak to the multitude, but Masaniello threw a bunch of figs in his face, the rest fell upon him, and he and his attendants escaped with difficulty. Masaniello then addressed the people around him in a speech of coarse, hot, fiery eloquence; he described their common grievances and miseries, and pointed out the necessity of putting a stop to the oppression and avarice of their rulers. 'The Neapolitan people,' said he, 'must pay no more taxes!' The people cried out, 'Let Masaniello be our chief!' The crowd now set itself in motion, with Masaniello at their head; it rolled onward, increasing its numbers at every step; their rage fell first on the toll-houses and booths of the tax-collectors, which were burnt, and next on the houses and palaces of those who had farmed the taxes, or otherwise supported the obnoxious system. Armed with such weapons as they could procure from the gunsmiths' shops and others, they proceeded to the viceroy's palace, forced their way in spite of the guards, and Masaniello and others of his companions having reached the viceroy's presence, peremptorily demanded the abolition of all taxes. The viceroy assented to this; but the tumult increasing, he tried to escape, was personally ill-treated, and at last contrived, by throwing money among the rioters, to withdraw himself into the Castel Nuovo. The palaces were emptied of their furniture, which was carried into the midst of the square and there burnt by Masaniello's directions. Masaniello was now saluted by acclamation as 'Captain-general of the Neapolitan people,' and a platform was raised for him in the square, where he sat in judgment in his fisherman's attire, holding a naked sword in his hand. Thence he issued his orders, and his will was law. The citizens in general, besides the populace, obeyed him, a sort of commonwealth was organised, and the men were armed and distributed into regiments. The few Spanish and German troops of the viceroy were defeated, and obliged to defend themselves within the castles. The viceroy in this extremity proposed Cardinal Filomarino, the archbishop of Naples, who was a man of abilities, and withal popular, to act as mediator between him and the people. Articles were drawn up under Masaniello's direction, by which all imposts upon articles of consumption were abolished, and the privileges granted by Charles V. restored, besides an amnesty to all concerned in the insurrection. It was agreed that these were to receive the viceroy's signature, and an early day was fixed for the purpose. The cardinal, accompanied by Masaniello, dressed in splendid attire and mounted upon a fine charger, proceeded to the Castle Nuovo, followed by an innumerable multitude. The viceroy received Masaniello with every mark of deference, and the conditions were examined and accepted. As Masaniello loitered within the castle, the populace outside grew impatient and tumultuous, when the chief of the people appeared at a balcony, and by a sign of his hand silenced them immediately: at another sign, all the bells tolled and the people shouted *Vivas!* and again, as he placed his finger across his lips, they all became mute. The viceroy being now convinced of the astonishing power of this man, the negotiation was soon concluded, after which the Duke d'Arcos put a gold chain round Masaniello's neck and saluted him as Duke of St. George. Masaniello returned in triumph to his humble dwelling, and peace was momentarily restored.

But Masaniello's mind gave signs of fatal decay: his sudden and giddy elevation, the multiplicity of questions that were referred to him, his total inexperience of business, the heat of the season, his want of sleep,—all helped to derange his intellects. He had already complained of a sensation 'like that of boiling lead in his head;' he became suspicious, and was in continual dread of traitors, especially after the attempt made by a troop of banditti who had mixed with the people to shoot him on his tribunal in the market-place. The wretches were of course put to summary death, but the fears of Masaniello continued, and he ordered every man, even ecclesiastics, to leave their cloaks and long robes, and appear in short clothes in the streets. Meantime the chief of the people was administering justice from a low window of his house, with a loaded blunderbuss in his hand, and his door surrounded by guards. He showed himself capricious, absurd, and cruel, though cruelty does not appear to have been a vice natural to his character. He began to lose his credit with the multitude; the rebel government besides required money; and, as the only expedient, taxes upon eatables were resorted to again from sheer necessity. Masaniello evidently had no fixed or regular plan; his only idea was to remove the taxes and to humble the nobility, but he had no notion of setting aside the sovereignty of the King of Spain. In his hatred against the Neapolitan nobility, he devoted to destruction sixty palaces, only twenty-four of which, however, were burnt. He pronounced sentences of death with a frightful volubility. His lazzaroni were animated with similar feelings: they carried boat-hooks in their hands, which they said were for the purpose of pulling the gentlemen from their horses. Masaniello at times felt his growing weakness; he talked of abdicating his power and returning to his fishing-nets; but he had gone already too far. Some wretches, among whom was the old priest Genoino, who had been bribed to effect Masaniello's ruin, encouraged him in his mad career. On the 14th of July, being the eighth day of the insurrection, Masaniello took it into his head to proceed on a party of pleasure by sea to the Cape of Posilipo. The viceroy ordered his barge to be got ready for him; and Masaniello went, accompanied by musicians and followed by an immense multitude, who crowded to meet him at his landing. On arriving, he went to mass, it being Sunday, and then threw himself into the sea with his clothes on. After this he sat down to supper, at which he swallowed an enormous quantity of the strongest country wine, and was carried home in a state of intoxication. Next day he repaired, as usual, to his judgment-seat; the people still clung to him, and he was still all-powerful: but he behaved so outrageously on that day, that his friends became convinced of his insanity, and watched him during the night. On the morning of the 16th, being the great holyday of the Virgin, Masaniello escaped from the care of his friends and ran to the church del Carmine, where the archbishop was performing mass. At the end of the service, Masaniello ascended the pulpit, with a crucifix in his hand, and harangued the numerous audience. He earnestly and pathetically reminded them of what he had done for them, he tore his clothes, bared his breast, and showed his body, extenuated by watching and continual anxiety. He entreated them not to abandon him into the hands of his enemies. The people were affected by his address, but all at once poor Masaniello relapsed into one of his fits of aberration; he lost the thread of his discourse, and talked incoherently and wildly. The people began to laugh, and many left the church; Masaniello was taken down from the pulpit by the priests, the archbishop spoke to him kindly, and advised him to rest and calm himself awhile in the adjoining convent. He was taken into one of the cells, where a change of clothes was given him, and he lay down on a couch and rested a few minutes. He soon started up again, and stood looking out of a window in a melancholy mood upon the tranquil and beautiful bay of Naples, which lay stretched before him, thinking, perhaps, of the happier times when he used to glide on the waters in his fishing-boat, when all at once cries were heard in the corridor, calling him by name. Armed men appeared at the cell-door. Masaniello turned towards them: 'Here I am—do my people want me?' A discharge from their arquebuses was the wretches' answer; and Masaniello fell, exclaiming, 'Ungrateful traitors!' and expired. His head was cut off, fixed on a pole, and carried to the viceroy, the body dragged through the streets by a troop of boys, as he had himself foretold a few days before, and then thrown into a ditch. The revolt, however, was not yet quelled: the people, after appointing the Prince of Massa for their chief, whom they soon after murdered, chose Gennaro Annese, one of the villains who had plotted against Masaniello's life. This chief was soon superseded by the Duke of Guise, who came to try his fortune at Naples as the representative of the antient house of Anjou. [See GUISE.]

ANIMAL, the general name for living organized beings. This is not intended as a definition: we purposely abstain from attempting one. The classification of animals according to Cuvier's system, is given under the head of ANATOMY, COMPARATIVE.

ANIMAL MAGNETISM, a pretended agent of a peculiar nature, supposed to be capable, in some mysterious mode, of producing the most powerful effects on the human body. The rise and progress of animal magnetism affords one of the most striking examples on record of the influence, through the imagination, of the mind upon the body, and at the same time, one of the most curious cases of knavery and credulity in the history of the delusions of the human mind. A brief account of it may be not without amusement and instruction.

It was in the year 1734 that Mersburg in Swabia had the honour of giving birth to Anton Mesmer, the discoverer of animal magnetism. This celebrated man studied physic at Vienna, and took his degree of doctor of medicine in the university of that place, in the year 1776. On that occasion he published an inaugural thesis on the *Influence of the Planets on the Human Body*. It chanced that the professor of astronomy at Vienna, a Jesuit, named father Hehl, the friend of Mesmer, had great faith in the influence of the loadstone on human diseases, and had invented steel plates of a peculiar form which he impregnated with the virtues of the magnet, and applied to the cure of diseases 'with extraordinary success.' Mesmer, who had his own notion of the virtues of the magnet, availed himself of his friend's steel plates to employ the magnet according to his own peculiar views. Wonderful were the results; on the communication of which to father Hehl, his friend published an account of them; but in this account he attributed all the cures to the form of the plates, and spoke of Mesmer as a physician whom he had employed to make his experiments. Mesmer, expressing great indignation at this representation, accused Hehl of treachery, and of endeavouring to turn to his own advantage a discovery with which he had been entrusted in the confidence of friendship. Hereupon arose a violent controversy which ended in the total defeat of Mesmer, who, as if deriving fresh energy from discomfiture, went on working greater cures than before, and making incomparably greater noise about them. Nevertheless, being deserted by all men of science, who universally regarded him as an impostor, he was obliged to quit Vienna. After travelling some time in different parts of Germany and Switzerland, continuing every where to work wonderful cures, at last in a lucky hour he set out for Paris, where he arrived in the year 1778. His first care, on reaching this new and favourable theatre for his exploits, was to procure public apartments for the treatment of patients. And thither speedily flocked peer and peasant in such numbers that his apartments were crowded, and hundreds were ready to attest the wonderful cures wrought upon their own persons by the great magnetizer. In the general excitement, it would have been wonderful if no regular member of the medical faculty had become a convert. Mesmer found a highly useful one in a certain M. d'Eslon, who openly professed his conversion to the system, and who practised it with so much success that he is said to have received in fees from his patients no less a sum than 100,000*l*. The disciple in this proceeded further than was altogether satisfactory to the master. Mesmer complained bitterly that he was betrayed and ruined; and that the fruit of long study and incessant watchings, which it had been the labour of his life to bring to perfection, was snatched from him by another. He now applied to the government, and succeeded in obtaining the patronage of the queen. 'A château and its lands, where he might be enabled to continue his treatments at leisure and independently of persecution,' was what he asked. A life-rent of twenty thousand francs per annum, and in lieu of the château and its lands another sum of ten thousand francs a year to enable him to select a proper situation for the treatment of his patients, were actually offered him. The offer, however, was coupled with one condition, namely, that three persons named by the government should witness and report upon his proceedings. Nevertheless it was stipulated that, even if the report of these persons should prove unfavourable, the sums promised him should not be forfeited, while, if favourable, he might look for the most splendid rewards. But Mesmer was sharp-sighted enough to foresee that the report would not be favourable, and that the reward would not be continued if undeserved. He therefore suddenly quitted France and repaired to Spa. Thither he was followed by several patients of rank and fortune, who, on condition that he would communicate to them his doctrine and practice, bound themselves to find one hundred persons who would pay him each 2400 francs for his instructions. The sum actually raised by this subscription amounted to 340,000 francs, nearly equal to 14,000*l.* sterling. On receiving this sum, Mesmer returned to Paris and recommenced his public treatments. Meantime his disciples, who had paid thus liberally for his instructions, formed themselves into what they termed *Sociétés de l'Harmonie*, for the purpose of gratuitously propagating the doctrines of animal magnetism. But the master disputed their right to do this: the disciples, on the other hand, maintained that they had purchased the privilege; at all events they resolved to exercise it, and set about doing so; and now Mesmer, seeing no prospect of making any further personal advantage by his discovery, quietly put the money in his purse, quitted France, retired to his native place, and gave himself no further trouble about the success or the failure of animal magnetism.

Such is the history of the discoverer: of the discovery Mesmer himself gives the following account:—'Animal magnetism is a fluid universally diffused; it is the medium of a mutual influence between the heavenly bodies, the earth, and animated bodies; it is continuous, so as to leave no void; its subtilty admits of no comparison; it is capable of receiving, propagating, communicating all the impressions of motion; it is susceptible of flux and of reflux. The animal body experiences the effects of this agent; by insinuating itself into the substance of the nerves it affects them immediately. There are observed, particularly in the human body, properties analogous to those of the magnet; and in it are discerned poles equally different and opposite. The action and the virtues of animal magnetism may be communicated from one body to other bodies, animate and inanimate. This action takes place at a remote distance, without the aid of any intermediate body; it is increased, reflected by mirrors; communicated, propagated, augmented by sound; its virtues may be accumulated, concentrated, transported. Although this fluid is universal, all animal bodies are not equally susceptible of it; there are even some, though a very small number, which have properties so opposite, that their very presence destroys all the effects of this fluid on other bodies. Animal magnetism is capable of healing diseases of the nerves immediately, and others mediately. It perfects the action of medicines; it excites and directs salutary *crises* in such a manner, that the physician may render himself master of them; by its means he knows the state of health of each individual, and judges with certainty of the origin, the nature, and the progress of the most complicated diseases; he prevents their increase, and succeeds in healing them, without at any time exposing his patient to dangerous effects or troublesome consequences, whatever be the age, the temperament, and the sex. In animal magnetism nature presents a universal method of healing and preserving mankind.' (*Mémoire sur la Découverte du Magnétisme Animal*, par M. Mesmer, Paris, 1779, pp. 74, et seq. *Ibid. Avis au Lecteur*, p. 6.)

The mode of bringing the magnetised under the influence of the magnetic fluid was peculiar. In the middle of each room in which the persons to be treated were collected was placed a large circular vessel, made of oak-wood about a foot or a foot and a half in height: the interior of this vessel was filled with pounded glass, iron filings, and bottles containing magnetised water arranged symmetrically: the cover or upper part of the vessel was pierced with numerous holes, in which were placed polished iron rods of various lengths, bent and capable of being moved: this was called the *baquet* or magnetic tub. The patients were placed in successive rows around the *baquet*, and each had one of the rods of iron, the end of which he applied to the part of his body which was supposed to be the seat of his disease: a cord passed around their bodies united the patients to one another, and sometimes they formed a second chain by taking hold of each other's thumbs. A piano-forte was placed in the corner of the room, and various airs were played upon it, sometimes accompanied with the sound of the voice and song. The magnetiser held in his hand a polished and pointed rod of iron from ten to twelve inches long. The baquet was a reservoir of magnetic virtues; its interior arrangement was for the purpose of concentrating the magnetic fluid; the rods were the conductors for transmitting it. The cords around the bodies of the patients and the other chain of connection by the thumbs were for increasing the effects of the fluid by communication. The magnetizer had previously charged the piano-forte with magnetic fluid; the person playing on it was incessantly giving out more; the sound conducted it to the patients. The purpose of the music was to put the patients into a state of quiet; to give them agreeable sensations, and thus to dispose them to receive the magnetic action. The purpose of the magnetizer's rod was to concentrate to a point the fluid which issued from him, and thus to render it more powerful. The sick persons arranged in great numbers and in several rows around the *baquet*, thus receive the magnetism by all these means; by the iron rods which convey to them that of the *baquet*; by the cords wound round their bodies; by the connexion of the thumbs which communicate to them that of their neighbours; by the sound of the piano-forte or of an agreeable voice diffusing the magnetism in the air; by the finger and rod of the magnetizer moved before their faces, above or behind their heads, and on the diseased parts, always observing the direction of the poles; by the eye of the magnetizer; but above all by the application of his hands and the pressure of his fingers on the hypochondria and on the regions of the abdomen; an application often continued for a long time, sometimes for several hours. Meanwhile the patients in their different conditions present a varied picture. Some are calm, tranquil, and experience no effect; others cough, spit, feel slight pains, local or general heat, and have sweatings; others again are agitated or tormented with convulsions. These convulsions are remarkable in regard to the number affected with them and to their duration and force; and are characterized by the precipitous involuntary motions of all the limbs and of the whole body, by the constriction of the throat, by the leaping motions of the hypochondria and the epigastrum; by the dimness and wandering of the eyes; by piercing shrieks, tears, sobbing, and immoderate laughter. They are preceded or followed by a state of languor and reverie, a kind of depression, and even drowsiness. The smallest unforeseen noise occasions shudderings; even a change of tone and measure in the airs played on the piano-forte influences the patients, a quicker motion agitating them more and renewing the vivacity of their convulsions. Nothing is more astonishing than the spectacle of these convulsions; one who has not seen them can form no idea of them. The spectator is equally astonished at the profound repose of one part of the patients and the agitation of the rest; at the various accidents which are repeated and the sympathies which are established. Some patients devote their exclusive attention to each other, rushing towards one another, smiling, speaking with affection and mutually soothing their *crises*. All are under the power of the magnetizer; it matters not in what state of drowsiness they may be—his voice, a look, a gesture brings them out of it.

Such is the account of M. Bailly, who, together with Lavoisier, Franklin, and other distinguished men were appointed by the French government to examine into these splendid pretensions. These commissioners report—'That this pretended agent certainly is not common magnetism, for that, on examining the baquet, the grand reservoir of this wonderful fluid, by means of a needle and electrometer, not the slightest indication of the presence either of common magnetism or of electricity was afforded; that it is wholly inappreciable by any of the senses or by any mechanical or chemical process; that they tried it upon themselves and upon many others without being able to perceive anything; that on blindfolding those who seemed to be most susceptible to its influence, all its ordinary effects were produced when nothing was done to them but when they imagined they were magnetized, while none of its effects were produced when they were really magnetized, but imagined nothing was done; that, in like manner, when brought under a magnetized tree nothing happened if the subjects of the experiment thought they were at a distance from the tree, while they were immediately thrown into convulsions if they believed they were near the tree, although really at a distance from it; that, consequently, the effects actually produced were produced purely by the imagination; that these effects, though some cures might be wrought, were not without danger, since the convulsions excited were often violent and exceedingly apt to spread, especially among men feeble in body and weak in mind, and almost universally among women: and finally, that there were parts of the operation of magnetizing which might readily be turned to vicious purposes, and that immoral practices had already actually grown out of them.'

Notwithstanding such a report from men so well qualified to form a judgment, animal magnetism continued to flourish to such a degree, that Dr. Franklin, writing some time after this report had become public, and adverting to the proneness of mankind to credulity, states that Mesmer was at that time getting more money in the shape of fees than all the regular physicians in Paris put together. To this day the belief of it is *common*, if not general, in Holland, Germany, and other continental nations. The thing never took root in England. There was at one time some danger of it, but it was prevented by the skilful management of a physician of eminence. A man of the name of Perkins had invented a wonderfully convenient instrument for collecting, condensing, and applying animal magnetism, composed of a metallic substance, and called the metallic tractor. For this instrument he had obtained a patent, and its virtues he set forth in a work bearing the following title—*The Efficacy of Perkins's Patent Metallic Tractors in various Diseases of the Human Body and Animals; exemplified by two hundred and fifty cases from the first literary characters in Europe and America. With a Preliminary Discourse in Refutation of the Objections made by Interest and Prejudice to the Metallic Practice.* Dr. William Falconer, of Bath, having made tractors of wood so exactly resembling the patent tractors that it was impossible for the eye to distinguish between the one and the other, tried, in conjunction with Dr. Haygarth, the effect of these fictitious tractors on a large scale on patients in the Bath Hospital, and produced precisely the same effects with the fictitious as with the genuine, affording a demonstration that whatever effects were produced, were produced solely by the imagination. The publication of these cases put an end to the virtues of the metallic tractors in England; but we have little cause to congratulate ourselves on a greater exemption from credulity than our continental neighbours, as we all know by very recent instances. Nothing can prevent the success of such impostors, or put an end to the grievous evils they occasion, but the diffusion among the people of sound knowledge relative to the functions of the animal economy, the nature of diseases, and the mode in which remedies operate in their prevention and cure. See *Report of Benj. Franklin and other Commissioners charged by the King of France with the Examination of Animal Magnetism as now practised at Paris. Translated from the French, with an Historical Introduction*, 8vo. 1785; *The Foreign Review and Continental Miscellany*, No. IX. Nov. 1829, art. Animal Magnetism.

ANIMAL PHYSIOLOGY. [See PHYSIOLOGY.]

ANIMA'LCULES, in zoology, is the name which has been applied to small animals of various classes, which cannot be distinctly seen without the use of a microscope, as the minute radiate animal of the coral, the worms found in paste, vinegar, and vegetable infusions, or the smaller crustacea found in pools, as the *minoculi*. Some of these will be referred to under their proper heads; and a general notice of them will be found under INFUSORIA.

ANIO. [See TEVERONE.]

ANISE. [See PIMPERNELLA.]

ANJAR, a small district in the province of Cutch, in Hindostan. It came into possession of the English in 1816, and was again transferred to the Rao of Cutch in 1819, in consideration of an annual sum of 88,000 rupees to be paid to the East India Company out of the surplus revenues. The government of the district is still, however, virtually exercised by the Company, by means of a resident commissioner deputed from the presidency of Bombay.

The country of Anjar is extremely arid, and suffers much from scarcity of water, which cannot be obtained without sinking wells to a great depth; the soil also is so loose and sandy as to present obstacles to forming tanks. It has been the custom, that any person who sinks a well at his own expense, in an uncultivated tract, should become entitled to appropriate to his own use the whole of the land which he could irrigate by means of its water. The Bombay government having an interest in the prosperity of the cultivators, has caused several tanks to be constructed, in consequence of which tillage has been extended, and the district much improved. (*Report of the House of Commons on the affairs of India. Session* 1832; Hamilton's *East India Gazetteer*.)

ANJAR, the capital of the district of the same name, is in 23° 3′ N. lat., and 70° 11′ E. long.

The town is built on the side of a hill, about ten miles from the Gulf of Cutch. The fortifications are not strong, the walls being only six feet in thickness, and without a ditch. Anjar was besieged and taken in 1816 by a British corps. In 1819 it experienced the shock of an earthquake, by which nearly one-half of the houses were thrown down, and about 200 persons were killed. The population in the following year was estimated at 10,000 souls. (Hamilton's *East India Gazetteer*.)

ANJOU, one of the provinces or military governments into which France was divided before the revolution. It includes the present departments of Maine and Loire, with portions of several of the surrounding ones, especially of Sarthe, Mayenne, and Vienne. It comprehends a part of the valley of the Loire, by which river it is traversed in a direction from east to west, and it is watered also by the navigable rivers Loir and Sarthe, which, entering the country from the north-east, unite their streams and fall into the Mayenne, (also navigable,) which, rising in Normandy and crossing Maine, enters Anjou from the north. The Mayenne, having received the Sarthe and Loire, passes the town of Angers, and falls into the Loire. Another feeder of the Mayenne, the Oudon, which flows from the north-west, is also navigable; so that few countries are more favoured by nature with the means of water-conveyance than the part of Anjou north of the Loire. The part south of that great river has only one navigable stream, the Thouet, which falls into the Loire at Saumur, near the western extremity of the province.

Anjou is bounded on the north by Maine, on the east by Touraine, on the south by Poitou, and on the west by Bretagne. Its form is very irregular, especially in the east, where the district of Saumurois runs out to the south-east between Touraine and Poitou. Its capital was Angers, (see ANGERS,) and nearly the whole country was included in the bishoprick of which that town was the seat.

The climate of Anjou is healthy and mild; and the soil, which is agreeably diversified with hills and plains, is rich in various productions. (*Encyclopédie Methodique; Dict. Univ. de la France*, &c.)

ANJOU, the DUKES and COUNTS of, were amongst the earliest noblesse of France. Some chronicler gives the title to the famous Roland. Charles the Bald, it is said, bestowed the province upon one of his courtiers, from whom the first family of counts, in general named Fulke, were descended. One of this name was amongst the peers who raised Hugh Capet to the throne; and his descendants gallantly defended their county against the lords of Champaign, of Poitou, and of Normandy. A count of Anjou, also styled Fulke, joined the early crusades, and became King of Jerusalem. His son Geoffrey married (in 1127) Matilda, or Maud, daughter and heiress of king Henry I. of England, to the crown of which kingdom he gave as heir, Henry Plantagenet. Thus merged the first house of Anjou. Soon after the conquest of the province, by the French, it was bequeathed by Louis VIII., in 1226, to his fourth son, Charles of Anjou, who commenced the second house of Anjou, and raised it to a height of grandeur and renown no longer proportioned to the little province from which it derived its title. He espoused the daughter of Raymond Berenger, last count of Provence, and through her inherited that extensive fief, including the greater part of the south of France. He accompanied his brother St. Louis in his crusade to Egypt, when he was taken prisoner with that monarch, but soon afterwards ransomed. His government of Provence was marked by rapacity, overbearing cruelty, and contempt for the privileges of his subjects. Such, however, was the prince whom the pope selected for the throne of Naples, in opposition to Manfred and Conradin, the last of the Hohenstauffen. The pontiff was induced to select Charles as his champion by the report of his great wealth, and Charles was forced to accept by the ambition of his wife, who could not endure that she alone of all her sisters went without the title of queen. Charles of Anjou therefore made his preparations in men and money for the conquest of Naples, whilst his ally, the pope, opened to him his spiritual treasures, by preaching a crusade in favour of Charles against Manfred. The Angevin prince invaded Italy with an army of 30,000 men, in 1265, but that year, and almost another, passed away, before the French entered the kingdom of Naples. Manfred, with a force of Neapolitans, Saracens, and Arabians, took post not far from Beneventum in the plain of Grandella. The French accepted with alacrity the battle that was offered, and it was fought with the utmost gallantry on both sides. The Neapolitan nobles, however, at last deserted their prince, who instantly tearing his crest from his helmet to prevent his being recognised, rushed into the thickest of the fight and was slain. The victory declared for Charles, who made the most cruel use of it. Not only was no mercy shown in the field, but the neighbouring town of Beneventum was given up with its population to the brutal fury and avarice of the soldiers. After this consummation of his crusade, Charles of Anjou made his triumphant entry into Naples. His government bore the same stamp with his conquest; it was but a succession of oppression and rapine. The pope himself was obliged to reproach the new sovereign of his choice, with employing 'none but robbers and brigands, to whom adultery and rape were as familiar as spoliations.' Such is the pope's record of the effects of the crusade preached by himself.

Charles of Anjou, as head of the Guelphic party in Italy, was more than sovereign of Naples. Ramifications of the two great parties disputed Tuscany also, and Charles marched to chase his enemies, the Ghibelins, from that country. In this enterprise also he succeeded, and the Guelphs of Florence procured his nomination as political chief of that city for a period of ten years.

The Ghibelin party, however, rallied. They summoned young Conradin, nephew of Manfred, from Germany to support their cause, and the young prince advanced with a small but valiant army of Germans into Italy. Recalled to the south by the disaffection of the Neapolitans, Charles was able to offer no effectual resistance to Conradin, till the invader penetrated through the Abruzzi into the kingdom of Naples. 'Never was a country,' says Sismondi, 'more formed for a protracted war of defence by its mountains and its shepherd race, yet the fate of Naples has always been decided by battle in the plain.' (See ABRUZZO.) So was it now. The armies met at Tagliacozzo, 5000 on the German, and 3000 on the Neapolitan side. Of these 3000, Charles placed 800 in ambush, and with them waited till the Germans, having routed the rest, were scattered in the pursuit. He then quitted his ambush, and gained an easy victory. Conradin was taken in flight. Charles did not blush to bring his young competitor to a mock trial, when he was of course condemned to death. This infamous sentence pronounced against the rightful prince, so stirred up the indignation even of Charles's friends, that his very son-in-law, Robert of Flanders, struck the judge, whilst in the act of pronouncing the sentence, with a blow that proved mortal. But this did not prevent young Conradin, together with his friends, amongst whom was the duke of Austria, from being brought to execution, which took place in one of the great squares of Naples. Charles of Anjou was present with all his court. When Conradin laid down his head for the executioner, he flung his glove amongst the weeping crowd, thus challenging an avenger. The glove was picked up and carried to don Peter of Aragon, who had married the daughter of Manfred, and who, under this claim, became the competitor of the House of Anjou.

For the time, however, Charles reigned without opposition, not only over Naples, but over the whole of Italy. An interregnum of the pontificate left Rome at his disposal, whilst almost all the cities of Lombardy imitated Florence in acknowledging him as their protector, and in swearing allegiance to him. Had Charles limited his views to Italy, he might perhaps have formed an independent kingdom of that country, but his boundless ambition drew him off to other enterprises, and instead of founding his dominion in Italy, he began to aspire after that of the East. His superstition, too, seemed to lead him astray; he was guilty of great crimes, and he could not neglect an opportunity of washing them away. This induced him, when his brother St. Louis set out upon a new crusade, to assume the cross. Charles, however, arrived at Tunis only in time to take command of the army which the death of St. Louis had left without a leader, and having satisfied his vow, Charles hastened to make peace on condition that Tunis should be tributary to Sicily. Gain was ever his first object. In returning, he confiscated all the vessels of his allies, the Genoese, which had been wrecked in a storm, claiming them as waifs, although they had been damaged in the service of transporting his army.

But Charles's power, and his dream of founding an empire in Italy, were overthrown by the hands that had raised him. A pope was elected, (Gregory X.,) who had at heart the interest of Christianity, more than those of a party. Instead of crushing the Ghibelins, he sought to reconcile them to the Guelphs, and in order to remove the anarchy of Germany, he procured the nomination of an emperor in the person of Rodolph of Hapsburgh. This was raising a dangerous rival to Charles, who had hitherto ruled the north of Italy in the character of *Imperial Vicar*, conferred on him by the pope. But old, bereft of spirit, and conscious of the general hatred borne to him, Charles was unable to make any effectual resistance. After a year or two of vain manœuvres and complaints, he was obliged to give up the great object of his ambition, and cede to Rodolph the hold which he had usurped over the north of Italy.

A vacancy of the pontificate enabled Charles to rally his party, and recommence his machinations for empire. By surrounding the conclave which met at Viterbo, and getting rid of the cardinals obnoxious to him, he succeeded in procuring the nomination of a pope in his interests. From Martin IV., (so the pontiff was called,) he obtained the preaching of a new crusade, directed however, not against the north of Italy, but of Greece. It was by occupying the throne of Constantinople, that Charles hoped to rise superior to Rodolph, and make good eventually his imperial claim on Italy itself. Whilst engaged in preparations for this great project, Peter of Aragon was making similar preparations for attacking Sicily and Naples. Peter gave out that he, too, was proceeding upon a crusade, but the French and papal courts divined his intentions, and gave due warning to that of Naples.

Charles had raised an enemy amongst his own subjects more active and deadly than any kingly rival. This was John of Procida, a Sicilian noble, a partizan of the house of Hohenstauffen, and who had suffered confiscation and exile on that account. This man never rested, even during the years of Charles's greatest triumph and power, from exciting disaffection towards him. For this purpose he visited Sicily to form a league amongst the nobles and people of the island against the French. He undertook to negotiate with Genoa, with Venice, and with the pope himself, a league for that purpose. He journeyed even to Constantinople, represented to the emperor Palæologus the designs of Charles, and succeeded in procuring for the king of Aragon a subsidy from the Greek. Peter fitted out a powerful fleet. But an accident in the mean time set fire to that train of disaffection and rebellion which John of Procida had prepared in Sicily.

It was on Easter Monday, in the year 1282, a day consecrated in Catholic countries to a mixture of gaiety and religion, that the citizens of Palermo set out, according to custom to hear vespers at the church and village of Montereale, not far distant. The French soldiers and authorities unsuspectingly joined the procession, and, according to their custom, did not refrain from taking liberties with the young females whom they met or whom they accompanied. One Frenchman, more bold than the rest, under pretence of searching for arms, forbidden to a Sicilian, seized a young girl, and thrust his hand into her bosom. The betrothed of the girl instantly pierced the Frenchman with his own sword. This act was a signal; it corresponded so fully to the intentions and feelings of all present, that the cry of 'Death to the French' ran from mouth to mouth. The deed accompanied the word, and every Frenchman in the procession was assassinated, whilst the vesper bell was still sounding. Excited by blood, the assassins rushed back to Palermo to complete their massacre Not a Frenchman, save one, escaped: all, to the number of 4000, were butchered; and even Sicilian women, who had married Frenchmen, suffered the same fate, in order that the progeny of the hated strangers might be eradicated from the island.

This massacre, notorious under the name of the *Sicilian Vespers*, was of course the signal of revolt. John of Procida hastened to Peter of Aragon, who after some delay landed in Sicily, and assumed the title of its monarch. His admiral, Roger de Loria, sailed for Messina, to which place Charles had laid siege, and experienced no difficulty in capturing Charles's fleet, and defeating all his projects of vengeance. The Angevin prince, in despair, acknowledged these disasters as the just judgment of Providence, and only prayed that his inevitable ruin might not at least be precipitate. His anger against his competitor was not the less outrageous. Despairing or impatient of the tedious method of warfare, Charles challenged Peter of Aragon to single combat; and Peter, whose object was to gain time, accepted the challenge. Bordeaux was fixed on as the place of combat, which was to take place between the monarchs in person, each supported by a hundred knights; and it was solemnly agreed on, that Sicily was to be the prize of the victor. On the day appointed, the 15th of May, 1283, Charles of Anjou appeared at the head of a hundred knights, whilst his brother king Philip the Hardy of France, approached with an army. Peter, however, demurred. He complained of the presence of a French army, of the insecurity of the place of rendezvous, not guaranteed, as was agreed on, by Edward of England. The king of Aragon, therefore, either did not make his appearance, or appeared but for a moment to make his protest, and instantly retreated to Spain. Thus the challenge of Charles served, as might have been expected, to delay, rather than hasten, a decision.

Charles now set about collecting a new fleet and forces in Provence, to which the pope contributed, as usual, the promise of an indulgence, and the sacred name of a crusade. But whilst thus engaged in recruiting, the fleet which he already possessed at Naples was defeated by Roger de Loria, and his son, who commanded it, was taken prisoner. Charles hastened to repair this fresh disaster; but in vain. The vigour of his character, as well as of his cause, was gone; and whilst endeavouring to muster ships and form a junction between his fleets, Charles of Anjou died at Foggia in the kingdom of Naples, at the age of seventy-five years, in the early part of 1285. Villani, the Florentine historian, has sketched his character minutely, calling him 'sage, severe, and magnanimous, much dreaded, more famed than any prince for royal dignity, of few words, but great activity, sleeping little, laughing never, and taking no pleasure in mimes or poets, or courtesans.' Charles of Anjou had, in fact, many great qualities; and no prince certainly had ever greater opportunities. Had he made the most of them, he might perhaps have founded an empire in Italy. His reign, however, not only destroyed his own hopes of such an achievement, but that of his countrymen ever after. Henceforth the hatred borne to the French by the Italians was greater than the hate borne by them to the Germans, who have ever since preserved, with the exception of a few intervals, their predominance in the peninsula.

The posterity of Charles of Anjou continued, notwithstanding, to fill for a time the thrones of Naples and also that of Hungary. It is rather as monarchs of these countries, than as counts of Anjou, that their history is to be read or written, since of course they had become utter strangers to this province, and to France itself.

In consideration of this, king John of France reunited Anjou to the crown, giving it soon after in appanage to his son, Louis, who thus commenced the third house of Anjou. The county was elevated into a duchy, by an ordinance of John, in 1360, and Louis is thus the first of the ducal house. He was born in 1339, was taken prisoner with his father at the battle of Poictiers, and remained long in England. Wearied at length with captivity, he fled ftom that country, and refused to return, notwithstanding all the persuasions of John, who entreated him to keep his parole and return. After the death of king John, the duke of Anjou was entrusted with many commands by his brother Charles V., in all of which he displayed rapacity and cruelty. The title of Anjou seemed contagious in conveying these qualities. Still Charles at his death appointed Louis regent of the kingdom, who made use of his power to further his own personal interests. Instead of consulting the prosperity of France, the regent sought to amass wealth for the purpose of afterwards conquering the kingdom of Naples, to which Jeanne, the heiress of the last house of Anjou, had given him a title by adoption. The pope, as usual, seconded the attempt of the French prince, and Louis was accordingly crowned king of Sicily and Jerusalem at Avignon in 1382. He then led his armies to the conquest of Naples, but they perished, as Louis did himself, by disease, in 1384.

His son, Louis II., duke of Anjou, was also crowned king of Sicily by the pope. Three times he essayed to render himself master of Naples, and on one occasion he defeated his rival, Ladislas, in battle. But all his efforts, united to the papal support, were unable to lessen the repugnance of the southern Italians to the French. Far from conquering Naples, he was unable to defend Anjou from the English, who continually ravaged it. He died in 1417.

Louis III., son of the last duke, attacked Naples, in 1420, with some success, but was beaten off by his competitor, Alphonso of Aragon. In 1423, he renewed the attempt, aided by the duke of Milan. The armies of this prince brought Louis in triumph to Naples, but while he was victorious in Italy, Alphonso was ravaging Provence. Louis, however, still persisted in prosecuting his conquest; he laid siege to Tarentum, but died soon after at Cosenza, in 1434.

He was succeeded, not so much in his kingdom as in his claim, by his brother René, surnamed the Good king René, who not only failed in recovering the Italian empire of his family, but was dispossessed of Anjou itself by Louis XI. [See Rene'.]

From the days of Louis XI. the title of Anjou lay dormant, whilst the sovereigns of France themselves prosecuted their claims to Italian dominion, as heirs of the Angevin princes. With Francis I. these hopes expired. His successor, Henry II., bestowed the duchy of Anjou upon his third son, who bore this title when elevated to the throne of Poland. As this prince, however, succeeded to the throne of France, he is better known under the name of Henry III., to which the reader is referred. Henry's younger brother, at first duke of Alençon, succeeding to the title of Anjou, is best known under this latter name.

This prince was born in 1554, and was first christened Hercules, a name that was afterwards changed for that of Francis at confirmation. He had the small-pox very young, and was so 'horribly spoiled' that his mother, Catharine of Medicis, took a dislike to the boy, and sent him to Amboise to be educated apart from his brothers and from the court. Having once visited this place, Catharine spoke of him as 'a little *moricaud* (black), who had nothing but war and tempest in his head.' The young prince naturally returned his mother's aversion; and this may have been the original cause of his liberality of opinion, since it threw him into the confidence and friendship of Catharine's enemies, the Huguenots. The duke of Alençon, such was the title he first bore, was much attached to Coligny, their leader, who exerted himself to draw the young prince to his party. According to queen Margaret's Memoirs, the Huguenots had promised her brother Francis, at a very early epoch, to procure for him the principality of Flanders; and when the negotiations between Elizabeth and the first duke of Anjou were growing hopeless, Coligny mentioned to Walsingham, how much more desirable a husband for Elizabeth the duke of Alençon would prove than his brother. The idea was acted upon afterwards; and the duke of Montmorency in person proposed prince Francis as a husband to the queen of England. She wrote over for an account of his person, which was far from favourable. He was too young, it seems, and too small; and though Catharine de Medicis wrote to remind Elizabeth that heroes were of small stature, Du Guesclin himself, the famous constable, being no more than four feet high, and added in excuse of her son's youth, that his beard was beginning to grow, still Elizabeth showed herself more politic than amorous. The massacre of St. Bartholomew, which soon after occurred, created a distance and aversion between the two courts.

On that occasion the duke of Alençon maintained an honourable part. He so openly expressed his abhorrence of the event, and his admiration for Coligny, that he became as much an object of suspicion as any of the Huguenots. He was sent against La Rochelle, as to a school of martial orthodoxy, where he was nearly killed by a shot from the ramparts. Returning to court, he found himself more a captive than anything else, with Henry of Navarre, the future Henry IV., as his companion. Rivalry in their amours prevented the princes from agreeing perfectly, but the duke of Alençon not the less joined in all the projects and conspiracies of the Huguenots. They now conceived other hopes for him. Charles IX. was lingering under a mortal malady; his brother, the next heir, was in Poland. The Protestants hoped to elevate the duke of Alençon to the throne in his place; thus exchanging a monarch whom they detested, for one who favoured their own opinions.

A plot was accordingly formed. A Huguenot insurrection was to take place; the duke of Alençon, Henry of Navarre, and the prince of Condé were to fly secretly from court and join it. The queen herself was to be surprised at St. Germains. This promising scheme utterly failed through the perfidy and weakness of him whom it was designed chiefly to benefit. The duke of Alençon, instead of escaping at the appointed moment, hurried to his mother's feet, and confessed the whole affair. The consequence was the arrest of all who were implicated, and the failure of the enterprise. To render the act more base on the part of Alençon, the whole weight of vengeance fell upon his confidents and followers.

Whatever had been the motive which had influenced the duke of Alençon in betraying his friends, he reaped no advantage from the act. Catharine of Medicis took him and Henry of Navarre with her, when, after the death of Charles IX., she went to welcome Henry III. on his return from Poland. She presented them as prisoners to the new king, who at first seemed severe, but inflicted no punishment. The duke of Alençon continued at court, the rallying point of opposition to Henry; opposition, however, which was as trivial as the character of the two princes.

At length the duke of Alençon, becoming reconciled to the Huguenots, who once more trusted him, entered into more manly schemes of vengeance. He escaped from court in the autumn of 1575, and placed himself at the head of the armies raised by the reformers. The king had not the vigour requisite to march against his brother; and he knew, perhaps, that under such a chief his enemies were not much to be dreaded. Instead of an army, Catharine surrounded her person with a score of beauties, and proceeded to entice the mutinous princes to colloquies, where seduction was the means of negotiation. A truce first, and a peace afterwards, were the fruit of a year's show of hostility. The duke of Alençon secretly proposed to desert his party once more; but the Huguenot chiefs insisted upon favourable terms, which they obtained, in name at least, in 1576. The duke, on his part, obtained advantages equally favourable; letters patent being soon after issued, which gave him the duchies of Anjou, Tourraine, and Berri.

In this arrangement, however, the negotiators on both sides may be said truly 'to have reckoned without their host.' The Catholics, disgusted with the weakness of the monarch, formed the *league*, which soon rendered the articles of peace null. The Protestants on their side, little trusting to empty promises, kept armed and in an hostile posture, and Henry of Navarre was now rising amongst them to fill the place of honour that the now duke of Anjou had ceded. War, in consequence, recommenced, and, strange to say, the duke of Anjou himself appeared in command of a Catholic army.

In perusing the history of these times, it is difficult to say where most fickleness is found, whether in princes, or in the people. After having turned against the Huguenots, and even sacked one of their towns, the duke of Anjou was still trusted by them, and when overtures were made to him by the malcontents of the Low Countries, several of the leading Protestants forsook Henry of Navarre for the banner of the duke of Anjou. Sully himself was of this number. Henry was afflicted by this desertion, but remarked, that Anjou had 'so little courage, so little address, and so false a heart, that he would soon throw away all the advantages that fortune placed at his command.'

Catharine of Medicis and Henry III., reconciled to their son and brother, now laboured to procure for the duke of Anjou those very prizes that Coligny had before sought to give him—the sovereignty of Flanders, and the hand of queen Elizabeth. When the States asked for French aid, every facility and support was given by the king towards the raising of an army for his brother; at the head of this the duke of Anjou marched against don John of Austria. He had at first some success, but not being so well received by the Flemings as he expected, his career of conquest was suspended. In pursuance of the other part of his scheme, he had deputed to Elizabeth his envoy, Simier. The French manners and gallantry of this personage quite won the English queen, who threw off much of her habitual prudery, and began to entertain serious thoughts of marrying Anjou. She made him a present of a considerable sum of money, and went so far that articles of marriage were drawn up. Fortune seemed on all sides to favour the duke.

He was elected sovereign of the Netherlands in 1581, and took possession of Cambray in spite of the prince of Parma. Thus, crowned with honour, the duke hastened over to England to terminate in person his suit with the queen. Nothing could be more brilliant or warm than his reception. When he stooped to kiss the hand of Elizabeth, she substituted the English custom of offering the mouth. Agreements of the closest alliance were concluded, and in token of her affection she gave him a ring, which she placed upon his hand in public. In the midst of all this graciousness, however, clouds began to arise. Leicester and other counsellors were jealous and averse; the people of London grew clamorous in their dislike of a popish prince, a dislike much increased by the conduct of the French, which was turbulent and licentious. One of them drew his dagger and pursued a foe into the private cabinet of the queen; and nearer acquaintance enabled both Elizabeth and the English to form a true judgment of their proffered allies. The queen at length hesitated. The habitual caution of her character got the better of her temporary whim; and at the end of three sleepless nights she sent for her suitor in order to put an end to his hopes by demands that amounted to a refusal. She wanted Calais, she could not tolerate his religion, and not satisfied with her own arguments, she called in Hatton to repeat them to the prince. The duke naturally railed at the inconstancy of women, especially of the English, and was about to depart instantly; but Elizabeth did all to soften his disappointment and her own. She detained him for months, feasted, and promised, and avoided him; beguiling both him and, perhaps, herself with hopes of a union which her prudence could never permit.

At length the duke of Anjou took his departure from England to govern the Netherlands. Bred up at the French court, however, he had no idea of a sovereign whose authority was to be shackled in any way, either by the institutions of a country, or even by his own most solemn oaths. The son of Catharine of Medicis was not to be thus restrained. The duke of Anjou appeared to assume the sovereignty of the Netherlands with the determination to usurp despotic authority, and trample on the citizens as well as the family of Orange.

Unaccustomed to the free display of popular and personal independence, he mistook the rival influence of the prince of Orange, and of the citizens in the several towns, for insults to his dignity and treason to his rights. Instead of making use of such means to overcome them, as were allowed and might have succeeded with the Flemings, he formed a conspiracy similar to those which disgraced the annals of France at that epoch. He proposed, in fact, to seize the Flemish fortresses by means of his soldiers, and thus to bridle the turbulence of an independent people. But he mistook the character of the people. The Flemish citizens mastered his soldiers everywhere; the people of Antwerp especially made a successful resistance, and not only Anjou himself, but the French were expelled by the united force, and amidst the general execrations of the country. It was thus that another prince of Anjou had caused his countrymen first to be detested, and then driven from Italy. The name is linked with the chief political failing and chief disasters of the nation.

From this hour the duke of Anjou sunk into insignificance. He was too low in fortune and in character to mingle, or to have influence in any party, or in any struggle. He expired soon after, in 1584, at Château Thierry, bequeathing to his royal brother his creditors, 'whose substance and tears and suffering,' they being chiefly his own servants, 'he dragged with him to the grave.' Such were the words of his testament. His brother Henry, in lieu of paying the 300,000 crowns, to which his debts amounted, preferred expending 200,000 on a pompous funeral.

ANJOUAN. [See ANZOUAN.]

ANKER, a measure of wine and spirits, particularly of the latter, formerly in use, containing 10 old wine gallons, or 8¼ imperial gallons, that is, 2310·62 cubic inches. This measure is also in use in various parts of Europe, and the comparison between the ankers of different places is in the table underneath. A full account of the other measures connected with it may be found in Kelly's *Cambist*.

Place.	Anker in old wine gallons.	Anker in imperial gallons.
Amsterdam . . .	10·250	8·542
Berlin	9·894	8·245
Copenhagen . . .	9·950	8·292

Place.	Anker in old wine gallons.	Anker in imperial gallons.
Danzig	9·900	8·250
Hamburg	9·563	7·969
Oldenburg	10·988	9·157
Pernau	10·233	8·528
Revel	11·172	9·310
Riga	10·333	8·611
Russia	9·738	8·115
Rotterdam	9·998	8·332
Rostock	9·562	7·968
Stettin	13·700	11·417
Sweden	10·372	8·643

ANKARSTROEM (JOHN JAMES), a Swede, born in 1759, of a family then recently ennobled. He was placed in the king's guards as ensign, but left the service when only twenty-four years of age, having obtained the honorary or brevet rank of captain in the army; he then retired to his patrimonial estate in the country. He seems to have been early dissatisfied with Gustavus III. on account of the change that king had effected in the constitution of the country. At the Diet of 1772, Gustavus curtailed the power of the senate, or high nobility, who were till then possessed of an almost unlimited authority, and he was in this attempt supported by the other three orders, especially by the citizens and the peasants, who were tired of the irresponsible oligarchy of the senators; but the king having thus wrested the power from the nobles, took it to himself, and ruled almost absolutely. This caused as much dissatisfaction among the popular estates as his former measures had caused among the high nobility. (See GUSTAVUS III.) Ankarstroem, who did not himself belong to the high nobility, seems to have sympathised more in his political discontent with the popular orders against the absolute power attained by the king. He was accused of having spoken against the king before an assembly of peasants, and although the charge could not be proved against him, he was confined first in the castle of Wisby, in the island of Gothland, and afterwards transferred to other fortresses: he was, however, at last released. Ankarstroem was present at Stockholm in 1789, when the king, after suppressing the senate and arresting the most refractory members of the nobility, came in person to their Chamber, which he had previously surrounded with his soldiers in order to force them to assent to his innovations. Ankarstroem spoke with great vehemence, even in the king's presence, against the violation of the constitution, and his speech made a considerable impression on the assembly. The execution of colonel Hœstko, an officer of the army of Finland, who had opposed the king's orders and refused to act on the offensive against Russia, on the ground that the war had not been sanctioned by the estates of the kingdom, seems to have filled the measure of Ankarstroem's resentment against Gustavus. It appears that it was then that he first thought of murdering the king, without being connected with any other conspirators; but falling in afterwards with several disaffected nobles, among others counts Horn and Ribbing, he communicated to them his purpose, and they encouraged him in his determination. They first tried to seize the king at Gefla, where he had convoked the Diet for 1792, but being thwarted in their design, they at last determined to strike the blow at a masked-ball where the king was to be present, on the 16th March, 1792. Count Horn agreed that he should point out the king among the crowd to Ankarstroem. Gustavus received an anonymous note warning him not to go to the ball, but he disregarded the advice, and went in a domino dress. As he was pacing down the hall, leaning on count Ersen's arm, Horn, followed by Ankarstroem, accosted the king, saying, "Good day, fair mask." At these words, which were the signal agreed upon, Ankarstroem fired a pistol loaded with two balls, and dangerously wounded the king in the thigh. He was not then recognized, and went out of the hall unmolested. After the assembly had dispersed, a pistol and a dagger were found on the floor. The armourer whose name was on them, deposed that he had lately sold them to Ankarstroem, who was then arrested in his house; on his first examination he was subjected to the torture, but he was afterwards tried before the ordinary tribunals. He acknowledged his crime, but denied having any accomplices. He, however, confessed that several persons knew of his determination. He was condemned to be publicly whipped with rods for three successive days, and then to be beheaded after having his right hand cut off. The king had expired a few days after receiving the wound. Ankarstroem went to the scaffold with resignation; he was then only thirty-three years of age. Many other persons were arrested and tried; two of them destroyed themselves, but none were executed. Counts Horn and Ribbing, and colonel Lilientholm, were banished for life. The report of Ankarstroem's trial was published at Stockholm

ANKLAM, a strong town of Hither Pomerania, in Prussia, lying on the river Peene, twenty miles south-east of Greifswald. Its port enables it to carry on a brisk intercourse with other countries, and it possesses considerable manufactures of woollens, linens, leather, and tobacco. By the census of 1831, its population appears to have amounted to 6286.

Anklam is the capital also of a circle of the same name in the government of Stettin, which circle contains 22,600 inhabitants.

ANNA BOLEYN. [See BOLEYN.]

ANNA COMNE'NA, the daughter of Alexius Comnenus I., emperor of Constantinople, born Dec. 1, 1083, best known as the author of the *Alexiad*, a work written in Greek, containing the history of her father's life. She was the favourite child of Alexius, and her talents were sedulously cultivated by an education comprehending the study of eloquence, poetry, mathematics, natural science, and the philosophy of Plato and Aristotle (see her preface to the *Alexiad*); and the voice of loyal admiration soon pronounced that her acquirements surpassed those of her most skilful masters. She married Nicephorus Bryennius, a man of high birth, and of high literary attainments. Presuming on parental partiality, she solicited Alexius to name her husband for his successor, to the exclusion of her brothers, John and Isaac; and in this attempt she was assisted, if not mainly prompted, by her mother, the empress Irene. Pressed on this subject, the dying emperor uttered some allusion to the vanities of the world, which drew from Irene the unfeeling speech, 'You die, as you have lived, a hypocrite.' Alexius died Aug. 15, 1118, and John Comnenus, the lawful heir, possessed himself of the royal signet, and became master of the palace, and of the empire. Disappointed ambition drove Anna to conspire against her brother's life. All was prepared, but fear or remorse induced Bryennius to absent himself at the moment of action; and in her passionate disappointment the princess exclaimed, that 'nature had mistaken the two sexes, and endowed Bryennius with the soul of a woman. On the discovery of the meditated treason, the life and fortune of Anna became justly forfeited. Her life was spared by the clemency of John, the best and greatest of the Comnenian princes; but her palace and treasures were confiscated, and bestowed upon a friend of the emperor who proved how well he deserved favour, by declining the gift, and interceding for the criminal. The guilty princess escaped with no further punishment than a forced retirement from the world, and exclusion from the splendour and intrigues of a court. Thus thrown on herself, she relieved the heaviness of her solitary hours by composing the *Alexiad*, a history of her father's life and reign in fifteen books, from 1069, twelve years before he ascended the throne, to his death in 1118. She completed it in 1148, and died in the same year. The *Alexiad* is distinguished by an air of filial piety both as regards the person and the fame of Alexius. Aware that she was exposed to the suspicion of partiality, she professes to have compared her own impressions, drawn from the intimacy of relationship, with all that had been said and written by the most competent judges. She describes herself as having lived in melancholy solitude for the last thirty years, without hope, and without fear, forgotten by the world and forgetful of it, and declares truth to be more dear to her than even her father's memory. But the internal evidence afforded by the style does not confirm these high pretensions. The book is overloaded by rhetorical display, and by the affectation and misplaced obtrusion of science. Individuality of character is lost in indiscriminate panegyric, and the likeness is rendered suspicious by the barefaced flattery of the portrait. The most curious and important part of Anna's history, as of her father's reign, is that which relates to the first crusade. It is often at variance with the Latin authorities, and on no point more so than on the character of Alexius. The comparison of these conflicting statements, with due allowance for the prejudices of each party, affords some chance of approximating to the truth

The Alexiad forms a part of the collection of Byzantine historians. The first complete edition of it was published at Paris, 1651, by the Jesuit, Poussines, with a Latin translation and glossary. It has been translated into French by the president Cousin. A series of valuable notes on it, by the learned Du Fresne, will be found at the end of the *Historiæ* of John Cinnamus, containing an account of the reigns of John and Manuel Comnenus. There is a German translation of the *Alexiad*, in the historical collection of F. Schiller, Jena, 1790.

ANNA IWANOWNA, empress of Russia, was the second daughter of the czar Iwan or John I., the elder brother of Peter the Great, and for some time his associate on the throne. She was born on the 8th of February, (O.S.,) 1694. In 1710 she was married to Frederic William, duke of Courland, who died in 1711. On the death of the emperor, Peter II., on the 29th of January, 1730, without issue, it was pretended by the Dolgorouckis, who for some time had been the ruling favourites of the late monarch, that he had left a will appointing their sister, the princess Catherine Dolgoroucki, to whom he had been betrothed, his successor. The project of raising that lady to the throne, however, miscarried, in consequence, it is said, of a want of union among the heads of the powerful family by whom it had been contrived. The duchess dowager of Courland was elected by the council of state, the senate, and the principal military officers then at Moscow, who assembled in the Kremlin immediately after the emperor's death for the purpose of determining who should wear the crown. The object of the persons who composed this meeting unquestionably was to reduce the government of Russia to a limited monarchy, or rather, perhaps, to an aristocratical form. They did not, however, take their measures with either the good management or the boldness requisite for so great an undertaking. For the present they deemed it necessary to name a successor to the late emperor, and the duchess Anna was unanimously fixed upon, being, it is believed, indebted for this preference to her residence at so great a distance from the capital as would give the projectors of the revolution time to strengthen themselves in their position before she could make her appearance. Her elder sister, the duchess of Mecklenburgh, who was then in Moscow, was passed over on the pretence that she had forfeited her claim to the throne of Russia by having married a foreigner. The princess Elizabeth also, the daughter of Peter the Great, who afterwards became empress, was in the palace; but although her surgeon, on hearing of the death of the emperor, ran immediately to her chamber, and pressed her to present herself to the people and assert her title to the crown, she could not be prevailed upon to leave the room.

The Empress Anna, however, was not simply called upon to assume the vacant throne. Seven articles or conditions were attached to the invitation that was sent to her, to which she was required to give her consent before being permitted to reign. These conditions went to subject the crown entirely to the power of the nobility; and it was possibly calculated by their authors that Anna would at once reject them. To take her by surprise, all those present at the meeting were forbidden, under pain of death, to reveal to any one what had been done. One individual, however, the count Jagouzinski, defeated this scheme by sending a courier to the duchess, who, in spite of the guards placed on the road, contrived to reach Mittau, where she was, just in time to make her acquainted with what had taken place before the deputies from the council of state arrived. The advice sent by Jagouzinski was, that she should unhesitatingly promise whatever was asked of her, and leave the rest to him. She followed this counsel, and immediately set out for Moscow.

She arrived in the capital on the 20th of February. For a few days she dissembled her designs. But on the 8th of March, having previously made all the necessary arrangements to secure success, she assembled the council of state and the senate in the palace, at all the avenues of which her guards had been stationed with their pieces loaded, and displaying before them the papers which she had signed, declared her promises annuiled as having been fraudulently obtained, and announced herself empress and autocrat of all the Russias, with the full authority and prerogatives which her ancestors had enjoyed. The revolutionary party, struck with surprise and consternation, acquiesced without an attempt at resistance; while by the people generally the intelligence of what had taken place was received with tumultuous rejoicings. Thus terminated the last of the only two attempts to limit the royal power which are recorded in the history of Russia; the former, which was equally unsuccessful, being that which was made in 1613, on the election of the czar Michael Federowitz, the founder of the reigning house. The banishment of the Dolgorouckis, the dismissal of the council of state and the nomination of another, and the remodelling of the army, quickly followed these events. In January, 1732, the empress left Moscow, and took up her residence at Petersburg.

One of the first acts of the new reign, after these domestic matters had been arranged, was to enter into a treaty with Denmark, with which power Russia had been in a state of hostility since the time of Peter the Great. Another treaty was also soon after made with Persia, by which several of the conquests of Peter the Great, which had been found only sources of expense to Russia, were restored to that power. About the same time an embassy arrived at Petersburg from China, being the first which had ever been sent from that country to any European court.

This peaceful policy, however, was soon interrupted. On the 11th of February, 1733, Augustus II. king of Poland died suddenly at Warsaw, and the three powers of France, Austria, and Russia, were immediately embroiled in a contest respecting the succession to the vacant throne. France supported Stanislaus Lescinski, who had formerly been king, but had been deprived of his crown by the result of the great battle of Pultowa, in 1709; and the two other powers joined to bring about the nomination of the elector of Saxony, the son of the late sovereign, afterwards Augustus III. Before the end of the year Russia had marched a body of 20,000 troops into Poland; and on the 22d of February, 1734, the count Lacy, who commanded them, sat down before Danzig, which held out for Stanislaus. field-marshal Munich soon after arrived and took the command; under whose conduct, notwithstanding all the efforts of the French to raise the siege, the town was forced to surrender on the 30th of June. Count Lacy was the following year sent into Germany to assist the emperor Charles VI. with a body of 10,000 men, who advanced as far as the Rhine, and were the first Russian troops which had ever been seen in the centre of Europe.

In the course of the same year an expedition was sent to the Crimea against the Tartars inhabiting the steppes between that peninsula and the Ukraine, who had long been in the habit of making incursions into the Russian territory. This led, in 1736, to hostilities with Turkey. The war was conducted by field-marshal Munich; and the principal operations of the first campaign were the capture of Perecop on the 1st of June, after a short attack, and of Azof on the 29th, after a siege of three months, by count Lacy. Various other places of less importance were also forced to surrender; and the Turks and Tartars were beaten wherever they showed themselves. The operations of the next season were on a larger scale. On the 13th of July the town of Ockzakow surrendered at discretion to the Russian troops after a bombardment of two days, the victors, however, being indebted for their speedy success to a fire which broke out in the town and threatened its destruction. A subsequent attempt of the Turks to recover the place was unsuccessful, after having cost them 20,000 men. In the course of this year also, Austria, in conformity with a treaty which had been concluded between the two powers, came to the aid of Russia in this new war. The operations of the emperor's troops, however, were as unfortunate as those of the Russian army were the reverse; and after the war had been continued in these circumstances for nearly two years longer, in the course of which time the most important event was the capture by marshal Munich of the town of Chockzim, on the 31st of August, 1739, Austria was compelled, on the 18th of September, in the same year, to conclude the treaty of Belgrade, by which she gave up Belgrade and Servia to Turkey; and in consequence Russia, whose troops had now passed the Pruth, was also a few weeks after obliged to make peace, and to restore to the Turks Ockzakow and all her other conquests, except Azof, the fortifications of which, however, it was stipulated should be destroyed. The year before the question of the Polish succession had been settled in favour of Augustus by the treaty of Vienna, concluded on the 18th of September.

The peace with Turkey was proclaimed at Petersburgh on the 26th of February, 1740. Towards the end of September the empress was taken ill, and although no apprehensions were entertained at first, the attack soon assumed a serious form. When she found herself in this state, she proceeded to arrange the succession; and on the 18th of October, the prince Iwan, the son of Anthony Ulrick, duke of Brunswick, and the grandson by his mother of the empress's elder sister Catherine, being then a child only three months old, was publicly declared grand duke of Russia, and successor to the throne. This matter having been settled, the empress died on the 28th of the same month.

The empress Anna had a considerable share of the ability which has long distinguished the imperial family of Russia. The manner in which she conducted herself on coming to the throne showed great decision of character, and the success with which the affairs of the empire were managed throughout her reign may be taken as a general proof of her superior talents and judgment. She was not, however, a very popular sovereign, owing principally to the many acts of oppression which were perpetrated in her name by her favourite Biron, as he called himself, his true name being *Bieren*, a minion whom she had raised from a low condition to be gentleman of the chamber in her court at Courland, and whom, having brought him with her to Russia, she eventually forced the nobility of Courland to elect as their duke. Biron was really the ruler of Russia during the whole of the reign of Anne. On her death-bed, she also appointed this person regent of the empire, till her successor should attain his eighteenth year; but her signature to the paper, by which this disposition was made, is said to have been obtained partly by fraud and partly by force. Biron did not long enjoy his dignity, having before the end of the year been seized by a body of conspirators, and soon after banished to Siberia. In one important respect, Anna did something to reform the gross habits of the Russian court, namely, by discountenancing and putting down as far as she could the drunkenness in which both men and women had been accustomed to indulge. Only one nobleman, prince Kourakin, it is said, had her permission to drink as much as he pleased. The empress also, although there was a great deal of deep play at court, never would herself play for money. Her favourite amusements were music and theatrical entertainments. It was in her reign, in 1736, that the first Italian opera was played at Petersburgh. In 1739, the famous palace of ice was built by her directions, on occasion of the marriage of prince Galitzin with a peasant girl, the newly-wedded pair, as a part of the frolic, being compelled to pass the night in one of the rooms, all the furniture of which, including the bed in which they slept, was of the same material with the building itself. A full and excellent account of this reign, and especially of the military events by which it was distinguished, has been given by the baron de Manstein in his *Memoirs of Russia from* 1727 *to* 1744. An English translation of this work from the baron's manuscript was published in 1770, under the superintendence of David Hume.

ANNABERG, a town in the Erzgebirg (ore-mountain district) of the kingdom of Saxony, 2800 feet above the level of the sea, containing 5500 inhabitants. It has considerable manufactures of cotton-lace, bobbinet, and ribbons, and trades in silver, tin, cobalt, and marble, which it receives from the neighbouring mines and works. Annaberg has a handsome church, orphan asylum, and high school. It is about thirty-six miles south-west of Dresden.

ANNAGOONDEY. [See BISNAGHUR.]

ANNAH, a town on the right bank of the Euphrates, about 34° 15′ N. lat., 41° 50′ E. long., where the river makes a small bend to the north-east. Opposite the town is a line of cultivated islands. The town consists of a long, narrow, winding street, on the bank of the river, and at the base of the hills which here line the Euphrates. This narrow strip is occupied by the town, and has numerous date groves, which overhang the clay buildings. The town contains about sixteen mills, some for irrigating the grounds and others for grinding wheat. Annah contains the remains of four antient castles, one of which is on the largest island; there are two mosques, and a beautiful minaret, eighty feet high. There is a manufactory of coarse cloth for Arab cloaks; much wool is prepared, and some cotton. The number of houses is about 1800. On the left, or west bank, the hills rise abruptly, and are without wood: the boat-passage is along this bank as far as the last and largest of the islands, opposite to which the modern town terminates, and the remains of old Annah, or the Anatho of Isidore, commence, covering the island and extending eastward for two miles farther along the left bank. Nitre is procured at Annah, or near it; and Tavernier says, that chalk is dug in many places. Annah has apparently always been a town of some importance from its position in the desert, and serves as a resting-place between Bagdad and Aleppo, and between Bosrah and Aleppo.

From Annah to Aleppo is a journey, at the ordinary rate of travelling, of about 106 hours, or 15 or 16 days; from Annah to Bagdad, across the desert of Mesopotamia, 5½ days. (*Itinerary* of Isidorus Characenus, in Hudson's *Minor Greek Geogs.*; Captain Chesney's *Report on the Euphrates*; *London Geog. Journ.*, vol. iii.)

ANNALS, in Latin *Annales*, is derived from 'annus,' a year. Cicero, in his second book, On an Orator (*De Oratore*, chap. xiii.,) informs us, that from the commencement of the Roman state down to the time of Publius Mucius, it was the custom for the Pontifex Maximus, or high priest, annually to commit to writing the transactions of the past year, and to exhibit the account publicly on a tablet (*in albo*) at his house, where it might be read by the people. Mucius was Pontifex Maximus in the beginning of the seventh century from the foundation of Rome. These are the registers, Cicero adds, which we now call the *Annales Maximi*, the great annals. It is probable that these annals are the same which are frequently referred to by Livy under the title of the *Commentarii Pontificum*, and by Dionysius under that of the ἱέραι δέλτοι, or *Sacred Tablets*. Cicero, both in the passage just quoted, and in another in his first book On Laws, (*De Legibus*,) speaks of them as being extremely brief and meagre documents. It may, however, be inferred from what he says, that parts of them at least were still in existence in his time, and some might be of considerable antiquity. Livy only says that *most* of the contents of the Pontiffs' Commentaries were lost at the burning of the city after its capture by the Gauls. It is evident, however, that they were not in Livy's time to be found in a perfect state even from the date of that event (A.U. 363); for he is often in doubt as to the succession of magistrates in subsequent periods, which it is scarcely to be supposed he could have been, if a complete series of these annals had been preserved.

The word annals, however, was also used by the Romans in a general sense; and it has been much disputed among the critics what was the true distinction between annals and history. Cicero, in the passage in his work *De Oratore*, says, that the first narrators of public events, both among the Greeks and Romans, followed the same mode of writing with that in the *Annales Maximi*; which he further describes as consisting in a mere statement of facts briefly and without ornament. In his work *De Legibus* he characterizes history as something quite distinct from this, and of which there was as yet no example in the Latin language. It belongs, he says, to the highest class of oratorical composition (*opus oratorium maxime*).

This question has been considerably perplexed by the division which is commonly made of the historical works of Tacitus, into books of annals, and books called histories. As what are called his *Annals* are occupied with events which happened before he was born, while in his *History* he relates those of his own time, some critics have laid it down as the distinction between history and annals, that the former is a narration of what the writer has himself seen, or at least been contemporary with, and the latter of transactions which had preceded his own day. Aulus Gellius (*Noctes Atticæ*, v. 18) has stated this doctrine, which, after his manner, he has endeavoured to support by a reference to the etymology of the word history, from the Greek ἱστορέω, properly to inquire in person.

It must be evident that this is quite an unfounded notion. Without attempting to define at present what history properly is, which will be more conveniently done under the word itself, we may venture to assume, that it does not mean merely memoirs of events by contemporaries. And it is equally clear that there is nothing in the term annals which should make it exclusively applicable to accounts o past ages. We doubt if Tacitus himself ever gave the name of histories to any of his writings. If he gave either work a title at all, more probably he gave to both that of annals only. We rather think it will be found, that wherever he mentions his historical writings, he refers to them by this name. It is, at any rate, by no means certain that the common division either originated with him, or was even recognised by others of his own age.

Tacitus has himself in one passage intimated distinctly what he himself understood annals to be, as distinguished from history. In his *Annals* (commonly so called), lib. iv. cap. 71, he states his reason for not giving the continuation and conclusion of a particular narrative which he had commenced, to be simply the necessity under which he had laid himself by the form of composition he had adopted of relating events strictly in the order of time, and always finishing those of one year before entering upon those of another. The substance of his remark is, that 'the nature of his work required him to give each particular under the year in which it actually happened.' This, then, was what Tacitus conceived to be the task which he had undertaken as a writer of annals, 'to keep everything to its year.' Had he been writing a history (and in the instance quoted above, he insinuates he had the inclination, if not the ability, for once to act the historian), he would have considered himself at liberty to pursue the narrative he was engaged with to its close, not stopping until he had related the winding up of the whole. But remembering that he professed to be no more than an annalist, he restrains himself, and feels it to be his business to keep to the events of the year.

It is of no consequence that on some other occasions Tacitus may have deviated somewhat from the strict line which he thus lays down for himself—that he may have for a moment dropped the annalist and assumed the historian. If it should even be contended that his narrative does not in general exhibit a more slavish submission to the mere succession of years than others that have been dignified with the name of historians, that is still of no consequence. He may have satisfied himself with the more humble name of an annalist, when he had a right to the prouder one of an historian; or the other works referred to may be wrongly designated histories. It may be, for instance, that he himself is as much an historian in what are called his *Annals* as he is in what is called his *History*. In that case all we can say is, upon any interpretation of the words that may be advanced (except indeed the foolish one proposed by Aulus Gellius), that one of the titles is wrong.

In lib. iii. cap. 65 of his *Annals*, Tacitus tells us that it formed no part of the plan of his *Annals* to give at full length the sentiments and opinions of individuals, except they were *signally* characterized either by some honourable or disgraceful traits. In chap. 22 of the treatise on Oratory, attributed to Tacitus, the author expresses his opinion of the general character of the style of antient annals; and (*Annal.* xiii. 31) he carefully marks the distinction between events fit to be incorporated into annals and those which were only adapted to the Acta Diurna. [See ACTA DIURNA.]

The distinction we have stated between history-writing and annal-writing seems to be the one that has been commonly adopted. An account of events digested into so many successive years is usually entitled, not a history, but annals. The *Ecclesiastical Annals* of Baronius, and the *Annals of Scotland*, by Sir David Dalrymple (Lord Hailes), are well-known examples. In such works so completely is the succession of years considered to be the governing principle of the narrative, that that succession is sometimes preserved unbroken even when the events themselves would not have required that it should, the year being formally enumerated although there is nothing to be told under it. The year is at least always stated with equal formality whether there be many events or hardly any to be related as having happened in it. In this respect annals differ from a catalogue of events with their dates, as, for instance, the *Parian Chronicle*. The object of the latter is to intimate in what year certain events happened; of the former, what events happened in each year. The history of the Peloponnesian war by Thucydides has the character of annals. The events are arranged distinctly under each year, which is further divided into summers and winters. All political reflections are, for the most part, placed in the mouths of the various commanders on each side.

In the *Rheinisches Museum für Philologie*, &c., ii. jahrg. 2 heft. pp. 293, &c., there is a disquisition by Niebuhr on the distinction between History and Annals, in which he limits the latter nearly as has been done above. But the greater part of the paper is taken up in endeavouring to account for the definition given by Aulus Gellius, which is illustrated in a manner perhaps more fanciful and ingenious than convincing. There is a translation of it in the Sixth Number (for May, 1833) of the *Cambridge Philological Museum*.

It scarcely need be noticed that the term annals is popularly used in a very loose sense for a record of events in whatever form it may be written—as when Gray speaks of

> 'The short and simple annals of the poor.'

In the Romish Church a mass said for any person every day during a whole year was antiently called an annal; and sometimes the same word was applied to a mass said on a particular day of every year. (See Du Cange, *Glossarium ad Scriptores Mediæ et Infimæ Latinitatis.*)

ANNAGOONDEY. [See BISNAGHUR.]

ANNAMABOE, or ANNAMABOO, a town with a fort belonging to the English, on the Gold Coast in West Africa. It is ten miles east from Cape Coast Castle, and six miles east from the intervening Dutch fort of Nassau. In Mr. Bowdich's map (*Mission to Ashantee*) it is placed in 5° 5′ N. lat. and 5° 40′ W. long. The fort of Annamaboe is considered to be the strongest on the coast. It is of a quadrangular form, and is built on a low site close to the shore, the town surrounding it in the form of a crescent, and coming down to the sea on both sides of it. The direction of the coast here, it will be recollected, is nearly due east and west. The fort of Annamaboe is commanded by an officer who holds the next rank to the governor of Cape Coast Castle. According to Captain John Adams, in his *Remarks on the Country extending from Cape Palmas to the River Congo*, (8vo. 1823,) the population of the town then amounted only to 3000 or 4000 persons, most of whom, he says, had become opulent from the trade in gold and slaves, of which this fort had long been the chief mart. Some among them are described as acting by a sort of hereditary right in the capacity of gold-takers to all ships that arrive, that is, of functionaries whose business it is to manage all negotiations and bargains between the traders and the natives, and to be responsible for the quality of the gold, by a per centage on the amount of which their services are paid. Mr. Meredith, however, in his *Account of the Gold Coast*, (1812,) speaks of the place as having been formerly much more populous. In 1807, the inhabitants, who considered themselves as belonging by their position to the nation of the Fantees, took part with them against the Ashantees; in consequence of which both the town and fort were attacked by a vast body of the latter. About 10,000 of the inhabitants of Annamaboe, according to Mr. Meredith, being two-thirds of the whole, were slain on this occasion; and about 2000 more of them took refuge in the fort. The fort was held by a garrison of only about thirty men, and with difficulty withstood the assault of the immense host that encompassed it. A ledge of rocks extends in front of this town a few yards from the shore, which makes, Captain Adams says, a good breakwater.

ANNAMOOKA, island of. [See ROTTERDAM.]

ANNAN. [See COCHIN CHINA.]

ANNAN, a town in Scotland, in the former stewartry of Annandale, and in the county of Dumfries, 79 miles S. of Edinburgh, 15½ E. by S. of Dumfries, and 20½ W. by N. of Carlisle, 54° 59′ N. lat., 3° 14′ W. long. of Greenwich.

The town is situated on the river Annan, not far from where it falls into the Solway Frith. Over this river there was formerly a bridge of five arches, now replaced by a more modern one of three; the river is navigable for vessels of 250 to 300 tons, to within half a mile of the town, and for vessels of 60 tons up to the bridge, forming a good natural harbour. The road from Carlisle to Dumfries runs along the principal street, and there are small lanes or closes leading to the right and left, but the increased size of the place has caused some new streets to be built. The houses are, in general, good; some handsome buildings have been lately erected; and the town is paved, and has a neat and improving appearance. The manufactures carried on are of cotton and leather, but not to any great extent. The trade of the place is chiefly coasting trade: there being little foreign commerce, except the annual importation of a cargo or two of British American timber. The exports are grain, malt, potatoes, bacon, freestone, and Scotch timber: the imports, coal, lime, slate, timber, herrings, salt, colonial produce, and general merchandise from Liverpool and Whitehaven.[*] There is a freestone quay to enable vessels to take in or discharge their lading. There is a salmon fishery in the river, and the sea yields cod, turbot, and a variety of small fish. The rise of the tide on the coast is twenty-one feet.

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[*] See Appendix to Dr. Singer's *Agricultural Survey of Dumfriesshire* (*Edinb.* 1812), from which these particulars of the trade of Annan are chiefly taken.

The parish of Annan extends three miles along the coast, and eight miles inland, and had a population, in 1831, of 5033. It is intersected by the river. It yields a considerable quantity of potatoes, and contains quarries of freestone, limestone, and granite. The living is in the Presbytery of Annan and Synod of Dumfries, and in the patronage of the earl of Hopetoun. There is a flourishing academy lately established and endowed by the heritors and the burgh council.

Annan is thought to have been a Roman station. It was held in fief, with the whole territory of Annandale, by the ancestors of Robert Bruce. This family had here a stately castle, of which the ruins may still be seen. Upon the succession of the Bruces to the throne, Annan became a royal burgh, and it now returns a member in conjunction with Dumfries, Sanquhar, Kirkcudbright, and Lochmaben. (Sinclair's *Statistical Account of Scotland*, &c.)

ANNAN, a river of Scotland, which rises in the mountain range that runs along the northern boundary of Dumfriesshire. It has a general southern course in a long narrow valley, into which a number of small lateral valleys open. The Moffat Water, which is the chief branch of the river, rises in Loch Skene, at an elevation of 1300 feet. The whole course of the Annan is perhaps about forty miles.

ANNANDALE, the district on the banks of the above river, and the middle division of the county of Dumfries. It formed, under the designation of the stewartry of Annandale, one of the three jurisdictions into which the shire of Dumfries was once divided: the others were the shire of Nithsdale and the regality of Eskdale. A stewartry was a district governed by a sheriff or *steward* appointed by the king.

ANNA'POLIS, a town in Maryland, on the south-west bank of the Severn, near its outlet into Chesapeake Bay, 38° 57′ N. lat., 76° 27′ W. long., and twenty-five miles E.N.E. from Washington. Annapolis, though only an inconsiderable place with a population of about 2260, has been the seat of government for Maryland ever since 1699. The chief building is the state-house. The total tonnage of the district of Annapolis up to December 31, 1831, was only 3472, enrolled and licensed, of which 332 was employed in the coasting trade. (*Report on the Commerce and Navigation of the United States, 2d Congress, 22d Session.*)

ANNA'POLIS, a county of Nova Scotia, in the north-western part of the province, bordering on the Bay of Fundy. It contains six townships, and returns five members to the provincial parliament. The first European settlement in Nova Scotia was made by the French in this quarter, in the year 1604, at the place where the town of Annapolis Royal now stands. The French settlement was called Port Royal, and was twice taken by the English, once in 1614, and again in 1710, by expeditions fitted out from the colonies of New England. On this last occasion, the name of the town was changed to Annapolis, in honour of Queen Anne; at the same time the province, which had been called Acadia by the French, had its name changed to Nova Scotia. Under this name it was ceded to England by France in 1713, and has since continued in British possession.

The town of Annapolis remained the seat of the provincial government until 1750, when, upon the founding of Halifax by Governor Cornwallis, the government offices were transferred to the new town.

The town of Annapolis, situated in 44° 40′ N. lat., and 65° 37′ W. long., is built on a peninsula formed where the two rivers, Annapolis and Allen, discharge themselves into Annapolis Bay. Since the building of Halifax, it has lost much of its importance. The government buildings and fortifications have fallen to decay, and the trade of the place is much diminished.

The river Annapolis, which rises in the township of Cornwallis, King's County, runs parallel with the Bay of Fundy for about seventy miles, and falls into that bay through Digby's Gut, having previously expanded into a wide æstuary, called Annapolis Bay. The river is navigable for boats and small vessels through the greater part of its course. The population of the county, at the census taken in 1827, was 14,661. (Bouchette's *British Dominions in North America*; Monsom's *Letters from Nova Scotia*; M'Gregor's *British America*.)

ANNA'TES, from 'annus,' a year, a sum paid by the person presented to a church living, being the estimated value of the living for a whole year. It is the same thing that is otherwise called Primitiæ, or First Fruits, under the last of which terms the origin and history of the payment will be treated of. We may merely mention here that the amount of the annates in each cure was formerly regulated, in England, by a valuation of benefices, made by Walter, bishop of Norwich, under the direction of Pope Innocent IV. in the year 1254, in the reign of Henry III.—that a new valuation was made in 1292, in the reign of Edward I.—and a third in 1535, in the reign of Henry VIII., according to which last, commonly called the Liber Regis, or King's Book, the clergy are at present rated. These fines went formerly to the bishop or the pope; but on the king being recognized as head of the church at the Reformation, they were transferred to the crown. In the reign of queen Anne, however, they were given up in England to form a fund for the augmentation of poor livings. In Ireland, until the act of last session for the reform of the church, they were applied in the first instance to the repair of churches, and to the augmentation of poor livings after that object had been satisfied. By the late act the demand of first fruits is abolished in that country, and in lieu of it all ecclesiastical incomes above a certain amount are to pay yearly a tax regulated by their value. In Scotland, by an act passed by the parliament of that kingdom in 1672, the heirs or executors of every holder of a spiritual benefice are allowed the first half-year's stipend after that to which the incumbent was entitled at the time of his death; and this is called the Ann, or Annat. As it belongs to the executors of the clergyman, and not to himself, it can neither be assigned by him during his life, nor seized in payment of his debts. [See First Fruits.]

ANNE OF AUSTRIA, queen of Louis XIII. of France, and regent during the minority of Louis XIV., occupies a prominent place in French history. Daughter of Philip II. of Spain, she became the wife of the young Louis XIII. in the year 1615. It is worthy of remark, that the will and policy of the great princes who have governed France have always been counteracted by their queens or female favourites, thus exemplifying the witty saying of Louis XIV.'s granddaughter, that when queens reign, men govern, and that when kings reign, women eventually decide the course of events. The great Henry IV. of France had for his darling project the humbling of the House of Austria. His queen, Mary of Medicis, was averse to this policy, and no sooner was Henry in his grave than she took measures for a reconciliation with Spain, and sealed it by a double marriage, one of which was that of young Louis XIII. with Anne of Austria. The administration, however, fell in a few years into the hands of that master-spirit, cardinal Richelieu, who resumed Henry IV.'s views of humbling the pride and ambition of the House of Austria. In this he instantly found an enemy in Anne of Austria, and a struggle ensued betwixt them, in which Anne, though a queen, and a queen regnant, was compelled to yield, as long as he lived, to the great minister.

Had Anne been a woman of greater talents or more pleasing character, it might have been otherwise, but her Spanish education, her coldness and gravity of demeanour, which only covered frivolity of thought, alienated, rather than attracted Louis XIII. Upon this feeling Richelieu worked, and he was able at once to inspire Louis with dislike and with jealousy of his queen. Her natural attachment to her native country was another fault which the cardinal represented as a crime, and his whispers as to her betraying intelligence brought upon Anne the ignominy of having her person searched, and her papers seized by the jealous vigilance of officers commissioned by Louis himself. When it was generally known that the queen was in disgrace, and was the object of Richelieu's anger and mistrust, this was sufficient to rally around her the host of malcontent nobles, with Gaston, the king's brother, at their head; they were all jealous of the minister's ascendency, and fearful of his schemes, which menaced the remaining independence of the aristocracy. It does not appear that Anne was more privy to their plan of resistance and rebellion than she could have avoided being. But her name was unavoidably implicated, and the artful cardinal made of this a specious tale for the king's ear. He represented Anne as disgusted with her royal husband, and endeavouring to get rid of him through conspiracy, in order to place Gaston, duke of Orleans, in his stead. Louis XIII. fully believed this malicious tale, and compelled his queen to appear at the council-table, there to listen to this grave charge from the royal mouth. In such a situation, Anne's dignity of character came to her aid. She scorned to reply directly to such a charge, but observed contemptuously, 'That too little was to be gained by the change, to render such a design on her part probable.'

What gave most force to Richelieu's tale, was the court which the duke of Buckingham had openly paid to the queen of France. Madame de Motteville, Anne's attendant, who has written the memoir of her life, gives a circumstantial account of the arrogant passion of Buckingham, and confesses that the suit of the English duke pleased the queen's vanity, if it did not touch her heart. On one occasion, after having taken leave on his return to London, he hurried back from Amiens, found his way into the queen's sleeping-room, where it was usual for her to receive visits, flung himself on his knees by the bedside, and gave full vent to a passion that shocked the attendants, as passing beyond the bounds of etiquette. Anne gave but a gentle reprimand. Neglected by her husband (who partook not of her bed for twenty-three years after their marriage), Anne was not insensible to the chivalric attachment of a noble and a statesman, and might perhaps have given some handle to malicious insinuation. At all events, she remained without influence, alienated from the king's affections and council, till death took away monarch and minister, and left to Anne, as mother of the infant monarch, the undisputed reins of power.

There was then a change of policy similar to that which had taken place on the death of Henry IV. Mary of Medicis had counteracted and abandoned all his schemes for humbling Austria, by making peace with that rival power. Anne, of Austrian blood, now did the same, from hatred to Richelieu's memory, as much perhaps as from family affections. She did this with less abruptness, indeed, than Mary, having the good fortune and good sense to have and to choose for her minister a man bred in Richelieu's school, one who had learned his address, but who had never been endowed with his disinterestedness and high views. This was Mazarin. Anne's selection of such a man for minister is the greatest proof of her discernment. As a foreigner, he was completely dependent on the hand that raised him; and consequently there was less danger of his becoming ungrateful, as Richelieu had been to Mary of Medicis. For the same reason, he was unconnected with any powerful party, and the queen made full use of his abilities, without being in danger from his ambition.

Anne of Austria's policy in this choice, though perhaps the wisest, was still not the less fraught with danger. It alienated from her at once the party of the noblesse, which, crushed by Richelieu, had made common cause with Anne in her disgrace, and now raised its head to claim vengeance and spoil. Amongst them were even the queen's peculiar friends, the duke of Beaufort, who was a kind of favourite, and the duchess of Chevreuse, the bosom companion of Anne. Mazarin's advice compelled his mistress to resist the unreasonable demands of these, her former partizans; and the consequence was a general conspiracy against the queen and her minister. Beaufort was sent to prison, and madame de Chevreuse again exiled. Mazarin, like his predecessor, might have triumphed over the noblesse alone; but this class now called to its aid a new, and hitherto neglected body, that of the citizens, or burgess-class. These were easily inflamed against Mazarin as a foreigner, and as a financier, fertile in the invention of new taxes. In addition to this, the great offices of the judicature, which had become venal, had fallen into the hands of the middle or citizen-class, and the magistracy, being possessed of the power of sanctioning or resisting the royal edicts, made common cause with the citizens, and thus a powerful combination was raised against the authority of Anne. An attempt on her part to treat the magistrates as she had treated the duke of Beaufort, by imprisoning them, gave birth to a popular insurrection, which proved successful. The queen and court were for a time prisoners in the Palais Royal, and compelled to submit to the dictates of the mob. The Spanish pride of the queen was with difficulty induced to submit to necessity. She threatened at first to fling the heads of the captive magistrates to the mob, rather than deliver their persons, and her indignation at the time provoked a powerful enemy in the future cardinal de Retz. But she was compelled to smother both pride and anger. The people had their will. The court, however, took the first opportunity of escaping from Paris and recurring to arms. A civil war commenced between Anne, her minister, and their adherents on one side; and the noblesse, the citizens, and people of Paris on the other.

One might think that the advantage in such a quarrel must necessarily remain to the latter. But Anne and Mazarin's address, after many vicissitudes of fortune, came off triumphant. First they rallied a considerable portion of the army, and the king's name was to them a tower of strength, which enabled them to resist the formidable rebellion of the capital. The *Frondeurs* too, as the insurrectionists were playfully called, were not very earnest in their rebellion. There was no enthusiasm, no fanaticism. The resistance was rather the effect of momentary impatience and despite, which vented itself in epigrams more than in deadly missiles. The young noblesse considered the campaign as a frolic, and however the citizens and magistrates might wish to obtain a certain measure of political freedom, similar to that for which England had so lately struggled, it was evident that the nobles looked with no favour on such schemes, and would eventually concur to mar them. Seeing this, the magistracy determined to bring about an accommodation. It was no easy task. A suspension, or rather a cessation of hostilities, was produced by the retirement of Mazarin.

He returned, however, for Anne was but a cypher without her minister; and the war again broke out. The court had secured a defender in Turenne, who triumphed even over all the valour of the young noblesse, headed by the great Condé. The result of the rebellion, and of Anne of Austria's administration, was, that the nobles and middle classes, vanquished in the field, were never afterwards able to raise their heads, or to offer resistance to the royal power, up to the period of the great revolution. Louis XIV. is, in general, said to have founded absolute monarchy in France. But it was rather the blunders and the frivolity of those who idly espoused the cause of freedom during that monarch's minority which produced this effect. Anne of Austria's triumph was that of monarchy. She, or at least the events of her regency, contributed far more to it, than all the subsequent imperiousness of Louis XIV.; and hence the epoch of Anne's administration is one of the most important in French history.

Anne must have been of pleasing exterior, as not only the account of M. de Motteville, but her portrait in the Vienna gallery, testifies. That she was unchaste does not appear, notwithstanding all the accusations of her story-telling times. Though not a woman of talents, she was at least fortunate in her regency; above all, in her choice of Mazarin. Her influence over the fate and the court of France continued for a long time; her Spanish haughtiness, her love of ceremonial, and of all the pride of power, were impressed by education upon the mind of her son, Louis XIV., who bears the blame and the credit of much that was hers. Anne of Austria died at the age of sixty-four, in the year 1666.

ANNA. AVGVSTA.

ANNE, queen of England, the second daughter of James II. by his first wife Anne Hyde, was born at Twickenham on the 6th February, 1664. She was educated in the religion of the Church of England; and, in 1683, was married by the bishop of London to prince George, brother of Christian V., king of Denmark. At the revolution in 1688, Anne and her husband adhered to the dominant party of her brother-in-law William III.; and, by the act of settlement, the English crown, in default of issue to William and Mary, was guaranteed to her and her children. During the reign of William she appears to have lived in much discomfort, neglected by her sister, and treated with coldness by the king; and she sustained the heavier affliction of losing all her children in infancy, except one son, the duke of Gloucester, who died at twelve years of age, in 1699. This event, as well as the previous death of queen Mary, rendered an alteration in the act of settlement necessary; and the princess Sophia, dowager electress of Hanover, and her descendants being Protestants, were declared next heirs to the throne, in default of direct heirs to William and his sister-in-law Anne. [See SETTLEMENT, ACT OF.] The exiled king James II. died on the 16th November, 1701; and Louis XIV. of France having recognised the claims of James's son to the English throne, William III. commanded the return of his ambassador from France, and dismissed the French ambassador from England. Another cause of hostility between France and England had arisen in the recognition by Louis XIV. of the claim of his grandson, Philip of Anjou, to the crown of Spain. The PARTITION TREATIES between France, England, and Holland, in 1698 and 1700, had otherwise regulated the succession of Spain. the first treaty declaring Joseph Ferdinand, electoral prince of Bavaria, presumptive heir; and the second, upon the death of Joseph Ferdinand, declaring the archduke Charles presumptive heir. The will of Charles II. of Spain, who died November 1, 1700, by giving the crown to Philip of Anjou, had materially disturbed the balance of power in Europe established by the PEACE OF RYSWICK in 1697; and the recognition by France of this testamentary disposition, in violation of the partition treaties, united, in 1701, England, Holland, and other European powers, in the determination to resist an arrangement which seemed to bestow such a formidable preponderance upon the French monarchy. [See HAGUE, ALLIANCE OF.]

Under these circumstances, Anne ascended the throne, upon the death of William III., on the 8th March, 1702. The hostility between the whig and tory faction at home, which went on increasing in violence to the end of the reign of Anne, was in its commencement greatly mitigated by the united opinion of the country as to the justice and policy of the war with France and Spain. On the 4th May, within two months after Anne had succeeded to the throne, war was declared by England, the Empire, and Holland, against these powers. The general progress of this memorable war will be detailed under the head SUCCESSION, WAR OF. The extraordinary campaigns in the Low Countries and Bavaria, by which the military glory of England was raised higher than at any period since the days of Edward III., will be described in the life of MARLBOROUGH; the brilliant successes of the English arms in Spain under lord PETERBOROUGH will be found in the notice of that singular commander; and the naval exploits of this war, of which the most signal examples were the capture of GIBRALTAR and PORT MAHON, will be found in our accounts of those places; and in the biographies of the English admirals, LEAKE, ROOKE, SHOVEL, and STANHOPE.

The legislative union of Scotland and England, completed on the 27th July, 1706, was one of the most important events in the reign of Anne, of which the progress and consequences will be detailed in their proper place, SCOTLAND, UNION OF.

During the brilliant course of Marlborough's conquests, the spirit of political intrigue, which was perhaps never more fully developed than in the latter years of the reign of Anne, was stifled by the enthusiasm of the people. But as the war of the succession proceeded with few indications of its being brought to an end, the great commander of the English forces gradually lost his popularity, from the belief that his own avarice and ambition were the principal causes of the burdens which the war necessarily entailed upon the nation. A formidable party, too, had arisen, who asserted the supremacy of the church and the doctrine of the right divine of kings and the passive obedience of subjects—opinions which had expelled James II. from his kingdom, and had placed his childless daughter upon the throne. These opinions, however, were supposed to be indirectly encouraged by the queen, and were exceedingly popular amongst a passionate and unreasoning people. The impeachment of Dr. SACHEVEREL for preaching these opinions,—his mild punishment, which had the effect of a real acquittal,—and his subsequent triumphant progress through the kingdom, furnished an unerring presage of violent changes. In the elections of 1710 the tory supremacy was established. The duchess of MARLBOROUGH, to whose talents and decision of character the queen had long submitted, was thrust out by the new favourite, Mrs. MASHAM. The ministry of GODOLPHIN and SUNDERLAND was displaced by that of BOLINGBROKE and OXFORD. The command of the army was taken from Marlborough and bestowed upon the duke of ORMOND. During the progress of these convulsive changes, which must have been distracting enough to the quiet temper of Anne, she was deprived of the sympathy of her placable husband. Prince GEORGE OF DENMARK died on the 28th October, 1708.

The first act of the tory ministry was to enter upon arrangements to bring the war to a conclusion. In 1711 negotiations were entered into with France, amidst the protestations of the allies of Great Britain, and these negotiations, after various difficulties, were terminated by the memorable treaty of April 11, 1713. [See UTRECHT, PEACE OF.]

By the treaty of Utrecht the succession to the crown of Great Britain had been guaranteed to the House of Hanover. But a suspicion began soon to prevail that the queen and a portion of her government secretly favoured the pretensions of the son of James II. The minority in parliament attempted to carry several measures which would bring these supposed partialities to a test. The queen was compelled to invite the Electress of Hanover to England; and upon the death of that princess in June, 1714, to issue a proclamation offering a reward for the apprehension of her brother should he attempt to land in Great Britain or Ireland. It is affirmed by a writer in the *Biographie Universelle*, upon the authority of some secret memoirs, that the son of James II. at this juncture clandestinely visited England, and in an interview with his sister concerted measures for defeating the Hanoverian succession. The tory ministry was, however, shattered by the quarrels of Oxford and Bolingbroke; the whigs carried the nation along with them in their denunciation of the peace of Utrecht, which had left the country little besides a barren glory; and the dissatisfaction with the union of Scotland threatened to break out in open insurrection. The health of the queen gave way under these distractions. On the 20th July, 1714, she prorogued parliament for a month, and falling almost immediately after into a state of weakness and lethargy, died on the succeeding 12th of August. It is said that her last words were an expression of pity for her brother.

The reign of Anne has been called the Augustan age of English literature. It produced Addison, Arbuthnot, Congreve, Pope, Prior, Steele, and Swift, writers of a high degree of excellence in their particular walks, but scarcely to be compared with the great poets of the reign of Elizabeth, or with a few other illustrious names of a succeeding generation, such as Milton and Dryden.

ANNEALING. There are certain substances, more especially glass and some of the metals, which on sudden cooling after having been melted, acquire great brittleness, and in the case of glass, a disposition to fly to pieces by moderate changes of temperature, or slight external force. This is remedied by annealing, which, with respect to glass, consists in heating it, below the point at which it softens, in what are termed *annealing ovens*, the glass being gradually removed from the hotter to the cooler parts of the furnace. The brittleness of glass has been attributed to the disturbance, attendant upon the hasty cooling, in the regular arrangement of its particles. [See GLASS.]

The metals also suffer remarkable changes as to their hardness, toughness and brittleness; this is especially the case with iron after it has been converted into steel. The alteration of structure which they undergo is not thoroughly understood; it is, however, certain that some malleable metals which crystallize on cooling, are brittle in their crystalline state, and that this structure is altered, and they are rendered tough by heating and rolling. This is remarkably the case with zinc, which is incapable of extension under the hammer, except in a slight degree, without cracking; but when it has been passed through the rollers, at a moderate increase of temperature, it becomes almost as flexible and as tough as copper. This change must be derived from some alteration of structure, and fresh arrangement of the particles, which must be considered as owing to a process, if not identical with annealing, yet bearing a strong analogy to it. [See BRASS and STEEL.]

ANNECY, an episcopal city of Savoy, on the north bank of the Lake of Annecy, stands at the extremity of a beautiful plain surrounded by delightful eminences and lofty calcareous mountains, and at an elevation of 1456 E. feet (Saussure) above the level of the sea. It is 22 miles N.N.E. of Chambéry. Annecy is the principal seat of manufacturing industry in Savoy, and has between 5000 and 6000 inhabitants, with establishments for cotton-spinning, calico-printing, and a glass-house. Some iron-mines are worked in the neighbourhood.

The Lake of Annecy washes the edge of the town. Its greatest length is about nine miles and a quarter, and its average width three. The greatest depth is 196 E. feet. This lake discharges itself by several canals, said to be Roman work, all of which unite just beyond the town of Annecy in one stream, called the Thion, which empties itself into the Fier, a tributary to the Rhone.

ANNE'LIDA (Cuvier), an extensive division or class of animals, established by modern naturalists partly at the expense of Linnæus's heterogeneous class of worms (*vermes*). It was Baron Cuvier who first proposed to distinguish the annelida in 1802, chiefly on account of their blood being of a red colour, as in the leech, and circulating by means of a double system of complicated blood-vessels.

The name is derived from the Latin word *annulus*, a ring, because the animals arranged under this division always have their bodies formed of a great number of smaller rings, as in the earth-worm. Their external covering, or skin, is soft and pliable, and their bodies, having no bony skeleton, are soft, and in general more or less of a cylindrical form.

The annelida are for the most part oviparous, but the leeches and earth-worms deposit what are termed capsules, or membranous cocoons, containing many embryo young.

There is little variety in their mode of life. Some live in fresh and others in salt water; and others, like the hair-worm (*Gordius*), are amphibious. Some species construct tubes in the interior of stones, or in shells, which they perforate, or in madrepores. Some species again form calcareous cases, or cement around them various foreign substances, particularly sand. The sedentary species are timid, and when taken from their retreats can neither escape nor defend themselves. The *Errantia*, on the other hand, are frequently very nimble, and can defend themselves well by means of their bristles.

The researches of Baron Cuvier and M. Savigny did much to produce a clear arrangement of the animals under notice according to their physiological structure; and hence MM. Audouin and Milne Edwards, who have more recently investigated the structure of many species, have in part adopted the classification, slightly modified, of those naturalists. They make four divisions, groups, or orders, each differing in structure and in manners—the Errantia, the Tubicola, the Terricola, and the Suctoria.

The *Errantia* (*Nereidæ*, Savigny, *Dorsibranchia*, Cuvier) are, with few exceptions, essentially fitted for walking or swimming, and are rarely sedentary. They have in general a head distinct from the body, with antennæ and eyes. Their mouth is furnished with a protractile tube, more or less distinct, and in general with jaws.

The *Tubicola* (Cuvier) are essentially sedentary, and live almost uniformly in the interior of solid tubes, which their structure forbids them to quit. Their respiratory organs are usually observable on a certain number of the segments of their bodies, commonly at the anterior extremity. The feet are distinct, though short, and always armed with hooks as well as bristles. The head is not distinct, and they have no eyes, antennæ, nor jaws.

The *Terricola* always live in a hole or gallery in the ground, and are without feet, instead of which they have some short bristles to aid their movements. They have no distinct head, eyes, antennæ, or jaws. The mouth is always terminal, and sometimes furnished with tentacles.

The *Suctoria* differ from all the preceding in having neither feet nor bristles, and by being furnished at each extremity of the body with a prehensile cavity or sucker. They have no distinct head, but may almost always be observed to have eyes and jaws. They are chiefly parasites, and live at the expense of other animals.

ANNIBAL. [See HANNIBAL.]

ANNIUS of Viterbo, a well-known Dominican monk, who lived in the fifteenth century. His real name was Giovanni Nanni, but in conformity with the custom of the age he Latinized it, and dropped the first letter, in order to render it more completely classical. He was born at Viterbo, in 1432, and died in 1502. He entered early into the Dominican order, and became famous for his acquaintance with the Eastern as well as the Greek and Latin languages. His works are voluminous: the most remarkable is entitled *Antiquitatum Rariorum Volumina XVII., cum Commentariis Fr. Joannis Annii Viterbiensis*, in folio, Rome, 1498, several times reprinted. This collection professes to contain a number of historians of high antiquity, Berosus, Manetho, Myrsilus the Lesbian, Fabius Pictor, Marcus Cato, and others, whose works, hitherto unknown, he professed to have discovered at Mantua. That these pretended historians were forgeries, there can now be no doubt; whether Annius was deceived or the deceiver, whether he forged them himself, or suffered from credulity and want of penetration, is a matter on which authorities are divided, and which it is of little moment to discuss now. He published two other works which excited a great sensation from the circumstances of the times, and the recent capture of Constantinople, one entitled *Tractatus de Imperio Turcorum*, the other, *De Futuris Christianorum Triumphis in Turcos et Saracenos ad Xystum IV., et Omnes Principes Christianos*, being the substance of a set of sermons preached by him at Genoa on the Apocalypse. (*Biog. Universelle;* see also Bayle and Moreri.)

ANNIVE'RSARY, the yearly return of any remarkable day, called, in old English, by the expressive term year-day.

Anniversary days are festivals celebrated by the Romish church in honour of the saints, one or two of whom are assigned to every day in the year. The long catalogue of saints being unknown to the church of England, anniversary days are not generally made a matter of religious observance. Some few days, unconnected with religion, are however still noticed. The birth-day of the reigning monarch is very generally celebrated by holydays and rejoicings; the anniversary of the Gunpowder Plot has been rescued from oblivion by the love of school-boys for fire-works and the pageant of Guy Fawkes; and the oaken bough still preserves the remembrance of the restoration of the Stuarts.

Literary and scientific associations generally celebrate the anniversary of their original institution, and social parties are still held in domestic life on the birth-days of heads of families; with these exceptions, the observance of particular days has greatly declined in England.

ANNO. [See HANNO.]

ANNO BOM, the smallest and most southern of the four islands in the bight of Biafra, is about four miles long and two broad. It is mountainous, and rises abruptly from an unfathomable depth to the elevation of near 3000 feet; but with the exception of one precipitous mass, the heights are of a rounded form. The ascent to this peaked summit is very steep and dangerous, owing to the looseness of the numerous stones which cover the side of the slope, and are in a state of decomposition. At the foot of this height is a small shallow lake, about three-quarters of a mile round, with a bottom of stiff bluish clay: the water was found to be very sweet.

The regular winds are from the S.W.: less rain falls here than in the other islands of the bight; the rainy season is confined to April and May, and October and November. The precise character of the climate as to health seems still doubtful. This island is chiefly visited for supplies of sheep, goats, pigs, fish, cocoa-nuts, bananas, lemons, Seville oranges, &c. Fowls are scarce. There is plenty of water on the island, but the heavy surf on the shore makes it difficult to procure. The population is about 3000, who live chiefly in a large village near the north-east point of the island, off which is the only tolerably safe roadstead for shipping round it. The natives are quite harmless. Their houses, which are small, are rudely constructed of rough boards, grass, mud, and the foot-stalks of the cocoa-nut tree. This island was discovered by the Portuguese in 1473, but is now governed by a native of the island, who is totally independent of the Portuguese, but appears to have no great authority.

Anno Bom lies in 1° 24′ S. lat., and about 6° E. long.; but we are not able to state its longitude accurately. Cape Lopez is the nearest part of Africa to Anno Bom. (From *Memoir descriptive of Prince's Island and Anno Bom*, by the late Captain Boteler, R.N. *London Geog. Journal*, vol. ii.)

ANNONAY, a town in France near the northern extremity of the department of Ardèche, at the junction of two rivers, the Diaume (or Déom) and the Canche, whose united streams flow into the Rhone, from the right bank of which Annonay is only five or six miles distant. The town itself, which is neither large nor handsome, stands on the tongue of land between the two streams above-mentioned, by which it is separated from its suburbs. It is celebrated for its paper, which is considered the best in France; and it also has manufactories of cloths, silks, cotton, wax, and leather. It is the busiest town in the department, and its population has risen with great rapidity until it has surpassed that of any other place in Ardèche. In the *Encyclopédie Methodique*, (published in 1782,) it is called "petite ville," (a small town,) in the *Dictionaire Universelle de la France*, (1804,) the inhabitants are given at 3800; but the latest authorities (MM. Brun and Balbi) raise it to 8000. It is about thirty-four miles in a straight line north of Privas, capital of the department.

Annonay was the birth-place of Mongolfier the aëronaut, and of the Count Boissy d'Anglais; to both of whom monuments have been erected by their townsmen.

ANNUAL REGISTER. The earliest English publication which has any claim to be considered as an *Annual Register* is Edward Chamberlayne's *Angliæ Notitia, or the Present State of England*, which first appeared in 1668, and continued to be annually republished with the requisite alterations till the year 1703 inclusive. But this work, as its title indicates, presented merely an account of the country in its existing state, with lists of public functionaries, &c., and gave no register of occurrences. Our first history of the year, we believe, was that given in the *Political State of Europe*, which was begun in 1711 by Abel Boyer, a French refugee, and the author of the well-known *French and English Dictionary*. This publication was continued till the year 1739. Although this work appeared also in annual volumes, it was really published in monthly numbers. In 1716 was commenced the *Historical Register*, a quarterly publication, which in like manner was republished in volumes at the end of each year. The regular publication having taken up the history of public affairs only from the 9th of January, 1716, two volumes were printed together in 1724, containing an account of events from the last day of July, 1714, up to that date, being the first seventeen months of the reign of George I. With these introductory volumes, therefore, the Historical Register forms a chronicle of the affairs of this and other countries of Europe from the accession of the House of Hanover. The compilers, to use their own words, confine themselves to mere 'matters of fact, without making any descant thereon either of commendation or reprehension.' This work also, about the year 1737, began to appear in monthly numbers. The change was probably a dying effort, as the volume for 1738 was, we believe, the last that appeared. The Historical Register was printed and sold by G. Meere in the Old Bailey. The price, while it was published quarterly, was one shilling each part.

The first Annual Register, properly so called, which appeared in this country, was the well-known and valuable work which still continues to be published under that title. This work was projected by Robert Dodsley, the bookseller, in conjunction with Edmund Burke, who was already well-known in the literary circles of the metropolis as the author of the Essay on the *Sublime and Beautiful*, the *Vindication of Natural Society*, and other anonymous works. The first volume of Dodsley's Annual Register appeared in June, 1759, under the title of *The Annual Register, or A View of the History, Politics, and Literature of the Year* 1758, printed for R. and J. Dodsley, in Pall-Mall. In the Preface are enumerated the several points of novelty in respect of which the work is conceived to have an advantage over its predecessors; and of these the first-mentioned is that it is an annual, and not a monthly publication. Others are, that it takes up the history of the war in which the country was then engaged, from its commencement in 1755; that it contains a collection of state-papers, illustrative of the historical narrative; and that, by its miscellaneous department and its notices of new books, it unites the plans of the magazines and reviews. The history in this volume consists of seventy-six pages divided into thirteen chapters, the first seven of which, running to thirty-two pages, are occupied with the first three years of the war. Then follow in order the chronicle, extending to sixty-seven pages; the collection of state-papers; characters; extraordinary adventures, including an account of the sufferings of the persons confined in the Black Hole at Calcutta in June, 1756; literary and miscellaneous essays; poetry, including pieces by Akenside, William Whitehead, and the king of Prussia; and lastly, an account of remarkable books published in 1758, among which are Jortin's *Erasmus* and Walpole's *Royal and Noble Authors*. The volume consists of 496 pages in all, besides Preface, Contents, &c. This and several of the succeeding volumes were so popular that they quickly ran through five or six editions. There is no doubt that, for some years, the historical narrative was written by Burke, who also probably edited the publication and selected the rest of its contents. He appears to have been paid for his services at the rate of 100*l.* the volume. Mr. Prior, in his Life of Burke, has given engraved fac-similes of two receipts signed by him for two sums of 50*l.* paid to him by Dodsley for the Annual Register of 1761, the first dated on the 28th of March in that year, and the second on the 30th of March in the year following. This volume was not published, as appears by the preface, till a later period than usual in 1762. These receipts are in the possession of Mr. Upcott of the London Institution. Burke took a great interest in the conduct of the Annual Register almost as long as he lived; and Mr. Prior states that much of it was written from his dictation for about thirty years. Latterly it was written by a Mr. Ireland under his direction. It is generally believed that the work again received occasional contributions from Burke after the breaking out of the French revolution; and certainly some of the volumes belonging to that period are written with remarkable ability. To the departments above enumerated were afterwards added others of natural history, useful projects, and antiquities; together with lists of promotions, marriages, births, deaths, and patents; but some of these heads have been since discontinued. The difficulty of bringing out the work within six months of the close of the year appears to have been very early felt. In volume third the Chronicle has, for the first time, a different paging from the History, according to the plan which is still followed, having, as is stated in the preface, been put to press before the History was ready, in order to expedite the publication. The work, however, gradually fell into arrear, and at length, instead of some months, it was nearly as many years after the events had taken place till their history appeared. The publication was in this state about the year 1780. Great exertions, however, were soon after made by the conductors to recover their lost ground; on one occasion, two years, 1784 and 1785, were compressed into one volume, the 27th; and early in 1801 they had the satisfaction of publishing the volume for the year immediately preceding; thus closing the century with the work completed up to that date. Since then the publication has proceeded regularly at the rate of a volume each year. That last published, being the Annual Register for 1832, is the 74th of the series. Of the older volumes, several have been reprinted of late years in order to complete sets. An index to the work, from its commencement to the year 1780 inclusive, was published soon after the completion of the volume for that year, and has been several times reprinted; and in 1820 a second index appeared, comprehending the former, and embracing also all the additional volumes up to that for 1819 inclusive.

In 1781 was published the first volume of the *New Annual Register*, containing the history of the preceding year. It was projected and originally edited by Dr. Kippis; after whose death, in 1795, it was conducted by the Reverend Thomas Morgan, LL.D., the coadjutor of Dr. Aikin in the preparation of his *Biographical Dictionary*. Watt, in his *Bibliotheca Britannica*, states that this publication was at one time edited by the late Mr. John Mason Good; but we do not observe that this is mentioned in Dr. Olinthus Gregory's life of that gentleman. The New Annual Register was continued till 1825, but it never attained the reputation of its predecessor and rival.

The *Edinburgh Annual Register* was commenced in 1808, and was continued at least till 1825. We believe it is no longer published. Some of the earlier volumes of this work were written by Sir Walter Scott and Mr. Southey; and it was throughout conducted with great ability.

Other works of this description are the *Annual Asiatic Register*, begun in 1799; the *Baptist Annual Register*, first edited by the late Dr. John Rippon; the *Historical, Political, and Literary Register for* 1769, published in 1770; and the *Imperial and County Annual Register* for 1810, in 2 vols. 8vo. 1811. The two last mentioned seem to have been dropped after the first year.

A French work, in imitation of the English Annual Registers, was commenced at Paris in 1818, under the title of

Annuaire Historique Annuel; and there is also the *American Annual Register*, published at New York.

ANNUALS. By this name gardeners designate all plants which, if sown in the spring, will flower, perfect their seed, and perish in the course of the same season; if two seasons are generally requisite for this purpose, they then call plants biennials—but in fact they are both of the same nature: annuals, if sown in the autumn, become biennials; and the latter, if sown early in the spring, will go through every stage of life in the same year; the only difference between them is, that biennials are rather longer in completing the term of their existence than annuals are.

Physiologically considered, such plants belong to a much more extensive body of vegetables than is usually supposed. Plants may be said to consist of two kinds, those which perish after once producing their fruit, and those which continue to grow and produce fruit year after year. To the first of these classes belong not only annual and biennial herbs, but also many palms, the agave, and several other monocotyledonous trees.

The usual method of multiplying annuals is by their seed. It is, however, possible to dispense with this mode, and to perpetuate them by cuttings, care only being taken that the part used for a cutting is not in a flowering state; in this way the fugitive beauties of such plants as balsams and the like may be perpetuated. Even cucumber and melon plants may be renovated when in the last stage of decay by their young branches being cut off and made to put forth roots; and the different races of cabbages, the qualities of which can scarcely be preserved by the precarious plan of seed-saving, may be carried forward from year to year. (See *Gardener's Magazine*, vol. ix. p. 226.)

Gardeners distinguish annuals into two kinds, hardy and tender: the first comprehends all those which will grow if their seeds are sown at once in the open border; the last consist of such as require to be raised in artificial heat. The management of both these is so simple and well known that little requires to be said upon the subject: there are, however, two or three points that deserve to be particularly adverted to. The seeds of hardy annuals are apt to be destroyed by birds, or to be scorched up by a continuance of dry weather; both these accidents may be prevented by inverting over the patch in which they are sown a common flower-pot; this should be examined daily, and as soon as the plants are found to be making their appearance, it should be elevated a little by resting its rim on two or three pebbles, so as to admit air and light. After a little while the plants will be fully established, and the pots may be removed.

Two things only are to be observed in the management of tender annuals beyond the ordinary practice of every gardener. Firstly, they should not be raised in a very high temperature if they are afterwards to be planted in the open air; and secondly, the seedlings should never be transferred from the seed-pan at once to the open ground, but should always undergo the intermediate operation of being transferred into small pots. Very great care should be taken not to give them much heat, especially at night, and they should be exposed as much as possible to air after they have once rooted in their pots: unless this is attended to, they become weak and what is called drawn up—or what might be called starved—for this well-known appearance arises from the plants not having been able to consume the necessary quantity of carbonic acid gas, which is, as is well known, the matter on which they feed. Plants can only feed in free air and bright sunlight: if therefore they are prevented from doing this they are starved; for it must not be supposed that a copious supply of stimulating manure will supply the place of light and air; on the contrary, it will but augment the mischief that results from their deficiency.

ANNUITY (in Law) consists in the payment of a certain sum of money, yearly calculated, and charged upon the person or personal estate of the individual from whom it is due; for if it is charged upon his real estate, it is not an annuity but a rent. [See RENT.] A sum of money payable occasionally does not constitute an annuity; the time of payment must recur regularly at certain stated periods, but it is not necessary that these periods should be at the interval of a year; an annuity may be made payable quarterly, or half-yearly, (as is very generally the case,) or at any other aliquot portion of a year; and it may even be made payable once in two, three, twenty, or any other number of years.

Under the Roman law, annuities were chiefly such as were created by will, constituting a charge upon the heir in favour of the legatee. (See *Digest.* lib. xxxiii. tit. 1. Domat's *Civil Law*, 2d Part, book iv., tit. 2, sec. 1.) In the middle ages they were frequently given to professional men as a species of retainer; and in more modern times they have been very much resorted to as a means of borrowing money. When the person who borrows undertakes, instead of interest, to pay an annuity, he is styled the *grantor;* the person who lends, being by the agreement entitled to receive the payments, is called the *grantee* of the annuity. This practice seems to have been introduced on the Continent with the revival of commerce, at a time when the advantages of borrowing were already felt, but the taking of interest was still strictly forbidden. In the fifteenth century contracts of this kind were decided by the popes to be lawful, and were recognized as such in France, even though every species of interest upon money borrowed was deemed usurious. (Domat's *Civil Law*, 1st Part, book i., tit. 6.) The commercial states of Italy early availed themselves of this mode of raising money, and their example has since been followed in the national debts of other countries. [See NATIONAL DEBT. FUNDS. STOCKS.]

An annuity may be created either for a term of years, for the life or lives of any persons named, or in perpetuity; and in the latter case, though, as in all others, the annuity as to its security is personal only, yet it may be so granted as to descend in the same manner as real property; and hence an annuity is reckoned among the species of incorporeal hereditaments.

A perpetual annuity, granted in consideration of a sum of money advanced, differs from interest in this, that the grantee has no right to demand back his principal, but must be content to receive the annuity which he has purchased, as long as it shall please the other party to continue it:—but the annuity is in its nature redeemable at the option of the grantor,—who is thus at liberty to discharge himself from any further payments by returning the money which he has borrowed. It may, however, be agreed between the parties (as it generally has been in the creation of our own national debt, which consists chiefly of annuities of this sort) that the redemption shall not take place for a certain number of years. The number of years within which, according to the present law of France, an annuity of this sort (une rente constituée en perpetuel) may be made irredeemable, is limited to ten. (See *Code Civil*, Art. 1909, &c.)

An annuity for life, or years, is not redeemable in the same manner; but it may be agreed by the parties to the contract that it shall be redeemable on certain terms;—or, it may afterwards be redeemed by consent of both parties: and where the justice of the case requires it, (where there has been fraud, for instance, or the bargain is unreasonable,) a court of equity will decree a redemption. When such an annuity is granted in consideration of money advanced, the annual payments may be considered as composed of two portions, one being in the nature of interest, the other a return of a portion of the principal, so calculated, that, when the annuity shall have determined, the whole of the principal will be repaid. Annuities for life or years, being the only security that can be given by persons who have themselves but a limited interest in their property, are frequently made in consideration of a loan. Besides this advantage, annuities for life, inasmuch as they are attended with risk, are not within the reach of the usury laws, and are therefore often used in order to evade them: the legislature has for this reason thought fit to require that certain formalities should be observed in creating them. It is enacted (by stat. 53 Geo. III., c. 141) 'That every instrument by which an annuity for life is granted shall be null and void, unless, within thirty days after the execution thereof, there shall be inrolled, in the High Court of Chancery, a memorial containing the date, the names of the parties and witnesses, and the conditions of the contract; and if the lender does not really and truly advance the whole of the consideration money,—that is, if part of it is returned, or is paid in notes which are afterwards fraudulently cancelled, or is retained on pretence of answering future payments, or if, being expressed to be paid in money, it is in fact paid in goods,—the person charged with the annuity (that is, the borrower) may, if any action should be brought against him for the payment of it, by applying to the court, have the instrument cancelled.' The same statute also enacts, that every contract for the purchase of an annuity, made with a minor, shall be void, and shall remain so, even though the minor, on coming of age, should attempt to confirm it. The provisions of this act are intended to be confined to cases where the annuity is granted in consideration of a loan.

Annuities may be, and very frequently are, created by will, and such a bequest is considered in law as a general legacy, and, in case of a deficiency in the estate of the testator, it will abate proportionably with the other legacies. The payment of an annuity may be charged either upon some particular fund (in which case if the fund fails the annuity ceases) or upon the whole personal estate of the grantor; which is usually effected by a deed of covenant, a bond, or a warrant of attorney. If the person charged with the payment of an annuity becomes bankrupt, the annuity may be proved as a debt before the Commissioners, and its value ascertained, according to the provisions of the bankrupt act (6 Geo. IV., c. 16, s. 54). The value thus ascertained becomes a debt charged upon the estate of the bankrupt; and hereby both the bankrupt and his surety are discharged from all subsequent payments.

If the person on whose life an annuity is granted dies between two days of payment, the grantee has no claim whatever in respect of the time elapsed since the last day of payment [see APPORTIONMENT]: from this rule, however, are excepted such annuities as are granted for the maintenance of the grantee,—and the parties may in all cases, if they choose it, by an express agreement, provide that the grantee shall have a rateable portion of the annuity for the time between the last payment and the death of the person on whose life it is granted. On government annuities a quarter's annuity is paid to the executors of an annuitant, if they come in and prove the death. (See Comyn's *Digest*, tit. Annuity; Lumley *On Annuities*.)

ANNUITY, a term derived from the Latin *annus*, a year; signifying, in its most general sense, any fixed sum of money which is payable either yearly, or in given portions at stated periods of the year. Thus, the lease of a house, which lets for 50*l.* a year, and which has 17 years to run, is to the owner an annuity of 50*l.* for 17 years. In an ordinary use of the term, it signifies a sum of money payable to an individual yearly, during life. In the former case, it is called, in technical language, an *annuity certain*, and in the latter, a *life annuity*.

It is evident that every beneficial interest which is either to continue for ever, or to stop at the end of a given time, such as a freehold, a lease, a debt to be paid in yearly instalments, &c., is contained under the general head of an *annuity certain*, while every such interest which terminates with the lives of any one or more individuals, all that in law is called a *life-estate*, and all salaries, as well as what are most commonly known by the name of life annuities, fall under the latter term. Closely connected with this part of the subject are COPYHOLDS, (which see,) in which an estate is held during certain lives, but in which there is a power of renewing any life when it drops, that is, substituting another life in place of the former, on payment of a fine—REVERSIONS, or the interest which the next proprietor has in any estate, &c., after the death of the present—and *life-insurance*, (see INSURANCE,) in which the question is, what annuity must A. pay to B. during his life, in order that B. may pay a given sum to A.'s executors at his death.

If money could not be improved at interest, the value of an annuity certain would simply be the yearly sum multiplied by the number of years it is to continue to be paid. Thus a lease for 3 years of a house which is worth 100*l.* a year, might either be bought by paying the rent yearly, or by paying 300*l.* at once. A life annuity, in such a case, will be worth an annuity certain, continued for the average number of years lived by individuals of the same age as the one to whom the annuity is granted. But if compound interest be supposed, which is always the case in real transactions of this kind, the landlord, in the case of the annuity certain just alluded to, must only receive such a sum, as when put out to interest, with 100*l.* subtracted every year for rent, will just be exhausted at the end of 3 years. To exemplify this, let us suppose that money can be improved at 4 per cent. In Table I., in the column headed 4 p. c. (4 per cent.) we find 2·775 opposite to 3 in the first column, by which is meant that the present value of an annuity of *one pound* to last 3 years is 2·775*l.*, or $2\frac{775}{1000}$*l.* The present value of an annuity of 100*l.* under the same circumstances is, therefore, 277·5*l.*, or 277*l.* 10*s.* This is the value of a lease for three years corresponding to a yearly rent of 100*l.* The landlord who receives this, and puts it out at 4 per cent., will, at the end of one year, have 288*l.* 12*s.* From this he subtracts 100*l.* for the rent which has become due, and puts out the remainder 188*l.* 12*s.* again at 4 per cent. At the end of a year this has increased to 196*l.* 2*s.* 10½*d.*, from which 100*l.* is again subtracted for rent. The remainder, 96*l.* 2*s.* 10½*d.*, again put out at interest, becomes at the end of the year 99*l.* 19*s.* 9*d.*, within three pence of the last year's rent. This little difference arises from the imperfection of the Table, which extends to three decimal places only.

TABLE I.—*Present Value of an Annuity of One Pound.*

No. of Years.	3 p. c.	3½ p. c.	4 p. c.	5 p. c.
1	·971	·966	·962	·952
2	1·913	1·900	1·886	1·859
3	2·829	2·802	2·775	2·723
4	3·717	3·673	3·630	3·546
5	4·580	4·515	4·452	4·329
6	5·417	5·329	5·242	5·076
7	6·230	6·115	6·002	5·786
8	7·020	6·874	6·733	6·463
9	7·786	7·608	7·435	7·108
10	8·530	8·317	8·111	7·722
15	11·938	11·517	11·118	10·380
20	14·877	14·212	13·590	12·462
25	17·413	16·482	15·622	14·094
30	19·600	18·392	17·292	15·372
40	23·115	21·355	19·793	17·159
50	25·730	23·456	21·482	18·256
60	27·676	24·945	22·623	18·929
70	29·123	26·000	23·395	19·343
For ever	33·333	28·571	25·000	20·000

To find the present value of an annuity of 1*l.* per annum continued for 10 years, interest being at 5 per cent., look in the column headed 5 p. c., and there, opposite to 10 in the first column, will be found the value 7·722*l.* or 7*l.* 14*s.* 6½*d.* This would be commonly said to be 7·722 *year's purchase* of the annuity. For a convenient rule for reducing decimals of a pound to shillings and pence, and the converse, see the *Penny Magazine*, No. 52. It may also be done by the following table:

TABLES II. and III.—*For reducing Decimals of a Pound to Shillings and Pence, and the converse.*

Dec.	*s.*	Dec.	*s.*	*d.*	Dec.	*d.*
·1	2	·01	0	2½	·001	0¼
·2	4	·02	0	5	·002	0½
·3	6	·03	0	7¼	·003	0¾
·4	8	·04	0	9¾	·004	1
·5	10	·05	1	0	·005	1¼
·6	12	·06	1	2½	·006	1½
·7	14	·07	1	5	·007	1¾
·8	16	·08	1	7¼	·008	2
·9	18	·09	1	9¾	·009	2¼

s.	Dec.	*d.*	Dec.	*f.*	Dec.
1	·05	1	·004	¼	·001
2	·1	2	·008	½	·002
3	·15	3	·013	¾	·003
4	·2	4	·017		
5	·25	5	·021		
6	·3	6	·025		
7	·35	7	·029		
8	·4	8	·033		
9	·45	9	·037		
10	·5	10	·042		
		11	·046		

For example, what is ·665*l.* in shillings and pence?

TABLE II.	·6	is	£0	12	0
	·06	„		1	2½
	·005	„			1¼
	·665		£0	13	3¾

Again, what is 17*s.* 10¾*d.* in decimals of a pound?

TABLE III.	£0	10	0	is	·5
		7	0	„	·35
			10	„	·042
			¾	„	·003
	£0	17	10¾		·895

These conversions are not made with perfect exactness, as only three decimal places are taken. The error will never be more than one farthing.

To use Table I. where the number of years is not in the table, but is intermediate between two of those in the table, such a mean must be taken between the annuities belonging to the nearest years above and below the given year, as the given year is between those two years. This will give the result with sufficient nearness. We must observe, that no tables which we have room to give are sufficient for more than a first guess, so to speak, at the value required, such as may enable any one, who is master of common arithmetic, not to form a decisive opinion on the case before him, but to judge whether it is worth his while to make a more exact enquiry, either by taking professional advice, or consulting larger tables. As an example of the case mentioned, suppose we ask for the value of an annuity of 1*l.* continued for 12 years, interest being at 4 per cent. We find in Table I., column 4 per cent.

For 10 years 8·111
„ 15 „ 11·118
Difference 3·007

Since 5 years adds 3·007 to the value of the annuity, every year will add about one-fifth part of this, or ·601, and 2 years will add about 1·202. This, added to 8·111, gives 9·313. The real value is more near to 9·385, and the error of our table is ·07 out of 9·313, or about the 133rd part of the whole. The higher we go in the table, the less proportion of the whole will this error be.

The last line in Table I. gives the value of the annuity of 1*l.* continued for ever: for example, at 5 per cent., the value of 1*l.* for ever, or, as it is called, a *perpetuity* of 1*l.*, is 20*l.* This is the sum which at 5 per cent. yields 1*l.* a year in interest only, without diminution of the principal. We see that an annuity for a long term of years differs very little in present value from the same continued for ever: for example, 1*l.* continued for 70 years at 4 per cent. is worth 23·395*l.*, while the perpetuity at the same rate is worth only 25*l.* Hence the present value of an annuity which is not to begin to be paid till 70 years have elapsed, but is afterwards to be continued for ever, is 1·605 at 4 per cent.: which sum improved during the 70 years, would yield the 25*l.* necessary to pay the annuity for all years succeeding.

Table IV.—*Amount of an Annuity of One Pound.*

Y.	3 p. c.	3½ p. c.	4 p. c.	5 p. c.
1	1·000	1·000	1·000	1·000
2	2·030	2·035	2·040	2·050
3	3·091	3·106	3·122	3·153
4	4·184	4·215	4·246	4·310
5	5·309	5·362	5·416	5·526
6	6·468	6·550	6·633	6·802
7	7·662	7·779	7·898	8·142
8	8·892	9·052	9·214	9·549
9	10·159	10·368	10·583	11·027
10	11·464	11·731	12·006	12·578
15	18·599	19·296	20·024	21·579
20	26·870	28·280	29·778	33·066
25	36·459	38·950	41·646	47·727
30	47·575	51·623	56·085	66·439
40	75·401	84·550	95·026	120·800
50	112·797	130·998	152·667	209·348
60	163·053	196·517	237·991	353·584
70	230·594	288·938	364·290	588·529

In this Table we see what would be possessed by the receiver of an annuity at the end of his term, if he put each year's annuity out at interest so soon as he received it. For example, an annuity of 1*l.*, in 40 years, at 5 per cent., amounts to 120·8*l.*, which includes 40*l.* received altogether at the end of the different years, and 80·8*l.* the compound interest arising from the first year's annuity, which has been 39 years at interest, the second year's annuity which has been 38 years at interest, and so on, down to the last year's annuity, which has only just been received. When the annuity is payable half-yearly, or quarterly, its present value is somewhat greater than that given in the preceding Table. For the annuitant, receiving certain portions of his annuity sooner than in the case of yearly payments, gains an additional portion of interest. Since 4 per cent. is 2 per cent. half-yearly and 1 per cent. quarterly, and since every term contains twice as many half-years as years, and four times as many quarters, it is evident that an annuity of 100*l.* a-year, payable half-yearly, at 4 per cent., for 10 years, is the same in present value as one of 50*l.* per annum, payable *yearly*, at 2 per cent., for 20 years. Again, 100*l.* a-year, payable quarterly for 10 years, money being at 4 per cent., is equivalent to an annuity of 25*l.*, payable yearly for 40 years, money being at 1 per cent.

The principles on which the calculation of life annuities depends will be more fully explained in the articles Probability and Mortality. Let us suppose 100 persons, all of the same age, buy a life annuity at the same office. Let us also suppose it has been found out, that of 100 persons at that age 10 die in the first year, on the average, 10 more in the second year, and so on. If then it can be relied upon that 100 persons will die nearly in the same manner as the average of mankind, or at least that in such a number, the longevity of some will be compensated by the unexpected death of others, the fair estimation of the value of a life annuity to be granted to each may be made as follows. To make the question more distinct, let us suppose the bargain to be made on the 1st of January, 1833, so that payment of the annuities is due to the survivors on new-year's day of each year. Moreover let each year's annuity be made the subject of a separate contract. The first question is, what ought each individual to pay in order that he may receive the annuity of 1*l.*, if he survives, in 1834? By the general law of mortality, we suppose that only 90 will remain to claim, who will, therefore, receive 90*l.* among them, the remaining 10 having died in the interval. It is sufficient, therefore, to meet the claims of 1834, that the whole 100 pay among them, January 1, 1833, such a sum as will, when put out at interest, (suppose 4 per cent.,) amount to 90*l.* on January 1, 1834. This sum is 86·654*l.*, and its hundredth part is ·86654*l.*, which is, therefore, what each should pay to entitle himself to receive the annuity in 1834. There will be only 80 to claim in 1835, and, therefore, the whole 100 must among them pay as much as will, put out at 4 per cent. for 2 years, amount to 80*l.* This sum is 73·968*l.*, and its hundredth part is ·73968*l.*, which is, therefore, what each must pay, in order to receive the annuity, if he lives, in 1835. The remaining years are treated in the same way, and the sum of the shares of each individual for the different years, is the present value of an annuity for his life. We must observe, that in the term *value of an annuity*, it is always implied that the first annuity becomes payable at the expiration of a year after the payment of the purchase money.

The value of a life annuity depends, therefore, upon the manner in which it is presumed a large number of persons, similarly situated with the buyer, would die off successively. Various Tables of these *decrements of life*, as they are called, have been constructed, from observations made among different classes of lives. Some make the mortality greater than others; and of course, Tables which give a large mortality, give the value of the annuity smaller than those which suppose men to live longer. Those who buy annuities would, therefore, be glad to be rated according to tables of high mortality or low expectation of life; while those who sell them would prefer receiving the price indicated by tables which give a lower rate of mortality. In insurances the reverse is the case: the shorter the time which a man is supposed to live, the more must he pay the office, that the latter may at his death have accumulated wherewithal to pay his executors. We now give in Table V, the values of annuities according to three of the most celebrated Tables.

Table V.—*Present Value or Purchase-money of a Life Annuity.*

	Northampton.			Carlisle.			Gov. M.	Gov. F.
Age.	3 p.c.	4 p.c.	5 p.c.	3 p.c.	4 p.c.	5 p.c.	4 p.c.	4 p.c.
0	12·3	10·3	8·9	17·3	14·3	12·1		
5	20·5	17·2	14·8	23·7	19·6	16·6	19·3	20·0
10	20·7	17·5	15·1	23·5	19·6	16·7	18·8	19·7
15	19·7	16·8	14·6	22·6	19·0	16·2	18·0	19·1
20	18·6	16·0	14·0	21·7	18·4	15·8	17·3	18·6
25	17·8	15·4	13·6	20·7	17·6	15·3	16·9	18·1
30	16·9	14·8	13·1	19·6	16·9	14·7	16·4	17·5
35	15·9	14·0	12·5	18·4	16·0	14·1	15·7	16·9
40	14·8	13·2	11·8	17·1	15·1	13·4	14·9	16·2
45	13·7	12·3	11·1	15·9	14·1	12·6	13·8	15·3
50	12·4	11·3	10·3	14·3	12·9	11·7	12·4	14·2
55	11·2	10·2	9·4	12·4	11·3	10·3	11·0	12·8
60	9·8	9·0	8·4	10·5	9·7	8·9	9·7	11·3
65	8·3	7·8	7·3	8·9	8·3	7·8	8·2	9·6
70	6·7	6·4	6·0	7·1	6·7	6·3	6·8	7·9
75	5·2	5·0	4·7	5·5	5·2	5·0	5·4	6·3
80	3·8	3·6	3·5	4·4	4·2	4·0	3·8	4·9
85	2·6	2·5	2·5	3·2	3·1	3·0	2·3	3·8
90	1·8	1·8	1·7	2·5	2·4	2·3	1·3	2·1
95	·2	·2	·2	2·8	2·7	2·6	·6	1·0

The first of these is calculated from the Northampton Table, formed by Dr. Price, from observations of burials, &c.,

at Northampton. As compared with all other Tables of authority, it gives too high a mortality at all the younger and middle ages of life, and, consequently, too low a value of the annuity. The second is from the Carlisle Table, formed by Mr. Milne, from observations made at Carlisle. It gives much less mortality than most other Tables, and, therefore, gives higher values of the annuities; but it has since been proved to represent the actual state of life among the middle classes, in the century now ending, with much greater accuracy than could have been supposed, considering the local character of the observations from which it was derived. The third table is that constructed by Mr. Finlaison, from the observation of the mortality in the government tontines and among the holders of annuities granted by government in redemption of the national debt, and differs from the former two in distinguishing the lives of males from those of females. Most observations hitherto published unite in confirming the fact, that females, on the average, live longer than males, and in the annuities now granted by government, a distinction is made accordingly. The mean between the values of annuities on male and female lives, according to the Government Tables, agrees pretty nearly with the Carlisle Tables, the rate of interest being the same.

For the materials of Table V., we are indebted to the works of Dr. Price, on *Reversionary Payments;* of Mr. Milne, on *Annuities and Insurances;* and to Mr. Finlaison's *Report to the House of Commons on Life Annuities;* to all of which we refer the reader. The tables are of course very much abridged.

To use the Table V., suppose the value of an annuity of 100*l*. a-year, on a life aged 35, is required, interest being at 4 per cent., which is nearly the actual value of money. We find in the column marked 4 per cent., opposite to 35, under the Northampton Tables 14·0, under the Carlisle 16·0, and under the Government Tables 15·7 or 16·9, according as the life is male or female. These are the number of pounds which ought to buy an annuity of 1*l*., according to these several authorities; and taking each of them 100 times, we have:—

Northampton Table . .	1400*l*.
Carlisle Table . . .	1600*l*.
Government Table (males) .	1570*l*.
Government Table (females)	1690*l*.

We cannot suppose that the annuity could be bought for less than would be required by the Carlisle Tables.

To find the value of an annuity on a life whose age lies between two of those given in the table, the process must be followed which has been already explained in treating of annuities certain.

An annuity on two joint lives is one which is payable only so long as both the persons on whose lives it is bought are alive to receive it.

TABLE VI.—*Present Value or Purchase-money of an Annuity of* 1*l. on two Joint Lives.*

Carlisle.—4 p. c.

Age.	0.	10.	20.	30.	40.	50.	60.	70.
0	8·9	12·3	11·7	10·9	9·9	8·6	6·6	4·7
5	16·8	16·5	15·6	14·4	12·9	10·5	7·8	5·0
10	17·0	16·3	15·2	13·8	12·0	9·2	6·5	4·1
15	16·3	15·5	14·3	12·9	10·5	7·9	5·1	3·0
20	15·6	14·7	13·4	11·8	9·0	6·4	4·1	2·4
25	14·8	13·8	12·5	10·3	7·8	5·0	3·0	2·6
30	13·9	12·9	11·4	8·8	6·3	4·0	2·3	1·6
40	12·1	10·9	8·6	6·2	3·9	2·3	1·6	
50	10·1	8·1	6·0	3·9	2·3	1·6		
60	6·9	5·3	3·6	2·1	1·5			
70	4·4	3·1	1·9	1·5				
80	2·4	1·6	1·3					

Northampton.—4 p. c.

Age.	0.	10.	20.	30.	40.	50.	60.	70.
1	8·3	10·8	10·1	9·4	8·6	7·5	6·1	4·4
5	13·6	13·5	12·6	11·7	10·5	8·9	7·0	4·6
10	14·3	13·4	12·6	11·5	10·1	8·3	6·0	3·5
15	13·4	12·6	11·8	10·6	9·1	7·1	4·7	2·5
20	12·5	11·9	10·9	9·6	8·0	5·8	3·4	1·7
25	11·9	11·2	10·2	8·8	6·9	4·6	2·4	0·2
30	11·3	10·5	9·3	7·8	5·7	3·4	1·7	
40	9·8	8·8	7·5	5·6	3·3	1·7		
50	8·1	7·0	5·3	3·2	1·7			
60	6·2	4·9	3·1	1·6				
70	4·1	2·8	1·5					
80	2·1	1·3						

The preceding table gives the results of the Carlisle and Northampton Tables on the value of this species of annuity, interest being at 4 per cent. The first column shows the age of the *younger* life, and the horizontal headings are *not* the age of the elder life, but the excess of the age of the elder life above that of the younger. For example, to know the value of an annuity in two joint lives, aged 25 and 55, in which the difference of age is 30 years. In the Carlisle Table *opposite* to 25, the *younger*, and under 30, the *difference*, we find 10·3; and 8·8 in the Northampton. For the value of an annuity of 100*l*., the first tables give, therefore, 1030*l*., and the second 880*l*.

The value of an annuity on the longest of two lives, that is, which is to be payable as long as either of the two shall be alive to receive it, is found by adding together the values of the annuity on the two lives separately considered, and subtracting the value of the annuity on the joint lives. For the above species of annuity puts the office and the parties in precisely the same situation as if an annuity were granted to each party separately, but on condition that one of the annuities should be returned to the office so long as both were alive, that is, during their joint lives. For example, let the ages be 25 and 55 as before, and let the Carlisle Table be chosen, interest being at 4 per cent., we have then:—

TABLE V.—Annuity at age 55 . .	11·3
. . . . . 25 . .	17·6
Sum . . .	28·9
TABLE VI.—Joint annuity, 55 & 25 .	10·3
Difference . .	18·6

The value, therefore, of an annuity of 1*l*. per annum on the survivor is 18·6*l*.

The value of an annuity which is not to be payable till either one or other of two persons is dead, and which is to continue during the life of the survivor, is found as in the last case, only subtracting *twice* the value of the joint annuity, instead of that value itself. In the preceding case it is 8·3*l*. For this case only differs from the preceding, in that the annuity is not payable while both are alive, that is during the *joint* lives. Consequently the value in this case is less than that in the last, by the value of an annuity on the joint lives.

The value of an annuity to be paid to A. from and after the death of B., if the latter should happen to die first, is the value of an annuity on the life of A. diminished by the value of an annuity on the joint lives of A. and B. For the situation is exactly the same as if the office granted an annuity to A., to be returned as long as both should live. The ages and Table being as before, and the life on whose survivorship the annuity depends being that aged 25, we have:—

TABLE V.—Annuity at age 25 . .	17·6
TABLE VI.—Joint annuity, 25 & 55 .	10·3
Difference . .	7·3

whence the value of the required annuity of 1*l*. is 7·3*l*.

The following Table, extracted with abridgment from Morgan on *Insurances*, deduced from the Northampton Table, with interest at 4 per cent., gives the average sum to which the savings of an individual may be expected to amount at the end of his life, improved at compound interest from the time when he begins to lay by:—

TABLE VII.—*Probable amount of* 1*l. laid by yearly, and improved to the end of Life.*

Age.	Amount.	Age.	Amount.	Age.	Amount.	Age.	Amount.
0 . .	137·8	25 . .	79·2	50 . .	29·5	75 . .	7·2
5 . .	159·1	30 . .	66·0	55 . .	23·6	80 . .	4·8
10 . .	137·9	35 . .	54·6	60 . .	18·5	85 . .	3·2
15 . .	114·1	40 . .	44·9	65 . .	14·1	90 . .	2·0
20 . .	94·5	45 . .	36·6	70 . .	10·3		

That is to say, according to the Northampton Tables, if a person were, at the age of 26, (that is, a year after 25,) to begin laying by 100*l*. a year at interest, he might expect the amount at the end of his life to be 79·2*l*. for each pound laid by yearly; or 7920*l*. Or to speak more strictly, if 100 persons were to do this, they might expect that the average amount of their savings, reckoning the accumulations at their deaths, would be 7920*l*. each. As we have already observed, the mortality of the Northampton Table is greater than the fact, and the average accumulations would be greater, from young ages considerably greater, than those shown in the preceding table

We have seen that the security of the method for estimating the value of life annuities, depends upon the presumption that the average mortality of the buyers is known. This average cannot be expected to hold good, unless a large number of lives be taken. Therefore, the granting of a single annuity, or of a few annuities, as a commercial speculation, would deserve no other name than gambling, even though the price demanded should be as high as that given in any tables whatsoever.

In the preceding tables, we would again remark, that our object has been simply to furnish the means of giving a moderately near determination of a few of the most simple cases. We should strongly recommend every one not to venture on important transactions, without professional or other advice on which he can depend, unless he himself fully understands the principles on which tables are constructed. The liability to error, even in using the most simple table, is very great, without considerable knowledge of the subject; and most cases which arise in practice contain some circumstances peculiar to themselves, which have not and could not have been provided for in the general rules.

The following references to works on this subject may be found useful.

Annuities Certain. 1. Smart's *Tables of Interest, &c.* London, 1726. There is an edition published in 1780, which is said to be very incorrect. The values for the intermediate half years given in this work are not correctly the values of the annuities on the supposition of half yearly payments; in other respects it is to be depended upon. 2. Corbaux, *Doctrine of Compound Interest, &c.* London, 1825. 3. Baily, *Doctrine of Interest and Annuities.* London, 1808. Smart's Tables are republished in this work from the correct edition. Works on *life-annuities* generally contain principles and tables for the calculation of annuities certain.

Life Annuities. 1. Price, *Observations on Reversionary Payments, &c.* Edited by W. Morgan, London, 1812. (Seventh Edition.) 2. Baily, *on Life Annuities and Assurances.* London, 1810. 3. Milne, *on the Valuation of Annuities and Assurances, &c.* London, 1815. 4. Morgan, *on the Principles of Assurance, Annuities, &c.* London, 1821. 5. Davies' *Tables of Life Contingencies.* London, 1825. 6. Finlaison, *on the Evidence and Elementary Facts on which Tables of Life Annuities are Founded.* Printed by the House of Commons, 31st March, 1829. 7. Gompertz, *Estimation of the value of Life Contingencies,* in *Philosophical Transactions,* 1820.

ANNULET, in architecture. This term is applied to the small eccentric rings or bands which enrich the lower part of the moulding of the Doric capital, just where it falls into, or grows out of, the top of the shaft, or trachelium. It is formed from the Latin word signifying a ring.

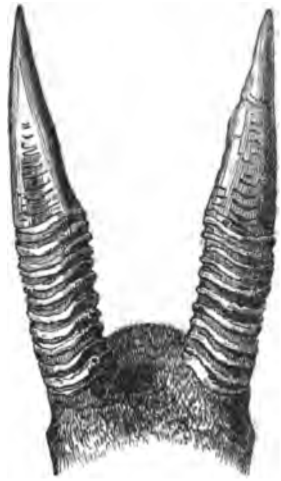
A'NNULUS, the geometrical name of a ring, or solid formed by the revolution of a circle about a straight line exterior to its circumference as an axis, and in the plane of the said circle.

To find the surface of a ring, measure the interior and exterior diameters in feet or inches, &c. Multiply together the sum and difference of these diameters, and multiply the product by 2·4674011, taking as many decimals as may be thought necessary. For common purposes it will be sufficiently exact to divide 200 times the product of the sum and difference twice successively by 9. If still greater correctness be required, subtract from the last result its 500th part. The result will be the number of *square* feet, or inches, &c., in the surface of the ring.

To find the solid contents of a ring, measure the outer and inner diameters as before, multiply together their sum and the square of their difference, and multiply this product by ·3084251. For common purposes, it will be sufficient to annex three ciphers to the product of the sum and the square of the difference, and to divide by 3242. The result will be the number of cubic feet or inches, &c. in the ring.

ANOA, a species of ruminating animal, so very imperfectly known, that zoologists are undetermined whether to consider it as an antelope or a species of buffalo. This uncertainty arises from the fact, that though the animal has been noticed for many years, only a few fragments of skulls and horns have been hitherto brought to Europe, and even these too imperfect to acquaint us with the zoological characters of the animal. Judging, however, from these materials, the anoa would really appear to be a species in many respects intermediate between the buffaloes and antelopes, as at present defined; agreeing with the former in the form of its horns, and with the latter in their position.

Mr. Pennant is the first naturalist who has mentioned this animal, but he has given no account of its characters, and merely relates, that it is about the size of a middling sheep, is wild and fierce, and resides in large herds among the rocky mountains of the island of Celebes. He considers it as a small species of wild buffalo, and adds, that it is captured only with great difficulty, and is so fierce in confinement, that some of these animals, belonging to Governor Loten, in one night ripped up the bellies of fourteen stags which were kept in the same paddock with them. The next author who mentions the anoa from original documents or personal observation, is Colonel Hamilton Smith, who in the fourth volume of Griffith's translation of the *Régne Animal*, describes the head and horns, and considers the animal as a species of antelope. Colonel Smith's fragment was brought from Celebes by the late Dr. Clarke Abel, who obtained it on his return from China in the suite of Lord Amherst; but since that period various other heads have been brought to Europe, some of which are deposited in the British Museum, and in the collection of the London Zoological Society. The horns are erect, perfectly straight and in the plane of the forehead; they are about the same length as the head, that is, about nine or ten inches, strongly depressed or flattened in front, of nearly the same breadth till within three inches of the extremities, whence they are rather attenuated to the tips which are bluntly pointed, and irregularly wrinkled, or rather crumpled throughout the greater part of their length. The head is long and narrow, terminating in a broad muzzle, and all the characters so different from those of antelopes, that we prefer, in the present state of our knowledge, describing the animal under its native name of anoa, to the risk of originating future error by associating it with a genus to which it appears to bear but a very remote analogy.



[Horns of Anoa.]

ANODY'NES, from the Greek word ἀνώδυνος (*anódunos*), which sometimes signifies, 'that which relieves from pain.' We may consider pain as an intimation of some derangement of the system, the continuance of which would be hurtful. It therefore prompts us to take measures to remove the causes of it, which being done, the pain generally ceases. But as pain itself, from the inconvenience and suffering which it occasions, frequently aggravates the disease of which it is the accompaniment, it becomes necessary to employ means to lessen or suspend it, even though we should not be able to control the disease: these means are termed *anodynes*, and are either applied externally, or given internally.

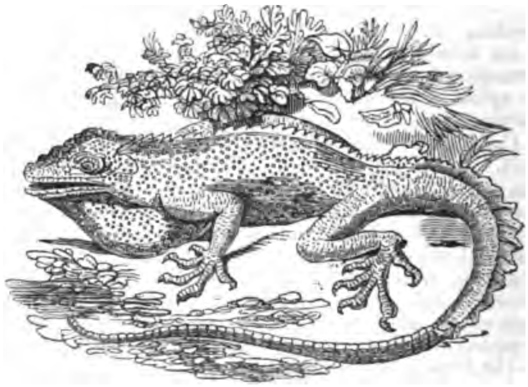
The seat of pain is evidently in the nervous system, but its cause and origin appear to be intimately connected with the state of the circulating system, particularly with the quantity of blood contained in the arteries, and the degree of force and rapidity with which it passes through them. Hence pain may be said to be of two kinds; that which occurs when the blood stagnates in the extreme vessels, or capillaries, while the larger vessels propel it with increased force, or the state termed *inflammation*; and that which occurs when there is a deficiency of blood in the extreme vessels, from the action of the large vessels being too feeble to propel it, as happens after long abstinence from food, or other causes of exhaustion—such as prolonged suckling of infants by mothers. The discrimination of these two kinds of pain is of great practical importance; for while the first will be relieved by bleeding and anodynes, the second will be greatly aggravated by the employment of either of these means. It is therefore to the former that the use of anodynes must be limited, in which they appear to be productive of benefit in two ways: first, by rendering the nerves of the part less sensible; and, secondly, by diminishing the violence with which the large vessels propel the blood, when the anodynes are given in sufficient quantity to influence the brain, and through it, by a process extremely complex, which we need not explain here, the contractile power of the heart and arteries. As most of the articles termed anodynes have a powerful influence over the brain, they generally produce sleep, if given in a large dose: hence they are also denominated *hypnotics;* and from causing insensibility, they are also denominated *narcotics*. The knowledge of their possessing this power should lead us to observe great caution in their administration, lest by an over-dose we should produce a fatal coma, or very profound sleep, from which the patient might never be roused.

It deserves also to be mentioned, that their frequent repetition produces an injurious effect on the frame, particularly on the nervous system, and function of nutrition; we should therefore carefully guard against acquiring a habit of having recourse to them on slight occasions, or without the sanction of a competent authority. The opium-eater not less certainly induces disease, and brings himself to an untimely end, than he who indulges in ardent spirits.

The substances used as anodynes are, with one exception, derived from the vegetable kingdom, and will be further treated of under the names of the plants which produce them. They are Opium, Hyoscyamus, or *Henbane*, Solanum Dulcamara, or *Woody Night-shade*, Atropa Belladonna, or *Deadly Night-shade*, Hydrocyanic, or Prussic acid, and Carbonic-acid-gas applied in the yest poultice, and other forms.

ANOLIS, in zoology, a genus of saurian reptiles, belonging to that section of the iguanian family which Baron Cuvier distinguishes by having teeth in the palate of the mouth as well as in the maxillary bones. They are readily distinguished from the iguanas, properly so called, the basilisks, and other genera of this division, by the peculiar form of the antepenultimate phalange of the toes, which is flattened beneath, and furnished with a kind of pad or cushion, grooved or striated transversely, and serving to make the animals adhere more firmly to those substances which they grasp in walking. In this particular point of their structure the anolis approach the geckoes, but it does not enable them to exercise the singular power of walking with the legs uppermost, like flies on a ceiling, which some of these reptiles possess. The toes, however, are much longer and better separated than those of the geckoes, and the claws, instead of being short and flattened, are long, crooked, and sharp-pointed. The body and tail are long and slender, as are also the legs, particularly those behind, which are rather longer than the fore legs; each foot has five toes. The whole body and tail, both above and below, are covered irregularly with small round scales, which give the skin a granulated appearance like that of fine shagreen. The head is long and straight; the forehead and face flattened and covered with numerous little pentagonal and hexagonal scales; the tongue is fleshy, short, round, undivided at the point, and not protractile, being almost throughout its whole length attached to the under jaw. The tail is in all cases as long or longer than the body more or less compressed on the sides, with a few slight plies or indistinct foldings, each comprising two or three circular rows of scales, and in some species provided with a crest supported by the erect spinous processes of the caudal vertebræ. The teeth, as well maxillary as palatal, are small, sharp, and serrated; and the skin of the throat forms, at least in the greater number of species, a loose hanging bag, which is capable of being dilated or distended with air at the will of the animal. Finally, the ribs of the opposite sides are united in front, and form complete circular hoops round the body.

The anolis are entirely an American genus, and seem, in many respects, to supply, in the New World, the place which the chameleons occupy in the Old. The colours of their skins change with the same or even greater rapidity, especially on the loose skin of the throat, which is constantly distended when these animals are actuated by strong passions, either of fear, anger, or love, and in this state assume an endless succession of ever-varying hues. They differ from the chameleons, however, in their more slender and graceful proportions, and in the great activity of their movements, displaying all the restlessness and celerity of the common green lizard of Europe. They frequent woody and stony situations indifferently, climb and leap with such swiftness and facility that their pace has been compared to the flight of a bird; and when overheated or fatigued by their exertions, will stop, open their mouths, and pant like a tired dog. They are extremely timid and harmless; feed for the most part upon flies and other small insects, though M. Cuvier found the stomach of one species filled with berries; and though often inhabiting the neighbourhood of marshes and other moist situations, do not appear to be aquatic. There are two small subgenera, distinguished from one another by the presence or absence of the carinated crest on the upper surface of the tail. The first of these divisions, comprehending those which have this crest, consists of a number of species definitely characterised by M. Cuvier, but formerly confounded under the denominations of *Lacerta principalis* and *Lacerta bimaculata*. The principal are.



[Anolis velifer.]

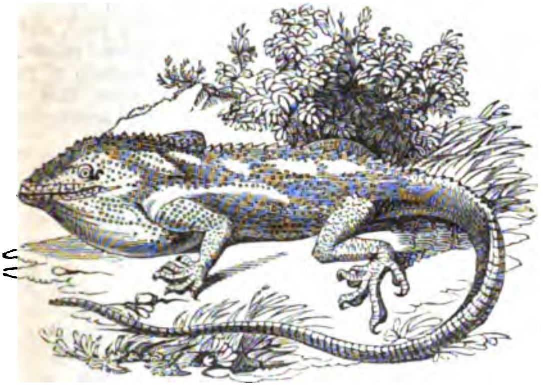
1. The *Anolis velifer*, of Baron Cuvier, of a beautiful dark ashy blue colour, and perhaps the largest of the whole genus, the body measuring a foot in length, and the tail being about half as long again. The crest extends along the top of the tail for half its length from the origin, and is supported by from twelve to fifteen rays; the loose skin beneath the throat extends from the chin even to the belly, and when not distended forms a longitudinal fold along the whole under surface of the animal; and the food, from the observation of Baron Cuvier, would appear, at least occasionally, to consist of berries and other vegetable substances. It inhabits Jamaica and the Antilles generally, preferring the woods to the open country, and lodging in decayed trees or small crevices in the ground, where the female likewise deposits her eggs. It is incessantly in motion, and when pleased frequently emits a low but acute chirp; though harmless and extremely timid, it possesses a considerable share of curiosity, and allows itself to be readily caught in little rush snares, which children in the West Indies amuse themselves by placing in its haunts, alluring it from its concealment by imitating its voice.

2. The *Anolis bimaculata*, of Sparrman, little more than half the size of the former species, but with the same general form and habits, and with a similar crest upon the first half of the tail. The general colour is a greenish blue, clear on the top of the head and neck, but mixed with dark brown on the body, tail, and extremities, and marked with numerous small black spots on the head and sides, and two large ones on the shoulders, from which it derives its specific name. It is found in North America, from Pennsylvania to the shores of the Gulf of Mexico, and in the Antilles.

The second subdivision of the genus anolis consists of species without a carinated crest on the tail, but in no other respect differing from those already described. Of these the principal are,

3. The *Anolis equestris* of Merrem, of which the tail, more flattened on the sides than in the following species, still retains a slight indication of the crest which distinguishes those of the former division. The body of this species mea-

sures about a foot in length, and the tail is nearly half as long again. It is of a light tawny colour, agreeably clouded in different parts with blotches of an ashy lilac tinge, but so blended and shaded off with the ground colour of the body, as never to assume the form of distinct spots. The skin of the throat is white, and a band of the same colour passes over each shoulder, and runs parallel to the back almost half way down each side. Though the crest on the tail does not appear externally, yet the spinous processes of the caudal vertebræ have the same elevated form as in the anolis of the first subgenus, and appear to be concealed only by the more fleshy form of the tail. The habitat of this species has not been exactly determined.


[Anolis Equestris.]

4. The *Anolis cepedii* of Merrem is a pretty little species, found likewise in the Antilles, about half the size of the last, of a green colour, with a short muzzle spotted with brown, and, except in the absence of the crest on the tail, very similar to the *Anolis bimaculata*. Its habits are well described by Lacepède.

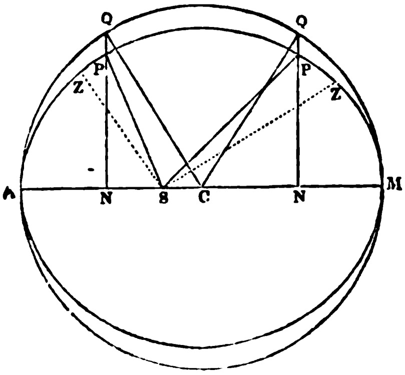
5. *Anolis lineatus* of Daudin resembles the last species in its pure bright green colour, but it is rather larger, and is marked along each flank with two parallel lines of oblong black spots, the upper of which passes over the arms and thighs, and the under between the shoulders and hips. It inhabits different parts of South America.

6. The *Anolis bullaris* of Merrem, first described by Catesby in his *Natural History of Carolina*, under the name of green lizard, is a very beautiful species, of a greenish gold colour, particularly distinguished by a black band on the temples, and the elongated and flattened form of its muzzle. This and the two last-described species, as well as various others described by Daudin, prince Maximilian, and others, have the loose skin of the throat of a beautiful cherry colour when distended, and change from one hue to another with a facility and rapidity truly astonishing.

ANOMALISTIC YEAR, the interval which elapses between two successive times when the earth is at the least distance from the sun. If the earth's orbit were a perfect ellipse, this would be exactly equal to the common or tropical year; the orbit is, however, more nearly represented by an ellipse of which the axis revolves through $11''{\cdot}8$ in a year. That is, if we imagine a star which is always eclipsed by the sun's centre, at the moment when the earth is at its least distance, that star must follow the sun at the rate of $11''{\cdot}8$ in a year, or a revolution in 108,000 years, in round numbers. The anomalistic year, or the time between two successive eclipses of the supposed star, is 25 minutes longer than the tropical year, being 365 days, 6 hours, 13 minutes, 45 seconds.

ANO'MALY, (in Astronomy,) a term derived from the Greek ἀνώμαλος (*anómalos*), unequal or irregular, and applied in astronomy to the angle through which the radius drawn from a planet to the sun, has moved with the planet from the time when the planet was at its least distance from the sun. The term was applied to this angle, as being the angle whose irregularities were first observed; though it must be confessed that this is not a happy specimen of mathematical nomenclature.

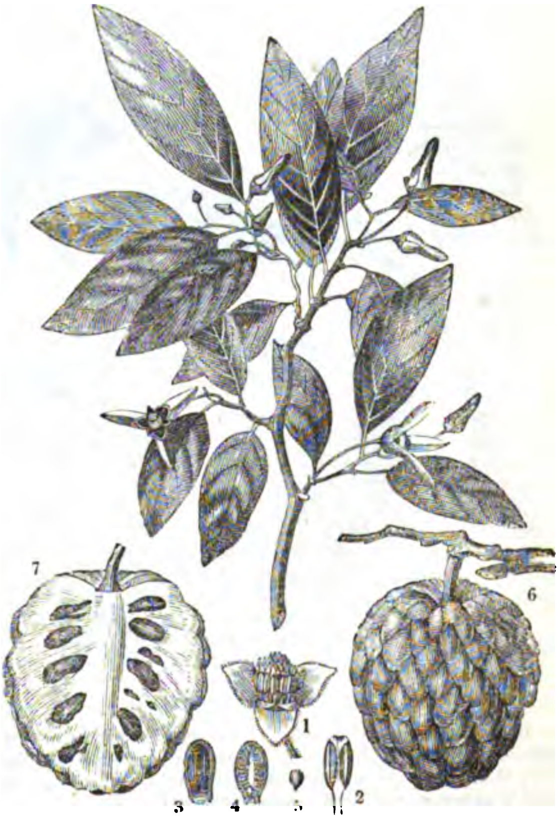
Let S be the position of the sun, in the focus of the ellipse described by the planet, A the *perihelion*, or point of least distance from the sun, A P M the ellipse described by the planet, A Q M the circumscribed circle, P the place of the planet, and Q P N a perpendicular to the axis A M. Let C be the centre of the ellipse and circle. The planet



moves quickest at A, and slowest at M. Conceive a fictitious planet Z to move round the ellipse A P M, with the average motion of the real planet, so as, without varying its motion, to make the angle A S Z increase uniformly, and to describe the whole revolution in the same time as the real planet. Then, for the moment when the planet is at P, the angle A S P is called the *true anomaly*, A S Z is called the *mean anomaly*, and ACQ the *eccentric anomaly*. In speaking of the sun or the moon, it is the earth which is supposed to be at S, and the sun or moon at P. Also, in speaking of the satellites of Jupiter or Saturn, the planet is supposed to be at S, and the satellite at P. For a double star, one star is supposed to be at S, and the other to revolve round it.

The determination of either two anomalies from the third, is a problem of considerable difficulty, the discussion of which may be found in any mathematical work on astronomy.

ANONA'CEÆ, a natural order of plants consisting of tropical or subtropical trees and bushes, that usually abound in a powerful aromatic secretion, which renders the flowers of some highly fragrant, the leaves of others a grateful perfume, and the dried fruits of many so highly aromatic as to vie with the spices of commerce; among these last is the Æthiopian pepper of the shops, which is yielded by the fruit of *Uvaria aromatica*. Of others of this order, the fruit is succulent and abounds in a delicate juice, which renders it a pleasant article of food: under the name of sour sop, sweet sop, and custard-apple, many kinds are



[Anonaceæ.]
[Anona squamosa, or sweet sop.]

cultivated in the West Indies and South America. Finally, the bark of some separates readily into fibres which make excellent cordage: a large tree called, in Brazil, pindaiba, and by botanists *xylopia sericea*, is advantageously employed for this purpose.

The natural order anonaceæ is known from all other dicotyledonous orders by its flowers having the calyx and sepals arranged in threes, a number of carpella occupying the centre, as in a ranunculus, and by the curious circumstance of their albumen, which here constitutes the bulk of the seed, being what is called ruminated, that is, perforated in all directions by twisting and crossing passages, like the nutmeg.

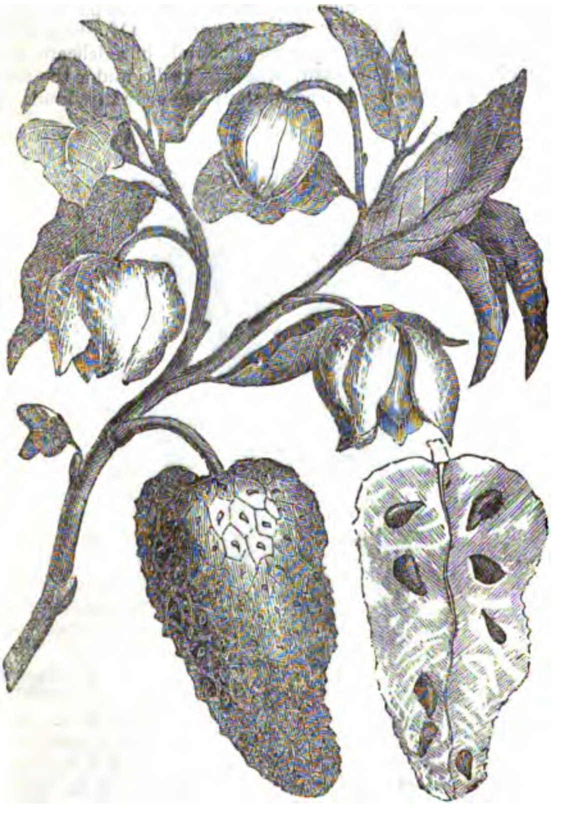
The preceding cut will give an idea of the structure of this order:—1. A calyx opened, the petals having fallen away, showing the arrangement of the stamens and carpella in the inside of the flower; 2. a stamen; 3. a seed; 4. the same cut in half, to show the ruminated albumen; 5. the embryo; 6. a ripe fruit, much less than the natural size; the projections on its surface are the points of the carpella which grow together into one fleshy mass, as in the raspberry; 7. a view of the same fruit cut in half.

Of the eatable fruited kinds above referred to, the most remarkable are the sweet sop, sour sop, and cherimoyer; all species of the genus Anona.

The sweet sop, *Anona squamosa*, is often only a small bush, growing in all the West Indian islands, where it bears a greenish fruit covered with scales, and having the appearance of a young pine cone. Its skin is half an inch thick, and contains an abundance of thick, sweet, luscious pulp; in many parts of the Indian Archipelago, it is a favourite fruit.

The custard apple, *Anona reticulata*, is an inferior kind, resembling the foregoing, but forming a larger tree, and having a much larger dark-brown fruit, the surface of which is netted all over. The bulb is yellowish, or reddish, and of about the consistence of custard.

The sour sop, *Anona muricata*, forms in the West Indies a picturesque small tree, resembling a great bay-tree. The flowers are yellow, and have an unpleasant odour. The fruit is often as heavy as 2 lb., or even 3 lb.; it is covered all over with weak prickles; its skin is yellowish-green, and very thin; its pulp is more like pith, is as white as milk, and is sweet, mixed with a most agreeable acid.



[Anona muricata, or Sour Sop.]

The cherimoyer, *Anona cherimolia*, is easily known from the preceding by its leaves not being shining and bright-green, but hoary, with short down, and very blunt. It forms a small tree about twelve or fourteen feet high, and is exceedingly valued in Peru, where it is cultivated on account of the excellence of its fruit. The flowers are very fragrant; the fruit heart-shaped, greyish-brown, or black, when ripe, with a scaly rind; the fruit is white, sweet, and rich. In the garden of the archbishop of Granada, in Spain, there were specimens of this which fruited every year, and were found to be really excellent even to a European palate.

The following spirited sketch, by Mr. Westall, of the appearance of the sour sop tree, will give some idea of the effect it would be likely to produce on the scenerv of the country where it grows.

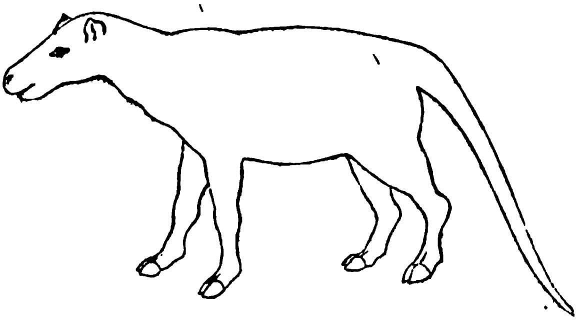
ANOPLETHE'RIUM (from ἀ privative, ὅπλον, and θὴρ, that is, a beast without offensive arms or tusks), in fossil zoology, a genus of extinct pachydermatous quadrupeds, discovered and characterized by Baron Cuvier. The bones of these singular inhabitants of a former world, occur in great quantities, mixed with those of the palæotherium, another extinct genus of the same order, likewise described by M. Cuvier, in the gypsum or plaster quarries in the neighbourhood of Paris, and they are occasionally, though more rarely, met with in the neighbourhood of Orleans and Genoa. It was only after researches continued for many years, that M. Cuvier succeeded in uniting the disjointed and broken fragments of bones belonging to the different parts and members of this genus, so as to reconstruct the complete skeleton of the animal, and obtain a definite and correct idea of its external form and appearance. The great labour and admirable skill which he has displayed in these profound and difficult inquiries were, however, finally crowned with success, and rewarded him not only with a knowledge of six distinct species, but even enabled him, in some instances, to depict their external forms, and infer, by an admirable chain of inductive reasoning, their probable habits and economy. Without entering into the minute and profound osteological comparisons which engaged the attention of M. Cuvier, and which those who desire to pursue the subject farther will find at length in the third volume of the *Ossemens Fossiles*, we shall here give the result of his inquiries, and endeavour to supply a correct idea of the form and affinities of these antediluvian inhabitants of our earth.

The first character in which the anoplotheria differ essentially from all other pachydermata, whether extinct or recent, is found in the number and arrangement of their teeth, which consist of six incisors, two canines, and fourteen molars in each jaw, making in the whole forty-four teeth. These, as in the human subject, are arranged in a continued and uninterrupted series, without any vacancies between the molars or incisors and the canines, a circumstance peculiar to this genus of animals among the pachydermata, and which, besides man, it shares only with the shrews and hedgehogs, mammalia, in all other respects, widely different. The canines, moreover, are perfectly similar in form and appearance to the incisors, and might easily be mistaken for lateral teeth of this description, did not their situation in the jaw, beyond the maxillary suture, prove their real nature. The four posterior molars resemble those of the rhinoceros and palæotheria, that is to say, they are quadrangular in the upper jaw, and marked in the lower, with a double or triple crescent of enamel, which penetrates their substance and shows itself on the crowns in the form of salient ridges.

This formation of the organs of mastication, intimately connected as these organs necessarily are with the food and alimentary canal, demonstrate most unequivocally that these animals fed upon vegetable substances, and that, in all probability, they differed but little in this respect from the tapirs and rhinoceroses at present existing. Other details of their structure, about to be noticed, will confirm these analogies, and afford us a still clearer insight into their habits and economy.

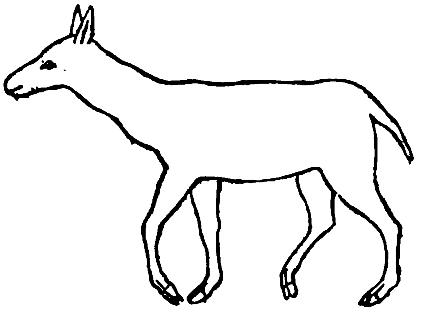
The second important character of the anopletheria which must have exercised a very decided influence upon their habits arises from the conformation of the extremities. These, as in ruminating animals, were terminated by two toes, enveloped in small hoofs, sometimes without accessory or false hoofs behind, as in the camels and lamas, sometimes with one or even two small lateral toes of this description, as in the pecaries, but the bones of the metacarpus and metatarsus respectively corresponding to these two toes were not united into a single canon, as they invariably are among the ruminantia, and this is in reality the principal difference between the extremities of the latter animals and those of the anopletheria. It is to be observed, however, that this character is not peculiar to the ruminants; the pecaries, or indigenous hogs of South America, have likewise the metacarpal and metatarsal bones soldered into a single piece, exactly resembling the canon bone of the sheep or deer, and in this respect, are intermediate between the orders of the ruminantia and pachydermata. The stomachs of the pecaries likewise partake of the complication characteristic of the former group, from which, on the other hand, the camels, in all other respects true ruminants, differ widely both by the form of their feet, and the number and arrangement of their incisor teeth. These animals are, in fact, far more anomalous among the ruminants than the pecaries are among the pachydermata, and it is to their extremities, particularly, that the construction of the corresponding parts of the anopletheria most nearly approximates. The structure of the carpus and tarsus are precisely the same in both genera; the scaphoïd and cuboïd bones, which are soldered together into a single piece in all the other ruminants, being separate in the camels and lamas, as they invariably are in the anopletheria and other pachydermata. These analogies prove that the anoplotherium, which its teeth have already shown to have been essentially a pachydermatous quadruped, approached in many of its characters to the ruminantia of the existing creation, partaking, on the one hand, of the characters of the camels and lamas, and on the other of those of the rhinoceroses and pecaries. In the less prominent details of organization, however, the different species of anopletheria present peculiarities which have induced Baron Cuvier to distribute them in three subgenera. In all, the prolongation of the nasal bones clearly shows that the anopletheria were not furnished with trunks like the elephants, tapirs, and palæotheria; and their head altogether, judging from the form of the skull, appears to be intermediate between that of the horse and that of the camel. The first subdivision comprehends those species which M. Cuvier calls

Anopletheria proper: they are distinguished by having all the lower molars marked by double or triple crescents in a longitudinal direction, without salient tubercles; and by a third, or supernumerary hoof on the fore-feet. This division comprehends two species, differing from one another principally in point of size, the one (*A. commune*) being about the size of the ass, and the other (*A. secundarium*) about that of the hog. These animals were low on the limbs, probably like the tapirs, but their long and powerful tail, equalling the body itself in length, made them still more essentially aquatic animals. The great size of their members, the depressed and heavy proportions of their bodies, and their long tails compressed horizontally at the base, must have given them much of the external form of the otter; but they resorted to the lakes and marshes of the antediluvian world, not for the purpose of preying upon other animals, but in search of aquatic plants, whilst the depressed form of their tails shows that they must have swam and plunged with greater ease and facility than either the tapir or hippopotamus. Like these animals, their ears were probably short and erect, and their bodies sparingly covered with hair, as in all the existing pachydermata. The following outline conveys a just idea of the external figure of this animal, as drawn from the skeleton by M. Cuvier.



[Anoplotherium commune.]

The subgenus *xiphodon* differs from that just described in having the inferior molars tuberculous, and being without the additional or false hoof on the fore-feet. It contains but a single species (*A. gracile*), which, judging from the length and smallness of its limbs, and the elevation of the tarsus, must have presented in every respect a complete contrast to the *A. commune*, exhibiting the light form and graceful proportions of the gazelle. Its course must necessarily have been rapid, and probably unembarrassed by a long tail; and instead of resorting habitually to the rivers and ponds, like the former species, it must have been confined to the dry land, and, probably like the gazelles and antelopes, fed upon dry aromatic herbs, and was provided with long moveable ears to warn it of the approach of danger. M. Cuvier likewise possessed a skeleton of this species, nearly perfect, and has furnished the following outline of its external form.



[Anoplotherium gracile.]

The third subgenus, *dichobunes*, contains three species, all established from the observation of detached bones, and of the actual forms of which it is consequently impossible to give a correct idea. They differed from the species contained in the two former subdivisions, principally by having a small additional or false hoof both on the fore and hind feet; and this character is so well marked in all the three subgenera of M. Cuvier, that, besides other considerations, it would suffice, among existing animals, to distinguish three separate genera, and perhaps should do so in the present instance. The dichobunes were all of small stature: the largest of the three known species (*A. leporinum*) was about the size of a hare; the other two (*A. murinum* and *A. obliquum*), about that of the guinea-pig, were in all probability the smallest of hoofed quadrupeds. M. Cuvier supposes them to have been the hares and rabbits of the antediluvian world, but their whole structure seems to approximate them more correctly to the musks of the present time, and they probably differed little from these animals either in form or habits.

ANQUETIL DU PERRON (Abraham Hyacinthe) was born at Paris on the 7th December, 1731. He received his early education in that capital, where he soon displayed a predilection for the study of the Hebrew language and literature. M. de Caylus, then bishop of Auxerre, induced him to study divinity, for which purpose Anquetil visited two theological seminaries. But his fondness for the literature of the East, especially the Arabian and Persian, did not allow him long to pursue his theological studies, and he returned to Paris, where he made use of the ample stores of oriental learning collected in the Bibliothèque du Roi. Accidentally, a fac-simile of a few pages of the *Vendidad-Sadé* came under his eyes, and this circumstance first turned his attention and inquiries towards India and the Parsis. A French army was just at that time fitted out for India. Anquetil resolved to avail himself of this opportunity to visit India, and enrolled himself as a private soldier, in which capacity he quitted Paris on the 7th of November, 1754. It was only after his departure that his friends obtained for him a small pension (500 livres) from the French government, to assist him in the pursuit of his inquiries. Anquetil disembarked at Pondichery, on the Coromandel coast, the 10th of August, 1755; hence he proceeded to Chandernagor, in Bengal, but was disappointed in his hope of finding there an opportunity of learning the Sanskrit language. At this place he was taken ill, and the capture of Chandernagor by the English soon obliged him to leave, and return on foot, by a journey of a hundred days, to Pondichery, where he embarked on board a vessel which was bound for Surat, but landed at Mahé, on the Malabar coast, and continued his way by land, and again on foot. At Surat he became acquainted with some *desturs*, or Parsi priests from Guzerat, whose assistance enabled him to make the necessary preparations for the translation of the Zend Avesta, which he published after his return home. The progress of the British power induced Anquetil to leave India. He embarked for Europe in an English ship, arrived at London, visited Oxford, and on the 4th of May, 1762, returned to Paris. The Abbé Barthélémy procured him an appointment in the Bibliothèque du Roi, and in 1763 he was elected a member of the Académie des Belles-Lettres. From this time Anquetil devoted himself entirely to literary labours. In 1771 he published his principal work, a translation into French of the *Zend Avesta*, or the sacred writings of the Parsis, attributed by them to Zoroaster. This work had scarcely appeared, when it was attacked with undeserved severity by Mr. (afterwards Sir William) Jones, in his *Lettre à M. A*** du P***, dans laquelle est compris l'Examen de sa Traduction des livres attribués à Zoroastre.* (London, 1771, 4to.) Jones himself seems to have subsequently felt that he went too far, when he declared the work translated by Anquetil a mere fabrication of modern times. But the question concerning the genuineness or authenticity and the exact date of these writings is not yet ultimately settled. A lithographed fac-simile edition of the beautiful manuscript of the most important of them, the *Vendidad-Sadé*, which Anquetil brought home from India, is now appearing at Paris; and several French and German Orientalists, especially Eugène Burnouf of Paris and Bopp of Berlin, have, by means of Anquetil's translation, analyzed the original language, and shown its close affinity to the Sanskrit. Of Anquetil's other works we shall here only notice his *Recherches Historiques et Géographiques sur l'Inde*, which he published in 1786; and his Latin interpretation of Dara Shekuh's Persian translation of the Sanskrit *Upanishads*, or antient and sacred treatises on the theology of the Brahmans, which appeared under the title *Oupnekhat sive secretum tegendum*, &c. (Strasburg, 1804, 2 vols. 4to.) Anquetil died on the 15th of January, 1805. (The biographical notices in the above sketch of Anquetil's life are taken chiefly from the *Biographie Universelle*.)

ANQUETIL DU PERRON (LOUIS PIERRE), the elder brother of the subject of the preceding article. He was born at Paris in 1723, and having studied theology, was, at an early age, appointed director of the Episcopal Seminary at Rheims. From this place he was removed in 1759 to the Priory of La Roé in Anjou, and thence to that of director of the College of Senlis, which situation he held for ten years. He then became Curé of Château-Renard near Montargis, where he spent twenty years of his life, performing his sacred duties in a manner which greatly endeared him to his parishioners. The new ecclesiastical arrangements made at the revolution transferred him from this village to that of La Villette near Paris; and here he remained till 1793; when, in the general proscription of the clergy, he was seized and thrown into the prison of St. Lazare. The catastrophe of the 9th Thermidor (27th of July, 1794) delivered Anquetil along with the other victims of the overthrown tyranny. He had before this been a corresponding member of the Academy of Belles-Lettres; and on the establishment of the Institute in 1795, he was nominated one of the members of the second class. He was soon after appointed to a place under government in the foreign office, and this he held till his death on the 6th of September, 1808, at the age of eighty-four. Anquetil had all his life been fond of literary occupation; and up to its close is said to have continued his early habit of studying regularly ten hours a day. He is the author of a considerable number of historical works, of which, however, only one or two are now held in much esteem. His best performance is considered to be a *History of the City of Rheims*, which appeared in three volumes, 12mo. in 1756-7. M. Felix de la Salle, however, is understood to have been conjoined with Anquetil in the composition of this work. His *Esprit de la Ligue*, which first appeared in three volumes, 12mo. in 1767, being a history of the troubles which distracted France after the death of Henry III., has also been several times reprinted. Another of his works is his *Précis de l'Histoire Universelle*, a considerable part of which was written in St. Lazare, and which was first published in nine volumes, 12mo. in 1797. This work has been translated into English, Spanish, and Italian, but is not regarded as having much merit. There is also a *History of France* by this writer in fourteen volumes, 12mo., the first of which appeared in 1805: he is besides the author of numerous papers published in the *Memoirs of the Institute;* and of an account of the life of his brother, the oriental scholar. (*Biographie Universelle; Biographie Nouvelle des Contemporains; Encyclopédie des Gens du Monde*, Paris, 1833.)

ANSBACH, ANSPACH, or ONOLZBACH, formed a portion of the old principality of Ansbach-Baireuth, in the southern part of Franconia, but it is at present merged in the circle of the Rezat, which surpasses every other province of the kingdom of Bavaria in relative population, trade, and manufactures. In more remote times, this principality was an appendage of the Burggraviate of Nuremberg, which fell to the house of Hohenzollern in the twelfth century, and subsequently passed into the possession of the Margraves of Brandenburg. It afterwards became the property of the collateral branch of Baireuth, and, on the extinction of that branch in 1726, descended to the subsequent Margraves of Ansbach-Baireuth. The last of this family, who intermarried with the celebrated Lady Craven, youngest daughter of Earl Berkeley, in 1767, ceded his inheritance to the King of Prussia, his feudal lord, on the 2d December, 1791. The latter, however, was compelled by the French emperor to relinquish it to him in 1806; and Napoleon shortly afterwards made it over to Bavaria, in exchange for Juliers and Berg. Baireuth, the other portion of the united principality, was also extorted from Prussia, after the disastrous conflict at Tilsit, and, by the same distributor of crowns and kingdoms, transferred to the Bavarian sovereign in 1809.

ANSBACH, formerly **ONOLZBACH**, the capital of the extinct principality of that name, and now the capital of the circle of the Rezat in Bavaria, lies in a fertile and richly-cultivated valley, traversed by the river Rezat, and is built round the confluence of that river with the Holzbach, 48° 12′ N. lat., 10° 33′ E. long., and about thirty miles south-west of Nuremberg. The town is embellished with handsome squares, and public, as well as private, buildings; the regularity with which the new town is constructed, combined with the attractive country which surrounds it, render Ansbach a pleasant residence. The palace of the former Margraves, a handsome structure in the Italian style, though at present a solitude, retains its gallery of paintings and library; and its grounds, which are laid out in the English taste, are still kept up for the recreation of the inhabitants. Ansbach is the seat of a court of justice and court of appeal, as well as of a Protestant consistory; it contains also one of the eighteen royal gymnasia, or high-schools, schools of design and music, and a society of arts and manufactures. The principal manufactures of the place are earthenware, tobacco, linens, cottons, woollens, and white-lead: the number of its inhabitants, which in 1825 was 14,000, is now between 16,000 and 17,000, and in this respect it ranks as e seventh town in the Bavarian dominions. The holy fraternity of St. Gumbert, who showed something better than a monkish taste in selecting a site of so much natural beauty for their abiding-place, may be looked upon as the founders of Ansbach. Under its native princes, it gradually grew into a busy, thriving spot; but, at the present day, it partakes in no small degree of the character of a remote quarter in the old town, which has been, not inappropriately, christened '*Ennui*.' The last Margrave, whenever he could persuade himself to abandon the more seductive charms which England, France, and Italy presented, was accustomed to devote himself to the pleasures of the chase and table at his neighbouring seat, Triesdorf, which was better known among his subjects by the name of the 'Falcon's Nest,' and was in high repute throughout the continent for its breed of horses and cattle. The peasantry of Ansbach are distinguished by a singular costume, consisting of a long black frock, scarlet waistcoat with white buttons, black leather breeches, and a Lilliputian round hat. The women of Ansbach are accounted the loveliest and most lively of the Franconian females. Cronegk, a dramatic, and Uz, a lyric, poet, who stand high in the estimation of their fellow-countrymen, were both of them natives of Ansbach, and a monument has been erected to the memory of the latter in the grounds attached to the palace. His translation of Anacreon is remarkable for its elegance and fidelity.

ANSELM, archbishop of Canterbury in the reigns of William Rufus and Henry I., commonly called St. Anselm, was by birth an Italian, and a native of Aosta, a town of the Alps belonging to the Duke of Savoy. He took the monastic habit in 1060, at the age of twenty-seven, at Bec in Normandy, where Lanfranc, afterwards archbishop of Canterbury, was prior. Three years after, when Lanfranc was promoted to the abbacy of Caen, Anselm succeeded him as prior of Bec, and when Herluin the abbot of that monastery died, Anselm became abbot of the house. Anselm came to England about A.D. 1092, by the invitation of Hugh Lupus, Earl of Chester, who requested his aid in sickness. Soon after his arrival, William Rufus, who was ill at Gloucester, also required Anselm's assistance, and finally nominated him (though with great difficulty of acceptance on Anselm's part) to the see of Canterbury, which had lain vacant so long, from Lanfranc's death in 1089, as to touch the king's conscience with remorse. Anselm, having first stipulated for the restitution of the possessions of the see as they had stood in his predecessor's time, was consecrated with great solemnity, December the 4th, 1093. In the following year, when William Rufus was endeavouring to wrest Normandy from his brother Robert, a stinted offer, as the king thought it, of 500*l.* was the first cause of the royal displeasure towards Anselm; followed by further discontent when Anselm desired leave to go to Rome to receive the pall from Pope Urban II., whom the king refused to acknowledge as pope, being inclined to favour the party of his competitor Guibert, or rather being desirous that Anselm should receive the pall from himself. At a great council held at Rockingham castle, when charges were made against Anselm, the majority of the bishops sided with the king, and renounced their canonical obedience to the archbishop, while the temporal barons supported him. During this conflict, Walter, bishop of Alba, the pope's nuncio, brought the pall into England, which it was at last agreed should be carried to Canterbury, and placed upon the altar of the cathedral, whence Anselm was to receive it as if it had been put into his hands by St. Peter himself. In short, the king pretended to be reconciled. He soon, however, took an opportunity of again quarrelling with Anselm for having furnished, as he alleged, an ill-equipped proportion of troops for the expedition against Wales. Anselm, now seeing no probability of terminating his disputes with the king, proposed a visit to Rome to consult the pope, but was personally refused the royal permission to depart. His resolution, however, was fixed: he went a second time to court to ask for leave, and was again refused, but gave his blessing to the king, and embarked at Dover. As soon as the king had ascertained that Anselm had crossed the channel, he seized upon the archbishoprick, and made every act of Anselm's administration void. The archbishop got safe to Rome, and was honourably received by the pope, whom he afterwards accompanied to Capua. Here he wrote a book upon our Saviour's incarnation; subsequent to which he assisted the pope at the synod or council of Bari, where he prevented Urban from excommunicating the king of England for his various and frequent outrages upon religion. The king, however, by presents and promises, finally bribed the court of Rome to desert Anselm, who retired to Lyons, where (with the interval of an attendance at a council at Rome in 1099) he continued to reside till he heard of William Rufus's death, with that of Pope Urban shortly after. Henry I., immediately upon his accession, invited Anselm to return to England, but fearing his brother Robert's arrival as a competitor for the throne, he was crowned by another prelate. The archbishop was received in England with extraordinary respect both by the king and people, but refusing to be re-invested by the king, and to do the same homage with his predecessors, he again fell under the displeasure of the court; open rupture, however, was deferred till the return of the agents of both parties, who had been sent to Rome. In the interim Anselm summoned a synod to meet at Lambeth, in which it was determined that the king might lawfully marry Matilda, the eldest daughter of Malcolm king of Scotland, although she was generally reported to be a nun; he also rendered signal service to King Henry against his brother, the Duke of Normandy, who had landed at Portsmouth; and gave his aid in preventing some of the nobles of Henry's court from joining in revolt. The agents to Rome now returned. One of them refusing to dispense with Urban's canons, and the king refusing to yield his prerogative, the dispute was still kept up, and rather inflamed in consequence of the majority of the bishops and nobility siding with the king. It was now determined that fresh agents should be sent to Rome; but when they returned, the two parties disagreed as to the answer they had received from the pope; the king's bringing a verbal answer in addition to the written letter. After this, for a short period, the controversy was allowed to sleep. In 1102 another national synod was held under Anselm, at St. Peter's, Westminster, which was attended by the king and principal nobility. In the year following, at the request of the king and barons, Anselm himself took a voyage to Rome, to arrange, if possible, an accommodation; the king, at the same time, in distrust, despatching an agent of his own to the papal court, who arrived before the archbishop. The pope still continued inexorable; but wrote a ceremonious letter to the king, promising compliance in other matters, if the king would but waive the matter of investiture. Anselm, in chagrin, again took up his residence at Lyons; while a fresh embassy to Rome from the king was still more unsuccessful than the former, the pope levelling the heaviest censures of the church against different persons of the English court who had dissuaded the king from parting with the investitures. Anselm now removed from Lyons to the court of Adela, countess of Blois, the king's sister, who, during a visit which Henry I. made to Normandy, contrived an interview between him and Anselm, July 22, 1105, at the castle of L'Aigle, when the king restored to him the revenues of the archbishoprick, but refused permission for Anselm to return to England unless he would comply with the investiture. Anselm, still refusing, remained in France, retiring to the abbey of Bec; and though the English bishops, who till then had sided with the king, now changed their minds, and pressed Anselm to return, he refused, till he was further informed of the proceedings of the court of Rome. At length the ambassadors returned, and announced that the pope, adopting a middle course, refused to give up the investitures, but was willing so far to dispense, as to give leave to bishops and abbots to do homage to the king for their temporalities. This was in 1106. The king now invited Anselm to England, but the messenger finding him sick, the king himself went over into Normandy, and made him a visit at Bec, where all their differences were adjusted. Anselm, being recovered, embarked for England, and, landing at Dover, was received with extraordinary marks of welcome. To omit other circumstances of respect, it is stated that the queen herself travelled before him upon the road, in his return, to provide for his better entertainment. From this time, little that is remarkable occurred in the life of Anselm, excepting a dispute with Thomas, elected archbishop of York in 1108, who, wishing to disengage himself from dependency upon the see of Canterbury, refused to make the customary profession of canonical obedience. Before the termination of this dispute, Anselm died at Canterbury, April 21, 1109, in the seventy-sixth year of his age.

The works of Archbishop Anselm were published first at Nuremberg, folio, 1491; at Cologne in 1573, and 1612; at Lyons in 1630; by Father Gerberon, at Paris, in 1675, reprinted in 1721; and again at Venice, 1744, in two volumes folio. In the library of Lyons there is a beautiful manuscript of his meditations and prayers. Some of his pieces in the Cologne edition of 1612, and the Lyons edition of 1630, are thought to be supposititious.

Anselm was a man of piety and learning according to the measure of the age in which he lived; but by promoting with zeal and obstinacy the ambitious views of the court of Rome, he involved both his king and country in many troubles, and set an example of opposition which was too well imitated by some of his successors. He was the first who restrained the marriage of the English clergy, by passing the ecclesiastical canons of the years 1102 and 1108. Eadmer the historian, who had been the archbishop's secretary, was the first who wrote his life; and there is another life of him by John of Salisbury, disfigured by the relation of many supposed miracles which the archbishop is said to have wrought. The canonization of Anselm took place in the reign of Henry VII. at the instance of cardinal Morton, then archbishop of Canterbury,—a singular mark of veneration for one who had been dead so long. (Godwin, *de Præsulibus; Biogr. Brit.* edit. 1778, vol. i. p. 205; Henry, *Hist. Brit.* b. iii. c. 2; Chalmers' *Biogr. Dict.* vol. ii. p. 280.)

ANSER, the goose, a genus of birds which M. Brisson, very properly as we think, separated from the genus *Anas* of Linnæus. Brisson has been followed in this by Baron Cuvier, Vieillot, Lesson, Drapiez, and Fleming; while Latham adheres to Linnæus, and Temminck confines *Anser* to a section of *Anas*. The following are M. Vieillot's characteristics, with some slight modifications. The bill shorter than the head, and higher than wide, but as thick as it is broad, in some species bulged at the base near the forehead, straight, rounded at the point, denticulated with conical and pointed lamellæ; the upper mandible is convex and unguiculated at the tip; the lower mandible is flat and rather narrow. The wings are of moderate length, and on some species furnished with tubercles. The legs are considerably longer, and more in the middle of the body than in *Anas*, and hence geese walk better than ducks. There is no enlargement at the base of the windpipe.

The species, twenty-eight in number, will be described under GOOSE.

ANSON, GEORGE, LORD, was the third son of William Anson, Esq., a gentleman of a good family, long established in Staffordshire. Anson's inclination to the seafaring life discovered itself early. It was his greatest pleasure to read and hear stories of eminent voyagers and admirals; his father, therefore, gave him such an education as was likely to foster and improve the natural bent of his genius. In 1722, he was made master and commander of the Weazel sloop, and the year following was raised to the rank of post-captain, and to the command of the Scarborough man-of-war. In this station in the profession, he was employed on various services, which he discharged with credit.

It was at the breaking out of the Spanish war that he first became an historical character. In 1740, he was appointed to the command of a small squadron, which was ordered to sail for the South Sea, a quarter where no attack was anticipated, to harass the coasts of Chili and Peru, and to cooperate occasionally with Admiral Vernon across the Isthmus of Darien. The scheme was well laid, but frustrated by unaccountable delays in the first instance, and afterwards by some unforeseen accidents. Anson was not able to sail until September; but the dilatoriness which retarded his departure till so late in the year was yet less culpable than the negligence which sent him out with ships ill-fitted for the dangerous navigation on which he was bound. He doubled Cape Horn, in March 1741, after experiencing most tempestuous weather off that dangerous coast, in which his whole squadron was dispersed. He arrived, with only his own ship the Centurion, at Juan Fernandez, 33° 40′ S. lat., 79° W. long., June 10, after suffering for near three months from a series of the most terrific storms, and from the ravages of the scurvy, which in that short time had carried off upwards of 200 from a crew of between 400 and 500 men, and left scarce enough of the remainder in health to work the ship. At that island he was rejoined by the remains of his squadron, consisting of the Gloucester man-of-war, a sloop, and a vessel, called in the phraseology of the times a pink, laden with provisions. His men were now reduced to the number of three hundred and thirty-five. With this small force he left Juan Fernandez in September kept the Spanish coast for eight months in continual alarm, made prize of several small vessels, and burned the town of Paita. The original design of the expedition being frustrated, he conceived the project of intercepting the Manilla or Acapulco galleon, a Spanish ship laden with bullion and other valuables to a vast amount, which sailed annually between Acapulco in Mexico, and Manilla, one of the Philippine islands. With this view he hovered on the west coast of America till May, 1742, when he set sail to cross the Pacific Ocean. In the course of this voyage, the Gloucester and the other vessels were destroyed for want of men to navigate them, and he proceeded with only the Centurion, and that but half manned, owing to the sickness and mortality which had thinned the crews. The hardship endured on this part of the voyage was extreme, from the shattered condition of the ship, as well as the prevalence of scorbutic disorders. The first land which the voyagers made was the uninhabited island of Tinian, one of the Ladrones, of which a most fascinating description is given. Here the commodore remained some time to refresh his crew; and his constancy and equanimity were signally shown during this period. The Centurion was driven from her moorings out to sea, leaving himself and the greater part of the sailors and officers on shore. In this emergency his calmness and spirits never failed. He gave orders immediately for the construction of a vessel, engaging personally in the most laborious employments; and the greatness of his anxiety would have remained unknown, but for his transports of joy on the unhoped return of the Centurion.

The health of the crews being in some degree recruited, Anson proceeded on his course to China; and arrived at Macao, an island and town in the bay of Canton, November 12, 1742. He remained there till the beginning of 1743. during which interval the vessel was new-sheathed, and a reinforcement of sailors procured. He now resumed his design of intercepting the Spanish galleon, and he steered his course back to the Straits of Manilla. He met and took her after a short but sharp engagement, June 20. In the moment of victory, a fire broke out near the powder-room of the Centurion, the extinction of which was owing to the commodore's calm promptitude. The prize was mounted with forty guns, manned by six hundred sailors, and laden with treasure and effects to the value of 313,000*l.* He returned to China for the purpose of selling her; and thence proceeded round the Cape of Good Hope to England, and arrived at Spithead in safety, June 15, 1744. The contrast between the disasters of the earlier and the good fortune of the latter half of his voyage is remarkable, for dangers beset him to the last. On his arrival in England, he discovered that he had passed in a fog through the midst of a French fleet then cruising in the Channel. The commander himself was enriched by this expedition, and the character of Great Britain for skilful and intrepid seamanship was confirmed and heightened; but in a political view, the nation was not indemnified for the expense. The object, as a general measure of warlike operations, was frustrated. The lying in wait for the Manilla ship was an afterthought· had the chapter of accidents, so eventful in maritime occurrences, terminated unfavourably in spite of all his vigilance, he might have been superannuated on his return to England, and have died in obscurity. But his talents as an officer were rendered influential by his wealth; he was heard as an oracle in all naval deliberations, and rose by uninterrupted gradations to the highest honours of his profession, and also to the peerage.

Soon after his return, Anson was appointed Rear Admiral of the Blue, and one of the Lords of the Admiralty. In April, 1745, he was made Rear-admiral of the White, and in July, 1746, Vice-admiral of the Blue. He was also elected parliamentary representative of the borough of Heydon, in Yorkshire. During the winter of that year, he commanded the Channel squadron in a long and tempestuous cruize. In the following spring, May 3, being in command of a powerful fleet of fourteen ships, besides a sloop, and fireship, he fell in with two combined French fleets, bound to the East and West Indies, laden with merchandise, treasures, and warlike stores, protected by a strong convoy. On this occasion he captured six ships of war, not one escaping, together with four armed East Indiamen. M. de St. George, captain of the Invincible, on presenting his sword to the conqueror, said, in allusion to the names of two of the captured ships, in the characteristic epigrammatic style of French compliment, 'Sir, you have conquered the Invincible, and carry Glory in your train.'

For his signal services, King George II. rewarded Admiral Anson with a peerage, by the title of Lord Anson, Baron of Soberton, in Hants. In the same year he was appointed Vice-admiral of the Red; and on the death of Sir John Norris, Vice-admiral of England, an appointment rather of a civil than a naval character, but always given to a naval man. In 1748, he was appointed Admiral of the Blue, and commanded the squadron which conveyed George II. to and from Holland. He ever after attended the king in his voyages to the Continent. In 1751, he was appointed First Lord of the Admiralty, in which station he continued, with a very short interval, till his death. The occasion of his temporary retirement was the unpopularity incurred by the government in consequence of the untoward events of which Admiral Byng was the victim; but those events belong more properly to the political history of the period than to the personal transactions of Lord Anson's life.

In 1758, being then Admiral of the White, he hoisted his flag on board the Royal George, 100 guns, and sailed from Spithead on the 1st of June. Sir Edward Hawke commanded under him. By cruizing continually before Brest, he covered the descent which was made that summer at St. Maloes and Cherbourg. On the accession of George III., he was appointed Admiral and Commander-in-chief of his Majesty's fleets. He died suddenly, June 6, 1762, aged 65, at his seat at Moor Park, in Hertfordshire, having for some time been in a shattered state of health. He married the eldest daughter of Lord Chancellor Hardwicke, who died before him without issue.

His professional characteristics were those of discretion, coolness, and steadiness. In contemplating the risk of his own ship being lost in doubling Cape Horn, he gave such directions to the other commanders as were calculated to secure the success of the voyage. At Juan Fernandez he set the example, and compelled his officers to assist, in carrying the sick sailors, in their hammocks, ashore. He sowed garden seeds, and planted fruit trees in that island, for the benefit of future voyagers. He was a strict disciplinarian, and his methods were attended with such success, that at the taking of Paita, only one of his men so far neglected his duty as to get drunk. When dissensions arose concerning the distribution of the plunder seized there, he showed his generosity by throwing up his own share to augment the portions of his officers and men. His humanity was eminently displayed in his kind treatment of his prisoners; by which he won the admiration and respect of the American Spaniards, and did much to remove the opinion of the excessive cruelty of the English, arising out of the atrocities committed in past times by the buccaneers. He directed his attention to the improvements of geography and navigation, by making careful surveys of the coasts which he visited. It has been said that he was addicted to gambling, and a dupe to sharpers. The charge is contradicted by Dr. Kippis in the *Biographia Britannica;* but the apologist contents himself with stating that 'upon the whole he neither won nor lost by gaming; and he made it, like hundreds of others who pass uncensured, his amusement rather than his business.' A witty remark that 'he had been round the world, but never in it,' was probably, like many similar sayings, hazarded for the sake of the point rather than for its strict applicability. *Lord Anson's Voyage round the World* went through four large impressions the first year, and has been translated into most European languages. It was written by Mr. Benjamin Robins, from materials furnished by Lord Anson, and digested under his own inspection. A journal of Anson's voyage was published in 1745, by Pascoe Thomas, teacher of the mathematics on board the Centurion.

ANSTEY, CHRISTOPHER, a poet of the last century, born October 31, 1724, now little known except as the author of the *Bath Guide*. He received the rudiments of his education at the free school of Bury St. Edmunds, whence he was removed to Eton; and in due time succeeded to a fellowship at King's College, Cambridge. He took his bachelor's degree in 1746, but was prevented from proceeding at the regular time to the degree of M.A., by a whimsical quarrel with the University authorities. In consequence of this, he was refused his master's degree, in 1749; but he continued to hold his fellowship, and occasionally resided at college.

On his mother's death, in 1754, he succeeded to the estates of his maternal grandfather, at Trumpington, near Cambridge, and resigned his fellowship. In the year 1766 he published his *Bath Guide*, a satire on the follies of fashionable life, especially as developed at that gay watering-place. This is one of the lightest, wittiest, and most amusing satires of the kind in the English language, and obtained great popularity; insomuch, that Dodsley the bookseller, who had purchased the copyright for 200*l*., after two editions had been published, returned it to the author in 1777, stating that he had made more by it than he ever had made by any book in the same length of time. It should be mentioned to Mr. Anstey's honour, that he presented the profits of the work to the General Hospital of Bath. The merits of the work are tarnished by a broadness of humour, and an occasional irreverence in speaking of things connected with religion, which, though aimed at hypocrisy, and not intended to bring true religion into contempt, would scarcely be tolerated in the present day. The manners and follies which this lively *jeu d'esprit* was written to commemorate, have passed away; and from the combined effect of these two causes, it is probable that the *Bath Guide* will be little known to the rising generation.

Mr. Anstey wrote several poetical pieces of no great length, which are collected in one volume quarto, with a memoir of his life prefixed by his son. The most remarkable of them is the *Election Ball*, written much in the same strain as the *Bath Guide*. This he translated into Latin verse; as well as a selection from Gay's *Fables*, Gray's *Elegy*, and some other pieces. He was fond of this exercise, and versified with elegance and correctness. He spent the latter years of his life at Bath, and died there in 1805.

ANSTRUTHER EASTER and **WESTER**, two royal burghs in Fifeshire, Scotland; situated on the sea-coast facing the S.S.E., and on each side of the mouth of a small rivulet, about 35 miles N.E. by N. of Edinburgh. Anstruther Easter is considerably the larger place of the two, having a population (in 1831) of 1007 persons; Anstruther Wester has only 430. Till the year 1636 Anstruther Easter was in the parish of Kilrennie, but was then erected into a separate charge and the church built. It is in the Presbytery of St. Andrew's and the Synod of Fife: Sir John Anstruther is the patron. In 1710 it was made a port, and the custom-house established; and, in 1753, a new quay was erected. The town lies low, and the only good street is that which runs along the quay. Ship-building, tanning, and fishing, are the chief occupations of the inhabitants. There is a post-office. Lat. 56° 14′ N., long. 2° 44′ W. of Greenwich.

Anstruther Wester was made a royal burgh in 1583, having been previously a burgh of Barony. The parish church is a very antient structure. The inhabitants were zealous covenanters in the time of Charles I., and suffered severe loss in the battle of Kilsyth against the Marquis of Montrose in 1645. The author of the account of this parish in Sir John Sinclair's *Statistical Account of Scotland*, remarks with great naiveté, 'Since the battle of Kilsyth the people here have a strong aversion to a military life.' The town was further injured to a great extent by two inundations of the sea, one in 1670, which destroyed or choked up the harbour, and another towards the end of the same century, which destroyed about one-third of the town. The rock on which the town-house once stood is covered by the sea every spring-tide. The trade of this and other towns on this part of the coast is thought to have suffered from the union with England. The harbour does not admit ships of burden; but a little to the westward is a creek, called Westhaven, much used in the fishing season, which might easily be made a good harbour.

The creek between Easter and Wester Anstruther is said to have been the seat of a considerable salmon fishery. A variety of fish is still caught and sent to Edinburgh, Glasgow, and other places: lobsters are sent to London. Several vessels belong to these towns; and some coarse linens are made in the different families. The Anstruthers are included in the St. Andrews' district of burghs, which district returns one member to parliament.

Opposite to the Anstruthers is the Isle of May, a mile long and three-quarters of a mile broad, which is considered an excellent place for improving the fleeces of sheep kept there, though only for one season: there is a lighthouse on it.

ANT (*Formica*), a well-known genus of insects, which has attracted attention from the earliest ages, on account of the singular economy and extraordinary industry manifested by the different species. In various parts of the three volumes on insects in the *Library of Entertaining Knowledge*, numerous minute details are given of the interesting proceedings of ants; but at present we shall confine ourselves to a more brief but more methodical outline of their natural history. In tracing the history of most insects, it is best, perhaps, to begin with the eggs; but in the case of the ant, the laying and hatching of the eggs could not be well understood without an acquaintance with their singular manner of pairing, with which, therefore, we shall begin.

Pairing of Ants.—It may be necessary to premise here, that, similar to bees, a community of ants, whatever the species may be, consists of males, which have always four wings; of females, much larger in size than the males, which only possess wings during the pairing season; and of a sort of barren females, which have been variously termed neuters, workers, or nurse-ants, and which, so far as we know, have never been observed to have wings in any stage of their existence.

If an ant-hill be examined any time after midsummer up to the close of autumn, there may be seen, mixed with the wingless workers, a number of both males and females furnished with white glistening wings. These, however, are neither kings nor queens in the state, at least so far as freedom of action is concerned, for they are not allowed to move without a guard of workers to prevent their leaving the boundaries, and if one straggles away unawares, it is for the most part dragged back by the vigilant sentinels, three or four of whom may, in such cases, be seen hauling along a single deserter by the wings and limbs. The workers, so far from ever facilitating the exit, much less the departure, of the winged ones, more particularly the females, guard them most assiduously in order to prevent it; and are only forced to acquiesce in it when the winged ones become too numerous either to be guarded or fed. There seems, indeed, to be a uniform disposition in the winged ones to desert their native colony; and as they never return after pairing, it would soon become depopulated in the absence of females. The actual pairing does not seem to take place within the ant-hill, and we have observed scouts posted all around, ready to discover and carry back to the colony as many fertile females as they could meet with. Nay, we are quite certain that whole colonies have been thus dispersed; and when they did not find fertile females near their encampment, they have gone farther and farther till they found them, and, if they had gone very far, never returned, but commenced a number of new establishments, according to their convenience. It is probable that, soon after pairing, the males die, as do the males of bees and other insects; for, as the workers never bring any of them back, nor take any notice of them after leaving the ant-hill, they must perish, being entirely defenceless, and destitute both of a sting and of mandibles to provide for their subsistence. The subsequent proceedings of the females are very different, and of curious interest. It was supposed by the antients that all ants, at a certain age, acquired wings; but it was reserved for the younger Huber, in particular, by means of his artificial formicaries, to trace the development of the wings in the female from the first commencement, till he saw them stripped off and laid aside like cast clothes.

This curious process, which was first hinted at by Gould in his interesting account of *English Ants*, we have repeatedly witnessed,—the females extending their wings, bringing them over their heads, crossing them in every direction, and throwing them from side to side, till at length they are disjointed from the body and fall off. Those, however, who are desirous of verifying the observation, must procure winged females immediately after pairing, and place them under a glass with some moist earth.

Foundation of Colonies.—Some of the females are, after pairing, usually captured by the working ants, and conducted back to the parent community; and others are laid hold of by straggling parties of from two to a dozen workers, who do not return to the parent community, but commence small colonies on their own account. This explains the common occurrence of a great number of small colonies being formed in the immediate vicinity of each other, while sometimes the parent community is thereby quite broken up and the hill deserted. This happens frequently in the case of the red ant (*Myrmica rubra*) and the ash-coloured ant (*Formica fusca*), both very common species in fields and gardens. In the case of the yellow ant (*F. flava*) again, and the wood ant (*F. rufa*), this rarely occurs, the parent community often remaining in the same spot for years together.

When a female, after pairing, does not chance to fall in with any scouting parties of workers, she proceeds without their assistance to found a colony herself in the same manner as is always done by the females of the social wasps and humble bees every spring. We have repeatedly verified this fact, both by confining a single female after pairing, and witnessing her proceedings, and by discovering in the fields single females occupied in laying the foundations of a future city for their progeny. We have met with these single females when they have just begun to form the first cell for the reception of their eggs; when the eggs have just been laid; when the eggs have been hatched; and also when a few workers had been reared to assist in the common labours. To verify the latter observations, however, many hundreds of stones must be turned over in August or September in a place where ants abound; and even with all this the naturalist will probably not discover more than three or four solitary females at work in the course of a season. We have ourselves met with only ten or a dozen instances in the course of several years.

The Laying and Hatching of the Eggs.—The younger Huber says, 'Having directed my close attention to the eggs of ants, I remarked that they were of different sizes, shades, and forms. The smallest were white, opaque, and cylindrical; the largest transparent, and slightly arched at both ends; while those of a middle size were semi-transparent. On holding them up to the light, I observed a sort of white oblong cloud; in some, a transparent point might be remarked at the superior extremity; in others, a clear zone above and underneath the little cloud. The largest presented a single opaque and whitish point in their interior. There were some whose whole body was so remarkably clear as to allow of my very distinctly observing the rings. On fixing attention more closely upon the latter, I observed the egg open, and the grub appear in its place. Having compared these eggs with those just laid, I constantly found the latter of a milky whiteness, completely opaque, and smaller by one-half, so that I had no reason to doubt of the eggs of ants receiving a very considerable increase in size; that in elongating they become transparent, but do not at this time disclose the form of the grub, which is always arched.'

Contrary to what takes place in most insects, the eggs of ants are not, when laid, glued to any fixed place, but are found in parcels of half a dozen or more loosely attached, so that they can be removed at pleasure during the hatching. It has been shown in the *Penny Magazine*, (vol. i. p. 60,) by a series of minute observations, that the female earwig moves her eggs with the utmost care from a place which she judges too dry, to one which is sufficiently moist; and in the same way the female ant, when she founds a colony without assistance, or the nurse-ants in a community, change the situation of the eggs according to the state of the weather or of the day and night,—a circumstance first observed by Dr. King in the reign of King Charles II. Heat being indispensable to their successful hatching, the eggs are carefully placed during the day near the surface of the ant-hill, but so sheltered from the direct influence of the sun as to prevent the too rapid evaporation of their moisture. During the night, or in cold weather, the eggs are not placed so high, to prevent the radiation and escape of the heat which they naturally possess. The attention to the state of temperature occupies much of the assiduity of the female and the nurse-ants.

When the eggs are at length hatched, (and during this process, we have already seen tnat they enlarge in size,) the young grubs are similarly treated with respect to temperature, but greater care is now taken to preserve them from too great heat, which might prove more injurious than before hatching.

The grubs are fed by the nurse-ants when any of these are in the colony, and by the mother when she is alone, by a liquid disgorged from the stomach, as is done in a similar way by wasps, humble bees, pigeons, and canary birds. It consequently requires no little industry on the part of a solitary female to procure for herself sufficient food to supply nutriment for a brood of perhaps a dozen or twenty grubs, which are insatiably voracious.

When the grubs are full grown, they spin for themselves cocoons of a membranous texture, and of a brownish-white colour, not unlike barleycorns in appearance, and indeed mistaken for these by early observers,—a mistake which led to the unfounded notion that ants store up corn for winter provision, though, from their always becoming torpid in the winter, they could have no need of this; and even were this not so, they never feed on corn, and would probably starve rather than taste it. The authority of Scripture, which has been supposed to countenance the popular notion, is shown by the Rev. Dr. Harris, Messrs. Kirby and Spence, and others, to have no foundation in the sacred text.

The cocoons are treated precisely like the eggs and the grubs with regard to exposure to heat; and the anxiety of the nurse-ants to shelter them from the direct rays of the sun is taken advantage of on the Continent to collect the cocoons (popularly and erroneously called ants'-eggs) in quantity as food for nightingales and larks. The cocoons of the wood-ant are the only species chosen; and in most of the towns in Germany one or more individuals make a living during summer by the business. In 1832 we visited an old woman at Dottendorf, near Bonn, who had collected for fourteen years. She went to the woods in the morning, and collected in a bag the surfaces of a number of ant-hills where the cocoons were deposited, taking ants and all home to her cottage, near which she had a small tiled shed covering a circular area, hollowed out in the centre, with a trench full of water around it. After covering the hollow in the centre with leafy boughs of walnut or hazel, she strewed the contents of her bag on the level part of the area within the trench, when the nurse-ants immediately seized the cocoons and carried them into the hollow under the boughs. The cocoons were thus brought into one place, and after being from time to time removed, and black ones separated by a boy who spread them out on a table, and swept off what were bad with a strong feather, they were ready for market, being sold for about 4*d.* or 6*d.* a quart. We have seen temporary areas made for the same purpose in the woods, but for want of a confining trench of water, many cocoons were carried off by the ants. Considerable quantities of these cocoons are dried for winter food of birds, and are sold in the shops.

In the case of moths, ichneumons, and other insects which spin themselves up in cocoons, the included insect, when the time of its change arrives, is enabled to make its own way through the envelope; but though it would appear, from some observations made by Swammerdam, that ants may, when forced thereto, effect their own disengagement, this is not the usual process. It is the nurse-ants that cut a passage for them with their mandibles, as was first minutely described by Baron de Geer and the younger Huber:—'Several males and females,' says the latter, 'lay in their envelopes in one of the largest cavities of my glazed ant-hill. The labourer-ants assembled together, and appeared to be in continual motion around them. I noticed three or four mounted upon one of these cocoons, endeavouring to open it with their teeth at that extremity answering to the head of the pupa. They began to thin it by tearing away some threads of silk where they wished to pierce it, and at length, by dint of pinching and biting this tissue, so extremely difficult to break, they formed in it a vast number of apertures. To expedite the work, some raised up a little slip cut out in the length of the cocoon, whilst others drew the insect gently from its imprisonment. When the ant was extricated from its enveloping membrane, the body was still confined by another membrane, from which it could not by its own exertions disengage itself. The labourer-ants removed the satin-like pellicle which embraced every part of the body, drew the antennæ gently from their investment, then disengaged the feet and the wings, and lastly the body, with the abdomen and its peduncle. The insect was now in a condition to walk and receive nourishment, for which it appeared there was urgent need. The first attention, therefore, paid it by the guardians was that of giving it the food I had placed within their reach.'

Labours of the Working Ants.—We have already seen that workers or nurse-ants have to labour assiduously in placing the eggs, the grubs, and the cocoons in due degrees of temperature; that they have to feed the grubs by a liquid disgorged from the stomach, and have to disengage the insect at its period of change from the envelope of the cocoon. They have also to perform the task of forming streets, galleries, and chambers for the habitation and protection of the colony, and they exhibit in the work such perseverance and skill as must excite the admiration of every observer. Many of their processes, indeed, it is not a little difficult to account for and explain, though these have been very carefully investigated, particularly by the younger Huber, in whose work, and in *Insect Architecture*, (p. 254 *et seq.*) may be found copious details of the mining, masonry, and carpentry of various species. We shall here give an instance of each of those operations.

Mining.—There is an interesting species called the sanguinary ant (*F. sanguinaria*, Latreille), reported to have been seen near London, but which is certainly very rare, if it is found in England. In the summer of 1832 we discovered several colonies of this ant on the brow of the heath above Godesberg, on the Rhine, and being desirous of taking a number of them alive to England for the purpose of observing their singular manners, we waited till the beginning of October, when they had ceased to work, and had retired for the winter to their galleries underground. After uncovering the thick coping of dry heath twigs and grass stems which was placed over the subterranean city of the colony so as to defend it from rain and cold, we found several covert-ways dug into the clay, wide enough to allow two or three ants to walk abreast; but not an individual now made its appearance, though some weeks previous we had observed thousands in all the bustle of industry; and we began to fear the whole had migrated elsewhere. Being anxious, however, to see the interior structure, we dug in the direction of the covert-ways to the depth of about six or nine inches, when we came upon a number of chambers communicating with each other by galleries, and from an inch to two or three inches in extent, in each of which a number of ants were lying along the floor in a half torpid state, being so sluggish that they could not be brought to run with their usual agility even when irritated.

The point which we wish to call attention to here is that the whole of the apartments which we laid open, amounting to a dozen or more,—and there were probably as many more to which we did not penetrate,—must have been dug out of the solid clay by the jaws (*mandibula*) of these little miners. We deemed it singular that we could see none of the rubbish lying about, which must have been cleared away from the interior, and we can only account for this by supposing the colony long established, and the rubbish battered into the grass by the weather.

In other instances of mining, such as in the case of the turf-ant (*F. Cæspitum*), the clay taken from the interior is built up on the outside, using the herbage for buttresses to support the walls thus formed. In the case of the sanguinary ants, however, we observed nothing of this kind, and do not think they ever employ any exterior masonry.

Masonry.—The most common of our English ants which employ masonry is the yellow ant (*F. flava*), whose hills are so usually found built up in old pastures, a foot or more in height, and from six inches to two feet in diameter. For the materials of their building they are wholly indebted to the soil below, which they quarry out with great assiduity; but as they have no means of tempering the clay when it is dry, they are always forced to execute their principal works in rainy weather. 'I was,' says Dr. J. R. Johnson, 'in the habit of visiting, almost daily, for a month, an extensive nest of red ants, of which a large flat stone formed the roof. During my visits for the first three weeks, scarcely a drop of rain had fallen, and the nest seemed considerably injured by the continual falling in of loose earth, which these little creatures with amazing industry removed, whenever it happened any of the avenues were blocked up. No attempt was ever made towards reparation; but what was my surprise, on visiting my little friends after a two days' heavy rain, to find that the repairs were already completed, and that the upper surface of their habitation presented as smooth a surface as if a trowel had been passed over it; yet all their work they had industriously effected by kneading with the rain-water the loose earth into a sort of paste. From the nest being situated in the midst of an extensive heath, where there could be no supply of water, and from its remaining unrepaired during the dry weather, it amounts to a full conviction that ants employ no other cement than water in the construction of their varied habitations.

'I have often been surprised at the ingenuity of these little creatures, in availing themselves of contiguous blades of grass, stalks of corn, &c., when they wish to enlarge the boundaries of their abode. As these are usually met with in the erect position, they are admirably calculated for pillars; they, therefore, coat them over with a fine paste of earth, giving them, by additional layers, the solidity they judge necessary for the work on which they are engaged; they then leave them to be consolidated by the wind, and afterwards spring a number of arches, from pillar to pillar, and thus form an extensive saloon. Should they be, at any time, in want of small apartments, they have only to prepare a quantity of moistened earth, and by placing this between the pillars, and carrying it up to the roof, leaving here and there an aperture for entrance, their object is completely attained.'

It is remarkable that the greater part of these masonic labours are performed during the night, or at least in gloomy weather.

Carpentry.—The coping which we have already described as placed over the subterranean abode of the sanguinary ants, and which is still more remarkable in the colonies of the wood-ant (*F. rufa*), cannot be referred to any sort of carpentry, for the small sticks and straws of which it is composed are not cut into fitting lengths, but collected in the vicinity of the hill and laid on it after the manner of thatch. The term carpentry, however, will apply most justly to those species which form excavations in the interior of trees, of which the following is an instance observed in 1832.

We had brought into our garden in the beginning of June, a large piece of a willow tree, which had been very curiously worked out by the species usually called the emmet (*F. fuliginosa*, Latreille). The tree, indeed, from which it had been taken, appeared to have been destroyed in a great measure from the extensive excavations of these little carpenters. Yet the portion of the tree alluded to seemed to be singularly strong, when the great number of the cells and their peculiar structure was taken into consideration. The walls of these cells were literally as thin as writing-paper, though not quite so smooth and even, and they were seldom quite parallel, but arranged, some perpendicularly, and others slanting in various directions, worked out, it would appear, upon no previous design, but beginning at any given point, and only limited in extent by the worker discovering his approach to one adjacent. The tact with which they chisel away the wood with their jaws, so as to come so near the next cell without actually cutting into it, cannot well be accounted for on any of the common principles of human mechanism. It cannot be the result of vision, from the worker-out looking along the level of the plane, as one of our carpenters would do, and thence working so as not to cut through it; for the wall has, in most instances, though not in all, no free edge along which such a level could be taken by the eye. Hearing might assist them, however, supposing workers to be engaged in chiselling on each side of the partition, but it would appear to be more from touch, or rather that modification of it denominated tact, which enables them to feel, as it were, when they have nearly penetrated the wall, and which consequently warns them to stop.

It is not a little remarkable, that all the wood which is worked out by these ants is tinged of a black colour, giving all their streets and lanes somewhat the appearance of having suffered from fire or of being smoked. M. Huber the younger did not succeed in ascertaining the cause of this black colour. We should conjecture it to arise from iron contained in the saliva of the ants acting on the gallic acid of the wood, in a similar way as the same wood becomes black when cut with a knife. The fine glossy black of the ants themselves may originate from the same chemical principle, and this is rendered more probable from the excavations made by other species, such as the dusky ant, (*F fusca*, Latreille.) not being tinged with this black colour. Neither are the excavations of the latter so regular in the form of the cells; and the delicately thin partitions do not occur. We have seen several colonies of the yellow ant (*F. flava*, Latreille) established in trees, though their usual habits lead them to prefer a hedge-bank, the dry ridge of a field, or a small knoll on a common. In none of these, however, had the workers much trouble in making their excavations, the trees being in every instance far gone with the dry rot, and the chambers were consequently as easy to construct as in a knoll of sand. In the instance of the black carpenter-ant (*F. fuliginosa*), on the other hand, the wood of the tree selected for their colony is always hard and tough, the easiness of working it being apparently considered a disadvantage rather than a recommendation. We have usually seen these colonies, therefore, in growing trees, the oak seeming to be preferred to all others; the honeycomb-like work does not seem to stop the vegetation, the tree continuing to put forth leaves and shoots as before it was excavated for the use of the colony. In the instance which gives rise to these remarks, the willow tree was indeed dilapidated and shorn of its leaves and branches, yet was it untouched with dry rot, and the wood was hard and tough.

Food of Ants.—Some species of ants are carnivorous and will eat insects, fruits, and almost anything eaten by other animals, but honey is the most universal favourite among all the species, particularly the excretion of the various species of aphides called honey-dew. It is on this account that, wherever aphides abound, we are always certain to meet with ants carefully attending their motions and greedily drinking the honey-dew, which becomes so injurious to plants when it increases in quantity so as to obstruct the pores of the leaves. It is stated by Huber and some other authors, that during winter the ants imprison some aphides in their cells, or, at all events, take advantage of individuals of the grass aphis (*Aphis Graminum*) in the vicinity of their hills to obtain honey-dew. We strongly suspect there must be some fallacy in this statement; for among numerous colonies which we have carefully examined during winter, we always found the whole population torpid or nearly so, and not inclined to touch even honey when we offered it to them. In the case of the sanguinary ants in Germany already mentioned, we have seen that they had become torpid as early as October, when the weather was still fine and far from being cold. We are therefore of opinion that the statement will be found as void of accurate foundation as that which represents ants as storing up corn for the winter.

Migrations.—We have already seen, under the head of pairing, one principle in operation for spreading around a parent ant-hill a number of young colonies. This indeed may be considered the main principle of migration; but besides this, the whole of a populous ant-hill which has been established for several years will, for some cause beyond our means of tracing, though most probably on account of more convenient forage, at once desert their homes and march to a new station. Among the yellow ants, the emmets, and the wood-ants or pismires, this is by no means common; but it is an every-day occurrence among the red ants, the ash-coloured ants, the turf ants, and others whose colonies never become very populous, and are consequently both more easily moved and more easily provided with lodging.

'Immense swarms of ants,' to use the words of Dr. Roget, 'are occasionally met with, and some have been recorded of such prodigious density and magnitude as to darken the air like a thick cloud, and to cover the ground to a considerable extent where they settled. Mr. Gleditsch describes, in the *History of the Berlin Academy* for 1749, shoals of a small black ant which appeared in Germany, and formed high columns in the air, rising to a vast height, and agitated with a curious intestine motion, somewhat resembling the aurora borealis. A similar flight of ants is spoken of by Mr. Acolutte, a clergyman of Breslau, which resembled columns of smoke, and which fell on the churches and the tops of the houses, where the ants could be gathered by handfuls. In the German *Ephemerides*, Dr. Charles Rayger gives an account of a large swarm which crossed over the town of Posen, and was directing its course towards the Danube. The whole town was strewed with ants, so that it was impossible to walk without trampling on thirty or forty at every step. And more recently, Mr. Dorthes, in the *Journal de Physique* for 1790, relates the appearance of a similar phenomenon at Montpellier. The shoals moved about in different directions, having a singular intestine motion in each column, and also a general motion of rotation. About sunset all fell to the ground, and, on examining the ants, they were found to belong to the *Formica nigra* of Linnæus.'

Wars and Expeditions to capture Slaves.—In the same way as the bees and the wasps of different hives manifest inveterate hostility when they meet, ants also of the same or of different species assail one another when they meet during their foraging excursions. Besides the individual skirmishes which thence occasionally arise, pitched battles are sometimes fought between the whole or nearly the whole force of populous adjacent colonies. We have never ourselves witnessed any very extensive battles of this kind, such as Huber describes, in which thousands of combatants were engaged, but we have seen as many as fifty of the wood-ants fighting most pertinaciously within the area of a few inches on what were supposed to be the boundaries of their several territories; their bite is so sharp, and the acrid acid which they infuse is so deleterious, that many are thus disabled or killed outright. Huber witnessed on such occasions very extensive carnage.

Besides these skirmishes and battles which occur among all the species, there are whole communities of warrior-ants, as was first discovered by Huber, whose history is so extraordinary as almost to exceed belief. The details indeed have hitherto been credited chiefly, if not solely, on the well-known veracity of Huber; but in the autumn of 1832 we had an opportunity of verifying them both in the Black Forest and in Switzerland, with respect to the species which he terms the Amazon ant, (*F. rufescens*, Latreille,) and on the Rhine with respect to the sanguinary ant.

Both of these species make war on the ants of a different species from themselves, particularly the dusky ant, (*F. fusca*,) not for the purpose merely of gratifying a propensity to combat, but to make slaves of the vanquished to do the drudgery of the conquerors at home. The manner in which they proceed in this affair manifests, so far as we can judge, deep design, such as might be ascribed to the counsels of a cunning diplomatist. They do not capture the adult ants and carry them into slavery, but make booty of the eggs and cocoons, which, after the contest is decided,—and the warriors are always conquerors,—are carried off to the Amazonian citadel, and being hatched there, the poor slaves are most probably not aware but that it is their native colony. Huber repeatedly witnessed such expeditions for the purpose of capturing slaves; but though we were not so fortunate, we witnessed, in a great number of instances, the slaves at work for their warlike captors.

The Amazons have not hitherto been found in Britain, and we were unsuccessful in our attempt to bring over from the Black Forest a nest of live ones with their slaves which we had placed in a box for the purpose. We succeeded indeed in bringing safe home two nests of the sanguinary ants already alluded to under *Mining*, together with a number of their slaves, but they all died within two months, having been kept, as we suppose, too warm for their state of winter torpidity, already begun, and they could not, in their half-awakened state, be induced to take any sort of nourishment.

ANT-BEAR, the name commonly given to the *Myrmecophaga jubata* by the English at Demerara. (See next article.)

ANT-EATER, (*Myrmecophaga*, Linnæus,) in zoology, a genus of *Edentata*, distinguished by their total want of teeth and hairy covering. The latter circumstance separates them from the *pangolins* (Manis), or scaly ant-eaters of Africa and Asia, which they resemble closely in other respects, as well in their general anatomy as in their food and habits. These two genera form a small but very distinct family of the Cuvierian order *Edentata*, differing from the common animals comprised in that singular group, as well as from all other known mammalia, by their entire deprivation of the organs of mastication, and acquiring an additional interest by the light which their osteological conformation throws upon the structure and organization of the *megatherium* and *megalonyx*, those extraordinary antediluvian animals, whose fossil remains have lately attracted so much of the attention, not only of the professed naturalist, but likewise of the public at large. The relations which these extinct inhabitants of a former world bear to another small family of edentatous mammalia have been already pointed out in the article Ai, and their general organization and affinities will be formally treated under the proper heads, at a future period. We shall therefore merely observe at present, that as the osteology of their skulls and trunks presents the closest analogies with that of the corresponding parts in the sloths, so the whole construction of their extremities appears to have been formed after the same model as that of the corresponding organs of the ant-eaters. The head of these latter animals, indeed, is altogether different from that of the sloths; not only does it want the organs of mastication, of which they are deficient only in the incisors, but the bones of the face, which in them are short and round like those of apes and monkeys, are prolonged in the ant-eaters, particularly in the great ant-eater, (*M. jubata*,) to double the length of the skull. This singular conformation arises from the form of the maxillary or jaw bones, and those of the nose, which form together a kind of long tube, very small in proportion to its length, and almost cylindrical. This prolongation of the muzzle is not carried to so great an extent in either of the other two known species of ant-eaters; but even there the construction here described differs only in degree, and presents, on a more contracted scale, all the characteristics of the *myrmecophaga jubata*.

It is in the construction of the anterior extremities, however, that these animals offer the greatest singularities, and become most important in their relations to the fossil species. The phalanges or joints of the toes, particularly the last, which bear the claws, are formed in such a manner as to permit them to be bent inwards only, as in the sloths; and for this purpose they are provided with very powerful ligaments, which keep them, in a state of repose, bent in along the sole of the foot, and never permit the hand to be completely opened, but only half extended, as we sometimes see in gouty or rheumatic people. The toes themselves are of very unequal size, and even differ in number in different species. The great ant-bear and tamandua have four on the anterior and five on the posterior extremities, whilst the smallest species, called, from that circumstance, *M. didactyla*, has only two on the fore feet and four on the hind. The toes themselves, as in the sloths, are united closely together as far as the claws, and are consequently incapable of any separate or individual motion; but the disadvantages arising from this circumstance are more than counterbalanced by the increased strength which it produces, and the consequent adaptation of the organ to the peculiar purposes of these animals' economy. The claws are all large and powerful, especially that of the middle toe, of which the dimensions are quite enormous. Nor do the ant-eaters, in walking, tread flatly upon the sole of the foot like the generality of mammalia; on the contrary, they rest entirely upon its outer edge, which is provided with a large callous pad for that purpose, whilst their toes being bent inwards along the palms, the sharp points of their powerful claws are preserved from being injured by the friction of the hard ground. In other respects the ant-eaters are remarkable for their long cylindrical tongues, covered with a glutinous saliva, by means of which they entrap and devour the insects upon which they live, and from which they derive their names, both among naturalists and common observers, *myrmecophaga* literally signifying ant-eater. This tongue is protractile, and capable of being extended to a surprising distance beyond the snout; it is nearly twice the length of the whole head and muzzle together, and when not extended is kept doubled up in the mouth with the point directed backwards. The eyes are particularly small, the ears short and round, the legs robust and amazingly powerful, but so unfavourably formed for locomotion, that the pace of these animals is almost as tardy as that of the sloths themselves, their greatest exertions not enabling them to surpass the ordinary walk of a man. The tail is always long; in the great species lax and thickly covered with very long flowing hair, in the other two, strongly prehensile and naked underneath. These species consequently climb trees and reside principally among their branches, feeding upon the wild bees and termites which inhabit the same situations: the great ant-bear, on the contrary, never quits the surface of the earth, and confines his depredations entirely to the numerous species of large ants which inhabit his native regions, and furnish him at all times with an abundant and easily procured nutriment. The whole genus is confined to South America, and contains at present only three distinct and well-defined species.

1. The *Great Ant-bear*, (*M. jubata*, Lin.,) called *gnou roumi* or *yoqui* by the Guaranis, *tamandua* by the Portuguese, *tamanoir* by the French of Cayenne, and *ant-bear* by the English and Spaniards, is a large animal which mea-

sures, when full grown, four feet and a half from the extremity of the snout to the origin of the tail. The tail itself is three feet three inches in length, reckoning to the extremity of the hair, or measured only along the stump, two feet four inches; the head, thirteen inches and a half from the snout to the base of the ear, and ten inches and a half to the anterior angle of the eye; its circumference immediately before the eyes, where it is the thickest, is fourteen inches, but from this part it gradually diminishes to the end of the muzzle, where it measures only five inches and a quarter. The height of the animal at the shoulder is three feet three inches, and at the croup only two feet ten, because, being perfectly plantigrade, it necessarily stands lower on the hind legs than before, as may be observed in the common bear, the badger, and other species which partake of the plantigrade formation of the extremities. The ear is short and round, being an inch and a quarter broad at the base, and only an inch in length; the eye is remarkably small, deeply sunk in the head, and with a naked eyelid; the head and snout, as already observed, are prolonged to a remarkable degree; they are in form almost cylindrical, and end in a small truncated muzzle, having the nostrils and mouth placed at its extreme end: the latter is so small that its whole width scarcely exceeds an inch, and the jaws are of equal length. The tongue is almost cylindrical, fleshy, extremely flexible, and capable of being protruded to the distance of sixteen or eighteen inches. The toes of the anterior extremities, four in number, are of unequal length, the innermost being the smallest and weakest of all; the second measures two inches and a half in length, and is provided with a powerful crooked claw nearly two inches long, sharp pointed, and trenchant on its under surface; the third, which is the largest of all, has a similar claw two inches and a half in length; and the fourth, or exterior toe, is provided with a smaller and weaker claw, like that of the innermost. All these claws, when in a state of repose, are kept bent inwards, and only extended, or rather half-extended, (for the animal cannot open the fingers farther,) when used for defence, or for breaking through the hard external crust of the ant-hills. For these purposes, however, its otherwise awkward conformation gives it an aptitude altogether peculiar, and such is the known power of the ant-bear, that nothing upon which he has an opportunity of fastening has any chance of escaping from the tenacity of his hold, as even in death, the structure of his legs and claws prevents them from being unclosed. The slowness of his motions, however, gives him but little chance against the activity of his most formidable enemies. Notwithstanding the exaggerated accounts which Buffon has recorded of the ant-bear successfully opposing the attacks even of the jaguar, we are assured by don Felix d'Azara, that he has not the slightest chance against this powerful animal, and that a very slight blow on the snout is sufficient to despatch him. The hind feet have five toes of nearly equal length, and all armed with short weak claws, quite useless as instruments of defence, and more resembling the claws of ordinary quadrupeds. The toes both before and behind are covered with one common integument, and are only distinguishable by their separate claws. The hair, over the whole body, is coarse, hard, and dry, resembling in texture the bristles of the wild boar, but in some parts flattened, and assuming the appearance of long, withered grass. That of the head is short and close, but, over all the rest of the animal, it is long and shaggy, particularly on the top of the neck and along the back, where it forms a kind of long mane, and on the tail, where it is a foot in length, and hangs down on each side, sweeping the ground when the ant-bear walks.

[Great Ant-eater, *M. jubata*.]

The prevailing colour on the head, face, and cheeks of the ant-bear is a mixture of grey and brown; that on the upper parts of the body and tail is deep brown, mixed with silvery white. A broad black band, bordered on each side with a similar one of a white or light greyish-brown colour, commences on the chest, and passes obliquely over each shoulder, diminishing gradually as it approaches the loins, where it ends in a point. The sides, arms, and thighs are silvery grey, with a slight mixture of brown, marked with two deep black spots, one on the carpus, and the other on the toes; the hind legs are almost perfectly black, and the breast and belly of a deep brown, almost equally obscure.

The habits of the great ant-bear are slothful and solitary; the greater part of his life is consumed in sleeping, notwithstanding which, he is never fat, and rarely even in good condition. When about to sleep, he lies upon one side, conceals his long snout in the fur of the breast, locks the hind and fore claws into one another, so as to cover the head and belly, and turns his long bushy tail over the whole body in such a manner as to protect it from the too powerful rays of the sun. The female bears but a single young one at a birth, which attaches itself to her back, and is carried about with her wherever she goes, rarely quitting her, even for a year after it has acquired sufficient strength to walk and provide for itself. This unprolific constitution, and the tardy growth of the young, account for the comparative rarity of these animals, which are said to be seldom seen, even in their native regions. The female has only two mammæ, situated on the breast, like those of apes, monkeys, and bats.

In its natural state the ant bear lives exclusively upon ants, to procure which it opens their hills with its powerful crooked claws, and at the moment that the insects, according to their nature, flock from all quarters to defend their dwellings, draws over them his long flexible tongue, covered with glutinous saliva, to which they consequently adhere; and so quickly does he repeat this operation, that we are assured he will thus exsert his tongue and draw it in again covered with insects, twice in a second. He never actually introduces it into the holes or breaches which he makes in the hills themselves, but only draws it lightly over the swarms of insects which issue forth, alarmed by his attack. 'It seems almost incredible,' says Azara, 'that so robust and powerful an animal can procure sufficient sustenance from ants alone; but this circumstance has nothing strange in it for those who are acquainted with the tropical parts of America, and who have seen the enormous multitudes of these insects, which swarm in all parts of the country to that degree, that their hills often almost touch one another for miles together.' The same author informs us, that domestic ant-bears were occasionally kept by different persons in Paraguay, and that they had even been sent alive to Spain, being fed upon bread and milk, mixed with morsels of flesh minced very small. Like all animals which live upon insects, they are capable of sustaining a total deprivation of nourishment for an almost incredible time.

The great ant-bear is found in all the warm and tropical parts of South America, from Colombia to Paraguay, and from the shores of the Atlantic to the foot of the Andes. His favourite resorts are the low swampy savannahs, along the banks of rivers and stagnant ponds, also frequenting the humid forests, but never climbing trees, as falsely reported by Buffon, on the authority of La Borde. His pace is slow, heavy, and vacillating; his head is carried low, as if he smelled the ground at every step, whilst his long shaggy tail, drooping behind him, sweeps the ground on either side, and readily indicates his path to the hunter; though, when hard pressed, he increases his pace to a kind of slow gallop, yet his greatest velocity never half equals the ordinary running of a man. So great is his stupidity, that those who encounter him in the woods or plains may drive him before them by merely pushing him with a stick, so long at least as he is not compelled to proceed beyond a moderate gallop; but if pressed too hard, or urged to extremity, he turns obstinate, sits up on his hind quarters like a bear, and defends himself with his powerful claws. Like that animal, his usual, and indeed only, mode of assault is by seizing his adversary with his fore-paws, wrapping his arms round him, and endeavouring, by this means, to squeeze him to death. His great strength and powerful muscles would easily enable him to accomplish his purpose in this respect, even against the largest animals of his native forests, were it but guided by ordinary intelligence, or accompanied with a common degree of activity. But in these qualities there are few animals, indeed, which do not greatly surpass the ant-bear; so that the different stories handed down by writers on natural history from one to another, and copied, without question, into the histories and descriptions of this animal, may be regarded as pure fictions. For this statement we have the express authority of Don Felix d'Azara, an excellent observer and credible writer, from whose Natural History of the Quadrupeds of Paraguay we have derived the greater portion of the preceding account of the habits and economy of this extraordinary animal. 'It is supposed,' says Don Felix, 'that the jaguar himself dares not attack the ant-bear, and that if, pressed by hunger, or under some other strong excitement, he does so, the ant-bear embraces and hugs him so tightly, as very soon to deprive him of life, not even relaxing his hold for hours after life has been extinguished in his assailant. It is very certain that such is the manner in which the ant eater defends himself; but it is not to be believed that his utmost efforts could prevail against the jaguar, which, by a single bite or blow of his paw, could kill the ant-eater before he was prepared for resistance; for even in so extreme a case, his motions are so slow and so heavy, that he takes some time to get himself ready, and besides being unable to leap, or turn with even ordinary rapidity, he is necessarily forced to act solely upon the defensive.' The flesh of the ant-eater is esteemed a delicacy by the Indians and negro slaves, and, though black, and of a strong musky flavour, is sometimes even met with at the tables of Europeans.

Tamandua, *M. tamandua.*

2. The *Tamandua*, (*M. tamandua*, Cuvier,) or second species of ant-eater, is an animal much inferior to the great ant-bear in point of size, being scarcely so large as a good-sized cat, whilst the other exceeds the largest greyhound in length, though, from the shortness of its legs, it is much inferior in height. The head of the tamandua is not so disproportionately long and small as that of the great ant-bear. It is, however, of the same general cylindrical form, and equally truncated at the extremity, having the nostrils and mouth situated in the same position, and equally minute, when compared with the size of the animal. Its whole length, from the extremity of the muzzle to the root of the ear, is five inches, and to the anterior angle of the eye, three inches; the body, from the muzzle to the origin of the tail, measures two feet two inches, the tail itself being one foot four inches and a half more; the height at the shoulder is one foot three, and at the croup an inch lower; the length of the ear is an inch and a quarter, its greatest bread than inch, and the greatest circumference of the head, that, namely, taken immediately in front of the ears, eight inches and a quarter. The conformation of the extremities, and the number of the toes both before and behind, is in every respect the same as in the great ant-eater already described; but the tamandua differs from this animal particularly in the prehensile power of its tail, which makes it essentially an arboreal quadruped, and altogether changes the most striking traits of its habits and economy. The hair over the entire body, also, is of a very different texture; instead of being long, harsh, and shaggy, as in the great ant-bear, it is short, shining, and of a consistence something between the qualities of silk and wool; standing out from the body like the latter, and of the same uniform length in every part. The colours of this species, however, are by no means so uniform and invariable as those of the species already described; on the contrary, they differ more in the tamandua, according to the individual, than perhaps in any other known animal in a state of nature. Accordingly many eminent naturalists are disposed to consider them as forming distinct species, rather than mere varieties of the same; and it is not improbable that, when we come to be better acquainted with this animal in its native woods, their opinion may be, at least partly, confirmed.

The eyes of the tamandua are minute, the ears small and round, the body long and cylindrical, the legs short and robust, the tail round and attenuated, covered with very short hair throughout its greater part, but naked underneath towards the point, and strongly prehensile. The following are the principal varieties, as regards the colours:—

1. *The straw-coloured Tamandua*, of a uniform straw-colour over the whole body, with a transverse triangular band passing obliquely over each shoulder, and encountering that from the opposite side, on the median line of the back. This band is only apparent in particular lights, and is not produced by any difference of colour, but merely by a difference of shade, arising from the hair having an opposite inclination, or direction, from that on the rest of the body.

2. The second variety is, like the former, of a uniform straw colour, but has a good deal of black about and particularly in front of the eye. This variety is found in Paraguay, and is described by Azara, who suspects its colours, as well as those of the preceding, to arise from immaturity of age, an opinion which seems to be well founded.

3. The third variety is of a silvery-white colour, with a dirty brown band running transversely over each shoulder.

4. The fourth variety is of the same silvery-white as the last, with similar dirty brown bands on the shoulders, and, besides, the croup, flanks, and belly of the same obscure colour.

5. The fifth is of a uniform clear brown, over all parts of the body, without any appearance of bands on the shoulders, or mixture of any other colour; and

6. The sixth and last variety is entirely black, with a little light brown under the tail. This variety is described by Azara, who found it in Paraguay, and who reports that it has proportionally shorter hair and larger claws than the other varieties.

The tamandua is an inhabitant of the thick primeval forests of tropical America; it is never found on the ground, but resides exclusively in trees, where it lives upon termites, honey, and even, according to the report of Azara, bees, which in those countries form their hives among the loftiest branches of the forest, and, having no sting, are more readily despoiled of their honey than their congeners of our own climate. When about to sleep, it hides its muzzle in the fur of its breast, falls on its belly, letting its fore-feet hang down on each side, and wrapping the whole tightly round with its tail. The female, as in the case of the great ant-eater, has but two pectoral mammæ, and produces but a single cub at a birth, which she carries about with her, on her shoulders, for the first three or four months. The young are at first exceedingly deformed and ugly, and of a uniform straw-colour.

This animal is called cagouaré by the Guaranis, on account of the noxious and infected vapours of the forests in which alone it is found, the word literally signifying, in the language of these Indians, the inhabitant of a stinking wood or marsh. Such at least is Azara's interpretation of the term, though it appears more probable that it may refer to the strong disagreeable odour of the animal itself, which, this very author informs us, is so powerful that it may be perceived at a very great distance, particularly when the animal is irritated. Tamandua is the name by which it is known to the Portuguese of Brazil; the French and English call it *fourmillier* and little ant-bear.

It is difficult to imagine how M. de Buffon could have been so far led astray as to mistake the stuffed skin of a coati-mondi for this animal, particularly after the severe though just criticism which he passes upon Leba for a similar mistake. A single glance at the plate of Buffon (*Hist. Nat., Supple.* tom. iii. tab. 56) is sufficient to convince any person who ever saw a coati, or who has any idea of the animal, of the real genus to which it belongs. Both Azara and Baron Cuvier long since exposed this error; yet, strange to say, notwithstanding his perfect knowledge of this circumstance, M. Desmarest, in general a very acute observer, commits himself the very identical mistake which he criticises and condemns in Buffon; giving, for a real ant-eater, a plate in the *Atlas to Krusenstern's Voyage*, which, though not of the very first order of engravings, yet very tolerably represents a coati *in the act of killing and devouring a serpent.* This latter circumstance alone is sufficient to show that the animal represented cannot be an ant-eater, even if the engraving itself left the question doubtful, which it does not. It is only surprising that so acute a zoologist as M. Desmarest could ever have committed the error, though, perhaps, not so much so that all subsequent writers should have copied his mistake, without taking the trouble to inquire into the matter.

[Little Ant-eater, *M. didactyla.*]

3. The *little Ant-eater (M. didactyla,* Lin.) is easily distinguished from the other two species, not only by its size, which does not exceed that of the common European squirrel, but likewise by the number of its toes, being four on the posterior and only two on the anterior extremities. The form and general proportions of its body resemble those of the tamandua, only on a very reduced scale. Its whole length, from the snout to the origin of the tail, is but six inches, that of the head not quite two inches, and of the tail seven inches and a quarter. This organ is consequently rather longer than the body: it is thick at the root, and covered with short fur, but tapers suddenly towards the point, where it is naked and strongly prehensile. The muzzle is not so long, in proportion, as in the other two species; the tongue also is shorter, and has a flatter form; the mouth opens farther back in the jaws, and has a much larger gape, the eye being situated close to its posterior angle; the ears are short, rather drooping, and concealed among the long fur which covers the head and cheeks; the legs are short and stout, and the hair very fine and soft to the touch, three-quarters of an inch in length on the body, but much shorter on the head, legs, and tail. The general colour is that of straw, more or less tinged with maroon on the shoulders, and particularly along the median line of the back, which usually exhibits a deep line of this shade. This species is said to have four mammæ, two pectoral, as in those already described, and two others on the abdomen. It is reported, nevertheless, to have but a single cub at a birth, which it conceals in the hollow of some decayed tree. The native countries of the little ant-eater are Guyana and Brazil, beyond which it appears not to extend farther towards the south, since Azara is not only unacquainted with it, but imagines, from Buffon's and Daubenton's descriptions, that it must be the young of his tamandua. The habits and manners of this little animal, hitherto very imperfectly known to naturalists, are so well described by Von Sack, in his *Narrative of a Voyage to Surinam,* a book little known to general readers, that we cannot avoid quoting the entire passage which refers to it.

'I have had,' says he, 'two little ant-eaters or fourmilliers, which were not larger than a squirrel: one was of a bright yellow colour, with a brown stripe on the back; the other was a silvery grey and darker on the back; the hair of each was very soft and silky, a little crisped; the head was small and round, the nose long, gradually bending downwards to a point; it had no teeth, but a very long round tongue; the eyes were very small, round, and black; the legs rather short: the fore-feet had only two claws on each, the exterior being much larger and stronger than the interior, which exactly filled the curve or hollow of the large one; the hind-feet had four claws of a moderate size; the tail was prehensile, longer than the body, thick at the base and tapering to the end, which, for some inches on the under side, was bare. This little animal is called in Surinam *kissing-hand,* as the inhabitants pretend that it will never eat, at least when caught, but that it only licks its paws, in the same manner as the bear; that all trials to make it eat have proved in vain, and that it soon dies in confinement. When I got the first, I sent to the forest for a nest of ants, and, during the interim, I put into its cage some eggs, honey, milk, and meat; but it refused to touch any of them. At length the ant's nest arrived, but the animal did not pay the slightest attention to it either. By the shape of its fore-paws, which resemble nippers, and differ very much from those of all the other different species of ant-eaters, I thought that this little creature might perhaps live on the nymphæ of wasps, &c.; I therefore brought it a wasp's nest, and then it pulled out with its nippers the nymphæ from the nest, and began to eat them with the greatest eagerness, sitting in the posture of a squirrel. I showed this phenomenon to many of the inhabitants, who all assured me that it was the first time they had ever known that species of animal take any nourishment. The ants which I tried it with were the large white *termites,* upon which fowls are fed here.

'As the natural history of this pretty little animal is not much known, I thought of trying if they would breed in a cage; but when I returned from my excursion into the country, I found them both dead, perhaps occasioned by the trouble given to procure the wasp's nests for them, though they are here very plentiful: wherefore I can give no further description of them, than that they slept all the day long curled together, and fastened by their prehensile tails to one of the perches of the cage. When touched they erected themselves on their hind-legs, and struck with the fore-paws at the object which disturbed them, like the hammer of a clock striking the bell, with both paws at the same time, and with a great deal of strength. They never attempted to run away, but were always ready for defence, when attacked. As soon as evening came, they awoke, and with the greatest activity walked on the wire of the cage, though they never jumped, nor did I ever hear their voice.'

This valuable account, the only one, as far as we are aware, ever drawn from actual and continued observation of the living animal, leaves us little to desire regarding the history and economy of this highly interesting species. The discovery of the true nature of its food is particularly valuable, and may enable us to have the animal brought alive to this country, a thing which, we believe, has not been attempted heretofore, and which, if attempted, has certainly never succeeded. To procure or carry ants during a long sea voyage is impracticable, but the larvæ of wasps can be obtained in any quantity, and will keep for months; so that the most serious difficulty to the introduction of the little ant-eater being thus removed, it only requires to be guarded from the effects of a colder climate, which may be as easily done in its case as in that of other South American mammalia. By the report of Azara also, it is probable that the tamandua lives upon the same food, and may consequently be introduced in the same manner.

ANTACIDS, from the Greek word, 'anti,' *against,* and the Latin word 'acidum,' *an acid,* signify means used to correct acidity in the stomach. Though hydrochloric acid (formerly called muriatic acid, or spirit of salt) is present in a free state in the stomach during the process of healthy digestion, yet under particular circumstances it is apt to be generated in excess. Other acids are also occasionally evolved in the stomach, probably from the fermentation of the articles, as vegetables and fruits of different kinds, by which the acetic acid is produced, or introduced ready formed, in wines, or hard beer; and in certain vegetables, as sorrel, which contains oxalic acid. The most frequent source of acidity, is that first mentioned, the secretion of acid by the vessels of the stomach. It is, therefore, dependent upon constitutional causes, or the state of the system generally. This is further proved by considering what kind of persons are most subject to it. These are individuals either naturally of a feeble and weak constitution, or who have weakened the stomach and system generally, by excessive indulgence in *good living*, as it is termed, *i. e.*, too much animal food, and wine, unaccompanied by exercise and other counteracting measures. Hence we see these persons, or their children, and even their children's children, subject to gout or gravel, and stone in the bladder. As it has been ascertained (see the works of Mr. Murray Forbes, *A Treatise on Gravel and Gout*, 1786; Wilson Philip, Marcet, Blane, Prout, and Majendie) that these painful diseases have their origin in the tendency of the stomach to the formation of an excess of acid, an inquiry into the causes of this, and the circumstances under which it takes place, is of great importance, as a means of preventing or counteracting them.

When an excess of acid is introduced into the blood, it occasions much irritation of the system generally, and the composition of the blood being different from its natural constitution, the secretions formed from it are unhealthy, proving a further source of disease. In consequence of the composition of the blood being altered, matters usually held in solution by it can no longer be kept in that state, but are precipitated; hence we have *chalk stones*, as they are termed, formed around the joints in gout, and calculi, or *stones*, of different kinds, in the kidney or bladder.

The signs or symptoms of acid being in excess, are not in general limited to the stomach, but shew themselves in several parts of the body. There is heartburn (cardialgia), often followed by eructation, and rejection by the mouth of a fluid so extremely acid, as to cause effervescence when it falls on a marble stone; the bowels are sometimes confined, sometimes too loose; the urine generally scanty, and high-coloured, from which, on standing, a sediment falls down; the skin dry, harsh, and often affected with eruptions of different kinds; and the mind of the patient fretful, and much given to take gloomy views of his health or circumstances; in short, decidedly hypochondriacal.

The medicinal means of remedying this state are all alkaline, either the pure alkalies, or some combination of them—such as solution of potash, or carbonates of soda, potash, magnesia, ammonia, or lime. Where the bowels are not disordered, but the urine denotes that the excess of acid mostly finds an outlet by that channel, the preparations of potash and soda are to be preferred; where the bowels are much confined, magnesia, or its preparations, may be given in conjunction with rhubarb. Nothing is more hurtful than the frequent use of magnesia alone, it being apt to accumulate in the bowels: in the case of an individual much addicted to its use, a mass of it was found after death, lodged in the large intestines, which weighed six pounds. If, on the other hand, the bowels be in a loose state, prepared chalk may be given with advantage, or lime-water, which is a very useful addition to milk, where, from excess of acid, it disagrees, and hence most serviceable for weak children. Should the mind be much depressed, or general languor of the system exist, and no state of stomach be present forbidding its use, ammonia, in some form, may be exhibited.

Such are the medicines by which the effects of an excess of acid may be in some degree counteracted; but the most efficient means of preventing its formation, consist in a strict attention to diet and regimen. Great moderation must be observed in the quantity as well as quality of the food and drink. The plainest and most digestible animal food should be taken once, or, at the utmost, twice a day, and sparingly. Hard-boiled puddings and dumplings must be avoided. Toast and water, or soda-water, or well-fermented beer, or cyder, are preferable as drinks, to wine or ardent spirits, the only one of which last that can be allowed, is Hollands, and never but under particular circumstances, and with the sanction of a medical adviser.

Regular exercise, friction, and every means, such as flannel next the skin, which can keep up a free action of the skin, form a most important part of the prophylactic treatment.

ANTÆ. This is a term used by architects to designate the pier-formed ends of a wall, as in the terminations of the lateral walls in a Greek temple, where a plain face returns on each side, having some relation in general proportion to the columns with which they compose. The antæ (for the word is used alike in the singular and in the plural) has a moulded and otherwise enriched cap or cornice, and generally a moulded base; in the simple Greek Doric style or order, both the cap and the base-moulding are of few parts, and the enrichments are few, and are confined to the mouldings, which may be either carved or painted; but in the more ornate Ionian or voluted style, both the cap and base of the antæ are in proportion deeper, are in a greater number of parts, and have extrinsic ornaments, besides the carving or painting of the mouldings of the cap, and the fluting or reeding of those of the base. The antæ of the foliated or Corinthian style will perhaps admit of still further enrichment, though the bold foliage and diagonal volutes of the capital of the column should never be placed on the square faces and sharp angles of the antæ. The moulded caps and bases of antæ are, in Greek works, generally continued along the flank walls so as to form the cornice and base of the whole wall, and not of the protruded faces of its ends alone. In Roman works, and in modern imitations of both, breaks are often made on the face of a wall with the caps and bases of antæ, but more frequently with those of columns, and these are called pilasters, though indeed they are but an abuse of the Greek *parastas*, in the plural *parastades*, or antæ. In classical Greek, and in the best Roman works, antæ and pilasters are never either diminished or fluted. The term antæ is of barbarous origin, and it would be difficult to say whether it is derived from a Greek or Latin source; it may be from *antes*, as used by Virgil in the second book of the *Georgics*, where he treats of vine-dressing.

ANTAGONIST MUSCLE, from *ἀντὶ*, against, and *ἀγωνίζομαι*, to strive,—a muscle the action of which is opposed to that of some other muscle. Muscles are the instruments by which, in the animal body, motion is effected. The object of each muscle is to produce some specific motion; among the various motions which are needed in the animal economy, it necessarily happens that some are directly opposite to others, and the muscles which accomplish these directly opposite movements are said to be with relation to each other *antagonists*. When any part of the body is placed between muscles which have an opposite or antagonizing action, the result of the combined action of such muscles is to keep that part steadily in a certain position. The form and position of the human mouth, for example, are maintained, such as they are, in a state of health and during repose of the features, by a number of muscles, composing the lips and cheeks, the action of some of which is directly contrary to that of others: the natural figure and position of the mouth may, therefore, be truly said to be the result of the combined action of a number of antagonizing muscles. The consequence of the disturbance of this antagonizing action is to change the natural form and position of the mouth. This is shown by the effect of paralysis when it affects one side of the face. Paralysis is a disease depriving the muscle of its power of acting. In paralysis of one side of the face, the muscles of that side are deprived of their power of acting; and the consequence is that the muscles of the other side, which retain their usual power, pull the mouth to their side, because they do not meet with the resistance which formerly opposed their effort to do this. Hence comes distortion of the mouth; and distortion is one of the most frequent and striking signs of apoplexy and paralysis, a sign dependent, it is obvious, on the loss of the antagonizing power of the muscles of that part of the body in which the distortion takes place. Sometimes the elasticity of a part is put in opposition to a muscle, and becomes the antagonizing power. The elasticity of the ribs, of the windpipe, of the arteries, may be so considered.

ANTALKALIES, from anti, *against*, and alkali, an *alkali*, are means of counteracting the presence of alkalies in the system. An alkaline condition of the system is not an unusual occurrence, and leads, when long continued or extreme, to very serious consequences. The worst of these is the formation of those calculi or stones in the bladder denominated *phosphates*. A tendency to this state exists in most weak individuals: hence most commonly in children, old persons, and females. It may also be brought on by any cause which occasions either temporary or general debility. The prevalence of the depressing passions, as fear, anxiety, or any other which keeps up *a nervous state* of the system, the frequent and continued use of mercury, of powerful purgatives in sickly frames, injuries of the back, or the previous existence of a very acid state of the system, will occasionally give rise to an alkaline state of the system, which, when considerable, shows itself by great general debility, pale countenance, deranged state of the stomach and bowels, and excessive secretion of urine of a pale colour, which, on standing, makes a white deposit. To cure, and prevent the return of, such a state, the causes must, as far as possible, be removed. This is best done by diet, regimen, and appropriate medicines. The diet should be nourishing, mostly animal food, but taken in moderation; and where wine is used, light French or Rhenish should be preferred; hard water should be carefully avoided; saline purgatives, as Rochelle salts, or Seidlitz powders, and indeed all combinations of a vegetable acid with an alkaline base, such as the common saline draught, must be abstained from. The irritability of the system is best lessened by opium and tonic medicines. These last furnish an excellent vehicle for the administration of acids which are the most fitting medicines—either muriatic, nitric, or the citric acid, which is most grateful to children. The phosphate of iron is also a very useful medicine. Purgatives of an active kind should seldom be given; but where the stomach and bowels of children are much disordered, calomel and rhubarb taken frequently for some time are of much service, especially when the phosphate of iron is employed at the same time. Pure, invigorating air, and moderate exercise, are very beneficial, with relaxation from too great mental exertion, where this has preceded the disease.

ANTALO. [See Abyssinia, p. 54.]

ANTAR, an Arabian warrior, best known to Europeans as the hero of a romance, translated into English, in 1819, by Mr. Hamilton, oriental secretary to the British embassy at Constantinople. The hero is not a completely fabulous person: he was the son of an Arabian prince, by a negro slave. Born, therefore, to his mother's condition, and for a long time disowned as an Arab, and ill-treated by his father, he yet raised himself to high consideration by his extraordinary strength, courage, and poetical talent. He lived at the close of the fifth and beginning of the sixth century.

The romance of Antar is conjectured to have been put together in its present form, from the original legendary tales, about the time of the famous Caliph Harun al Rashid; and it is still one of the favourite sources from which the professional story-tellers of Egypt, Syria, and Arabia draw their materials. The hero is an eastern Roland, routing whole armies for the love of his mistress. This poem is curious, as presenting an early picture of the manners of the Bedouin Arabs; but there is too much sameness in it to render it, in its English form, very interesting to the reader. (*Introduction to the Translation of Antar.*) [See Arabian Literature.]

ANTARCTIC CIRCLE. [See Arctic Circle.]

ANTARCTIC OCEAN, a term properly applied to the ocean between the antarctic circle and the South Pole. The word is sometimes used to express generally the cold oceanic regions round the South Pole, without strict regard to the limits of the antarctic circle. Numerous attempts at discovery have been made in these high southern latitudes, [see Cook,] and particularly of late years. The farthest point yet attained is in 74° 15′ S. lat. 36° W. long, which was accomplished by Captain Weddell in 1823. The most recent discoveries of land in the Antarctic Ocean were made by Mr. John Biscoe in 1831 and 1832. On February 27, 1831, in 65° 57′ S. lat., 47° 20 E. long. Captain Biscoe discovered land of considerable extent, closely bound with field ice, but was not able to approach it within twenty or thirty miles. At the time of the discovery the temperature of the air was 22°, and that of the water 30: the Aurora Australis was very vivid. This unapproachable land was called Enderby's Land, from the name of the owners of the vessel. On February 21, 1832, Captain Biscoe landed on what is now called Graham's Land, which the discoverer supposes to be of considerable extent: the highest mountain in view, called Mount William, is placed in 64° 45′ S. lat. 63° 51′ W. long. In front of this high continuous land is a range of small islands, now called Biscoe's Range. No living animals, except a few birds, were found on any of these islands, though there were many birds seen a few miles to the northward. For further information on the climate, &c., and the few pieces of land yet discovered in this part of the ocean, see the articles New South Shetlands, Sandwich Land, &c., and Polar Seas. For an account of Biscoe's voyage, see the *Journal of the London Geographical Society*, vol. iii., from which these facts are taken.

ANTARES, a name given to the bright star marked α in the constellation Scorpio, which see. In the latitude of Greenwich, it has not more than 12½° of altitude when on the meridian, where it is at midnight in the beginning of July.

ANTECE'DENT, a mathematical term used in proportion, meaning the *first* of the two terms of a ratio, in opposition to the *consequent*, or second term. Thus, in the continued proportion:—

$$2 : 4 :: 3 : 6 :: 4 : 8 :: 5 : 10, \&c.,$$

2, 3, 4, 5, &c., are antecedents; 4, 6, 8, 10, &c., are consequents. Antecedents may be made consequents, and consequents antecedents, without altering the truth of the proportion. Thus, if

$$a : b :: c : d,$$

it is equally true that

$$b : a :: d : c.$$

ANTECEDENTIA. When a heavenly body moves contrary to the order of the signs of the zodiac—from Gemini to Taurus, from Taurus to Aries, &c.—it is said to move *in antecedentia*. When it moves according to the order of the signs, it is said to move *in consequentia*.

ANTEFIXA, or **ANTEFIXÆ**, for this term is more frequently used in the plural, for both singular and plural, than otherwise. Antefixæ are blocks with vertical faces placed along over a cornice, in antient Greek and Roman buildings, to hide the ends of the covering or joint tiles, and their faces are generally carved with a flower, leaf, or other enrichment, to make them ornamental. The flanks and rounded projection from the eastern end of the church of St. Pancras in London exhibit antefixæ ranged along over the cornice, but without the parts of which they are fitting accompaniments. The fronts of the Travellers' Club-House to Pall-Mall and Carlton-Gardens, also in London, show antefixæ more judiciously composed with the roof, with which they form an ornament to, and help to enrich, the elevation.

ANTELOPE, (*Antilope*, Pallas,) in zoology, a genus of ruminating mammals, belonging to the hollow-horned family, and distinguished by the round, annulated form of their horns, the grace and symmetry of their external proportions, the presence of suborbital sinuses and inguinal pores in the majority of the species, and other less general and important characters. The great extent of this genus, comprising, as it does, above three-fourths of the known hollow-horned ruminants, and the numerous additions which have been made to it since the period of its formation, render it utterly impossible to define it by such simple logical terms as shall at once distinguish it from conterminous genera, and embrace all the species which are usually associated with it. It is true, indeed, that most of the characters which zoologists commonly assign to the genus *antilope* are not found either in *bos*, *ovis*, or *capra*, and in so far may be fairly considered as differential, and peculiar to the former genus: but unfortunately they are not in any instance common to all the individual species which compose this group, and consequently cannot be made the basis of a general definition. Hence it is that naturalists, in treating of the genus antelope, have been forced to content themselves with a general description of its most important characters and features, or even to define it by negative characters, such as the absence of a beard on the chin and a dewlap on the throat; and this mode of procedure, however unsatisfactory in general, appears to be unavoidable in the present instance, on account of the peculiar difficulties of the subject.

Perhaps the most general character belonging to the antelopes consists in the form of the horns being round and annulated, or at least never exhibiting the prominent angles and ridges which distinguish those of the sheep and goats. In their particular forms and curvatures, however, they vary in almost every different species, as among domestic sheep they do even in different varieties of the same species. Sometimes they form a single bend forwards or backwards, sometimes they are what is commonly called lyrated, or bend first backwards and then point forwards, in such a manner as, when opposed to one another, to assume the figure of an ancient lyre, the brachia or sides of which instrument were frequently made of the horns of the *dorcas* or common gazelle, as appears from the engravings of antique gems still preserved; sometimes they are twisted into a spiral form, and sometimes the horn itself is straight and surrounded by one or two turns of a prominent spiral wreath.

In many of the smaller species the bony core, or process of the os frontis which is inserted into the hollow sheath of the horn itself, is almost solid, or at least the osseous substance of it is penetrated only by very minute pores. M. Geoffroy St. Hilaire has proposed to make this character the distinctive mark of the genus, and his sentiments upon this subject have been adopted by M. Desmarest and most other subsequent writers, including Baron Cuvier himself; but it has been clearly shown by Colonel Hamilton Smith, that the character is by no means universal, nor even general, all the larger species having the core of the horn more or less cellular, and some as completely hollow as the ox, the sheep, or the goat. In other respects the character proposed by M. Geoffroy is so devoid of influence upon the habits and economy of the animals, and so unimportant even as an artificial distinction, that its practical failure is little to be regretted. A much more important, though unfortunately not a more general character, is found in the presence or absence of horns in the female sex. In this respect the antelopes are as variable as in all their other characters; in both sexes the greater number of them have horns, but at the same time the females of many species are deprived of these organs, and this character, though not universal to the whole genus, is invariably constant in the species which possess it.

The possession of *lachrymal sinuses*, or, as they are vernacularly called with reference to the stag and fallow-deer, *tear-pits*, is another circumstance which distinguishes the greater number of the antelopes, but which, like all their other characters, is far from being general. Many zoologists suppose these organs to communicate with the nostrils, so as to enable the animals to breathe freely during their long and rapid flights when pursued or frightened· some even suppose them to be subservient to the sense of smell, and to serve for detecting the noxious qualities of the numerous poisonous plants which grow in the deserts, or spring up among the rank vegetation of tropical climates. It is certainly true that all these animals possess a most delicate sense of smell, and that no known quadrupeds can surpass, and very few equal, them in the course. Mr. White, in his *Natural History of Selborne*, and Colonel Hamilton Smith in the fourth volume of Griffith's edition of the *Règne Animal*, even assure us that they have observed the air passing backwards and forwards through the suborbital sinuses of the fallow-deer and saumer (*Cervus hippelaphus*) whilst the animals drank with the nose completely plunged into the water; yet, notwithstanding the direct authority of these respectable writers, we are strongly inclined to believe that their observations rest upon some accessory circumstance which escaped their attention at the time, since it is very certain, as is demonstrated by the anatomy of the parts, that no internal communication exists between the lachrymal sinus and the nose, or indeed any other organ. The sinus itself is simply composed of a sack or fold of the skin, of greater or less extent according to the species, but always capable of being opened or shut at the will of the animal, and furnished at the bottom with a gland which secretes an oily, viscous substance of the colour and consistence of ear-wax, but which hardens and turns black upon exposure to the air. The precise functions of these organs are entirely unknown: that they serve some special purpose in the great economy of nature cannot be doubted for a moment by those who are in the least acquainted with the general principles of comparative anatomy, but the exact nature of their function can only be ascertained by those whom fortune has placed in a situation where they may have daily opportunities of observing a great many different species in their natural state and original habitat. All that we know with certainty at present is, that many of the antelopes which are most commonly brought to Europe and preserved in menageries, such as the common Indian antelope and the gazelle, make continual use of this organ when any strange substance is presented to their notice, particularly if it be odoriferous, and appear to derive great pleasure from protruding the lachrymal sinus and rubbing its interior surface against the odorous body. This, and similar observations render it by no means improbable that the organ in question may, in some manner or other, take cognizance of the qualities of matter, and thus be subservient to the intellectual faculties of the animal; but if so, it must be confessed that we are at present entirely ignorant of the precise mode in which it acts.

It has been already hinted that the antelopes are not the only ruminants which possess suborbital sinuses. in fact, these organs are more universally found in the deer kind than in the present genus; but, on the other hand, as these are the only animals belonging to the hollow-horned family which exhibit this character, it thus becomes sufficiently appropriate, and, as far as it goes, serves readily to distinguish the antelopes from the goats and sheep, with which they are most liable to be confounded. In this respect, as well as in the absence of horns in the females of many species, they form an intermediate link between the rest of the hollow-horned ruminants and the cervine or solid-horned family: so nearly indeed do some species of antelopes approach to the deer kind in general, and so perfectly similar are they in all their most prominent and essential characters, the horns alone excepted, that it is often next to impossible to distinguish the hornless females of the one genus from those of the other. In these cases it is only by such trifling appearances as the form of the tail and ears and the quality of the hair, that we are enabled to form even a tolerable guess as to the genus of the individual, and even these criterions are frequently fallacious, a strong and convincing proof of the close affinity which subsists between these two genera, and of the propriety with which Professor Pallas, on the original formation of the genus *Antilope*, considered these animals as forming the connecting link between the deer and the goats, with the latter of which they had been up to his time associated.

Besides the suborbital sinus, a few species of antelopes possess a different gland, which runs lengthwise between it and the mouth, in a direction for the most part parallel to the plane of the chaffron or face and nose, and secretes a dark oily substance; it is, however, entirely external, and has no internal opening like the lachrymal sinus, nor are its uses better known than those of that organ. It is likewise much less general, being confined to a very small number of species; and, as appears from the observations of M. F. Cuvier and Colonel Smith, sometimes accompanies the lachrymal sinus, and at other times is found alone without any appearance of the latter. The former fact, if it can be relied upon, proves at least that it is a separate organ, and not a mere modification of the lachrymal sinus; and, consequently, it may be fairly presumed that its function, whatever it may be, is likewise different Another character, but much more generally found to distinguish the antelopes than even the suborbital sinus itself, is derived from the inguinal pores, which are sacks or deep folds of the skin, situated in the groin, opening inwards, and secreting a glutinous substance similar to that of the glands already mentioned. Very few species, indeed, want these pores, but still they are not universal, nor can we form even a probable conjecture regarding their use. A single species, the chamois, (*A. rupicapra*,) has a pit or fold of the skin nearly half an inch in depth, opening externally by a small aperture immediately behind each ear, but not provided with a gland, nor appearing to secrete any matter. Baron Cuvier supposes, with great probability, that it was this circumstance which gave origin to the opinion of the ancient Greeks and Romans, so often alluded to by Ælian, Pliny, and other classical authors, that goats breathed through their ears, an opinion repeated by Gesner, Aldrovandus, and other writers of the middle age, and which finds a parallel among modern naturalists in the idea before referred to, that deer and antelopes breathe through their suborbital sinuses.

In the form of the upper lip, an important character among animals which seek their food on the ground, and in which the lips and tongue constitute the only organs of touch and prehension, the antelopes are as variable and inconstant as in the other characters already described. In some species it forms a broad naked muzzle, as in the ox; in others it is hairy and attenuated, like that of the goat; and finally, it sometimes assumes an intermediate form, and presents a modification of both these characters. The females are furnished with either two or four teats, forming a small udder; they usually bring forth but one at a birth, in a few instances two, and the period of gestation differs according to the species. Few observations, however, have been recorded upon this subject; the nyl-ghau, and some others of the larger species, are known to go with young about eight months, but it is probable that the smaller species do not go longer than the sheep and goat, or about five months. It is very seldom that the males and females in this genus, or indeed among mammalia in general, differ from one another in colour, but when this does happen, as in the instances of the nyl-ghau and common Indian antelope, the young males always assume the female's colours for the first two or three years of their lives, and only gain the adult colours of their own sex as they advance in age.

The hair of the antelopes is generally short and smooth, and of an equal length over every part of the body; some, however, have manes along the neck and on the shoulders, composed of long bristly hair, either growing upright or reversed towards the head as in the oryx; and a very few species, like the gnu, are furnished with a beard on the chin and throat. The ears are commonly long, narrow, and pointed, smooth on the outside and filled internally with long white hair growing in five longitudinal lines, with four naked black spaces between, and forming the appearance which, in describing these animals, is usually denominated *striated*. The tails are generally short, round and tufted at the extremity, and many species are furnished with little tufts of long black hair, called *scopæ* or knee-brushes, upon the upper part of the anterior canons, immediately below the carpal joint.

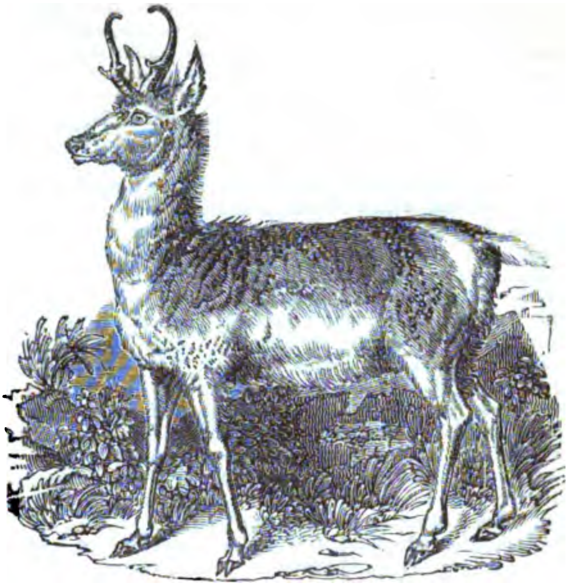
Generally speaking, the antelopes are gregarious and unite in large herds, either permanently, or at particular seasons of the year, but only for the purpose of migrating in search of more abundant and grateful pasturage; some species, however, reside in pairs or small families, consisting of an old male and one or more females, with the young of the two foregoing seasons. They are always extremely cautious in guarding against surprise, placing sentinels in various directions about their feeding ground, to warn them of the approach of danger whilst grazing or reposing, and their vision and sense of smell are so acute, that it is only by using the greatest caution and circumspection that the hunter can bring them within range of the gun. The names by which the animals themselves are distinguished in all languages, ancient as well as modern, have a direct reference to this quickness of sight, and to the brilliancy of the large black eyes which form so conspicuous a feature in the antelopes. Thus the word *dorcas*, (δορκάς,) the Greek and Roman name of the gazelle, or common Barbary antelope, is derived from the verb δερκομαι, to see. The common English word antelope, which zoologists have adopted as the generic name of the group, is a corrupt form of the term ἀνθολοψ, employed by Eustathius to designate an animal of this genus, and literally signifying *bright eyes;* and, according to the learned Bochart, *Tabitha*, the name of the disciple raised to life at Joppa, is derived from *tzebi*, the Hebrew name of the common gazelle, and alludes likewise to the beauty of her eyes. Among the Greeks and Romans also, as we learn from Agathias, and others, *dorcas*, *dorcalis*, and *damalis*, all names of different antelopes, were common names of women likewise, bestowed without doubt on account of the remarkable beauty of their eyes; and Prosper Alpinus, and more recent travellers, inform us, that 'Aine el czazel,' *You have the eyes of an antelope*, is the greatest compliment which at the present day an oriental admirer can pay to his mistress. Eastern poetry and romance, as well as the works of the Greeks and Romans, abound with similies and metaphors taken from the form and habits of these animals; they are universally the images of gentleness and timidity, of grace and fleetness. The inspired writer beautifully compares the speed of Asahel to that of the wild gazelle; the Gadites also are said to have been as swift as mountain gazelles—for this is the proper signification of the Hebrew word *tzebi*, improperly translated *roe* in our English version of the Scriptures; and many other instances might be adduced, both from sacred and profane writers. Throughout all parts of the East the fleetness and timidity of the antelope tribe is still proverbial, and furnishes the Persian and Arab poets with images of gentleness, beauty, grace, and affection. The swiftest dogs and horses are left far behind in the pursuit of these animals, and it is only by stratagem that they can be hunted with success. For this purpose the hawk or the cheetah (*felis jubata*) is commonly employed in the East, and the gun or various descriptions of snares and traps by the inhabitants of South Africa. The hawk, by attacking the animal about the head and eyes, harasses it and impedes its flight, till the hunter has time to come up; and the cheetah, like the rest of the cat kind, steals upon it unawares, and seizes it by a sudden spring before it has time for flight. If, however, the first spring misses in its aim, and the antelope escapes, there is no chance of taking it afterwards, and the cheetah, irritated by disappointment, is soothed only with considerable difficulty, and becomes unfit for the chase for some days afterwards. The Bushmen of the Cape often destroy vast numbers of the antelopes with which their country abounds, by poisoning the springs and reservoirs to which they are known to resort, nor is the flesh ever known to be injured by this mode of slaughter; they also shoot them with poisoned arrows, but in this case the parts immediately around the wound must be cut out before the rest of the body imbibes the poison, which would otherwise penetrate through it, and render it unfit for food.

Africa may be considered as the head-quarters of the antelopes. Of this numerous genus, consisting at present of nearly seventy different species, upwards of fifty species inhabit the African continent alone, two or three are common to it and Asia, about a dozen species are peculiar to this latter continent, two inhabit Europe, and one only is found in the new world: the Rocky Mountain-goat, described by Colonel Smith under the name of *antilope lanigera*, belongs certainly to a different genus, and has no other character in common with the antelopes, except the round form and small size of its horns. Australia and Madagascar are, as far as we at present know, completely destitute of antelopes, as indeed they appear to be of all indigenous ruminants. The precise nature of the habitat frequented by these animals has nothing of a uniform character, but, as might naturally be expected from the different modifications of organic structure observable throughout the genus, differs according to the particular species. Some frequent the dry sandy deserts, and feed upon the stunted acacias and bulbous plants which spring up even in the most arid situations, where the stony nature of the ground gives a certain degree of adherence to the soil; some prefer the open stony plains, the steppes of Central Asia and karroos of Southern Africa, where the grass, though parched, is still sufficient for their subsistence; some again inhabit the steep rocky mountains, and leap from cliff to cliff with the ease and security of a wild goat, whilst others are found only in the thick and almost impenetrable forests of tropical countries.

The great extent of the genus *antilope* has obliged zoologists to subdivide it into a number of minor groups, or, as they are sometimes called, subgenera; and some have even gone so far as to bestow different names upon each of these different subdivisions. So long, however, as these animals are simply considered as different species of a common genus, this latter practice is neither sanctioned by example in other instances, nor productive of so much practical utility as to justify an exception to the general rule in the present. We shall therefore be so far guided by the example of Baron Cuvier, as to dispense with the names imposed upon the different subgenera of the genus antelope, by Lichtenstein, De Blainville, and other writers; contenting ourselves, like the first-mentioned eminent zoologist, with designating the various subdivisions by appropriate numbers, which have all the advantage of perfectly distinguishing the different groups, without misleading the judgment by false associations, or directing it to mistaken affinities and relations which have no existence, the too common consequences of an inconsiderate application of vague and improper terms. The principles of division and arrangement which we shall adopt are those which appear best calculated to distinguish the different groups in a definite manner, and at the same time to place in contiguity those species which most nearly approximate to each other in their general characters and habits. M. Cuvier has, for this purpose, followed the example of Pennant and Erxleben by adopting simply the curvatures of the horns, and this method has indisputably the advantage of great clearness and simplicity; but it is, at the same time, purely arbitrary, and certainly does not arrange the different species of antelopes according to their natural affinities. The plan of MM. Lichtenstein, De Blainville, and Colonel Smith, is much superior in this respect, but is much more complicated, and their divisions are sometimes vague and indefinitely characterised. We shall endeavour to unite the advantages of both systems, by adopting those characters which are most constant and influential in each, and rejecting all those of a secondary or variable nature.

I. The first of these subgenera or subdivisions of the genus antelope, which has been denominated *antilocapra* by the French naturalists, and *dicranoceros* by Colonel Smith, comprises one or perhaps more species, remarkable for being the only hollow-horned ruminants in which these organs are provided with a snag or branch in front, like the antlers of the stag or roebuck; a peculiarity of conformation which, as well as the general form and habits of the animals themselves, assimilates them in a great measure to the deer kind, and seems to point them out as the natural connecting link between the solid and hollow-horned families of ruminating animals. Their horns are of a moderate size, hollow only for a short distance from the base, and almost straight till within a few inches of the points, where they bend suddenly backwards and form a complete hook, like those of the chamois: from the root to this bend they are rough and scabrous like the antlers of deer, but the point is black, smooth, and shining, and the prong or antler, which in old animals is situated about half-way up from the root of the horn, is short and compressed, points forwards and a little outwards, and never exceeds an inch or an inch and a half in length. The females are without horns and have four teats, forming a small udder; the lips are hairy and attenuated like those of the goat; there are neither suborbital sinus nor inguinal pores as in the generality of the antelopes, but the fore-knees are furnished with large and copious brushes, and an erect mane of long hair runs from behind the ears half-way down the neck. One of the most remarkable characters of this group, and, with a single exception, peculiar to it among horned ruminants, consists in the total deprivation of accessory or false hoofs, another affinity with the solid-horned family, which approximates it strongly to the giraffes, and forms an additional inducement to place it at the head of the genus antelope. These animals even seem in some manner to connect the otherwise anomalous genera of camels and lamas with the ordinary ruminants, at the same time that they connect the hollow-horned family with the solid-horned, by means of the double affinity which they bear on the one hand to the deer in the form of their horns, and to the giraffes on the other by the absence of accessory hoofs; the latter character being peculiarly confined, among ruminating animals, to the camels, the lamas, the giraffes, and the group of antelopes at present under consideration. Colonel Smith has described two species as belonging to this group, but we have the authority of Dr. Richardson, whose experience entitles his opinion to great weight, for considering the *antilope palmata* of that author, a species founded upon the inspection of a pair of horns in the Museum of the College of Surgeons, as nothing more than a very old specimen of the common species, *A. furcifer*. The same naturalist considers the present group (and though it consists of a single known species only, it is highly probable that the plains of Mexico and California contain one, if not two different species) to comprise the animals long since described by Hernandez under the generic name of Mazama; and it is at least certain that one of the species so denominated by the Spanish author very closely resembles the *A. furcifer;* but, on the other hand, we are expressly assured by Hernandes himself that the antient Mexicans comprehended all the deer kind under this term, and the various descriptions which he gives afterwards clearly refer to solid-horned ruminants. The prong-horned antelope seems therefore to have been associated with the deer, on account of its branched horns; but whether the animal referred to by Hernandez be the same as that which is known to the west of the great lakes is a question to be determined by future observers. The only species of which we have any certain knowledge at present is—

1. The **Prongbuck**, (*A. furcifer*, Ham. Smith,) called *cabree* by the Canadian *voyageurs*, and *the goat* by the fur-traders. This animal measures four feet four inches from the nose to the root of the tail; its height is three feet at the shoulder, and the same at the croup; the ears are upwards of six inches long, and the tail about four and a-half. The horns rise perpendicularly from the skull, immediately above the orbits; they spread outwards, and are perfectly straight till within two or three inches of the points, where they curve suddenly backwards and inwards, forming a small hook, like those of the chamois. The prong is situated upon their anterior face, and in adult animals, about half-way up from the root; below it the horns are strongly compressed, rough and scabrous or pearly, like the antlers of deer; above it they are round, black, and polished. The prong itself is also very much compressed; it is little more than an inch in length, and points forwards, upwards, and a little outwards. The ears are long, narrow, and pointed; the tail short and bushy; the eye large and lively; the limbs long and slender; and the whole form and appearance of the animal peculiarly graceful and elegant. The head, ears, and legs are covered with short close hair of the common description, but that of the body is long and padded, and of a texture altogether different from that of other animals. It is tubular or hollow within like the feather of a bird, but so brittle and devoid of elasticity that it snaps with the smallest effort, and, when pressed between the finger and thumb, crushes like a reed and never regains its original form. It stands directly out at right angles to the hide, is about two inches long on the back, sides, and buttocks, but from the ears half-way down the neck it exceeds six inches in length, and forms an erect mane, equally conspicuous in both sexes. On the nape of the neck, shoulders, back, and hips, it is of a uniform fawn colour for half an inch at the point, and light-blue with a tinge of rose-colour at the root; on the sides, chest, and belly, the latter colour prevails at the root, and the point is of a pure and shining white. The extremities are uniform light fawn-colour throughout, except on the interior of the fore-arms and thighs, which are white. A broad disk of pure white also surrounds the tail, and passes over the croup, and the throat is likewise marked with two transverse bands of the same colour. This is the winter dress of the animal; but Dr. Richardson, who has well described it in his *Fauna Boreali-Americana*, informs us that in summer when the new coat appears, it has at first the ordinary texture and appearance of common hair, and that it only assumes the appearances here described on the approach of the cold season.



[The Prongbuck, *A. furcifer*.]

The prongbuck inhabits all the western parts of North America from the 53° of north latitude to the plains of Mexico and California, that is, presuming this species to be the Mazama of Hernandez: it is particularly numerous on the banks of the southern branch of the Saskatchewan, and on the upper plains of the Columbia river, and a small herd annually visits the neighbourhood of Carlton House, where a few individuals even linger throughout the winter. They are gregarious, frequent the open plains and hills of moderate height, never inhabit closely-wooded districts, and migrate from north to south according to the season. When the ground is clear, their speed surpasses that of most other animals, but a good horse easily outstrips them after a slight fall of snow; they are extremely curious, and the Indians, and, as we are informed by Dr. Godman, even the wolves, know how to take advantage of their curiosity to get within reach of them, by crouching down, and moving forwards, or stopping alternately. The antelopes wheel round and round the object of their attention, decreasing their distance at every turn, till at last they approach sufficiently near to be shot or captured. This habit renders them an easy prey, but as their flesh is not much esteemed by the Indians, they are only hunted in times of scarcity. The females produce one, and occasionally two kids early in the month of June.

II. The second group of the genus antelope is equally without lachrymal sinuses, inguinal pores, or horns in the female sex, and has hairy lips like the group already described; but the females have only two teats, the knees are destitute of brushes, and the horns are simple, and without the branch which so prominently characterises those of the prongbuck. This division likewise consists, at present, but of a single species, lately discovered by Mr. Hodgson, the British resident at the court of Katmandoo in Nepaul, and described in the Proceedings of the Zoological Society. It is

2. The CHIRU, (*A. Hodgsonii*, Abel,) believed to be the unicorn of the Bhotias, and supposed by Colonel Smith to be the animal which Ælian describes under the name of *kemas*, (see also Homer. *Iliad*, x. 361.) an opinion founded upon very slight and not easily tenable grounds. The whole length of this animal, from the muzzle to the root of the tail, is about five feet, its height three feet; the tail is eight inches long; the head, from the nose to the root of the horns, nine; the ears four inches, and the horns, measured along the curves, upwards of two feet. These grow upright from the skull, are strongly compressed on the sides, bend slightly backwards at first, and afterwards point gradually forwards, thus assuming a lyrated form, but less strongly marked than in the common gazelle; they are surrounded, to within six inches of the points, with from fifteen to twenty annuli, forming prominent knobs in front, but more obscure on the sides and rear; the last six inches are smooth and round, and the points rather attenuated. The legs are long and slender, but the symmetry of the head is destroyed by two large fleshy tumours about half the size of a hen's egg, which grow close to the outer margins of the nostrils, as well as by a profusion of bristly hair which surrounds the mouth and nose. The body is furnished with two different kinds of hair, a long external coat of the usual quality, and a short interior one of fine close wool. The prevalent colour of the latter is uniform greyish-blue, and the outer coat is likewise of the same colour at the base, but it is tipped with reddish-fawn, and thus gives the whole of the upper parts a tawny hue, through which the lower tinge is but faintly visible. The belly and interior of the limbs are white, the nose and face black, and a dark brown band passes down the front of each leg.

The chiru, according to the information obtained by Mr. Hodgson, inhabits the elevated plains of Thibet, but never approaches the mountains, and is altogether unknown on the Indian side of the great Himalayan chain. It is gregarious, residing in herds of many hundreds on the open plains, extremely shy and difficult to approach, posting sentinels in all directions where the herd feeds or reposes, and flying with astonishing velocity on the first alarm or intimation of danger. When brought to bay, however, the males defend themselves with courage, and in confinement are sometimes mischievous, and should be always approached with a considerable degree of caution. Like most other ruminants, they are extremely fond of salt, and during the summer months unite in large herds to visit the beds of this mineral, which abound throughout Thibet, advancing under the guidance of an experienced leader, and as usual posting sentinels to prevent surprise.

III. The third group of antelopes, comprehending more particularly the animal to which the name is originally and properly assigned, is distinguished from the two former groups by the possession of large suborbital sinuses, and by round annulated horns, assuming more or less of a spiral form, but equally confined to the male sex. These animals have likewise large inguinal pores, and hairy, attenuated lips; the females are provided with two or four teats, and the knees of all the species, except one, are furnished with brushes of long stiff hair. They inhabit different parts of Asia and Africa, prefer the open stony plains and steppes, live in families consisting of an old male and a variable number of females, with the young of the two or three preceding seasons, and occasionally unite into flocks of many thousand individuals for the purpose of migration. The best-known species of this division, and indeed of the whole genus, is

3. The SASIN or COMMON ANTELOPE, (*A. cervicapra*, Pallas,) remarkable for the form and beauty of its horns, which compose a spiral of two or more turns, according to the age of the animal. This beautiful animal is, when full grown, about four feet in length, and two feet and a half high at the shoulder: the head, measured from the nose to the root of the horn, is seven inches long, the ears five and a half, and the tail, without the hair, six inches. The legs are long and delicate, the body round, but light, and well formed, the head small the eye large, lively, and expressive, the ears long and cylindrical, the suborbital sinus particularly developed, and in continual motion, and the horns forming a complete spiral of two or three turns, wrinkled at the base, distinctly annulated in the middle, and smooth for a couple of inches next the points. The females, and young males for the first three years of their age, are of a uniform tawny-brown on all the upper parts of the body, with a light silvery band passing longitudinally from the shoulder to the hips, about six inches below the spine, on either side; the breast, belly, and interior of the fore-arms and thighs are white; as is likewise the under surface of the tail, which is rather broad, and furnished with a small tuft of black hairs at the extremity. After their third year, the males begin to assume the adult colours of their sex, and gradually darken on all the upper parts of the body, till they finally become almost entirely black above and white beneath, the nose, lips and a large circle round each eye being likewise white, but the light bands of the sides completely obliterated. The hair is uniformly short and close over the whole head, body, and extremities, except on the knees, which are furnished with tufts of long bristles, forming small knee-brushes.

[The Sasin, or Common Antelope, *A. cervicapra*.]

The sasins are so swift that it is useless to slip greyhounds after them, as, unless taken by surprise, which their extreme precaution seldom allows, it is impossible to overtake them, and experience has convinced the Indian sportsmen that the dogs are more likely to be injured in the chase than the game. The bounds also which these animals occasionally take, either for their own amusement or over the long grass when pursued, are said to be almost inconceivable. Captain Williamson, in his splendid work on the *Wild Sports of the East*, assures us that he has seen an old buck antelope lead a herd of females over a net at least eleven feet high, and that they frequently vault to the height of twelve or thirteen feet, and pass over ten or twelve yards at a single bound. They reside on the open plains of India, where they can see to a great distance in every direction, live in large families of from five or ten to fifty or sixty grown females to a single male, and when they feed, or lie down to ruminate, detach a number of the young bucks to a distance of two or three hundred yards on every side, to watch over the common safety. Nothing escapes the notice of these careful sentinels; every bush or tuft of grass that might be suspected to conceal an enemy is strictly and attentively examined, and on the first alarm the whole herd betakes itself to flight, following closely in the footsteps of the old buck, and is soon beyond the reach of pursuit. The venison is dry and unsavoury, and being held in small esteem, consequently holds out no inducement either to the occasional sportsman or to the professional Indian hunter. The species extends over every part of India, from the borders of Persia to the most eastern parts of which Europeans have any distinct knowledge. It is found on rocky, open plains, avoids woody localities and the thick cover of the forest, nor is there any certainty of its existing beyond the limits of India, though many zoologists, from Ray to Hamilton Smith, are of opinion that it likewise inhabits some parts of Africa. The fakirs and dervishes polish the horns and form them into a kind of offensive arms by uniting them at the base; these they wear at their girdles instead of swords and daggers, which their vows and religious character prevent them from using.

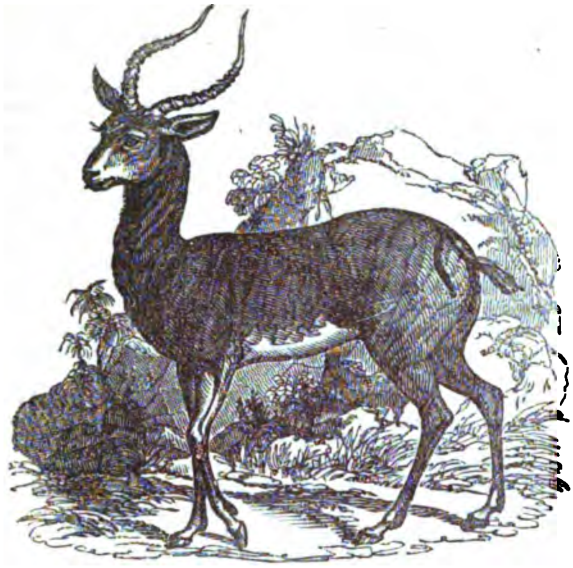
4. The **Saiga** (*A. colus*, H. Smith) is the only species of real antelope which inhabits any part of Europe; the chamois, though also considered as belonging to this genus, is really an intermediate species, partaking equally of the characters of the antelopes and the goats. The size of the saiga is about equal to that of the fallow deer, the length being four feet; but the form of the body more nearly resembles that of the sheep, being round and heavy, with a large head and short slender limbs, and the whole proportions of the animal want the usual grace and elegance which commonly characterise the antelope tribes. The nose is large, swollen, and cartilaginous, like that of the elk; it is marked above by deep transverse furrows or wrinkles, and, from its great size and protuberance, compels the animal to go backwards whilst feeding. The nostrils are large and open, the ears of a moderate size, the tail from three to four inches in length, and the lachrymal sinuses much smaller than in the Indian antelope. The hair is uniformly long and flowing over the whole body, of a greyish-yellow colour in summer, and greyish-white in winter on the upper parts, and white beneath at all seasons: the knees are furnished with small brushes. The horns of the male are longer than the head; they are semi-transparent and of a light yellow colour, which causes them to be much sought after by the Russians and Chinese for the purpose of making combs, lanterns, and other articles of domestic economy; their form is intermediate between that of the spiral-horned and lyrated groups, being distinctly twisted upon their axis, though without exhibiting the complete spiral threads which characterise the horns of the Indian antelope.

The saiga is mentioned by Strabo (book vii. p. 312. Casaub.) under the name of *colus* (κόλος); the Polish name of the animal, *sulak*, appears to bear some resemblance to the name in Strabo. The Tartars call it *akkak* and the Turks *akim*, which come so near to the Hebrew word *akko*, translated wild goat in our English version of the Scriptures, that we cannot help suspecting that the sacred writers alluded to this animal. In autumn the saigas unite into large flocks, composed sometimes of many thousand individuals, and migrate southward in search of a milder climate and more abundant pasturage; they return northward in small families about the commencement or middle of spring, and generally keep about the vicinity of lakes and rivers, as they drink a great deal, and, as we are credibly assured, by sucking the water through their large open nostrils. This last fact is also stated by Strabo. They like to feed upon acrid, saline, and aromatic plants, and grow very fat during the summer season, but their flesh acquires a disagreeable taste from the nature of their food, and must be allowed to cool after cooking before it is fit to be eaten. The females are gravid about six months, from the end of November to the end of May; they drop their kids soon after their return northward in the spring, and commonly produce one, rarely two, at a birth. They inhabit the open steppes and deserts from the Danube to the Irtish eastwards, and as far north as 54° of latitude, and are found in Poland, Moldavia, about the Caucasus and the Caspian Sea, in Siberia, and in Northern Persia. Their eye-sight is said to be defective from the reflection of the dry arid plains upon which they mostly reside; and, though amazingly swift for a short distance, they are soon exhausted and easily run down. They are hunted principally for the sake of their horns and skins, the latter of which, particularly those of the kids, are much valued for the manufacture of gloves. The hunters must always take care to approach them against the wind, as their sense of smell is remarkably acute. With all these precautions it is often impossible to get within shot of these animals, as, like many other gregarious species of antelope, they take care, whilst feeding or reposing, to place sentinels in different directions round their encampment to warn them of the approach of danger. The females, according to the traveller Gmelin, have four teats, but it is not always safe to rely upon the observations of this writer.

5. The **Dzeren** (*A. gutturosa*, Pallas), the hoang yang, whang yang, or yellow goat of the Chinese, is about the same size as the species last described, being nearly four feet and a half in length, and two feet six inches high at the shoulder; the body also is large and corpulent, and the legs shorter than is common to the antelopes in general; the horns are black, lyrated and marked to within a short distance of their points with prominent transverse rings; the suborbital sinuses are small; the larynx large and salient, forming, particularly in the old bucks, a prominent lump on the throat; upon the prepuce of the same sex there is likewise situated a bag about the size of a hen s egg, which contains a waxy substance similar to that produced in the analogous organ of the musk animal, but without any kind of odour; the tail is short, and the knees furnished with small bunches of hair, but scarcely sufficiently long and distinct to merit the name of brushes; the summer coat is of a greyish fawn-colour above, and white beneath; that of winter almost entirely white, being tinged but slightly with a greyish-yellow shade on the back and sides. The females resemble the males in colour, but are rather of smaller size, and without horns; they want the sack on the abdomen and have two teats.

The dzerens inhabit the dry arid deserts of Central Asia, Thibet, China, and southern Siberia; particularly the great desert of Gobi, and prefer the most sandy and stony plains, feeding upon such scanty herbage as these localities supply, and avoiding water, to which they appear to entertain a marked aversion. They are remarkably swift, take prodigious leaps, and, when frightened, will occasionally pass over twenty or twenty-five feet at a single bound. In spring and summer they form small families which live apart from one another, but, in the beginning of winter, unite into large flocks, always under the guidance of an experienced old buck. They never run, even when pursued, in a confused crowd, but form single files, and follow closely in the footsteps of their leader; they rarely emit any voice; when taken are easily tamed, and indeed appear to have rather a predilection for the domestic state, often mixing with flocks of sheep, and approaching human habitations during the severity of the winter season: their flesh is tender and well tasted, and they form a favourite object of chase with the Moguls and Tartars. The gestation of the females continues from December till the middle of June, and they produce but a single kid at a birth, which grows slowly, and is long in arriving at maturity. During the first year the young males have neither horns nor any appearance of the protuberance on the throat from which the specific name of gutturosa is derived; but these organs are gradually more and more developed in proportion as the animal advances in age, till at last, in very old animals, the laryngal protuberance attains the dimensions of five inches in length by three in breadth, and assumes the appearance of a large and deformed goitre. The females differ from the males by the absence of this protuberance as well as by the want of horns. Gmelin denies the antipathy to water which Messerschmid attributes to this species, and affirms that, when pursued, the dzerens do not hesitate to throw themselves into the first river they meet with, and that they swim remarkably well. The physical nature of the arid sandy plains which they frequent, in preference to all other situations, may probably have given rise to this presumed antipathy to an element which they seldom encounter, as well as to the marked antipathy to woody localities likewise attributed to them, trees and rivers being equally unknown in the indigenous habitats of these animals.

6. The **Pallah** (*A. melampus*, Lichtenstein) is a magnificent species of South Africa, discovered by Professor Lichtenstein during his travels in Caffraria, and since found in the Booshuana country on the elevated plains of Latakoo, by Trutell, Somerville, and Burchell. It is upwards of four feet and a half in length from the nose to the origin of the tail, and three feet high at the shoulder; the horns have an irregular lyrate tendency, bending first forwards and very much outwards, then with a large circular sweep inwards, and finally pointing forward again, approaching within three inches of one another at the tips, after being nearly a foot distant in the middle: they are about twenty inches long in adult animals, and surrounded for two-thirds of their length with irregular rings, often splitting into two, and forming prominent knobs on the front of the horn, but frequently obliterated, and always less strongly marked on the sides, which are slightly compressed. In the beautiful drawing of this animal given in Daniel's *African Scenery*, the horns are represented with an unnatural angular bend, which has misled many describers, and caused even Colonel Smith to describe them as forming an obtuse angular bend, though he has himself given an accurate drawing of the



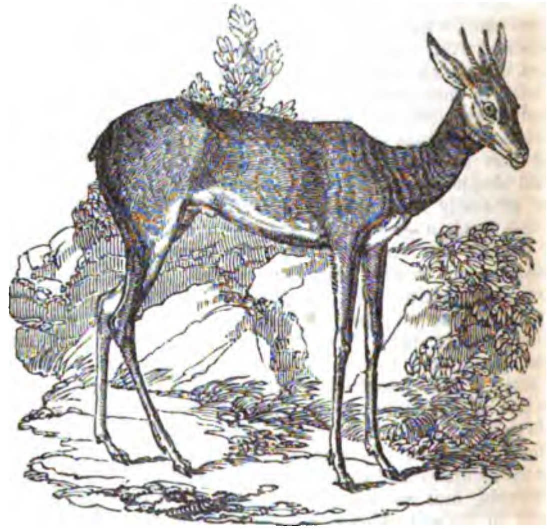
[The Pallah, *A. melampus.*]

pair which we have here described, and which certainly exhibit no appearance of the sudden angle attributed to them, which probably arose from the particular position in which Mr. Daniel's figure was drawn. The horns for a third of their length towards the points are black, smooth, and polished. The head, back, flanks, and outer surface of the legs and tail are of a deep rufous colour; the lips, eyebrows, interior of the ears, breast, belly, interior of the thighs and arms, and the region below the tail, white; the back is marked longitudinally by a band of deep shining black, which divides on the croup and passes down along each hip in the form of a crescent, separating the pure white of the buttocks and interior of the thighs from the general rufous colour of the upper parts; the outside of the knee and heel are likewise marked by brilliant black spots, which contrast strongly with the general rust-colour of the extremities, and from which the animal derives its specific name of *melampus*. The ears are very long, particularly in the females, which are without horns, and of a smaller size than the males, but similar in other respects; the ears are covered on the outside with short red hair, bordered and tipped with black, and the knees are without brushes. We are as yet very imperfectly acquainted with the characters of this magnificent species of antelope, so that it is not without considerable doubt, and only on the authority of Colonel Smith, that we venture to include it in the present group.

The pallah inhabits Caffraria and the country of the Bachapins or Booshuanas, never descending farther south than the Koosges valley in the one direction, and the Kamhanni mountains in the other. They reside on the open plains in families of six or eight individuals, run with amazing swiftness, and occasionally leap like the springbuck, which, according to Mr. Burchell, they much resemble in their general habits and manners. They are extremely numerous on the elevated plains in the neighbourhood of Latakoo, and constitute a favourite object of the chase with the natives, as their flesh, though deficient in fat, is well-tasted and wholesome. *Pallah* or *phaala* is the Bachapin name of the animal, but the mixed Hottentots, who travel into that country from the Cape, distinguish it by the Dutch term *roodebok* or redbuck, on account of the prevailing colour of its hair.

IV. The fourth subdivision or group of antelopes contains a single species, which differs from the last group principally by its small size, short straight horns, knees without brushes, and in the females being provided with four teats. The upper lip is hairy and attenuated; the lachrymal sinuses open externally by small circular apertures, about half an inch from the inner canthus of the eye, and there are no inguinal pores.

7. The **Madoqua**, (*A. Saltiana*, Blainville.) This is perhaps the smallest of all horned animals, being scarcely the size of a good English hare. It measures two feet in length from the nose to the root of the tail, and about fourteen inches in height at the shoulder, the height at the croup being about an inch more. The length of the head from the nose to the ear is five inches, that of the horns three; the ears are two inches and three-quarters long, and the tail an inch and a half. The horns of the male are situated in the plane of the forehead; they are very sharp-pointed, almost insensibly bent outwards and forwards, provided on the inner anterior margin with a prominent sharp ridge, which runs from the base to within a quarter of an inch of the points, and annulated for about two-thirds of their length from the roots. The females are without horns, but have, in common with the males, a tuft of long stiff hair standing upright from the crown of the head, and forming a small crest, particularly remarkable in the females, from their not being furnished with horns; the hair on all other parts of the body is short, close, and smooth, except on the hind face of the hips and thighs, where it is rather longer, and radiates outwards and round the tail, its pure white colour contrasting agreeably with the colours of the croup and thighs; the face, forehead, and legs, as well as the tuft of long hair between the horns, are of a bright and deep red, as are likewise the backs of the ears; the neck, shoulders, flanks, rump, and outsides of the thighs, are of a clear grey colour, like that of the American grey squirrels, each hair being annulated with alternate rings of black and white; the back, from the shoulders to the rump, is a deep reddish brown, and the breast, belly, interior of the fore-arms and thighs, and hinder surface of the hips, of the most pure unmixed white, forming altogether a variety, clearness and brilliancy of colouring rarely met with among quadrupeds; the tail is very short, being in fact little more than a mere stump; the ears are round and nearly the length of the horns; the hoofs small, well-formed, and, like the horns, of a deep black colour; the forehead is perfectly flat, and the head is compressed suddenly below the eyes, and tapers to a small and attenuated snout; the legs are long in proportion to the weight of the body, and so small that they scarcely equal the little finger in thickness.



[The Madoqua, *A. Saltiana.*]

The madoqua is found in all parts of Abyssinia, where it was originally noticed by Bruce, who discovered it in the country about the sources of the Abawi or eastern branch of the Nile. Mr. Salt afterwards procured specimens in the mountains of Tigrè, and sent the horns and legs to the British Museum, where they were observed by De Blainville, and described under the specific name of *Antilope Saltiana*, in compliment to the distinguished traveller who procured them. More recently complete specimens have been brought to Europe by Rüppel, and Hemprich and Ehrenberg, and the species has been well described and beautifully figured both by these travellers and in the *Darstellung neuer Oder wenig bekannter Säugethiere* of Professor Lichtenstein. Little is known regarding the habits of this species. It is said to live in pairs in mountainous districts; and Pearce informs us that many of the Abyssinians object to eat its flesh, from a superstitious belief of its being often found in the society of monkeys and baboons.

V. The fifth group comprises two species at present very imperfectly known, and introduced into the present article on the authority of Colonel Hamilton Smith, the only naturalist who has hitherto observed and described them. They are distinguished by moderately-sized lyrated horns, confined, as in the groups already described, to the male sex; by large suborbital or lachrymary sinuses, by brushes on the knees, two teats in the females, and probably inguinal pores; but the form of their upper lip differs from that of all those which we have described, and, instead of being hairy and attenuated as in the goat, terminates in a round naked muzzle, like that of the stag or roebuck, thereby indicating a decided difference in the habits and mode of life of these animals, more especially as regards the nature of their food. But for this circumstance, and the absence of horns in the female sex, another character which has a powerful influence upon the economy of ruminating mammals, the presence of the lachrymal sinuses, the number of teats, the existence of knee-brushes, and, above all, the lyrated form of the horns, would approximate the species at present under consideration to the group which includes the common gazelle, the springbuck, and other kindred species; but the characters attributed to them by Colonel Smith not only indicate a difference of food, but likewise a decidedly different habitat—the thick forest and the grassy meadow, instead of the barren stony hills and the parched and burning desert. All the details concerning their habits, as well as their local names, are however unknown, and it is only from their zoological characters that we are enabled to deduce a few facts regarding their economy.

8. *A. forfex*, H. Smith, supposed by its describer to be the species noticed by Pennant under the name of the Gambian antelope, and which that author identifies with the kob of Buffon, is said to be rather larger than the springbuck, the height at the shoulder being rather better than two feet, and the outward form and appearance similar to those of the kevel. The horns are about a foot long, black, and annulated for the first two-thirds of their length, smooth and pointed on the remaining portion; they stand close together at the base, bend slightly forwards at first, and then, with a wide sweep outwards, finally pointing inwards and forwards, and resembling in front the figure of a pair of forceps. The head is broad across the orbits, and measures about ten inches in length; the eyes large and black; the ears rather wide, open, slightly pointed, and filled internally with a bunch of long white hair; all the upper parts of the body are fulvous brown, darkest on the face and hips, all the under parts white, the latter colour being separated from the former by an indistinct dark stripe on the flanks; the legs are marked in front with a brown streak terminating in a black spot on the fore pasterns, and on the hind-legs extending but a short distance up the canon bones; small dark brushes protect the knees; and the tail, about six inches in length, is white beneath, light brown above, with a dark line down the middle and a black tuft at the extremity. The only specimen observed was brought from the west coast of Africa, and formerly exhibited at Exeter Change; it was remarkably timid, and of a mild, engaging disposition.

9. *A. adenota*, H. Smith, which this author identifies with the kob of Buffon, but certainly without sufficient grounds, since the kob has no lachrymal sinuses, whilst in the present animal they are, by Colonel Smith's own description, particularly long and open, is a species described from a pair, male and female, formerly in the Exeter Change collection, and distinguished by the peculiar manner in which the hair is directed upon the body, whirling round a small centre on the loins, and reversed or couched forwards on the back, upwards on each side of the neck, obliquely upon the flanks, and downwards on the hips. The general colour is a uniform fulvous bay above and white below, with a dark list down the front of the fore-legs, and a black ring round the hind canons immediately above the spurious hoofs. The tail is short and entirely covered with long black hair, and the lips, chin, and a space round the eyes are marked with white. The horns of the male rise immediately above the orbits, and are about nine inches in length; the first two-thirds are marked with ten rings, forming prominent knobs in front, but almost obliterated on the sides and behind; the superior third is smooth, black, and rather bluntly pointed; they are a little striated between the annuli and rather compressed on the sides; their direction is at first nearly in the plane of the forehead, but they afterwards spread outwards and backwards, with the points finally bending almost imperceptibly forwards, so as to assume, when seen in front, the figure of a common pitchfork. The female is without horns, but in every other respect perfectly resembles the male. The pair observed by Colonel Smith were brought from the west coast of Africa, and were excessively shy and timid.

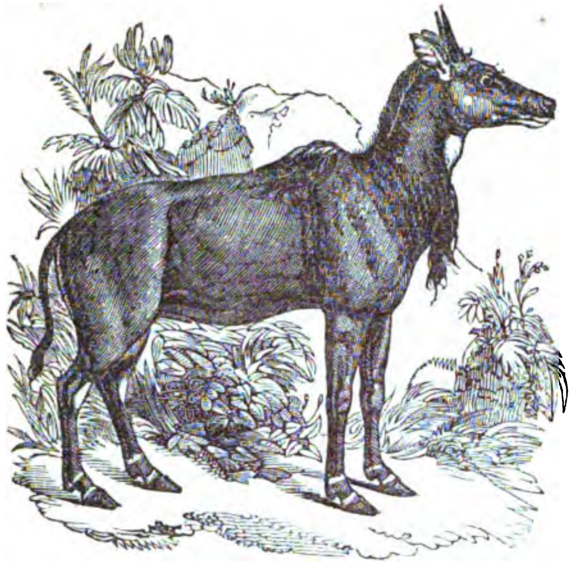
VI. The sixth subdivision of the antelope genus is distinguished by a round naked muzzle, large lachrymal sinuses, and horns confined to the male, but particularly by the number of the horns, which amounts to four, forming the only instance in which horned animals in a state of nature possess more than two of these organs. The inguinal pores and number of teats in the females have not been observed; the knees are without brushes. The group contains at present but a single authentic species, the two described by Dr. Leach and Colonel Smith being but different ages, or at most different varieties of the same animal.

10. The **Chickara**, (*A. quadricornis*, Blainville,) well-described by General Hardwicke in the *Linnæan Transactions*, is about two feet nine inches in length from the muzzle to the root of the tail; the tail itself is five inches long, and the height at the shoulder about one foot eight or nine inches. The superior or common horns are about three inches long, smooth, black, pointed, erect, and moderately divergent, bending very slightly forwards, and without the least indication of annuli. The spurious or additional pair of horns are placed in front of these, immediately between the orbits, and consist of short, erect, blunt stumps, about three-quarters of an inch in length, an inch and a half in circumference at the base, and of the same smooth and black appearance as the real horns. The head is seven inches and a half long, the ears four inches and three-quarters, erect and pointed; the general colour of the upper parts is uniform bright bay, and that of the under parts silvery white, more or less mixed with sandy-coloured hairs; the lips are bordered with black. The females differ from the males by the absence of horns, and likewise by being of a lighter colour, which character is conspicuous at a very early age and continues throughout life.

This species, called chickara by the Hindoos, and chouka by the Nepalese, is common in all the wooded parts of India, particularly in Bengal, Bahar and Orissa; it is monogamous, and lives in pairs, in the forests and thick jungle, being exceedingly wild and active, and rarely suffering a state of confinement unless taken young. During the rutting season the male becomes particularly mischievous, and it is then dangerous to approach him, as he butts at everything within his reach; the female produces two young at a birth, but the period of gestation has not been recorded. Baron Cuvier supposes, and apparently with reason, that the antients were acquainted with this species, and that the *Four-horned Oryx* of Ælian refers to the modern chickara.

VII. The seventh group includes a number of species which differ from the last; principally in the number of the horns, being two only, short, round, smooth, and slightly bent forwards. As in all the species hitherto described, they are wanting in the females. The head is terminated by a distinct, well-formed, naked muzzle, the lachrymal sinuses are large and conspicuous; one species only is without inguinal pores; another differs from the general type in the possession of knee-brushes, which are commonly wanting, and the females are universally provided with four teats, forming a small udder. A single species inhabits India; all the others are African, and reside on the open rocky plains, or in the gorges of mountain glens, sometimes bounding from cliff to cliff with all the ease and security of the ibex. These animals are generally monogamous, and associate in pairs or small families, but never unite into large herds like the saiga and springbuck, nor do they migrate from place to place like these species.

11. The **Nyl-ghau**, (*A. picta*, Pallas,) one of the largest and most magnificent antelopes known, being upwards of four feet high at the shoulder, inhabits various parts of India, whence it has often been brought to England, where it lives and breeds, and is not an uncommon animal. The face of this species is long and narrow, the muzzle large and naked, the horns about seven inches long, small, round, and black, rather distant at the base, nearly parallel throughout their whole length, pointed and slightly curved forwards. They are perfectly smooth and without annuli, but rather triangular at the base, and gradually rounded and attenuated towards the points. The lachrymal sinuses are large, the ears seven inches in length, broad and rounded like those of an ox, the neck deep and compressed like that of the horse,



[The Nyl-Ghau, *A. picta.*]

not round and cylindrical as in the stag and most other antelopes, and the tail broad, equally covered with hair on the sides and at the root, but terminated by a long black tuft, and descending to the houghs. The legs are small and well-formed, the anterior rather longer than the posterior, and the spinous processes of the dorsal vertebræ so much elevated between the shoulders as to give the animal the appearance of having a small hump. When at rest, the feet are gathered close under the body, and the tail turned in between the hind legs. The hair is uniformly short and close upon every part of the head, body, and limbs, excepting along the top of the neck and on the shoulders, where it is long, stiff, and upright, forming a thin erect mane which extends from between the ears half way down the back; and on the middle of the throat, where there is a species of beard composed of stiff bristly hair. The general colour is a uniform slaty blue on the upper parts in the male, and tawny red in the female, on the under parts uniform white in both sexes; the limbs and face are almost brown, and the lips, chin, and under surface of the tail white. There is a large white spot on the throat, and two smaller ones on the cheeks under the lachrymal sinuses; and the pastern joints are marked in front with one, and in rear with two conspicuous spots of the same colour, which contrast strongly with the dark brown of the surrounding parts, and have suggested the specific name of *Antilope picta* which has been given to this animal.

The nyl-ghau resides in the dense forests of India, whence it occasionally makes excursions very early in the morning or during the night, to feed upon the corn-fields of the natives which happen to be situated in the vicinity of the jungle. It is a vicious animal, of very uncertain temper, and as it is both powerful and resolute, and frequently turns upon its pursuers, it is seldom made an object of chase except by the native princes, who employ elephants for this purpose, or enclose the game in nets. The usual method which the shecarries or professional hunters employ for its capture, is to shoot it from an elevated platform when it comes out at night or early in the morning to feed on the confines of the jungle; this being likewise their mode of destroying tigers, wild boars, and other beasts which they dare not attack openly. Even in confinement, and when domesticated from birth, the violent and changeable temper of the nyl-ghau cannot be trusted. Previous to making its attack, it drops upon the fore-knees, advancing in this position till within a proper distance, and then darting suddenly forwards with the velocity of an arrow, and with a force which no ordinary animal can withstand. Yet, notwithstanding its vigour and resolution, it is the most common prey of the tiger, which the shecarries often destroy in the very act of devouring the mangled remains of this animal; for, when these are discovered, the hunters always erect their platforms in a convenient situation in the neighbourhood of the carcass, knowing, by experience, that the tiger is sure to return on the following night to glut himself at leisure with the produce of his previous chase. The nyl-ghau has often bred in confinement, both in this country and in India: the period of gestation lasts for eight months, and two young are most commonly produced at a birth. At first the young males are of the same reddish-brown colour as the females, and only assume the greyish-blue shade proper to their sex, on arriving at maturity: their growth is, however, rapid, and they attain their adult size in the second or third year of their age.

12. The OUREBI, (*A. scoparia*, Schreber,) called *bleekbok*, or *palebuck* by the Dutch colonists at the Cape, according to Professor Lichtenstein, is a much smaller species than the nyl-ghau, and differs from all the other species of the present section by the large brushes which, in common with many other antelopes, it has upon the upper end of the canons, immediately below the knees, and from which it derives its specific name of *A. scoparia.* It measures three feet eight inches in length from the muzzle to the root of the tail; the length of the latter is three inches and a half, that of the head seven inches and a half from the muzzle to the root of the horn, of the horns themselves five inches and a quarter, and of the ears three inches and three-quarters. The height at the shoulder is one foot ten inches, at the croup nearly two feet, and the size of the animal, as well as its general form and proportions, are nearly those of the roebuck, only that the head is longer and more slender. The horns are awl-shaped, sharp, slender, nearly straight and bending almost imperceptibly to the front; they are surrounded at the base with a few obscure wrinkles, succeeded by five or six well-defined rings, but are smooth and black throughout the greater part of their length, and end in very sharp points. The general colour of the upper parts is a uniformly pale yellowish-brown, darker in some individuals than in others; all the under parts, as well as the chin, lips, and a longitudinal streak over the eyes in the form of eyebrows, are white, and this colour likewise spreads over the posterior surface of the hips. The tail is covered with long bushy hair of a jet black colour, forming a marked and prominent contrast with the white of the buttocks; the ears are edged with a narrow border of dark brown, and immediately beneath their opening at the root there is a remarkable bald or naked spot of an oval form on each side of the head.

The ourebi inhabits the open plains of South Africa, and without being positively gregarious, is fond of the society of its own species. It is found chiefly in the eastern districts of the Cape colony towards Caffraria, and its flesh, though dry and destitute of fat, is esteemed one of the best venisons of the country. Great numbers of these animals are found on the plains about Zwartkops bay. When feeding, they straggle confusedly over the plain, and appear to be in company rather accidentally than by intention; when alarmed also, they do not fly together, but each runs off by itself in whatever direction it thinks most secure from danger for the moment. If the *antilope montana* of Rüppel, generally identified with this animal, be in reality the same species, it would appear to extend along all the eastern coast of Africa, from the southern confines of the continent to the banks of the Bahr el Abiad, or White Nile, close to which Rüppel procured his specimens.

13. The STEENBOK (*A. tragulus*, Lichtenstein) is one of the most graceful and elegant of the antelope tribe. Its legs are longer and smaller in proportion to its bulk than in any other species; its body is compact and well made; its head small, pointed, and ending in a well-formed naked muzzle, and its tail reduced to a mere tubercle, scarcely perceptible among the long hair of the croup and buttocks. The whole length, from the muzzle to the root of the tail, is about three feet four or five inches; that of the head, from the muzzle to the base of the horns, four inches, and from the same point to the root of the ear six inches, the tail being an inch and a half long, and the horns four inches. The height at the shoulder is one foot seven inches, and at the croup one foot nine. The colouring f this species is altogether peculiar, and alone sufficient to distinguish it from all other ruminants. In general, it is a reddish fawn-colour on the upper parts of the body, but this seems to be glazed, or, as it were, overlaid on the shoulders, back, sides, and hips with a light dun or silvery brown hue, arising from the hairs in these situations being tipped with that colour; the nose and legs are dark brown, the breast, belly, and interior of the fore-arms and thighs white; the hair of the forehead is long and of a deep red colour, and a remarkable black line passes from the root of each horn backwards, uniting

between the ears, and forming an obtuse angle equally as conspicuous in the hornless females as in the horned males, and affording an excellent criterion by which to distinguish the species. The horns of the male are small and round, furnished at the roots with a few faintly marked wrinkles, but smooth and polished throughout the greater part of their length, and ending in extremely sharp points, almost imperceptibly bending forwards. The ears are extremely large for the size of the animal, being nearly half as long again as the horns, and broad in proportion. But perhaps the most remarkable character of the species, and certainly that which most definitely distinguishes it from all the other ruminants with which it is at all likely to be confounded, though it has hitherto escaped the notice of observers, is the total absence of spurious hoofs, both on the fore and hind feet, a character which we have already found in the prongbuck, and which, as far as we are aware, no other ruminating animal of the hollow-horned family possesses.

The steenbok resides in pairs on the stony plains and mountain valleys of South Africa, not, however, frequenting very elevated or rocky localities, as its colonial name of steenbok, or stonebuck, would seem to imply. On the contrary, it prefers the dry open flats, covered here and there, it is true, with large rocks and boulder stones, but likewise interspersed with clumps of stunted bushes and underwood, which furnish it with cover. This is the general character of the South African plains in the neighbourhood of Cape Town, as well as of the gorges of the moderate hills and mountains, and it is in such situations that the steenbok is most commonly found. This animal is, moreover, remarkably shy and timid, runs with extraordinary swiftness, and when pursued will frequently bound over a space of twelve or fifteen feet at a single leap. When closely pressed, and without any further means or power of escape, it will hide its head in the first hole or corner it happens to meet with, and thus patiently resign itself to its fate. Though it cannot be called a rare animal at the Cape, it is nowhere particularly common, being much hunted on account of the delicacy of its flesh, which furnishes excellent venison, and great numbers of the young being destroyed by eagles and other birds of prey. Colonel Smith has described the young of the steenbok as a different species, by the name of *A. rufescens;* and the *A. pallida*, or *A. pediotragus*, of Afzelius, appears to differ in no respect from the adult of the present animal, the really distinctive characters of which have been hitherto very imperfectly reported.

14. The **Grysbok** (*A. melanotis*, Lichtenstein) is a species closely allied to the steenbok, but rather lower on the legs and more heavily made. The whole length of the body is nearly three feet, that of the head, from the muzzle to between the ears, six inches; the height at the shoulder is one foot five inches and a half, and at the croup one foot seven and a quarter; the horns are two inches and a half long, and the ears five inches. The head, as in the steenbok, contracts suddenly before the eyes, and ends in a pointed muzzle; the horns are situated immediately above the orbits, straight, upright, pointed, and shining, with two or three small annuli at the roots; the ears are long, wide, and open, and the tail, almost tuberculous, is concealed among the long hair which passes backwards over the hips. The hair of the body is universally long, particularly on the hind quarters; on the head and extremities it is, on the contrary, remarkably short. All the upper parts are of a deep crimson red colour, thinly but regularly intermixed with long coarse hairs of the purest white, giving the whole animal a hoary appearance, expressed by its colonial name of grysbok, or grey-buck, and forming altogether a character not easily mistaken; the inferior parts are uniform light sandy brown or red, the head and extremities fawn-colour; the muzzle, the openings of the lachrymal sinuses, and an obscure circle about the eyes, as well as a mark upon the occiput of some specimens are black, as are likewise the backs of the ears, which are nearly naked, with a few very short grey hairs thinly scattered over them.

The habits of the grysbok are in most respects similar to those of the steenbok. It lives in pairs upon the plains, never unites into troops or flocks, and conceals itself in clumps of underwood, whence it is not easily driven, lying close like a hare in her form, and seldom moving till almost trodden on. It is common in most parts of the colony at the Cape, and being less swift than the steenbok is more easily captured; its venison is much esteemed, though, like the generality of antelopes, destitute of fat.

15. The **Klipspringer**, (*A. oreotragus*, Forster,) called kainsi by the Hottentots, is an antelope which inhabits the most barren and inaccessible mountains of the Cape, and appears to supply in South Africa the place of the chamois and ibex. The entire length of this animal, from the muzzle to the root of the tail, is three feet two inches. its height twenty-one inches at the shoulder, and about an inch more at the croup; the horns are three inches and a half long, the ears four and a quarter, and the tail three. The head is short and small, compressed on the sides, and suddenly contracted immediately in front of the orbits, ending in a small, round, naked, black muzzle; the lachrymal sinuses open by a moderately-sized circular aperture; the horns of the male are perfectly straight and smooth throughout the greater part of their length, having three or four small but distinct annuli surrounding their roots; the ears are large, open, and rounded at the points; the eyes large and dark, and the tail appearing externally only by a brush of hair which clothes it. There are neither inguinal pores nor knee-brushes, but in place of the latter the knees of some specimens exhibit a naked callous patch, probably occasioned by rubbing against the rocks. The general colour of the animal on all the upper parts of the body is a lively and pleasing mixture of yellow and green, resulting from each hair being individually surrounded by alternate rings of these two colours; the under parts of the body are light sandy-red, tinged with yellow; the interior of the ears is filled with long white hair, a narrow black border surrounds their edges, and the eyes are encircled by the same colour. The hair of the body is long, padded, and stands perpendicularly out from the hide; that of the head and extremities is shorter, and lies in the usual direction; in quality the latter also resembles the hair of common animals, but the texture of the hair which covers all the upper surface of the body and neck is altogether peculiar, being similar to that of the prongbuck already described. It is round and hollow internally, and so fragile that it breaks with the slightest touch, crushing like straw when pressed between the fingers, and so deficient in elasticity that it never regains its original form. The tail is covered with a small bush of hair of the same description, but so short as to be scarcely perceptible among the long hair of the hips. The legs are more robust than in most other species of antelope, and the hoofs, instead of being pointed and flat beneath, are perfectly round and cylindrical, being worn only at the tips, upon which alone the animal treads. This peculiarity of structure in the hoof, and the rigid form of the pastern joints, which are perfectly stiff, and in a straight line with the canons, account for the amazing agility which the klipspringer displays in bounding among the most dangerous rocks and precipices.

The peculiar habitat of this species makes it impossible to hunt it with dogs, but it is easily shot as it exposes itself upon the naked rocks, and great numbers of the young are destroyed by eagles and other birds of prey which inhabit the same localities. In consequence of this, the animal is by no means common, and is becoming every day more scarce in situations where it most abounded formerly; the excellence of its venison and the value of its hair, which is held in great estimation for stuffing saddles and mattresses, hold out a powerful inducement to its destruction.

16. *A. acuticornis*, De Blainville. This species is only known from a mutilated skull and horns in the Museum of the College of Surgeons in London. The horns are round, vertical, very sharp-pointed, and perfectly smooth, without the least appearance of annuli at the base, nearly parallel throughout their whole length, and moderately curved forwards; they are three inches long, and little more than an inch in circumference at the base. The sinciput is narrow, square, and much elevated. These characters show the fragment in question to have belonged to a young animal. Colonel Smith adds, that it was brought from India, and considers it to be the species which Mr. Johnston alludes to in his *Sketches of Indian Field Sports* under the name of small deer, and which that author says is an inhabitant of the dense forests of the Rhamgur country.

17. *A. subulata*, Smith, is another species only known from the horns, which were likewise brought from India to the College of Surgeons, where they were observed by Colonel Smith, and afterwards figured and described by him in the fourth volume of Griffiths's *Animal Kingdom*. These horns are four inches and a half in length, an inch in circumference at the base, smooth, black, and sharp-pointed.

They are nearly vertical on the forehead, bending moderately outwards in the middle, and their points turning slightly inwards, and thus assuming something of the figure of a shoemaker's awl. Their distance at the base is one inch and two lines, and in the middle about two inches.

VIII. The eighth group into which we divide the genus *antilope* is distinguished from all those which precede it by the total absence of lachrymal sinuses, and by the beautiful spiral form of the horns, surrounded throughout the greater part of their length by a prominent wreath. The species comprised in this subdivision have likewise distinct naked muzzles and inguinal pores, but they want knee-brushes, and the females are without horns and provided with four mammæ. They inhabit the forests of South and West Africa, and are the only antelopes distinguished by the variety of their colours, being more or less spotted and ribbed with white upon a dark or fallow ground. They live in pairs or small families.

[The Koodoo, *A. strepsiceros*.]

18. The **Koodoo** (*A. strepsiceros*, Pallas) is a magnificent animal of South Africa, and one of the largest of the antelope genus, measuring upwards of eight feet in length, and being four feet high at the shoulder. The horns of the male are particularly magnificent; they are nearly four feet long, and beautifully twisted into a wide-sweeping spiral of two turns and a half, surrounded by a prominent wreath which follows all their windings, and is gradually obliterated towards the points, which are rather blunt and directed outwards. They are thick at the base, and marked for some distance up with irregular wrinkles, but not annulated, dark brown at the bottom, black in the middle, and the extreme points white. They spread boldly and widely outwards and are usually carried couched on each side of the back, on account of their great weight. The whole make of this animal is heavy; the head large and terminated by a broad muzzle, the ears broad and slouching, the limbs thick and robust, and the whole external appearance more nearly resembling that of an ox than of an antelope. The ground colour of the back and sides is a light fallow-brown, with a narrow white ribbon along the spine, and eight or ten similar bands descending from the back and passing obliquely down the sides and hips; the belly and under parts are pale silvery brown. On the neck and withers is a thin spare mane of a brown colour, and the chin, throat, and breast are furnished with similar long hairs, forming a species of beard. The cheeks are marked with two or three round white spots, and a narrow grey line passes from the anterior angle of the eye down towards the muzzle. The tail is moderately long, and equally covered with short hair.

This magnificent animal inhabits the woody parts of Caffraria, principally along the banks of rivers, to which it readily takes when pursued, and swims well. It lives in small families of four or five individuals, is never found on the open plains, much less on the mountains, as M. Desmarest erroneously supposes, and feeds on the shoots and leaves of young trees. Though a heavy animal, and by no means rapid in the course, it leaps with surprising agility, and has been known to clear a door of ten feet high at a single bound. The males are not deficient in courage, but defend themselves resolutely when driven to bay; when taken young, however, they are readily domesticated, and show no inclination to regain their original freedom. The females produce one young at a time.

19. The **Boshbok** (*A. sylvatica*, Sparrman) is a much smaller animal than the koodoo, measuring about four feet from the nose to the root of the tail, and being two feet six inches high at the shoulder. The horns are nearly a foot in length, thick at the base and gradually attenuated, but ending in rather blunt points; they are twisted on their own axis, but do not form the wide-spreading spiral curves so remarkable in those of the koodoo: from the base, however, two sharp, prominent wreaths, one on the outer and the other on the inner surface, wind spirally round them for the first two-thirds of their length, and are gradually obliterated towards the points, which are smooth and polished. The ears are large and rounded at the tops, the limbs robust but clean and well-formed, and the tail of moderate length and similar to that of the common fallow-deer. The male and female are of different colours; the ground colour of the former is a dark sepia brown above, and white beneath, the head and cheeks being light and sandy-red, and the extremities fulvous; that of the latter reddish-fawn above and white beneath. Two pure white bands cross the throat, one at the junction of the head and neck, and the other at the union of the neck with the chest; the lips and chin are also white; round white spots mark the cheeks, and sometimes the nose in front of the eyes, and similar spots are dispersed irregularly over the hips and thighs, to the amount of a dozen or more on each side, sometimes even forming interrupted lines. The hair is of moderate length, but it is smooth and lies close to the body; the backs of the ears are covered with short brown hair; the tail is black above and white underneath, and the pastern joints are marked behind with two oblong spots of the same colour. In very old males the legs become almost uniformly grey, and at all ages there is a white line running down their inner surface even to the very hoof. All these marks are equally found in the females, but not being so prominently contrasted, on account of the lighter ground colour of this sex, they are not so conspicuous as in the males. There is frequently also a narrow white list along the back, but this is not a constant character in either sex, and is, for the most part, wanting in the females. The young males are of the same colour as the adults, but rather lighter, and the white spots on the hips and thighs more faintly marked.

The boshbok, or bush-goat, as its colonial name implies, resides in the woods, which it never quits but during the bright moonlight nights, or early in the morning, when it comes out to graze on the border of the forest, or to make incursions into the neighbouring gardens and corn-fields. Its voice resembles the barking of a dog, and its deceitful tone sometimes leads the benighted traveller into the most remote and lonely depths of the forest in the vain search after some human habitation, which he is all the time leaving behind him. It is a slow runner, and easily caught when surprised in an open situation, but it keeps close to the woods, through which it penetrates with great ease, running with the horns couched backwards along the sides of the neck, to prevent them from impeding its course by striking against the branches, and having the neck and throat frequently denuded by rubbing against the underwood, as it forces its passage through the thick covers. The species is monogamous, the male and female being always found either alone, or accompanied by one or two kids, but never by adult individuals. It is common enough in Caffraria, and in such parts of the Cape Colony as have sufficient forest to afford it a secure asylum; its flesh makes good venison, that of the breast being particularly esteemed.

20. The **Guib** (*A. scripta*, Pallas) has the same general characters as the boshbok, and the horns of the male are likewise similar, but it is smaller, lighter, and more delicately formed, and is said to live in society upon the plains, a circumstance which, if it can be relied on, forms a remarkable exception to the habits of the other species of antelopes included in the present group. It measures four feet and a-half from the muzzle to the root of the tail; its height at the shoulder is two feet six inches, and at the croup two feet eight; the horns are eight inches long, the ears five, and the tail six. The horns are straight, a little compressed and twisted spirally upon their axis with two wreaths passing

round them strongly marked at bottom, but obliterated within an inch or two of the points. The general colour is a reddish fawn marked with white lines and spots. The head is unmixed fawn-colour with a dark mark on the forehead and face, white spots in front and beneath each eye, and another on the cheek, at some distance beneath the opening of the ear; the sides of the upper lip and the whole space under the chin are likewise white. The neck is unmixed fawn, deep above and lighter beneath, with a white mark on the breast: the body likewise is deep fawn-colour, with a dorsal line of white and black hair intermixed, and rather longer than those on the rest of the body. From this dorsal line originate eight or ten narrow transverse ribbons of pure white, which pass obliquely down over the ribs and hips, and are crossed on the sides and flanks by one or sometimes two longitudinal bands of the same colour, running from the shoulder to the hips on each side, in a direction parallel to the dorsal line. All these markings are constant in the species and equally common to both sexes; they are at regular distances from one another, and, as Buffon has observed, present the appearance of a set of small harness. A few small, round, white spots are frequently also scattered over the hips and thighs, as in the boshbok, and the interior of the fore-arms, thighs and legs, are likewise of this colour, but the breast, belly, and under parts of the body in general are uniform fulvous brown.

The guib inhabits the west coast of Africa, from Sierra Leone to the banks of the Senegal, from the latter of which localities it was first brought to Europe by the celebrated Adanson. It is said to associate with its own species and to form extensive herds, which reside equally in the forests and on the open plains, particularly in the vicinity of Podor and Goree, where these animals are very numerous. Guib is their name in the Jalloff language. The colours are sometimes subject to a slight variation as far as regards the number of longitudinal and transverse bands on the sides. Colonel Smith has considered this difference specific, and has bestowed the name of *A. phalerata* upon the variety with a single longitudinal line on the flanks, retaining the original name of *A. scripta* for the variety which is marked with two of these lines. This distinction, to say the least of it, is extremely doubtful, and the difference upon which it is founded is in all probability merely accidental.

IX. The ninth group of antelopes includes a number of species characterised by their distinct naked muzzles, horns in the male sex only, distinguished by a single curvature towards the point, more or less strongly marked according to the species, by their large inguinal pores, by the presence of four teats in the females, and by the absence of lachrymal sinuses and knee-brushes. This family is, like the last, exclusively African, the species residing in pairs or small families of five or six individuals in the hilly districts of the south and west coasts of the Continent, generally about the sources of mountain-streams, and among the sedges and reeds on the banks of dried-up river-courses. The qualities of their fur sufficiently indicate these upland and mountainous habitats. The hair is of a woolly texture, fine, close and warm, and in the young animals beautifully frizzled and parted into separate locks. Their legs are robust and powerful, and, though not deficient in point of beauty, they want the light form and graceful action which characterise the generality of the antelope genus.

21. The **Koba**, (*A. koba*,) called *Grande Vache brune*, or large brown cow, by the French of Senegal, is in size equal to the European stag, being upwards of five feet in length, from the extremity of the muzzle to the root of the tail. The head, measured from between the ears, is fifteen inches long, and the ears themselves nine inches. The horns are twenty inches long, annulated throughout the first three quarters of their length, compressed on the sides, and in full grown animals having a tendency to assume a lyrated form with the point rather blunt and directed forwards. The horns of this animal were originally brought from Senegal by Adanson, and described and figured by Buffon and Daubenton in the twelfth volume of the *Histoire Naturelle;* from that period till very recently nothing further was known of the species, but within the last eighteen months two living specimens, a male and female, have been brought to England, and are now exhibited, the latter at the gardens of the Zoological Society in the Regent's Park, and the former at the Surrey Zoological Gardens. The hair, without being exactly coarse, is long and rough upon every part of the body, standing out from the hide in different directions, and forming round the neck a kind of rough bristly mane; the ears are long, pointed, and habitually directed forwards, and the tail, broad, and uniformly covered with hair, reaches to the hough, and is without a terminal tuft. The general colour of the body is a dark vinous red on the upper parts and silvery grey beneath, the former being tinged with dark brown along the spine and on the croup, from an intermixture of black hairs. The face and legs are also dark brown, almost approaching to black, the lips, chin, and under side of the tail white, and a longitudinal stripe of the same colour passes over the eyes in the form of eyebrows, and descends for some inches along each side of the face. The feet are marked with faint grey rings immediately above the hoofs, and the ears are internally striated with three longitudinal white lines.

[The Koba, *A. koba*.]

The attitude of the koba when at rest very much resembles that of the nyl-ghau, the feet being gathered close under the body, and the tail pressed in between the hind-legs. In a state of nature its habits are altogether unknown; in confinement it is gentle and timid.

22. The **Kob**, (*A. kob*, Erxleben,) called *Petite Vache brune*, or little brown cow, by the French settlers on the western coast of Africa, is described as being about the size of the fallow-deer, and similar in colour to the koba, but the animal is only known by the skull and horns brought by Adanson from Senegal. These are pretty large, black, with a single concave curvature directed forwards, approaching one another at the points, and marked on the first two-thirds of their length with seven or eight prominent rings. The head is long and narrow, and without pits for the lachrymal sinus, showing therefore that this organ does not exist; its entire length is nine inches; the length of the horns is thirteen inches on the curves, and their circumference at the base five inches and a half: their distance from one another is eight lines only at the base, five inches in the middle, and two inches and a half at the points.

23. The **Reitbok**, (*A. eleotragus*, Schreber,) or reedbuck, so called from its habit of frequenting the reedy banks and beds of dry water-courses, is four feet and a half in length, and two feet nine or ten inches high at the shoulder. The head is ten inches long from the muzzle to the base of the horns, the horns ten inches and a half in a straight line, and thirteen inches along the curves, and the tail eleven inches. The horns are round, annulated at the base, with prominent sharp rings and beautifully striated between, smooth and sharp at the points, and curved forwards with a bold and regular sweep, so as to form almost the segment of a circle. The ears are long and pointed, filled internally with a profusion of whitish hair, and beneath them, on each side of the head, there is a remarkable bald spot of an oval form and shining black colour, which is very characteristic of the species, and readily distinguishes it from all the other antelopes with which it is likely to be confounded. The hair over every part of the neck and body is long and rough, of a uniform dull ashy grey colour, sometimes tinged with red, on the upper parts, and silvery grey on the throat, breast, belly, and interior of the fore-arms and thighs. The

tail is long and remarkably bushy, being covered with a profusion of long woolly hair, for the most part of a white or grey colour, with a narrow brown line running down the middle of the upper side. The females are in all respects similar to the males, excepting that they are without horns, and of rather smaller stature.

[The Reitbok, *A. eleotragus.*]

The reitbok is not found in the immediate vicinity of the Cape, but farther in the interior of the country it is by no means uncommon, living in pairs or small families, and, as already observed, frequenting the reeds and rushy banks of mountain-streams which flow only during the winter season, and are dried up by the summer heats. Sometimes also it is found in woods along the banks of rivers, but always in the neighbourhood of water, and a variety, if not a distinct species, is even said to inhabit the plains. This is of a very deep reddish fawn-colour, and has been described by Afzelius and Hamilton Smith as a distinct species under the denomination of *A. fulvo-rufula*. Excepting in the redder shade of its colour, however, and the name of *Roode Rheebok*, or red roebuck, by which it is said to be distinguished among the Dutch colonists at the Cape, it does not appear to differ materially from the common variety, and the slight shades of variation which it does present, are most probably the effects of its difference of habitat and other accidental circumstances. The same may be said of the *A. Isabellina*, or cream-coloured antelope of these authors, which does not appear to present any characters sufficiently marked or peculiar to be considered as indicative of a specific distinction.

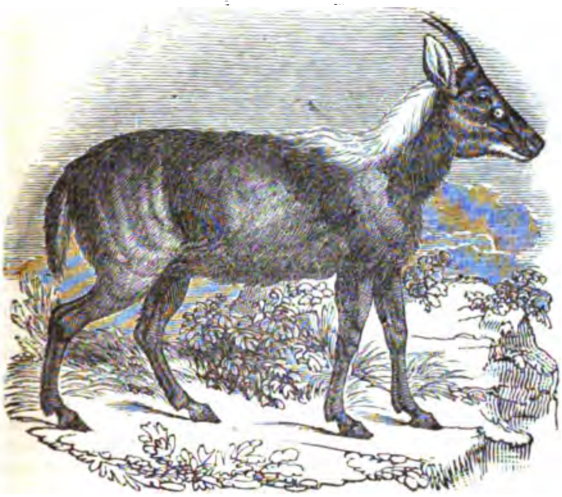
24. The **Nagor**, (*A. redunca*, Pallas,) known only from the description of Adanson and the figure of Buffon, is a species so nearly resembling the reitbok that some naturalists have not hesitated to unite them. It is four feet long from the muzzle to the origin of the tail, two feet four inches high at the shoulder, and two feet six at the croup; the head is nine inches long, the horns five inches and a half, and the ears five inches. The horns have one or two annuli at the base, but are smooth and shining throughout the remainder of their length; they are erect, parallel, and almost straight till within a short distance of the points, where they curve forwards, but not so boldly as in the last species, and this character appears to constitute their chief difference, though it is obvious, from the description, that Mr. Adanson's specimen was a young individual. The colour was uniform fawn or pale red, without any white about the breast or belly, and the hair was long, rough, and undulating, and did not lie smooth or close to the body, characters which all tend to approximate the animal to the reitbok, and more particularly to the variety which is said to inhabit the plains. It is found in the neighbourhood of Goree on the west coast of Africa.

25. The **Rheebok** (*A. capreolus*, Lichtenstein) is nearly five feet in length, and two feet and a half high at the shoulder; the head is six inches long from the muzzle to the root of the horns, the ears and tail, without the hair, about the same length, and the horns of the old male from nine to twelve inches. The head is long, and tapers gradually to the muzzle, which is small, round, and of a black colour; the horns are perfectly smooth and without any appearance of wrinkles or annuli for the two-thirds of their length next the points, but exhibit a few obscure wrinkles at the base; they are remarkably slender, long, straight, parallel, and so sharp at the points, that the Hottentots and Bushmen use them in place of needles and bodkins; the ears also are long, very broad at the base, and attenuated towards the points; the tail long and bushy. The hair, or rather fur, is of a woolly quality, and of a uniform ash colour on the neck, shoulders, sides, croup, and thighs, and white or light grey on the breast, belly, and inner face of the arms and thighs. In young individuals it is beautifully frizzled or curled into distinct locks, and its colour is much clearer than in the adults, which have it straight, loose, and often tinged with a sandy-brown hue on the upper parts of the body. The hair of the legs in the young animal is likewise long and curly like that of a young lamb, but in aged specimens the legs are covered with short close hair of the common quality, and frequently with more or less of a dark brown colour. The hair of the head, face, and cheeks, is always short, crisp, and close; it is brown on the nose, light fawn on the forehead and cheeks, and white about the margins of the lips and underneath the chin; the tail is slaty grey above, and white below, and at the tip; and there is a conspicuous black spot at the angle of the mouth on each side. The hairs individually are obscurely annulated with alternate rings of a grey and light rufous-brown colour, the latter becoming more conspicuous as the animal advances in age, and communicating to the general colour of the fur the light rufous shade already mentioned.

The rheebok is of a lighter and more graceful form than the generality of the other antelopes included in the present section. The body is long and small, the neck particularly so, and the legs slender and well-proportioned. Its pace, consequently, is proportionally swift; it runs with great velocity, keeping close to the ground and moving by long strides, and with a motion so rapid and uniform, that it seems to glide rather than run. The rheeboks live in small families of five or six individuals, consisting of an adult male and three or four females with their young; the males are pugnacious, and compel the young of their own sex to separate themselves from the family as soon as they become adult. Their general residence is on the sides of moderate hills, among stunted trees and underwood, or in the rocky glens and mountain passes, in the vicinity of the little pools of water which remain after the winter torrents have ceased to flow. Wherever such situations are found, the rheebok is not an uncommon animal in South Africa; its flesh is dry and insipid, and esteemed less than that of any other of the numerous Cape antelopes. The female produces but one at a birth, which grows rapidly, and, if caught at an early period, is readily domesticated.

26. *A. landiana*, Desmarest, appears, from the description of this author, to be a species very nearly allied to the rheebok, but differing in the quality and colour of the hair, and in the white marks above the eyebrows. The horns of the male are slender, straight, parallel, very sharp-pointed, and rather shorter than the head; the body is rather large, the legs robust, the ears of moderate size and rounded at the points, the tail twice the length of the ears, covered with hair of the same length throughout, and not descending lower than the hough, the hair of the body long, harsh, and not frizzled. The back, flanks, and sides are uniform clear greyish brown, as are likewise the croup, hips, and thighs, the legs becoming gradually darker brown towards the pasterns. The belly, breast, interior of the fore-arms, and thighs, under surface of the tail, throat, chin, lips, and a line over the eyebrows, are white, the colours of the sides and belly being separated on the flanks by an oblique longitudinal line. This animal is said to have the habits as well as the external form of the rheebok, living in small families in the mountainous districts about the Cape of Good Hope, and never by any chance descending into the plains.

X. The tenth group of the genus *antilope* exhibits a character which readily distinguishes it from all those which have preceded, in the possession of maxillary sinuses, or lengthened glands on the cheeks, which distil a dark oily substance, and are sometimes found alone, and at other times accompanied by the presence of lachrymal sinuses. The horns, as we have hitherto found, are confined to the male sex; they are round, short, slightly annulated or striated at the base, and have a slight curvature backwards or forwards; the head is terminated by a distinct naked muzzle; one species only possesses knee-brushes, and the females have two teats and large inguinal pores. These animals inhabit the moist tropical forests of Africa, and the great islands of the Indian Archipelago, and live in pairs among the underwood.



[The Cambing Outang, *A. Sumatrensis.*]

27. The Cambing Outang, (*A. Sumatrensis*, Desmarest,) first noticed by Mr. Marsden in his *History of Sumatra*, is about four feet and a half in length, and two feet three inches high at the shoulder. The horns are six inches long, very thick at the base and much attenuated, slightly and uniformly curved backwards. The muzzle is distinct and well formed, the lachrymal sinuses open by a small circular aperture, and between them and the muzzle, on each side, is a long linear space, nearly two inches in length by a quarter of an inch broad, naked, and covered with a soft black integument, which represents the maxillary gland, and secretes a particular humour. The ears and tail are of moderate length, the hoofs very large, the limbs short and stout, and the whole form of the animal robust and powerful. The body is thickly covered with a coat of long hair, of a dark brown colour, almost black, excepting along the nape of the neck, on the shoulders, and inside the ears, where it is white, and under the lower jaw, which is of a deep straw-colour. The white hairs of the neck and shoulders are much longer than on other parts of the body, and form a kind of flowing mane; the hair on the head and limbs, on the contrary, is much shorter than elsewhere, the knees are without brushes, and the tail, which is rather shorter than the ears, is covered throughout its whole extent with hair of moderate and equal length, and of the same dark-brown colour as that on the body.

The cambing outang, or wild goat, so called by the Malays, inhabits the hilly forests of Sumatra, and is described by Mr. Marsden as being of a wild character, extremely active and sure-footed, and with much of the habits and character of the common goat and ibex, of which it has the roving fearless eye, and bold undaunted bearing.

28. The Four-tufted Antelope (*A. quadriscopa*, Hamilton Smith) is known only from Colonel Smith's description and figure of a male specimen formerly exhibited at Exeter Change. The individual, from which Colonel Smith's description was taken, was brought from Senegal.

29. The Bush Antelope, (*A. silvicultrix*, Afzelius,) called bush-goat by the English residents at Sierra Leone, is about five feet in length from the muzzle to the root of the tail, three feet high at the shoulder, and three feet two inches at the croup; the head, measured from the muzzle to the base of the horns, is upwards of ten inches long, the horns and ears each four inches, and the tail with the hair half a foot. The circumference of the horns at the base is three inches, and their distance at the points five inches; they grow entirely in the direction of the forehead, are pointed, black, shining, nearly straight, with a slight inclination backwards, and diverging gradually towards the points. For about half an inch from the base they are finely marked with a number of small transverse striæ, then covered for about an inch with little depressions and inequalities, and smooth from thence to the points. The ears are situated rather close to the horns; they are about the same length as these organs, broad, open, rounded at the top, and nearly naked; the eye-lids are bordered with thick black lashes, the tail is bushy and pendent, the buttocks nearly naked, the limbs short and slender, the knees unprovided with brushes, and the female furnished with two teats. The hair is, in general, remarkably short, sleek, and shining, of a deep brown colour, rather paler on the neck and flanks, mixed with grey on the thighs, almost yellow on the throat, dun on the cheeks and sides of the jaws, clear brown on the face, nose, and backs of the ears, and chestnut brown on the legs and feet. A tuft of long hair surrounds the base of the horns, and along the middle of the back is a longitudinal line of silvery grey which expands upon the croup, and is provided with hair considerably longer than that on the rest of the body. The tail is black, covered with moderately long hair, and without a terminal tuft.

The proportions of this species are heavy and ungainly, and bear a considerable resemblance to those of the hog-deer of India. The legs are short and slender, and appear disproportioned to the size of the body, which is large and heavy; the head, too, is thick and clumsy, though much attenuated towards the muzzle, the neck short and thick, the croup depressed, and the back very much arched. This species inhabits the west coast of Africa, about Sierra Leone, and the sources of the Pongas and Quia Rivers. It frequents the thickets and underwood of the upland plains and moderate mountain declivities, keeping close to the cover during the day-time, and quitting it only at early dawn for the purpose of feeding in the neighbouring meadows. It is at this time that it is pursued by the hunters, who station themselves on the margin of the woods, and shoot it as it comes out to graze. It is a slow, heavy runner, as might be anticipated from the size and corpulent make of its body, and the shortness of its legs; but it affords excellent venison, and is much sought after on that account. It has long maxillary glands, but no appearance of lachrymal sinuses.

30. The Duikerbok (*A. mergens*, Blainville) is of a more active make, and has more graceful proportions than the species last described. In other respects, however, its characters are precisely the same, it has a long maxillary gland on each side of the face, running nearly parallel to the plane of the head, no appearance of lachrymal sinuses, nor brushes on the knees, and the females are provided with two teats. The horns are upright, straight, black, smooth, and very sharp at the points, annulated at the base with a few small rings, and compressed slightly on the sides so as to form a sharp edge in front; but this is not always apparent in old specimens, being perhaps rubbed off or obliterated by friction against the branches and underwood among which the animal resides. They are between four and five inches long, nearly parallel, and point almost imperceptibly forwards. The ears are four inches and a half long, narrow, pointed, and upright; and on the crown of the head, immediately between the roots of the horns and ears, is a remarkable tuft of long black hair, growing from a small centre, and falling round in every direction like the radii of a circle. This is more particularly conspicuous in the females, from the absence of horns in that sex; but besides this black tuft, the whole forehead is covered in both sexes with long hair of a deep red colour, directed upwards, and in the males partly concealing the base of the horns. The body is about four feet in length, and two feet high at the shoulder. It is covered uniformly with rather long but smooth hair of a light brown colour, with a very faint shade of yellow above, and ashy greyish brown beneath. The face and nose, from the eyes to the muzzle, are dark brown; and the legs, over the whole canons before, and half way up behind, are shining black, equally conspicuous at all ages and in both sexes. The tail is six inches long, rather flat, and covered with moderately long black hair, but not tufted.

The duikerbok, or diving-goat, so called by the Dutch of South Africa from its habit of plunging under the bushes in its passage through the woods, instead of leaping over them like the generality of other antelopes, is a common animal in Caffraria and in all parts of the Cape colony which abound in forest and underwood, from the cover of which it seldom ventures, unless occasionally at night to steal into a neighbouring garden. It is found alone or in pairs, makes its way readily among the thickets and low bushes, and when pursued will from time to time stand up on its hind legs to look round it, then dive under the branches to reappear again at some distance, and thus alternately continuing its flight and standing up at intervals to watch the motions of its pursuers. The peculiar nature of the humour secreted by the maxillary glands of this animal has given origin to a common saying among the Dutch colonists, that it carries the gall-bladder under the eyes. This species is most probably the animal of which the female was long since imperfectly described by Grimm, and which has been admitted into systematic catalogues under the name of *A. Grimmia*. The *A. ptox* of Colonel Smith likewise appears to be identical with, or at most a casual variety of the duikerbok, the characters upon which the separation is made being by no means constant, and some of them even of doubtful authenticity.

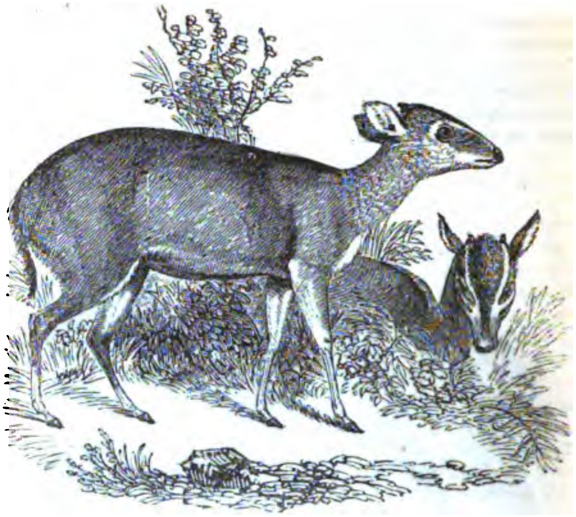
31. **Burchell's Antelope** (*A. Burchellii*, Smith) is a species which, from the description of Colonel Smith, though closely resembling the Duikerbok, yet seems to be really different, and to possess appropriate characters which readily distinguish it. The specimen procured by Mr. Burchell during his travels in South Africa was afterwards deposited in the British Museum.

32. The **Broad-eared Antelope** (*A. platous*, H. Smith) is another species of rather doubtful authenticity, described by Colonel Smith from a specimen in the Museum of the Missionary Society, said to have been brought from South Africa.

XI. The eleventh section or group into which we divide this genus begins to exhibit a new character, which we have not found in any of the former divisions, but which is common to all the remaining species of antelopes. It is the presence of horns in the female sex—a character which has a decided influence upon the habits and economy of these animals, not only as it affects the relation which subsists between the sexes by rendering them in a great measure independent of one another, but likewise in modifying the general manners of the species. Those of the present group are further distinguished by having complete naked muzzles, maxillary glands without lachrymal sinuses, inguinal pores, no knee-brushes, and four teats in the females. From the group last described they differ principally by the females being provided with horns, and having four instead of two teats, and by their small size; the present section being composed of the smallest of all horned quadrupeds, except, perhaps, the madoqua, already described. Like the species of the last group, they live singly or in pairs among the bushes or underwood, and rarely venture willingly to quit the thick cover of the woods and forests. As far as is at present known, their habitat is exclusively confined to Africa. There is no group of antelopes in which so much confusion reigns throughout the specific descriptions of naturalists as the present. At least two or three distinct species are known to inhabit the Cape of Good Hope and the west coast of Africa, but their names have been so confused, and their distinctive characters consequently so confounded, that it is now almost a hopeless task to attempt to separate them again, or to attribute to each what properly belongs to it.

33. The **Grimm**, (*A. Grimmia*, Desmarest,) the Grimme of MM. F. Cuvier and Desmarest, is certainly a different species from that of Pallas, which is the Kleenebok of the Cape, and likewise from the animal originally described by Dr. Grimm, and which, as we have already observed, appears to be the duikerbok. The original grimm was brought from the Cape of Good Hope, and was described from a female specimen without horns; the animal at present under consideration, and which has rather arbitrarily assumed its name, is an inhabitant of Sierra Leone and the coast of Guinea, and is probably the real Guevi of Adanson's *Travels in Senegal*. A male of this species formerly lived in the menagerie at the Jardin des Plantes at Paris, and was the subject of the foregoing description: it was brought from the coast of Guinea, and showed an extreme timidity in confinement; its habits in a state of nature are unknown.

34. The **Kleenebok**, (*A. perpusilla*, H. Smith,) very improperly called *guevi* by M. Desmarest, is about a foot high at the shoulder; the horns an inch and a half long in the male, three-quarters of an inch in the female, and the tail about two inches and a half. The horns are small, erect, black, slightly inclined backwards and towards one another at the points, and very sharp, with seven or eight minute annuli at the base; the ears about the same length as the horns, perfectly round at the tips, and nearly naked within; the head is long and pointed; the maxillary glands not parallel to the plane of the face, but nearly in the same line with the greater axis of the orbits, or rather in lines parallel to them; the forehead and nose are brown, bordered on each side by a narrow line of a sandy-red colour passing from the root of the horns down to the muzzle; the upper parts of the body are of a uniform dark slaty-brown colour; all the inferior parts, including the region under the chin, the breast, belly, interior of the fore-arms and thighs, and under-surface of the tail, ashy-grey, inclining to white in some specimens, particularly in young individuals; the legs are reddish-brown, and the hoofs small, narrow, and pointed.



[The Kleenebok, *A. perpusilla*.]

This species, called by the Dutch colonists of the Cape *Kleenebok*, *Kleene blauw-bok*, *Blauwbokje*, all signifying little goat or little blue goat, inhabits South Africa, and lives singly or in pairs among the bushes. It is extremely active, and of a mild and timid disposition, but from the nature of the thick bushes in which it resides is not often seen even in those districts where it abounds most plentifully. It is said to exhibit considerable sagacity in eluding pursuit, and when domesticated soon becomes familiar and learns to distinguish those about it and to answer to its name. This species is also the *A. cærulea* of Colonel Smith and the *A. pygmæa* of M. Desmarest, who confounds it with the *guevi* of Senegal.

35. **Maxwell's Antelope** (*A. Maxwellii*, H. Smith) is a species described only by Colonel Smith. The female specimen, from which Colonel Smith's description was taken, lived two years in England, and produced a kid in confinement.

36. The **Guevi**, (*A. pygmæa*, H. Smith,) said to be the smallest, and certainly the least known, of the whole antelope genus, was first mentioned by Adanson, as an inhabitant of Senegal, and the name has since been arbitrarily applied by different zoologists to two or three distinct, though ill-determined species. It is the royal antelope of Pennant; and though the female is described, on the authority of Bosman, as being destitute of horns, it is probable, from the other characters attributed to the species, that this fact is not correct, but arises from want of careful examination, and that the animal really belongs to the present section. The horns of the male are described as short, straight, black, polished, and not quite two inches long; the ears broad and round; the legs not thicker than a goose-quill; the height scarcely nine inches, and the colour a uniform reddish-brown. Notwithstanding its very diminutive size, it is said that the guevi will bound with ease over a wall twelve feet high. It is readily domesticated, but too tender to endure the cold of Europe. Adanson mentions a still smaller species or variety of guevi, which is said to inhabit the province of Kaior, on the northern banks of the Gambia, and to be not much larger than a good Norway rat. It is upon this animal that Buffon appears to have founded his *Chevrotaine de Guinée*, and Linnæus his *Moschus pygmæus*.

XII. We have now arrived at a group of antelopes which have been celebrated, from the most remote antiquity, for the beauty of their external forms, the grace and elegance of their movements, and the mildness and gentleness of their manners. Of this group, the common gazelle or Barbary antelope may be considered as the typical representative; but this animal is itself so closely related to two or three neighbouring species, that it has been found very difficult to distinguish them by characters at once sufficiently marked and constant. The group, however, is collectively characterised by prominent and peculiar traits which are in a great measure appropriate, and which definitely separate it from all other sections of the antelope genus. The principal of these consist in having the horns common to both sexes, more or less compressed on the sides, annulated nearly to the points, and lyrated, or with a double curvature, first backwards at the base, and afterwards pointing gently and moderately forwards, in the males; short, round, smooth, straight, and upright till within an inch of the points, which turn abruptly inwards towards one another, in the females; in the form of the upper lip, which is hairy and attenuated like that of the goat; in the possession of distinct suborbital sinuses without any appearance of the maxillary glands which characterise the last two groups; in the presence of very large inguinal pores, and, in most species, brushes on the knees; and in the females being provided with four mammæ or teats. The species belonging to this division are, for the most part, gregarious, living in large flocks on the open plains, karroos, and steppes of Africa and Asia, feeding upon the aromatic herbs and saline plants of the desert, and uniting for mutual defence against the attacks of wild beasts.

[The Gazelle, *A. dorcas*, Pallas.]

37. The Gazelle (*A. dorcas*, Pallas) is three feet six inches in length, one foot nine inches and a half high at the shoulder, and one foot ten and a half at the croup; the head is six inches long, the horns nine and a half, the ears four and three-quarters, and the tail, with its terminating tuft, eight inches. The horns of the old male are surrounded by thirteen or fourteen prominent rings, complete and close together at the base, more distant, oblique and interrupted behind towards the points, the last inch or inch and a half alone being smooth and free from annuli; they rise almost immediately above the orbits, are black, almost cylindrical, at first bent gently backwards, and finally forwards; in the females they are much smaller, seldom exceeding the ears in length, surrounded at the base with a few obscure wrinkles, smooth and polished throughout the rest of their extent, straight to near the tips, and pointing inwards. This is the character of the *corinne* of Buffon, which is now considered by the best zoologists to be nothing more than the female either of this or the following species, and not itself a distinct species, as was formerly supposed. The ears of the gazelle are long, narrow, and pointed, the eyes large, mild, and black, and the tail round, furnished on its upper surface only with an upright ridge of stiff black hair, and terminated by a little tuft of the same colour; the size of the body is about equal to that of the roebuck, but the legs are considerably longer, and the whole form lighter and more elegant; the face and cheeks are reddish fawn-colour, and the nose has a broad mark of a dark brown colour, approaching to black, on each side of the face, passing over the eyes from the horns down to the nose, there is a broad white stripe, and beneath this, from the anterior canthus of the eye, a narrower dark stripe, parallel to it and separating it from the fawn-colour of the cheeks; the hind part of the head, the back of the ears, neck, shoulders, back, sides, and croup, are fulvous, of different shades according to the age of the individual; all the under parts are white, and this colour is separated from the fulvous of the sides by a broad dark-brown longitudinal band on the flanks; the knees are furnished with brushes of dark hair, and the ears are filled internally with long white hair arranged in three longitudinal striæ.

The gazelle is found in Egypt, Barbary, and some say also in Asia Minor; but it is very questionable whether the animal of the Levant does not really belong to a different species, to the *Antilope Arabica*, or perhaps to the *Antilope subgutturosa*. It lives in large troops upon the borders of the Tell, or cultivated country, and the Sahara, or desert; when pursued, flies to some distance, then stops to gaze a moment at the hunters, and again renews its flight. The flock, when attacked collectively, disperse in all directions, but soon reunite, and, when brought to bay, defend themselves with courage and obstinacy, uniting in a close circle, with the females and fawns in the centre, and presenting their horns at all points to their enemies; yet, notwithstanding their courage, they are the common prey of the lion and panther, and are hunted with great perseverance by the Arabs and Bedoweens of the desert. When taken young, they are easily domesticated, and soon become familiar. This animal is frequently cut upon the monuments of Egypt and Nubia.

38. The Kevel (*A. kevella*, Pallas) is still very imperfectly distinguished from the gazelle, but appears to be in reality a different species, characterised principally by the compression of its horns, their being provided in the adult male with a greater number of annuli, and bending forwards with a more bold and sudden curvature at the points. The habitat also of these two animals is different, the kevel being found only on the opposite side of the great African desert to that inhabited by the dorcas; and this is itself a strong argument in favour of those who maintain their specific difference, though it must be admitted that they require a careful examination and comparison. This species is found in Senegal, where, according to the report of Adanson, kevel is its name among the natives. It resides in extensive flocks on the open stony plains, and is said to be in all respects similar to the gazelle in its manners and habits.

39. The Ahu (*A. subgutturosa*, Guldenstædt) is likewise a species which requires to be re-examined, and carefully compared with the gazelle and kevel, not that there is any reasonable doubt as to its actual existence, but because its characters have not been sufficiently distinguished from those of the conterminous species, which has given rise to no small confusion and fluctuation of opinion upon this part of our subject. The ahu inhabits all the central parts of Asia, Persia, Dauria, the country around lake Baikal, and from the eastern limits of Great Bucharia to the shores of the Hellespont. It associates with its own species in extensive flocks, frequents the open uncovered plains and naked hills of moderate elevation, and feeds principally upon the *absinthium Ponticum*. The flesh is much esteemed, and of an agreeable taste.

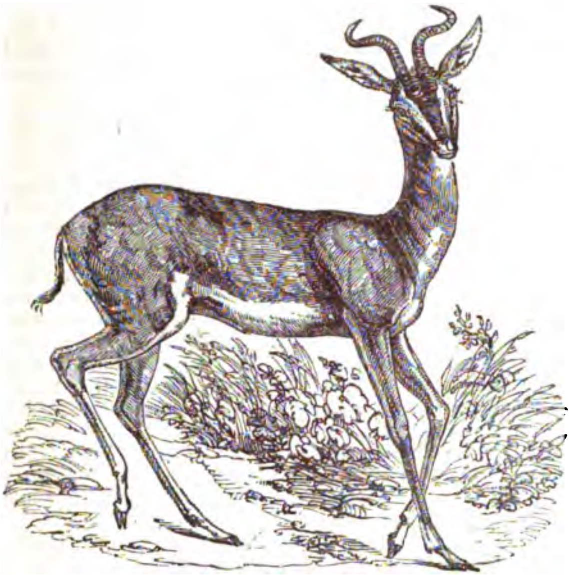
40. The Kalseepee, (*A. Bennettii*, Sykes,) described by Colonel Sykes in the first part of the *Proceedings of the Zoological Society*, is an elegant species closely allied to the dorcas in all its most prominent characters, but higher on the limbs, and considerably different in its habits. This species seems to be the *antilope cora* of Colonel Smith.

The kalseepee, or black-tail, so called by the Mahrattas, on account of the deep black colour of that organ, and distinguished by the name of the goat antelope by the Europeans, is found on the rocky hills of the Deccan, and, according to the report of Colonel Sykes, differs from most other antelopes of the present section in not being gregarious, there being rarely more than three or four found together in the same company, and not unfrequently a solitary individual.

41. The Ariel Antelope, (*A. Arabica*, Hemprich and Ehrenberg,) so called by the Arabs on account of its light, elegant, and graceful form. The size and proportions of this animal are similar to those of the gazelle and other

species already described in the present section; the colour, however, is considerably deeper and darker than that of the common dorcas.

This species inhabits Arabia, and was found on the stony hills along the eastern shore of the Red Sea, by the travellers Hemprich and Ehrenberg, whose recent journey in northern Africa and western Asia has been productive of such a vast collection of new and interesting zoological riches.



[A. Sœmmeringii.]

42. A. Sœmmeringii, (Cretzschmar,) one of the most beautiful antelopes of this section, was discovered by Rüppel, (during his journey through the northern provinces of Abyssinia,) and is described by Cretzschmar in the zoological part of that traveller's works. It is considerably larger than the species hitherto described in the present group. The horns are irregularly lyrated, bending boldly outwards towards the points, and then suddenly turning inwards towards one another, with a very sharp and well-defined curve; annulated with fifteen or sixteen prominent and complete rings which reach from the base to the inward curvature within about two inches and a quarter of the points. The colour of all the upper parts of the body, the neck, shoulders, back, croup, sides and outward faces of the fore-arms and thighs, is a beautiful clear isabel or yellowish dun, the hair being extremely short, and appearing almost as if it had been clipped or shorn. It does not lie close and smooth upon the hide, nor does it all follow the same direction, as in the generality of animals, but is disposed in innumerable small waves, pointing in different directions, as if it had been regularly shaded and parted on each side, and appearing glossy or glazed along their ridges with a shining dun shade, more or less intense according to the light in which it is observed. All the under parts of the body are of the most pure and brilliant white, and a large disk of the same colour surrounds the tail and passes over the rump and croup. The white of the belly also is separated from the yellowish dun of the sides, immediately, without being shaded off. The tail is small and slender, nearly naked at the root, and furnished at the extremity with a tuft of mixed brown and grey hairs. The outsides of the legs are very pale fawn-colour, the insides white, and the knee-brushes white and fawn mixed. The ears are pretty long and brown, with a narrow black border surrounding their outer edge. The face is dark brown in some specimens, and pure black in others, uniform towards the end of the nose, but curiously mixed with wavy red on the forehead: on each side of this a broad white band passes from the root of the horns over the eyes to the nose, and there is an indication of a small black one from the anterior angle of the eye to the corner of the mouth, separating this white band from the cheeks and sides of the lower jaw, which are uniform fawn-colour. The horns of the female have nearly the same curvature as those of the male, and are fully as long, but they are much more slender, and have not such prominent annuli. This is the only external difference observable between the sexes.

This antelope frequents hills of moderate ascent and elevation in the eastern provinces of Abyssinia, and is said to live in pairs, and not to unite into large flocks like the gazelle and kevel.

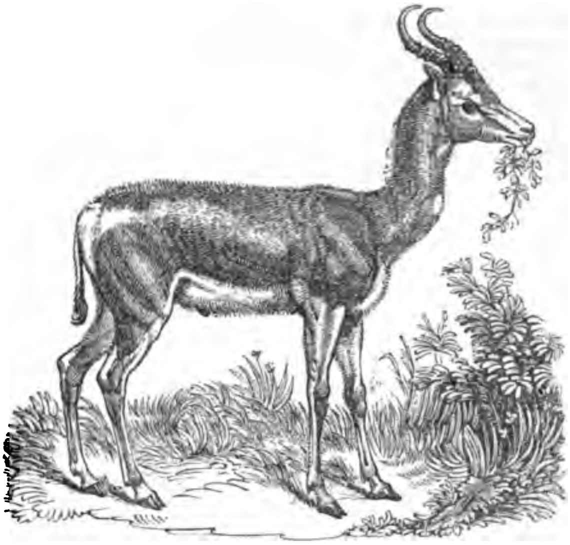
43. The **Springbok**, (*A. euchore*, Forster,) called likewise *Pronkbok*, or Showy goat, by the Dutch of South Africa, and *Tesbé* by the Hottentots, is perhaps the most graceful in its proportions, and beautifully varied in its colours, of all the antelope tribe. Imagination cannot conceive a quadruped more light and airy in form, more delicate in its proportions, or whose movements are executed with more natural ease and grace, than the springbok, or, as the English colonists now universally denominate it, springbuck. In point of size it is nearly a third larger than the dorcas. The horns of the springbuck are rather irregularly lyrated, like those of the species last described; they are round, black, annulated very regularly till within a short distance of the points, spreading first backwards and widely outwards, and finally turning inwards, and with an almost imperceptible twist on their own axis backwards. The hair is long on the upper parts of the body, particularly on the back and croup, but smooth, sleek, and shining: it is of a beautiful light cinnamon-colour on the shoulders, neck, back, sides, and thighs, and of a pure snowy white on the breast, belly, and inner face of the limbs, these two colours being separated on the flanks by a broad longitudinal band of a deep vinous red colour, larger and more distinct than in any other species of antelope. The whole head, face, cheeks, and chin are white, with a broad brown band on each side from the eyes to the corners of the mouth, and a mark of the same colour on the centre of the face, commencing in a narrow point on the muzzle, and enlarging as it proceeds upwards, till it joins the reddish fawn-colour of the body on the crown of the head. The eyes are large, lively, and of a brown colour; the ears long, small, and cylindrical at the root, then widening in the middle, and ending in an attenuated point. The neck is long, slender, and slightly compressed on the sides, the hoofs are small, black, and triangular, the legs remarkably long and slender, and the tail small, round, and naked, except a ridge of stiff black hair which fringes it along the upper surface, and forms a small tuft at the extremity. But the most remarkable and distinctive character of this species consists in two longitudinal foldings or duplications of the skin on the croup, which commence above the loins, or about the middle of the back, and run in a straight line from thence to the tail. The interior of these folds is lined with long hair of nine or ten inches in length, and of the most brilliant and snowy whiteness; they are likewise under the complete command of the animal's volition, and are opened and shut at pleasure. When closed, which they always are when the animal is at rest, their lips form a narrow line along the top of the loins and croup, which, being covered by the long cinnamon-red hair of the back and hips, is scarcely distinguishable, or only as a narrow white streak; but when the animal leaps or runs, these folds are expanded, and form a broad circular mark of the purest white, which extends over the whole croup and hips, and produces a most remarkable and pleasing effect.

The springbuck is so called from its remarkable habit of jumping almost perpendicularly upwards, apparently without any other motive than for its own amusement. It resides, in almost innumerable flocks, on the dry arid plains and karroos of the interior of South Africa, seldom approaching the inhabited districts of the colony, unless in seasons of peculiar drought, when the pools and pastures of the interior are dried and burnt up by the excessive heat, and these animals are compelled to migrate in search of a more abundant supply. On these occasions they are said to unite into flocks which often consist of from ten to fifty thousand individuals, spreading over the face of the whole country like a swarm of locusts, devouring every vegetable substance that they meet with, and scarcely deviating from their direct path to avoid the men and dogs which endeavour to turn them into another direction. So great are their numbers, that those which happen to get into the rear of the troop are lean and half starved before the migration is concluded, from the advanced ranks cropping the scanty pastures almost bare, and thus leaving them nearly destitute of food; but when the journey is concluded, and the troop begins to retrace its steps northwards, those which formed the van during the advance are necessarily in the rear returning, soon lose their plump condition, and are in their turn subjected to want and starvation. During these migrations they are closely followed by lions, panthers, hyænas, and wild dogs, which destroy great numbers of them. There is perhaps no object in nature finer than a flock of these beautiful antelopes enlivening the dreary brown karroos of South Africa with their graceful motions, now leaping perpendicularly upwards to the height of six or seven feet, displaying at the same time the snowy white marks on their croups, and anon flying over the desert with the speed of a whirlwind. It is only when disturbed, or otherwise excited, that they make those extraordinary springs from which they have derived their name; nor do they ever display the white mark on the rump except on these occasions. They are said to be particularly affected by the change of the weather, and are observed to leap more than usual before the setting in of the south wind, which, at the Cape of Good Hope, generally betokens stormy weather, and is always violent and tempestuous. When taken young, the springbuck is easily tamed, and soon displays all the petulance and familiarity of the common goat, butting at every stranger that approaches it, and warding off stones or other objects thrown at it with its horns.

44. The **Blessbok**, (*A. pygarga*, Pallas,) also a South African species, is considerably the largest animal belonging to the present group: it is, in point of size, superior to the stag of Europe, measuring, when full grown, five feet and a half in length, and rather better than three feet and a half in height at the shoulder. The horns are sixteen inches long, large, regularly lyrated, and of the same form in both sexes, those of the males being only thicker and heavier than those of the females. They are round, annulated with eleven or twelve prominent rings which reach to within a couple of inches of the points, rather close at the base, regularly but moderately divergent, and five inches separate at the tips. The ears are seven inches in length, erect, pointed, and cylindrical, reddish-fawn colour on the back and white within, with the usual longitudinal stria. The colours of the head and body are most singularly disposed; the whole animal appears as if it had been artificially painted with different shades laid on in separate masses. The head and neck are of a brilliant brownish-bay, so deep as to resemble the colour of arterial blood; this is particularly visible upon the cheeks and about the root of the horns, from the central point between which descends a narrow stripe of the purest white as far as the orbits, immediately above which it expands and covers the whole face and nose down to the muzzle, forming a broad mark, or, as it is called in horses, a blaze, and giving origin to the name of *blessbok* or *blazebuck*, by which this species is known among the Cape colonists. The back is of a brownish-bay, thickly overlaid, or, as it were, glazed or japanned with dull purplish-white, and there is a very broad purplish-brown band on the flanks passing from the fore-arm backwards, and extending obliquely over the outer face of the thighs. The breast, belly, and interior of the fore-arms and thighs are white, and this colour also shows itself on the posterior face of the hips and thighs, and passes in a small crescent over the rear of the croup, forming a white disk around the tail, and giving origin to the specific name of *pygarga*, which has been rather arbitrarily bestowed upon this animal, the real pygarga of the antients being certainly a different species, and an inhabitant of northern Africa. The tail is long and switched, nearly naked at the root, and terminated by a tuft of very long black hair; the trunk alone is seven inches in length, and the terminal tuft four inches more, making the tail altogether about a foot long. The knees are without brushes, but M. Desmarest, and indeed the generality of naturalists who have described it, are mistaken in supposing this species to be without lachrymal sinuses.

This splendid animal, which is likewise called *bontebok* or painted goat, by the Dutch, was formerly very common in the colony of the Cape, and is still found in the district of Zwellendam, east of Cape Town, but it has long ceased to abound in the enormous multitudes which old travellers mention to have spread over the plains like a troop of spring boks. The young are at first of a brownish-red colour on the body, partially glazed, as in the adults; but what is most remarkable of all is, that the face, instead of being white as in the grown animal, is of a very deep brownish-black colour, slightly mixed with scattered grey hairs. This singular mark of nonage, which could not have been well anticipated, has given rise to the very natural and pardonable error of Mr. Woods, who, in the 16th No. of the *Zoological Journal*, has described the young blessbok as a distinct species, under the name of *A. personata*. The mistake is pointed out in Smuts's *Dissertatio Zoologica*.

XIII. The thirteenth section of the genus *Antilope* contains a small but interesting group of these animals, which Mr. Bennett has formed and characterised in the first volume of the *Transactions of the Zoological Society*. It comprehends the species which Pliny has mentioned under the name of *dama*, and is distinguished from the last section only by the character of the horns, which are larger, thicker, and have much bolder curvatures, turning first almost horizontally towards the rear, and then suddenly forwards so as to form a hook towards the front almost as complete as that of the chamois is towards the rear. The legs are remarkably long, the neck long and slender, and there is a white spot on the throat of all the species. In other respects the characters are precisely the same as those of the species belonging to the twelfth section.



[The Mhorr, *A. mhorr*.]

45. The **Mhorr** (*A. mhorr*, Bennett) is four feet two inches long from the nose to the origin of the tail, two feet six inches high at the shoulder, and two feet eight inches at the croup; the length of the head from the nose to the root of the horn is seven inches; that of the horn nine inches and a half on the curve, and seven and a half in a straight line; and that of the tail seven inches without the terminal tuft. The hair of the body is sleek and of moderate length; on the head and face it is very short and close, except about the root of the horns, where it is slightly tufted; the hair of the limbs is also short, except the tufts below the knees, which are long and consist of a mixture of dark brown and grey hairs. The horns are thick at the base, and annulated with eleven or twelve prominent and complete rings, which occupy about two-thirds of their entire length; they are round, smooth, and attenuated towards the tips, which point directly forwards, and are but moderately sharp. The ears are narrow, erect, and pointed; the eyes large, dark, and lively; and the tail long, naked at the base, and furnished at the extremity with a tuft of long black hair. The colour of all the upper parts of the body, of the neck, back, shoulders, sides, fore-arms and thighs, as well as of the whole throat except a square spot on the larynx, is a deep brownish-red, and a narrow stripe of the same colour is continued down the outer face of the legs, both anterior and posterior, from the shoulders and thighs respectively to the hoofs and pasterns; the belly, buttocks, posterior face of the thighs and inner face of the extremities are pure white, as well as the spot on the larynx above referred to; and this colour, after spreading round the entire region of the tail, is continued forwards on the hip in a pointed stripe on each side, about half way between the croup and the knee joint, and reaching nearly over the whole hip. It contrasts strongly with the surrounding colour, and has a very singular effect. There is no dark band on the flanks, the light colours of the under parts being abruptly separated from the darker shade above without any blending or intermediate colour. The head and cheeks are light fawn-colour, intermixed, in front of the horns, with dark brown and grey hairs, and marked

below the opening of the suborbital sinuses with a small dark spot representing the black band which passes in the species of the last division from the anterior canthus of the eye to the corner of the mouth: the whole line of the nose and chaffron are likewise dark brown, mixed with grey in old specimens, and the back of the ears is fawn-coloured, tipped with black.

Two males of this beautiful species were sent from Mogadore to the Zoological Society, and lived for some time in the gardens of the Regent's Park. The species is not found in the empire of Marocco, but individuals are occasionally brought from the opposite confines of the Desert; the animal is much sought after by the Arabs on account of producing the bezoar stones so highly valued in eastern medicine. These stones are commonly called in Marocco, Baid-el-Mhorr, mhorr's eggs.

46. The Nanguer (*A. dama*, Pallas). This species was originally described and figured by Buffon from materials brought by Adanson from Senegal; since that time the animal has not been seen by any naturalist, and as the description of Buffon is imperfect, some reasonable doubt may be entertained whether it be not in reality the young of the mhorr.

47. The Addra (*A. ruficollis*, H. Smith) is a beautiful species of eastern Africa, discovered on the barren wastes of Nubia by Rüppel, and in Sennaar and Dongola by Hemprich and Ehrenberg. The whole length of this species is five feet four inches, its height at the shoulder three feet; the length of the head is eight inches, that of the horns twelve inches and a half, and that of the tail nine inches. The horns are precisely similar to those of the mhorr already described, as are likewise the general form and proportions of the body. This species is gregarious, and resides in flocks on the desert between Nubia, Dongola, and Kordofan.

XIV. The fourteenth group of antelopes is distinguished by having small horns perfectly smooth and black, springing immediately above the orbits, almost perpendicular to the plane of the face, and straight for the first two-thirds of their length, then bent abruptly backwards so as to form a perfect hook, very sharp at the points, and common to both sexes. The lips are hairy and attenuated; there is no lachrymal sinus nor maxillary gland, but a small fold or opening of the skin of the occiput nearly at the root of each horn, (which, however, appears not to be provided with a secreting gland like these organs,) is a character peculiar to the present group, and, as already observed, may have given rise to the opinion of the antients, that goats breathed through their ears. The form of the horns and the possession of inguinal pores are the only characters which the species included in this group possesses in common with the antelope tribes; all its other characters approximate it to the goats, as well as its habits and mode of life, and it appears in fact to form the natural link which connects these two genera. The knees are without brushes, and the females provided with two teats. There is but a single species,

[The Chamois, *A. rupicapra*.]

48. The Chamois, (*A. rupicapra*, Pallas,) the only animal of western Europe that partakes in any degree of the characters of the antelopes. The horns of this species have been sufficiently described above; they are seldom more than six or seven inches long, and are nearly parallel throughout their whole extent. The entire length of the body is about three feet three inches, that of the head to the root of the horns six inches, that of the ears four inches, of the tail three inches and a quarter, and the height at the shoulders rather better than two feet. The whole body is covered with long hair, hanging down over the sides, of a deep brown colour in winter, and brownish-fawn colour in summer, being in spring slightly mixed with grey: the head is of a very pale yellow or straw colour, with a dark brown band on each side passing from the root of the ears to the corners of the mouth, and encircling the eyes and base of the horns; the tail is short and black, and the edges of the hips and interior of the thighs and ears alone white. The face is straight as in the goat, the ears small, erect, and pointed, and the chin without a beard. In old individuals, particularly during the severe colds of winter, the cheeks, chin, and throat turn white, and the breast and belly are at all times of a light silvery brown or yellow. Underneath the external covering there is a short thick coat of fine wool, which lies close to the skin, and protects the animal from the rigours of the cold mountain regions which it inhabits The colours of both sexes are the same, but the females are rather smaller than the males, and have horns less abruptly hooked backwards. They go five months with young, and kid in March or April, producing one or very rarely two at a birth, which they suckle till the October following. The young are at first of a uniform deep yellowish brown, with the lower jaw, sides of the head and throat white, and the same dark bands through the eyes as in the adults, only not extending so far back on the head.

The chamois, like the ibex, inhabits the loftiest chains of the primitive mountain ridges, and displays all the vivacity, restlessness and agility of the common goat. It is extremely impatient of heat, and during summer is only to be found on the tops of the highest mountains, or in deep glens where the snow lies throughout the year: in winter, however, it descends to the lower ridges, and it is then only that the hunters can pursue it with any hope of success. Its senses of sight and smell are remarkably acute; it scents a man at the distance of half a league, and displays the greatest restlessness and alarm till it obtains a sight of the object of its terror, leaping upon the highest rocks at hand in order to command a more extensive prospect, and uttering a suppressed whistle or hissing sound, being all the time in a state of the greatest agitation; but no sooner does he appear in sight than it flies with the utmost speed, scaling rocks which few other animals could attempt, and, if not intercepted by stratagem, soon leaving its pursuers far behind. The usual and most successful mode of hunting the chamois is therefore for a party of hunters to unite, and surround some mountain glen which they are previously known to frequent for the purpose of lying on the fresh snow during the day-time; towards this point the hunters advance simultaneously, and the animals, of course scenting those which come down the wind, retire in an opposite direction and are intercepted by another party. The food of the chamois consists of mountain herbs, flowers, and the tender shoots of trees and shrubs; it seldom drinks. Nothing can be more admirable than the agility with which it ascends and descends rocks apparently perpendicular. It does not descend at a single bound nor in a vertical direction, but by projecting itself obliquely or diagonally forwards, striking the face of the rock three or four times with its feet for the purpose of renewing its force, or directing it more steadily to the point it aims at; and in this manner it will descend a perpendicular rock of twenty or thirty feet in height, without the smallest projection upon which it could rest its feet. This animal is extremely partial to salt, and many stones are met with in the Alps hollowed by the continual licking of the chamois on account of the saltpetre with which they abound. The species is found in all the high mountain chains of Europe and western Asia, in the Pyrenees, the Alps, the Carpathian and Grecian mountains, the chains of Caucasus and Taurus, and perhaps in other situations.

XV. We have now arrived at a group which departs considerably in form and proportions from the symmetry and grace of the antelope tribe in general, assuming something of the weighty, solid make and massive proportions of the bovine genus, which it likewise begins to approach in its zoological characters. The horns are common to both sexes, long, erect, and annulated, straight, or with a single curvature backwards, or in one species twisted into a beautiful spiral of two or three turns; the head is terminated by a half-formed muzzle, considerably more developed than in the sheep or goat, but not so completely as in the ox or stag; there are no suborbital sinuses (except, perhaps, in one species); neither are there any knee-brushes or inguinal pores, and the females are provided with four teats. The species belonging to this division are all natives of Africa, and perhaps one may extend across the southern shores of Arabia as far as the borders of Persia, but the fact is extremely doubtful.

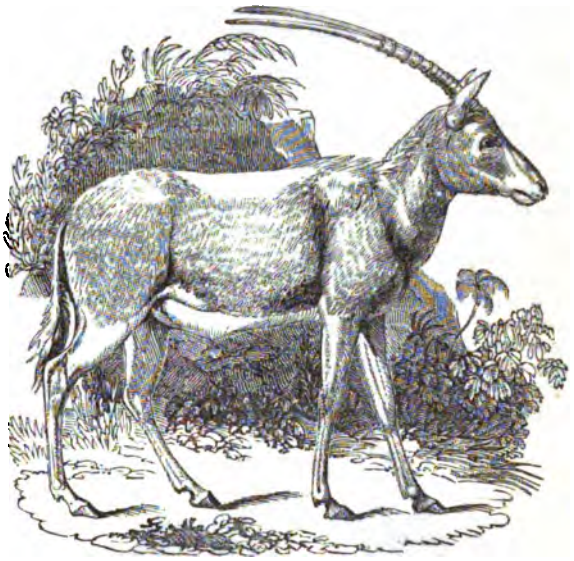
49. The **Addax** (*A. addax*, Lichtenstein) is mentioned by Pliny under the name of *strepisceros*, which, says he, the Africans call *addax*, (or it may be, *addas*, for the accusative *addacem* is the word used in the passage referred to, and it may be derived from either of these forms in the nominative.) From the time of Pliny the only information which we had about this animal till a very recent period was derived from a figure and description of the skull and horns sent by our celebrated countryman Caius to his friend Gesner, and inserted in the great work of that early naturalist: the recent travellers, Rüppel and Hemprich, and Ehrenberg, have lately rediscovered this species, and what is singular enough, under the antient African name ascribed to it by Pliny, the Arabs still denominating it *akasch*, *akas*, or *addas*, with the addition of the syllable *abu* (father), which they bestow upon many other animals, as *abu-Hannis* (father John) for the ibis, &c.

The length of the full grown addax is six feet from the muzzle to the root of the tail, and its height at the shoulder three feet; the horns, measured along the curves, are three feet long, the ears six inches, and the tail, with its terminating tuft, one foot. The animal is therefore about the size of a large ass, of which it has likewise much of the make and proportions, the heavy head, thick neck and legs, and switch tail. The horns are round, rather slender in proportion to their length, twisted outwards and describing two turns of a wide spiral, annulated to within five or six inches of the points, which are smooth and sharp; the form of the horns of the female does not differ from that of the male, but in the young they are almost straight. The ears are pretty long and proportionally broader than in most of the smaller antelopes, and the tail reaches almost to the hough and is terminated by a switch of long, coarse grey hair. The whole head and neck, both above and below, are of a deep reddish-brown colour, except a transverse mark of pure white across the lower part of the forehead, between the orbits, which expands on the cheeks and half surrounds the eyes; a patch of black curly hair surrounds the root of the horns, and there is a scanty beard of the same colour on the larynx; all the rest of the animal, including the entire body from the neck backwards, as well as the legs and tail, are greyish white; the hoofs are black, and remarkably broad, to enable the animal to pass more easily over the fine and loose sands of the deserts in which it resides.

These animals live in pairs on the sandy deserts of central Africa, and appear to extend over the greater part of the continent. Hemprich and Ehrenberg found them in Dongola; and a pair of horns were brought from Bornou by Denham and Clapperton, and deposited in the British Museum. [See the article Addax.]

50. The **Abu-Harb** (*A. leucoryx*, Pallas) is, perhaps, the most celebrated of all the antelope genus, being the species which is generally supposed to have given rise to the fabulous unicorn of the antients. It is, indeed, properly speaking, the *oryx* of antient writers, but modern authors have followed the example of Pallas in bestowing that name upon a species of southern Africa with which it is impossible that the antients could have been acquainted, whilst the present species has received the name of *leucoryx*, from an epithet bestowed upon it by Ælian on account of its white colour. The dimensions of this animal are very little less than those of the addax. The horns are at first directed in the plane of the forehead, and have a single gradual and moderate curvature throughout their whole course, forming, as it were, the segments of a very large circle; they are small in proportion to their great length, annulated about half way up, gradually attenuated, and very sharp at the points. The ears are long, erect, and pointed, and the tail is terminated by a very copiously furnished tuft of long hair of a mixed black and grey colour, which reaches below the houghs. The hair on the head, body, and extremities, is universally short, and lies smoothly along the hide, except upon the ridge of the back, where it is rather longer and reversed, or turned towards the head in a direction contrary to that on the other parts of the body, and forming a short reversed mane from the middle of the back to the occiput. The head is white, with a brown mark descending perpendicularly from each orbit, and expanding over the cheek, and a similar stripe passing down the centre of the face from the horns to the muzzle; the whole neck also, on the throat as well as on the upper part, is of a uniform rusty brown colour, but, with these exceptions, all the rest of the body, as well as the legs and tail, are milk white.

This species is frequently represented on the monuments of Egypt and Nubia, and particularly in the inner chamber of the great pyramid at Memphis, where a whole group of these animals is represented, some being driven or pushed forwards, and others led by the horns or by a cord about the neck, apparently by way of tribute from some subject or conquered nation. With one exception, these representations are invariably in profile, so that only one horn is seen. The present species is gregarious, and lives in large herds in Sennaar and Kordofan, feeding principally upon different species of acacias.



[The Algazel, *A. gazella*.]

51. The **Algazel**, (*A. gazella*, Pallas,) described and figured first by Prosper Alpinus, and more recently by M. F. Cuvier, is so nearly related to the last species, that we should have no hesitation in considering it as absolutely the same, did not this eminent zoologist expressly inform us that his algazel was furnished with lachrymal sinuses, which certainly no other species of the present group possesses. The specimen described by M. Cuvier was sent from Senegal, and lived for some time in the menagerie of the Jardin des Plantes. As this is at present the most obscure species of the group, we have copied the engraving of M. Cuvier, to give the reader the opportunity of comparing it with the beautiful engravings of the former species published in the works of Lichtenstein, Rüppel and Hemprich, and Ehrenberg. Though the specimen described by M. Cuvier was obtained from Senegal, we are assured that the animal is unknown, or at least very rare, in that country, and only brought occasionally from a distant part of the interior.

52. The **Gemsbok** (*A. oryx*, Pallas) is in all respects a very distinct and marked species. It is a heavy, stout animal, about five feet in length, and three feet two inches high at the shoulder; the length of the horns is from two feet to two and a half, that of the ears seven inches, and that of the tail thirteen or fourteen. The horns are almost perfectly straight, very little divergent, and situated in the plane of the forehead; they are obscurely annulated for half their length, black, and blunt in the male, but very sharp-pointed in the female. The ears are large and pointed, and the tail pretty uniformly covered with long black hair, forming

a large switch. The general colour of the body is dark rusty-iron grey on the upper parts, and white on the under, the two being separated on the flanks by a broad longitudinal band of dark brown or black; and the hair of the back and neck reversed, as in the two species last described. The head is white, marked with two transverse bands of deep black, rising from the root of the horns and passing down the face, then encircling the eye, and uniting under the lower jaw with those of the opposite side. From this point, a black band passes down the throat upon the chest, where it divides into four, one pair of which pass along the flanks and divide the colours of the upper and under parts of the body, the other pair encircles the fore-arms; the thighs are likewise black, whilst all the rest of the limbs is white, except a black mark on the canons. On the upper surface, the black line passes down the neck and back, and expands into a broad disk on the rump. These colours are all boldly separated from one another, and the harshness of their contrast produces a very singular effect upon the appearance of this animal.

The oryx inhabits the karroos of South Africa: it is never found in the woods, but keeps on the open plains, and lives in pairs or small families of four or five individuals. It is extremely dangerous to approach when wounded, if not completely disabled, making vigorous use of its long powerful horns, and it is said being not unfrequently the first to commence the assault. We are even assured that the lion himself is afraid to attack this powerful and courageous animal, and that sometimes, when pressed by famine he has ventured to do so, he has been beaten off with disgrace, or even paid for his temerity with his life.

XVI. The sixteenth group differs from that which we have just described by having the muzzle more completely formed, but in all other respects the characters are precisely the same, at least as far as they are known. There are neither lachrymal sinuses, inguinal pores, nor knee-brushes; the characters of the females, however, have not been observed, but it is most probable that they are provided with horns like the males, and have four teats. The horns themselves are round, annulated, and uniformly bent backwards, or in one species forwards; and there is, as in most of the species of the former division, a reversed mane on the shoulders and neck. These animals are confined to Africa, and, as far as we are at present aware, to the southern portion of it, yet seldom, if ever, passing the Orange River, and absolutely unknown in the neighbourhood of the Cape.

[The Blauwbok, *A. leucophæa.*]

53. The **Blauwbok** (*A. leucophæa*, Pallas) was formerly an occasional visiter in the district of Zwellendam, but has not been seen within the boundaries of the colony for the last thirty years. It is six feet in length, and three feet seven inches high at the shoulder; the head is nine inches long from the muzzle to the base of the horns; these are two feet two inches, measured along the curves; the length of the ears is eight inches, and that of the tail, with its terminating tuft, one foot. The horns are round, uniformly curved backwards, and marked with from twenty to thirty prominent and complete rings, the last six inches being smooth, and the points very fine and sharp. The hide of this animal is perfectly black, and it is this colour reflected through the ashy-grey hair that communicates the dark blue shade which has given rise to the name of *Blauwbok*, or *Bluebuck*, by which it has long been known among the Dutch at the Cape of Good Hope.

The blauwbok lives in pairs or small families of five or six individuals on the open plains of South Africa, north of the Gareip or Orange River. It is dangerous when wounded, and during the rutting season in particular is said to attack indiscriminately every animal that comes in its way.

54. The **Takhaitze**, (*A. barbata*, H. Smith,) beautifully figured by Mr. Daniell in the *African Scenery*, is a species which appears to differ from the blauwbok only by its long flowing mane, copious beard, and superior size. This animal inhabits the country in the vicinity of Latakoo, and is called *Takhaitze* by the Booshuanas. It is said to be so wild and ferocious that the natives are afraid to attack it openly with the *hassagai* or spear, as they do other game, but do take it generally in pitfalls covered over with sticks and earth. It is commonly found in pairs upon the open plains, but when disturbed makes for the wooded heights, which are thickly covered with the common mimosa, upon which both this animal and the giraffe delight to feed. The name takhaitze signifies a fierce or wicked beast, and expresses the dread with which the resolution and prowess of this powerful animal inspire the Booshuanas, who seldom venture to approach it openly.

55. The **Equine Antelope** (*A. equina*, Geoffroy) is a large species which measures seven feet and a half in length, and four feet in height at the shoulder. The horns are much larger and heavier in proportion to their length than those of the blauwbok; they are, however, much of the same general form. This species, of which the native name has not been recorded, inhabits the same localities as the last two, living like them in pairs or small families on the elevated plains and low wooded hills of South Africa. It is abundant about the sources of the Gareip, and was found by Mr. Burchell in the vicinity of Latakoo.

56. (*A. Ellipsiprymnus*, Ogilby.) A description of this new species lately appeared in the *Proceedings of the Zoological Society*. The whole length of the animal from the muzzle to the root of the tail was seven feet three inches and a half; its height at the shoulder nearly four feet, and to the top of the horn upwards of seven feet; the horns measured thirty inches upon the curves, the ears were upwards of eight inches long, and the tail, with its terminal tuft, one foot nine. The horns are very thick and heavy; they spread widely outwards, are nearly straight for the first half of their length, and then turn forwards with a gradual and uniform curvature. They are surrounded with twenty-four prominent annuli, forming large knobs in front and deeply striated between, but nearly obliterated behind: the last six inches are smooth, and the points blunt. Next to the character of the horns, this species is most readily to be distinguished by a ribbon of pure white, which passes over the croup and down each hip, uniting between the thighs and forming a perfect ellipse, having the root of the tail in one of its foci, and contrasting most singularly with the dark rusty-iron grey of the surrounding parts. It is to this mark, which is so peculiarly characteristic of the species, that the name of *Ellipsiprymnus* refers; the native name of the animal is unknown.

The specimen from which this description was taken was brought to this country by Mr. Steedman, and exhibited with a fine collection of South African zoology at the Colosseum in the Regent's Park. It had been procured from a tribe of the Damaras, a nation who inhabit the country beyond the Great Namaqualand, and about twenty-five days' journey north of the Orange River. They described it as fierce and dangerous to approach.

XVII. The seventeenth section or subdivision of antelopes has all the characters of the group last described, except the horns, which are either of a spiral form themselves, or else surrounded by a prominent spiral wreath throughout the greater part of their length. They are common to both sexes, very large and heavy in the males, but longer and more slender in the females. These animals are without either lachrymal sinuses, inguinal pores or brushes on the knees; they have naked muzzles, large hanging dewlaps, and the females are provided with four teats forming a small udder. The group contains two species, both natives of South Africa

[The Canna, *A. oreas.*]

57. The **Canna**, (*A. oreas*, Pallas,) improperly called *eland* or elk by the Dutch colonists of South Africa, and *impoof* by the Caffres, is considerably the largest of all the antelopes, being the size of a good horse, and measuring eight feet two inches in length and full five feet in height at the shoulder. The horns of the male are a foot and a half in length, very thick and heavy, almost straight till within three inches of the tips, where they bend outwards, attenuated at the points, and surrounded throughout the greater part of their length with a thick spiral wreath, which passes twice completely round them, and finishes by becoming indistinct near the points. Those of the females are longer and smaller, and the spiral wreath is, in some specimens at least, scarcely to be seen. The head is long and pointed, the ears are large, the neck thick, compressed on the sides, as in the ox, and furnished underneath with a loose hanging skin or dewlap, fringed along the margin with a border of long hair. There is likewise a large protuberance of the size of a man's fist on the larynx, and it was probably from this organ, which is likewise found in the elk of Europe, that the animal derived the name of eland, by which it is universally known at the Cape. From the centre of the forehead to the root of the tail, runs a short, erect mane of dark brown hair, which is reversed on the neck, but directed backwards, in the usual manner, along the spine of the back. The length of the spinous processes of the interscapular vertebræ produces a considerable and sufficiently remarkable elevation of the shoulders; but there is no actual hump, as in the camel or Indian ox, though at first sight such a formation might be supposed to exist. The tail is upwards of two feet long, and terminated by a tuft of long black hair. The colour of the body is uniform reddish-fawn on the upper parts, and white on the under; the head and neck ashy-grey, but in some individuals the latter colour extends over all the upper parts of the body.

The canna is a large heavy animal, which, when full grown, weighs from seven to nine hundred weight, and contrary to the usual rule observed among antelopes, is commonly extremely fat. Its flesh is, consequently, more prized than that of any other wild animal of South Africa, and the large muscles of the thighs, in particular, are held in the highest estimation when dried and cured, under which form they are denominated thigh-tongues. The character of this animal is very mild, and, as it were, predisposed to domestication; it is gregarious, and lives in large herds upon the open plains and low hills, the old males generally residing apart. Elands were formerly very common in the immediate neighbourhood of Cape Town, but were so much hunted, that they have long since ceased to frequent the inhabited districts, and are now rarely met with except in the most distant and retired parts of the colony. Being generally very fat and pursy, they do not run well, and are soon fatigued; it is even said that when hard run, a red oily perspiration has been known to ooze out from the pores of their skin, and that they occasionally drop down from plethora. Like most other animals when hunted, they always run against the wind. As the carcass is weighty and consequently difficult to transport, the great object of the hunters, in the chase of the canna, is to turn their game in such a direction as to drive it close to their own residence before killing it; and, in fact, the Cape farmers, from long practice and intimate knowledge of the animal's habits, very frequently succeed in accomplishing this masterpiece of South African field-sports They are so gentle that a man on horseback may penetrate into the very middle of a herd, without alarming them, and pick out the fattest and best-conditioned, and as the old bulls are commonly chosen on account of their greater size and weight, it not unfrequently happens that the herd is left altogether without a male.

58. (*A. canna*, H. Smith.) This is a species of which Colonel Smith has given a description, and which he supposes to be the *baastard* eland of the Cape colonists. Col. Smith is the only naturalist who has seen the skin of this animal: its horns and skull are found in several museums.

This species is said to be common in the Great Desert north of the Gareip, and to be occasionally seen on the Karroos of the southern bank. It lives in large herds.

XVIII. The eighteenth section contains a single species, distinguished by its short upright horns slightly bent backwards, common to both sexes, with a few transverse annuli at the base, and marked by deep longitudinal striæ almost to their extremities. The species is without either lachrymal sinuses, inguinal pores, or knee-brushes, but it has a complete naked muzzle, and the female is furnished with four teats. As the former division seemed to unite the antelopes with the oxen, so this seems to be intermediate between them and the goats, being about the same size as these latter animals and inhabiting similar localities. The only known species is

59. The **Goral**, (*A. goral*, Hardwicke,) first described by General Hardwicke in the *Linnæan Transactions*.

The goral inhabits the kingdom of Nepaul, and lives in large herds upon the elevated plains which crown the lower ridges of the great chain of the Himalayan mountains. It is wild and fleet, and when pursued flies to the rocky hills, where it easily escapes the hunter, and is indeed rarely taken except by stratagem. Its flesh is considered excellent venison. It is entirely confined to the cold upper regions of Nepaul, and is incapable of bearing the sultry heat of the plains of Hindustan.

XIX. The nineteenth group contains a single species like the goral, a native of Nepaul and upper India, but differing from all those which we have lately been discussing by the development of large suborbital sinuses, which shows a return to the characters of the common antelopes. The horns are common to both sexes; short, parallel, slightly curved backwards as in the goral, and traversed throughout the greater part of their length with longitudinal striæ, crossed by transverse depressions, and thus marking the whole surface of the horns with alternate rows of small pits and little pearly excrescences; the points only being smooth and sharp. Besides these characters, the present section is distinguished by a complete naked muzzle, four teats in the females, and neither inguinal pores nor knee-brushes.

60. The **Thar** (*A. thar*, Hodgson) was described for the first time in a paper by B. H. Hodgson, Esq., British resident in Nepaul, read before the Zoological Society, and printed in the second part of the *Proceedings* of that body.

The thar inhabits the central region of Nepaul, at an equal distance from the snows of the Himalayan range on the one hand, and the sultry heats of the low plains of India on the other. It is the most common of all the wild ruminants which are found in that country, and its chase is the favourite exercise and amusement of the hill tribes; its flesh is, indeed, coarse, but there is plenty of it,—and these rude people are easily satisfied on the score of quality, provided the quantity be sufficient. Its habits are wild and solitary; it is seldom found in herds, however small, and the grown males especially live apart in the mountains, and never seek the society of their species except during the rutting season. As might be supposed from its heavy make and short stout limbs, it is a slow runner, and soon brought to bay, but it leaps well, and makes its way over broken ground with greater ease than in open level situations. It is found from the eastern confines of Nepaul to the banks of the Sutledge, but abounds especially towards the east.

XX. We are now arrived at a group of antelopes of which two species at least are well known, and one has been celebrated under the name of *bubalus* from the most remote periods of Grecian and Roman literature. This group is distinguished by having heavy, thick, annulated horns, at first inclining slightly forwards, and then suddenly bent backwards, so as to form a prominent angle or shoulder in front. The muzzles are small and not so completely developed as in some of the other groups; the lachrymal sinuses are also small, and instead of opening by a fold in the skin, consist simply of a small gland on its surface, almost concealed by the surrounding hair, and only to be distinguished by the viscous matter which exudes from them. The character of the inguinal pores has not been observed, but the species are without scopæ, and the females are provided with horns and have only two teats. The species is spread over the whole continent of Africa, and lives in large herds on the open plains and karroos.

[The Bekr-el-Wash, *A. bubalus*.]

61. The **Bekr-el-Wash** (*A. bubalus*, Pallas) is about the size of the largest stags, and is particularly remarkable for the great length of its head, and its narrow, flat, and straight forehead and face.

This animal, called *Bekr-el-Wash*, or wild ox, by the Arabs, is common in every part of northern Africa, living in numerous herds on the confines of the Tell or cultivated parts, and the Sahara or Desert, and also, according to Captain Lyon, upon the mountains south of Tripoli. Barbary seems to be the chief habitat of the species, but it sometimes happens that a few individuals find their way across the Desert to the banks of the Nile, where, however, they are seldom seen, and, as it is said, only when they stray from their native habitat. At the same time it is to be observed, that its representation occurs among the hieroglyphics of the temples of Upper Egypt. Dr. Shaw informs us, that the bubalus is naturally of a familiar disposition, and that the young calves frequently mix with domestic cattle, and soon learn to attach themselves to the herd without attempting to escape afterwards. They fight like the common bull, by lowering the head, and striking suddenly upwards with the horns, which are formidable weapons either for attack or defence.

62. The **Caama** (*A. caama*, Cuvier) is a species of South Africa, nearly allied to the bekr-el-wash, and long confounded with it.

The caama, called *Hartebeest* by the Dutch farmers, inhabits the plains of South Africa, and is the most common of all the large antelopes in that country. It resides in large herds, and is a favourite object of pursuit with the natives and colonists. Its pace, when at full speed, resembles a heavy gallop, but is tolerably quick notwithstanding; and the animal has a habit of frequently stooping to gaze at its pursuers when it has got to any distance a-head of them. Its manners are sufficiently mild and tractable, but when put upon its defence it makes good use of its powerful horns, dropping on its knees before charging, and after advancing some distance in this position, darting suddenly forwards with great force against its adversary. The flesh is rather dry, but of a fine grain, more nearly resembling the beef of the ox than that of any other antelope, except perhaps the canna, and it has a high game flavour which makes it universally esteemed. The female produces but a single calf, which she brings forth in September or April, and which, if taken young, is easily domesticated.

63. The **Sassaby** (*A. lunata*, Burchell) is a species at present very imperfectly known. It is found in the Booshwana country, where, however, it would appear that the species is rare, as Mr. Burchell, the only traveller except Daniell that mentions it, met with but a single specimen. In many respects the descriptions of Burchell, and of Colonel Hamilton Smith, who also has given one, are both imperfect, but the drawing of Daniell, in his *Sketches of African Scenery and Animals*, supplies most of their omissions, and clearly shows at least that the animal belongs to the present division, if it does not supply the more minute details. The meat of the specimen shot by Mr. Burchell was tender and well tasted, and the name of *Kaama*, which his attendants bestowed upon the animal, shows that they consider it as a kindred species with the Hartebeest of the colonists, the *Antelope caama* of the last article. The Booshwanas call it Sassaby.

XXI. We are now arrived at the last and perhaps the most extraordinary of the small groups into which we have found it convenient to subdivide the extensive genus of antelope The distinguishing characters of this group are found in the horns, which are common to both sexes, and which, after first expanding over the whole upper part of the skull and forehead, like a broad helmet of bone, curve downwards between the eyes, and then suddenly turn upwards, becoming round and attenuated as they advance, and ending in moderately sharp points. They have no annuli, but are rough and scabrous at the roots, and smooth toward the points. The head is heavy like that of the ox, and terminated by a very broad muzzle, which expands on each side into a thick muscular flap, which fits into each nostril, and covers it like a lid or valve. The lachrymal sinus, as in the last section, consists of an external gland, which is placed below the anterior angle of the orbit, and concealed in a tuft of long feathering hair which entirely surrounds it. There are neither inguinal pores nor brushes on the knees; the females are provided with two mammæ. There are three distinct species belonging to this group, one of which is generally supposed to be the *Katoblepas* (κατωβλεψ) of the ancients. (Plin. *Hist. Nat.* viii. 21. The singularity of their forms renders them very remarkable; the head and horns are those of an ox or buffalo, the tail, neck, and mane resemble those of the horse, and the body and limbs have the light taper form and round contour that distinguish those of the stag. The whole three species inhabit the open plains of South Africa to an unknown distance in the interior. They live together and form extensive herds.

The Gnu, *A. gnu*.

64. The **Gnu** (*A. gnu*, Gmelin) is about the size of a well-grown ass. The neck, body, and tail precisely resemble those of a small horse, and the pace also, which is a species of light gallop, is so perfectly similar, that a herd of gnus, when seen at a distance flying over the plains of South Africa, might be readily mistaken for a troop of the wild

zebras or quaggas which inhabit the same localities, if their dark and uniform colour did not distinguish them.

The gnus live in extensive herds on the karroos of South Africa; they are naturally wild and difficult of approach, and when wounded will turn upon the hunter and pursue him in turn, dropping on their knees before making an attack, and then darting forwards with amazing force and velocity. When first alarmed they commence by flinging up their heels and capering like a restive horse, tossing their heads and tails, and butting at the mole-hills or other objects, but immediately after taking to flight, and traversing the desert with a speed which soon carries them beyond the reach of danger. They do not run in a confused crowd like sheep or oxen, but in single file following a leader, and have a pleasing appearance as they skim over the level plains. They are said to be subject to a cutaneous eruption at particular seasons of the year, which they sometimes communicate to domestic cattle, and which invariably ends in death.

65. The **Kokoon** (*A. taurina*, Burchell) is of a larger size than the gnu, to which, however, it is very similar in its external form and proportions.

The habits and manners of the kokoon closely resemble those of the gnu, but it possesses neither the speed, spirit, nor activity of that animal. It is sometimes found solitary, but more frequently in large herds, and inhabits the open plains and karroos in the country of the Tambookies and Booshwanas; it never associates with the gnu, which frequents the same localities, at least about Latakoo, but which it appears to replace along the eastern coast of South Africa, as the following species seems to do along the western. The species has been observed in the situations here mentioned by Professor Lichtenstein, Messrs. Truter and Somerville, Burchell and Thompson. Kokoon is its Booshwana name.

66. The **Brindled Gnu**, (*A. gorgon*, Hamilton Smith,) a very distinct species from the two last described, is however known only from a specimen in the Museum of the London Missionary Society, which was brought from South Africa, and most probably from the country of the Namaguas or Damaras who inhabit the western coasts about the mouth of the Gareip, or Orange River.

Colonel Smith supposes, with great probability, that this species is the *Baas*, not, however, of the Namaquas as he states, but of the Dutch Boors of South Africa, who are in the habit of making occasional excursions into the Namaqua country, and in whose language the word signifies *master*, and most probably refers to the bold and resolute character of the animal. It appears to be the variety of gnu mentioned by Le Vaillant in his *Second Voyage*.

In the preceding enumeration of the species belonging to the extensive genus *Antilope*, as it is at present constituted, we have carefully avoided the multiplication of fictitious species, by rejecting all those of which the authenticity is in any degree doubtful. Our list of species will, therefore, be found to differ in many instances from those contained in general catalogues, but it is hoped that it will, at the same time, be found to contain all that is really certain in the present state of the science. Those who desire to pursue the subject further, must consult the professed treatises on mammology, and the various detached notices scattered through the works of the different Asiatic and African travellers.*

ANTENNÆ, horn-like members placed on the head, and peculiar to insects and crustaceous animals; their functions are not well understood, and have given rise to several very different opinions among naturalists. The term is derived from the Latin *ante*, 'before,' and was applied by the Romans to the sail-yard of a ship. In insects, they are uniformly two in number; but in crabs and lobsters there are more than two. They are connected with the head always near the eyes by means of a ball (*bulbus*) and socket (*torulus*). They are composed of minute cylinders or rings successively added to each other, to the number of thirty in some butterflies, and thus forming a tube which incloses nerves for sensation, muscles for moving, as well as air-pipes and cells, all of which are figured with minute precision by M. Straus-Dürckheim, in his splendid work *On the Anatomy of the Cockchafer*, published at the expense of the Institute of Paris.

The form of the antennæ is exceedingly various, some being simple and some feathered, clubbed, comb-shaped, in endless diversity. In moths, the female is distinguished from the male by the antennæ being more simple. In some moths and beetles the antennæ are very long compared with the length of the body, whereas in the house-fly, and some other two-winged flies, they are very short. Their length does not depend on the number of joints, for they may be long when composed of only three or four pieces, and short when composed of ten or more pieces.

With respect to the functions of the antennæ, it is the most common opinion that they are organs of touch, and are, on that account, often termed feelers; 'but,' as M. Straus-Dürckheim justly remarks, 'this conjecture is founded upon facts imperfectly investigated, if not altogether false. I have made numerous researches on this subject, and I have never been able to satisfy myself that insects examine objects by feeling them with their antennæ. On the contrary, I have rarely observed these animals touch anything with these organs, and when this did happen, it appeared to be only by accident, and not at all from design. Many insects, besides, have their antennæ so short, that they would be obliged to stand erect upon their heads in order to come at the bodies which they might thus wish to explore, and for this their feet are certainly much better adapted.

'Since,' continues M. Straus-Dürckheim, 'almost all articulated animals possessing a solid skin (*peau*) have antennæ, which are furnished with nerves of an extraordinary thickness in proportion to their own size, there cannot remain a doubt that they are organs of some sense, and that too a very acute one.

'I have said that insects are proved, by observation, to be furnished with an organ of hearing. It is, indeed, scarcely probable that creatures, such as the tree-hopper (*cicada*) and the locust (*locusta*), to which nature has given the faculty of producing a peculiar sound by means of an appropriate organ, should, at the same time, be deprived of the means of hearing such sounds, inasmuch as these can have reference only to their own kindred. It is still further proved that these insects share the faculty of hearing along with all other living beings, by their ceasing to sing the instant they fear they have been discovered.

'When observing the various actions of insects we see them suddenly stretch their antennæ forwards in case of noise, danger, or, in general, when anything is done to attract their attention; and they keep them thus stretched forward as long as their attention continues, a circumstance which proves that the antennæ serve the purpose of apprising them of what passes at a distance, and consequently must either be organs of hearing or organs of smell. M. Réaumur, (*Mém. des Insectes*, i. 643,) while he rejects the opinion that the antennæ serve to explore objects, thinks it possible they may be the organs of some unknown sense, or of smell. The latter opinion, however, is supported by no fact either anatomical or physiological; nor is it at all even probable, inasmuch as the antennæ are not soft and lubricated, as observation proves to be necessary for this kind of sensation; it appears to me more plausible to infer that the antennæ serve for the perception of sounds. This opinion is founded partly on the analogy of what occurs in the larger animals, who prick up their ears under similar circumstances in order to hear better; and partly on comparison of the organs of hearing in the first of the vertebrate animals (*vertebrata*), and the antennæ of articulated animals, where we observe a sort of transition occurring in the lobster and craw-fish (*astacus*), a genus in which this organ occurs in the simplest form, compared with that of superior animals.

'The solidity of the envelope of antennæ renders these organs well adapted to undergo the same vibrations as the air, in the same manner as the strings of an Æolian harp vibrate and emit various sounds according as they are differently struck by the air. In this view, however, we might infer that nature would have made antennæ in the form of rods, consisting of a single piece, in order that they might be more susceptible of vibrations; but it ought to be considered, that these organs would, by such a conformation, have been much exposed to breaking, while, in consequence of their jointed form, they have the advantage of regulating the degree of vibration at pleasure, as may indeed be observed when insects listen with attention; I mean, that the joints of the antennæ perform the same functions as the chain of small bones in the chamber of the human ear, inasmuch as they form a similar chain, and transmit the vibrations of the air to the auditory pulp.'

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* The length to which this article has extended requires some explanation. The genus *Antilope*, embracing a great variety of species, has presented difficulties to naturalists in its many sub-divisions into groups; and one species has frequently been confounded with another. A complete and connected view appeared, therefore, desirable to be here attempted. According to our usual plan, we should have described the *species* under their respective heads; but this would have prevented that comprehensive arrangement which the writer has here aimed at. We insert this note to prevent an impression that the same principle will be carried into other zoological articles.

Professor Bonsdorff of Abo in Finland came to embrace a similar opinion from his own observations, in opposition to those of Linnæus and Bergmann with whom he was contemporary. His paper on the subject is long and desultory, but the following passage is worth quoting. 'No evidence more clear,' he says, 'could be desired of the sensibility of the antennæ to quick sounds, than what occurred to me last summer in my garden. I observed in a morning walk, undertaken for the purpose of catching insects on the hazels, that while standing in the shade a nut weevil was sitting quietly at a distance upon a leaf, with the antennæ hanging down as if they were asleep, on which account I directed a pocket telescope to the spot, which was above five feet distant, and therefore convenient for viewing the insect. The point of view being thus determined, I made a loud sound, and I was delighted with the opportunity of seeing the weevil not only roused, but the antennæ which had been hanging down became elongated, and, being full of joints, struck by the undulations of sound they extended themselves and remained on the alert till alarmed again by a fresh sound. All my observations agreed in this one circumstance of the antennæ being erect as soon as they were put on the alert; they were moved hither and thither by means of loud sounds, but they disregarded such as were very small. These they may be said to have drunk in; and if alarmed by new sounds they rejoiced when they could effect their escape as soon as possible, and preserve life and safety by the most rapid flight. So I have observed very frequently when the antennæ were folded up in the *Lepturæ*, *Elateres*, *Curculiones*, *Papiliones*, and *Apes*; nay, even the house-flies, as soon as they were moved and excited by irregular sounds or noise, would erect their antennæ and betake themselves to flight without any other excitement.'

We have deemed it best to give the very words of these able naturalists upon a point which is doubtful, or at least obscure. Some additional experiments and arguments illustrative of the same view are given in the volume on *Insect Miscellanies*, chap. iv. in the *Library of Entertaining Knowledge*.

There is one other subject connected with the antennæ which requires notice:—the younger Huber has attributed to ants the use of certain signs made with these organs, which he terms antennal language, understood not only among ants themselves, but also among the aphides, on which they depend for the excretion popularly termed honey-dew. The motions of the antennæ, however, to which he refers in proof of his views, do not, so far as we can judge, authorize us to conclude that they are used in the way of language, any more than to theorize in the same way upon the bills of nestling birds which are opened to receive food, or their wings which are opened and vibrated rapidly while they receive it. That there is nothing peculiar in this alleged antennal language, so far as the aphides are concerned, any one who chooses may prove by taking a pin or a camel-hair pencil and gently touching the aphis, when it will eject the honey-dew as readily as in consequence of being touched with the antennæ of an ant. This we deem to be quite fatal to M. Huber's conclusions.

ANTEPAGMENTA. This is an antient term for the jambs of a door, or, as they are familiarly termed, the door-posts.

ANTEQUERA, ANTIKARIA, a town of Andalusia, in the province of Malaga. The old town is built on a hill, but the new one stands in a plain surrounded by mountains. Its vega (plain) is one of the richest in the province, owing to its being irrigated by the two rivers Guadalhorce or Guadaljorce, and Lavilla, and produces all sorts of grain, fruit, wine, and oil. The neighbouring mountains abound in fine wood, white, black, and red marble, limestone, and gypsum. About eight miles north-west of the town is a lake of salt-water, four miles in length and a mile in breadth, which, in the summer months, from the watery particles being evaporated, becomes a solid mass of salt.

Seven miles south of Antequera is the Sierra del Torcal, a mountain elevated 4219 feet above the sea, and consisting principally of marble and limestone. The sandstone which united the rocks being now decomposed, the assemblage of rocks remaining presents the most singular appearance. At a certain distance they assume the forms of houses, temples, and even figures of men and animals. The order of their arrangement is such that they form streets, lanes, and squares, and indeed, such is the illusion produced to the eye, that one might almost be tempted to believe the old Moorish story, that it was once a populous town, miraculously converted into stone. Travellers ought to be aware how they venture into this intricate labyrinth without a proper guide, as they run the risk of never finding their way out of it again. The spaces left between the rocks form as many natural meadows, in which are fed numerous herds of bullocks, sheep, and goats.

The Roman municipium Singilis was situated about four miles north of Antequera, and another Roman town, Nescania, stood eight miles westward, on the spot where now is a village called Fuente de la Piedra, (the stone fountain,) on account of a fountain springing there, the water of which is said to possess the property of curing the gravel. Several Roman inscriptions bearing the names of both these towns, as well as of Antikaria, have been preserved in the stones of the *Arco de los Gigantes*, or arch of the giants, built in 1585, at the entrance of the old city.

Antequera was conquered from the Moors in September, 1410, by the Infante Don Fernando, who was afterwards king of Aragon. King Juan II. gave it back afterwards to the kings of Granada; but the inhabitants refusing to submit, headed by their gallant alcaide, Rodrigo de Narvaez, boldly defended their independence, and compelled the Moors, who besieged them twice, to abandon the place This is the origin of the motto '*Antequera por su amor*,' 'Antequera for its sake,' which is on the arms of this city.

The manufactures of the inhabitants consist of common woollen stuffs, silk, leather, paper, and soap. The population amounts to 22,732 souls. There are at Antequera, a collegiate church with twelve canons, four parish churches, eleven convents of monks, eight of nuns, an ecclesiastical seminary, an hospital, and an alms-house.

Antequera is in 37° 9′ N. lat., 4° 32′ W. long.

See Miñano; Ponz, *carta* iv., n. 50 to the end, tom. xviii.

ANTHELMINTICS, from two Greek words, signifying means used to expel worms from the intestinal canal, and to prevent their formation. Though the origin of worms in the intestines has been a subject of enquiry and controversy for many ages, we are far from having arrived at a satisfactory conclusion respecting it. While some have regarded them as the result of what is termed *spontaneous* or *equivocal generation* occurring in the intestines, (see Aristot. *Hist. Anim.* v. 19.) others have maintained that they are introduced into the stomach from without, either along with our food, or in some other way, in so small a form as to be unobserved. Great difficulties attend either view of the question. If it is held that they come from without, the sources of them have never been seen, and cannot be pointed out. The opinion of their spontaneous generation is also rendered very improbable. both by the consideration that such an occurrence would be at variance with the present universal mode of production of all other animals, which invariably issue from parents similar to themselves, and by the fact that, however the worms may be at first produced, when once developed in the intestines, they are propagated like other animals of the same grade in the scale of organization, viz. by parents of distinct sexes; and the *ova* or *eggs* which the female produces are both to be seen in the oviducts, (see fig. 1. a,) before they escape, and also are to be found among the contents of the intestines previous to their development as perfect worms. The settlement of this question would be interesting, and might prove useful in directing us in our prophylactic treatment. But as we cannot pretend to this in the present state of our knowledge, we must refrain from further discussion of the subject, and rather enquire into the circumstances and conditions favourable to their development and the means of counteracting them.

The causes of worms, and of the tendency to their formation, may be divided into, 1. general and local, referring to the residence, and, 2. special, referring to the individual infested by them, his constitution, habits, diet, &c.

Of the first division, the most general is climate. In certain countries worms prevail more than in others; and hence their frequency in Holland, where there is no want of personal cleanliness, or attention to the food; but the constant moisture of the atmosphere, both producing general weakness, and acting hurtfully on the skin,—the state of which, owing to the sympathy existing between it and the digestive organs, influences greatly the health of the body,—farther predisposes to their development. We see the same causes operate in producing the rot in sheep, which is always accompanied by the presence of a worm (the *Distoma hepaticum* or *fluke*) in the liver; and we shall find the same means prove successful in preventing their formation in both cases: as only sheep feeding in wet pastures, such as marshes, are subject to the rot.

Dwelling in an impure air, where there is not sufficient ventilation, prepares the body for becoming the seat of worms, and hence their greater frequency among the crowded inhabitants of towns than among the peasantry.

The effect of these general causes is to produce a weak state of the system, the existence of which, however occasioned, seems the first requisite for the developement of worms. When in addition to these there are other causes which operate only on individuals, we perceive the reason why one person becomes subject to worms, from which another person continues exempt. This naturally conducts to the second set of causes, connected with the individual affected by these parasites. These we shall find to be a constitution, either hereditarily weak, or debilitated by sedentary occupations and improper diet. Accordingly, those most subject to worms are females and children, especially of a scrophulous habit. In these last there exists very commonly weakness of the digestive organs, along with an immoderate craving for food, which injudicious parents and nurses are too apt to indulge—regarding it as the sign of a good appetite—by which more aliment is introduced into the stomach than it can conveniently digest, and consequently the stomach and bowels become clogged, both by the undigested matters remaining in them, and also by the unhealthy secretions, which, under such circumstances, are invariably poured into them. The articles given to satisfy this craving, which generally shows itself between meals, are almost always those which experience has shown to be the most calculated to favour the production of worms, viz., articles of too farinaceous a kind, as biscuits, cakes of different sorts, or bread and butter, or cheese: for milk, and the preparations of it, which we have just mentioned, seem to dispose to the formation of worms more decidedly than anything else.

The presence of worms in the intestines cannot always be determined by any one, or even by the concurrence of many symptoms, for enormous tænias (*tape-worms*) have sometimes been passed, of the existence of which not the least suspicion was entertained by the individual; nor was any derangement of the health observable. But we are justified in suspecting them to be present where the appearance and expression of the countenances are much altered from the natural state; when it is of a pale, somewhat leaden, hue, subject to sudden flushings, often limited to one side of the face, where the eyes have lost their brightness, the pupil is enlarged, and the lower eye-lid surrounded by a livid circle. In addition to these symptoms, the nose is often swollen, and affected by an intolerable itching, or frequently bleeding; there are pains in the head, with ringing of the ears; the tongue is coated, and the breath disagreeable. The appetite is very variable, sometimes there is none, at other times it is ravenous. there is often a feeling of sickness and a disposition to vomit; occasionally there are violent cholics, the bowels irregular, seldom costive, more frequently loose; the stools slimy, sometimes tinged with blood; the belly swollen and hard, while there is generally a wasting of the rest of the body; the urine is rarely clear, often of a milky appearance. The sleep is disturbed, and the child grinds the teeth; during the day, it is indolent, and very variable in temper.

It is necessary to be thus minute in stating the symptoms of worms, as, sometimes on very slight grounds, individuals have been subjected to a long and severe course of treatment for worms, when none existed; while, too often, they are allowed to commit their ravages unmolested, and to plunge the unhappy victim into a state of great misery and suffering, and even to lead to a fatal termination. We are not willing to attach full credit to all the horrible consequences attributed to worms, but that they often produce many serious diseases, and aggravate others, is certain.

The number of different kinds of worms infesting the stomach or intestines of man is not very great, but they propagate their species often with astonishing rapidity. We shall enumerate the most common sorts, following the nomenclature of Bremser, (*Lebende Würmer in lebenden Menschen.* Wien, 1819; also translated into French, by Dr. Grundler, Paris, 1828. *Traité des Vers Intestinaux*).

The *Trichocephalus dispar*, (or *long thread-worm*,) found in the upper part of the large intestines (or *Cœcum*), *Oxyuris vermicularis*, (*Ascaris vermicularis*, the *maw*, or *thread worm*), which inhabits the rectum, or lowest intestine; *Ascaris lumbricoides*, (the large round worm,) mostly found in the small intestines; *Bothriocephalus latus*, (*Tænia lata*, the *broad tape-worm*,) found in the small intestines, (principally of the inhabitants of Russia, Poland, and Switzerland. seldom met with in Britain;) *Tænia solium*, (the *tape-worm*,) in the small intestines, generally alone, but occasionally three or four together: the *Distoma hepaticum*, (or *fluke*,) is sometimes found in the liver and gall-bladder of man, but more commonly of sheep, goats, &c.

The worms which are occasionally found in other parts of the body are not under the influence of the medicines termed *anthelmintics*, and we therefore leave them unnoticed here

To assist us in distinguishing the particular kind of worm present in the intestinal canal, and to regulate thereby our treatment, it is proper to mention that the maw, or thread worm, and large round worm, are most common in youth, and the tape-worm in adult age.

From what has been said above, the principles of treatment may readily be deduced: these are, to strengthen the individual, and weaken the worms, which facilitates their expulsion, and diminishes the tendency to their formation. This last is a point of great practical importance; for not only is it of little use to expel worms already existing in the intestines, unless we remove the tendency or disposition to their production, but, very frequently, many of the articles inconsiderately administered, (which however are regarded as valuable anthelmentics, because, by their operation, they bring away worms,) often do more harm to the individual who takes them than to the worms. It is clear that all articles which by their sharp angles merely irritate the worms must do much more injury to the inner coat of the stomach and intestines, and cannot possibly be introduced or insinuated between the mouths of the animals and the surface to which they are attached. The wood-cut (*fig.* 4) shews by what a number of hooks the *tape-worm* attaches itself to the gut. When we see these, need we wonder at the difficulty of expelling this formidable and most determined parasite?

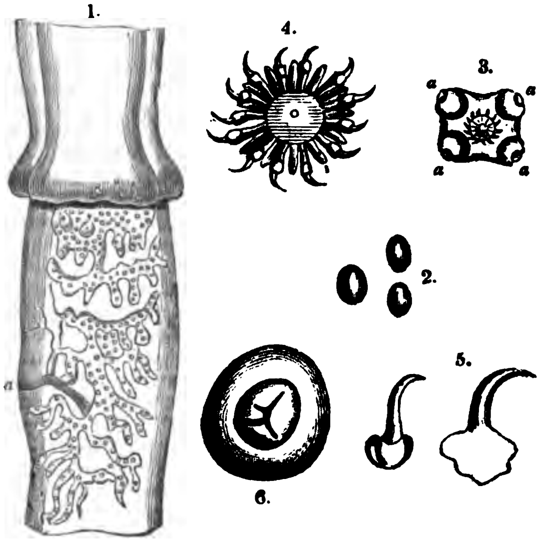
The means employed to effect the ends proposed are very numerous, but reducible to three heads: viz., those which by increasing the peristaltic motion of the intestines, displace the worms, and often occasion their expulsion, as purgative medicines of different kinds; those which tend to increase the strength of the stomach and intestines, and system generally, as tonics, or analeptics; and lastly, those which are conceived to act in an especial manner on the worms, dislodging, weakening, or killing them—or anthelmintics, in the strict sense of the word. Our means must be varied, for not only are the different kinds of worms limited to different parts of the intestinal canal, and the species of worms infesting it different at different periods of life, but particular substances are found to be more efficacious against one species than against others.

As a part of the general treatment of worms, purgatives are indispensable, and those should be selected which bring away the greatest quantity of slime; but the frequent repetition of such is inexpedient. Calomel with jalap, or scammony may be given, with the interval of two days between each dose, two or three times, followed by tartrate of antimony in very small doses, for a week: this may be succeeded by aloes, with antimonial powder, which last being laid aside, preparations of iron alone, or with gentian and canella, may be united with the aloes. This plan may be pursued, whatever be the kind of worm supposed to be present, being merely intended to improve the general health of the patient. When the strength is somewhat increased, cold, which is very pernicious to the worms, may be added to our means of cure, and employed in various ways. Large quantities of cold water, rendered still colder by dissolving in it, immediately before drinking, a quantity of common table-salt, or muriate of soda, may be taken. Sea-water may also be drunk with great benefit.

Among our purgative means we must not omit to mention sulphate of potass and rhubarb, to which, if there be nervous symptoms present, such as a tendency to epilepsy or hysteria, valerian may be advantageously added. Different mineral waters are of great service, particularly in the treatment of the maw-worm. These both remove the slime in which the worms nestle, and diminish the tendency to its formation. With this view we may have recourse to the Beulah Spa at Norwood, to Cheltenham, and above all, to the sulphureous springs of Harrowgate, followed by chalybeates there, or at Tunbridge.

The means of strengthening the digestive organs, consist of tonic and astringent medicines, both vegetable and mineral. Vegetable bitters are doubly advantageous, since they both strengthen the stomach, and prove direct poisons to the worms: of these, the best are chamomile tea and infusion of quassia, or gentian, to which muriatic acid, or tincture of muriate of iron may be added; for children the tartrite of iron, being almost tasteless, is advisable. The utility of vegetable bitters is proved by the fact, that wherever the *menyanthes trifoliata*, (*bog-bean*,) or the tormentil, grows, however damp the pastures may be, the rot never infests the sheep. A similar immunity from the rot is generally enjoyed by sheep fed on the salt marshes, or where salt is regularly mixed with their food. (See *Reports of Lord Somerville.*) The omission of a proper quantity of salt with our food favours the engendering of worms. The great tendency to the formation of worms in Holland has been mentioned, and when ‘the antient laws of that country ordained men to be kept on bread alone, *unmixed with salt*, as the *severest* punishment that could be inflicted upon them in their moist climate, the effect was horrible; the wretched criminals are said to have been *devoured by worms*.’ The medicines enumerated constitute the most effectual means of preventing the return of worms; those which follow are deemed the best for expelling particular kinds of worms. The tape-worm (*Tænia solium*) is almost invariably expelled dead, by a large dose of oil of turpentine; and even the *long round worm* is influenced by it in somewhat smaller doses. Scarcely any other article need be employed, unless the disagreeable smell and taste be objected to, when the *brayera anthelmintica* should be given as at once safe and efficacious: we might naturally expect this result, since it belongs to the same natural family tribe as the tormentil, viz. the *Rosaceæ*. The root of the pomegranate is much esteemed in India. No reliance should be placed on the root of the male fern, as it is only useful against the *Bothriocephalus latus*, or *broad tape-worm*, which, though common in Switzerland, is rare in Britain.

The *long round worm* is almost invariably expelled by the *Spigelia Marylandica*, or Indian pink, which belongs to the same natural family as the bog-bean, or water trefoil, viz., the *Gentianæ*. The *Oxyures*, or maw-worms, are the most troublesome to the patient, and the most difficult to remove, as medicines taken by the mouth are too much altered before reaching the rectum to produce any great effect. After the employment of the above-mentioned general measures, we should use local means only. The intolerable itching which they occasion about the rectum, is best relieved by a lavement of sweet-oil. A lavement of very cold water, or lime water, may be useful, if after it, a portion of aloes be introduced, and left to dissolve in the bowel. Injections of tobacco, and the use of all such dangerous articles as bear's-foot, (*Helleborus fœtidus*,) are to be avoided. The same may be said of tin-filings, cowhage, and all things which can act only as mechanical irritants.



1. Two joints of the Tænia solium, tape-worm, magnified, in one of which are seen the numerous ova, or eggs. *a.* The oviduct by which they pass out. 2. Some of the eggs, much magnified. 3. Head of the animal, seen in front to show the mouth in the centre, surrounded by a circle of hooks, and the four suckers, *a. a. a. a.*, of which two are alternately protruded, and two retracted. 4. The mouth with its hooks. 5. Two of the hooks, very greatly magnified. 6. A sucker, much magnified.

ANTHEM, in music, a word of doubtful origin, but supposed to be derived from *ἀντιφωνία* (see Antiphony), because antiently sung alternately by the two sides of the choir: it then, however, was originally but a simple hymn, or kind of psalm tune. The term is now applied to those compositions in use in all our choirs, set to verses from the psalms, or to any portion of the Scriptures or liturgy, and the *anthem* may be for one, two, or any number of voices, but rarely exceeds five parts.

There are three kinds of *anthem*,—*verse*; *full, with verse*; and *full*. The first, which is solo, or duet, &c., has only one voice to a part, and, requiring nicety of execution, is generally assigned to the best singers in the choir. The second, consisting chiefly of chorus, is sung by the whole choir, but the verse parts by single voices. The third is chorus wholly, and performed by all the voices.

The English school has always excelled in the composition of *anthems*. Tallis led the way in full anthems, and was immediately followed by Birde and Farrant. Their harmony is quaint, but indescribably solemn, and in true keeping with the Gothic structures wherein it was first heard, and still continues to resound,—fanes whose ‘high embowed roofs’ soften and blend the tones of the ‘full-voiced choir below,’ and give an effect to the music which, Milton might well say, ‘brings all heaven before our eyes.’ Orlando Gibbons soon succeeded those masters, and in the same kind of anthem—but highly elaborated, and enriched with whatever florid counterpoint could supply—brought forth works that have always been, and must ever continue to be, admired, not for their ingenuity only, but their effect. Blow was one of the first to introduce the verse anthem, but his compositions, dry and stiff, are become nearly obsolete. Purcell, his pupil, produced numerous anthems, some few of them exhibiting striking beauties, and much grandeur of conception, but the majority, being written in the manner of his master, are more learned than pleasing. Michael Wise and Jeremiah Clark made our cathedrals acquainted with natural and pathetic melody; and Doctors Croft, Greene, Boyce, and Nares, in anthems of all the three species, united air and harmony, genius and learning, in a manner unequalled; though it is to be regretted that their works are so little known, except where choir service is performed, and so seldom heard, if ever, in our parochial churches and other places of worship.

A'NTHEMIS is the genus of plants to which the useful herb chamomile belongs. It is of the compound flowered order, and is distinguished by having the scales that surround its flower-heads membranous at the border, like those of a chrysanthemum, from which genus it, in fact, differs chiefly in the receptacle of the flowers being furnished with little chaffy projections.

Anthemis nobilis, or chamomile, is frequent in a wild state on many of the commons near London, where it adds a peculiar richness of colour and fragrance to the turf. It is a very dwarf plant, with finely-cut leaves; its flower-heads are white in the ray, but deep yellow in the disk; all the parts are intensely bitter, but especially the little yellow flowers of the disk: for this reason the wild blossoms are far more efficacious than those of the cultivated sort, in which there is scarcely any disk; the flowers of the ray having almost entirely usurped their place. Besides the bitter principle for which chamomile is so celebrated, it has been found by chemists to contain camphor and tannin, and also a volatile oil of a beautiful blue colour.

There is another wild plant, called *Anthemis cotula*, or mayweed, which must not be confounded with chamomile, to which it bears great resemblance: it may be distinguished by its being an erect branching plant, with an exceedingly disagreeable and powerful odour.

Anthemis tinctoria is used in France by the dyers for the sake of a brilliant yellow tint, which is obtained from it.

ANTHER. The part thus named in plants is the upper half of the stamen, or fertilizing organ, of a flower; it is the case which contains the pollen in which the principle of fertilization is inclosed. An anther generally consists of two hollow lobes, lying side by side, and united by a fleshy body, which is sometimes of great size, but more usually extremely small, and called the connectivum. Their position is, for the most part, such that, when they open, the line by which they burst is next the stigma, so that the pollen they emit may fall upon that organ; but to this there are many exceptions, and we sometimes find the anther so placed, that it is impossible to explain the manner in which its pollen can reach the stigma, without supposing the pollen to be conveyed by insects.

The deviations from the usual structure of the anther are caused, in most cases, either by the augmentation or suppression of some of its parts. For example, the lobes sometimes grow together into one, and then the anther is only one-celled, instead of two-celled; or one of the lobes of the anther never grows, and then also it is one-celled. In other cases, each lobe is divided into two partitions by a plate that springs out of its back in the inside, and then an anther becomes four-celled. Anthers generally open by a line that passes along the face of the lobes from end to end; but it not unfrequently occurs, that a portion only of this line opens, and then they are said to burst by pores, as in the potato blossom.

The most singular deviations from regular structure are those in which the connectivum becomes excessively enlarged. In the hand-flower of Mexico, it is coloured deep red, and so long and fleshy as to be far larger than the lobes, and to resemble the talon of a bird of prey. In many of the ringent flowers it spreads horizontally, till the lobes are quite separated from each other at the base, and thrown from a perpendicular into a horizontal position; and in the common sage it forms a long, flat body, which looks exactly like a second filament placed across the first one.

The dehiscence, or act of bursting, of the anther, should take place at the exact time when the stigma is ready to receive the influence of the pollen, and this is insured by the following beautiful contrivance of nature. At the time when the flower is closed, all the parts contain much more watery matter than after its bursting; this superfluity of water is got rid of by the pistillum absorbing it like a sponge from the surrounding parts; by degrees the anther among the rest becomes dry, and as soon as that happens an immense number of tiny springs which line the anther, having no appreciable individual force, but a considerable power when combined, begin to contract sideways, and at last pull asunder the two sides of each lobe, which give way at the line of dehiscence above referred to, and the pollen falls out, or is ejected, according to the degree of rapidity with which the springs contract. It is scarcely possible to find in all the animated world a more striking proof of the perfect design with which every part of every living object is fitted for the fulfilment of the end of its creation.

If an anther is looked at in its most usual state, it seems so different from any other organ in plants, that one would not suspect it to be what it really is, a part of a petal in disguise. But if we look at a double rose, or a double pæony, or almost any other double flower in which the stamens are changed into petals, we shall find abundant proofs that an anther is only the upper end of a petal in a contracted state; each lobe will be seen to answer to one side of the petal, and the connectivum to be the central part of the petal; or if the evidence afforded by a double, and, therefore, a monstrous, flower be objected to, take a white water-lily, and you will see so insensible a transition from petals to stamens, that no one can say where the limit is between them, for many of the parts are half petals and half anthers. Botanists have numerous anatomical facts by which the real nature of anthers is further proved, but this would not be the place for an explanation of them; we can only point out to our readers the curious circumstance, that what are considered totally distinct organs, may be often shown to be nothing but other organs in masquerade. [See Filament, Pollen, Stamen, Sexes of Plants.]

ANTHO'LOGY, a compound Greek word, used metaphorically, signifying *a Garland of Flowers*, viz. of poetry, and consisting of short poems on amatory, convivial, moral, funereal, monumental, descriptive, dedicatory, satirical, and humorous subjects. Their characteristic merit consists in the just expression of a single thought with brevity and poetic beauty. The compass of a few couplets admits not of sublimity, but is well fitted to exhibit elegance without tediousness. The term *anthology* is peculiarly appropriated to a collection of Greek epigrams, taking the word not in the confined sense in which we now use it, for a pointed and witty conceit, but in the more enlarged and literal acceptation, of an *inscription*. The earliest and closest application of the term epigram was to certain short sentences inscribed on offerings in the temples. Inscriptions on buildings in general, on the statues of gods, heroes, living or dead men, next came under the denomination. They might be either in verse or prose. Their brevity, easily impressing striking events or illustrious names on the memory, recommended them also to general purposes. A moral precept, or the main bearing of a law, was embodied in this convenient form. The lover was sure to breathe out his passion in a simple strain of tenderness and gallantry. Hence, every little poem presenting one distinct idea, or insulated argument, gradually acquired the title of epigram. The largest portion of those collected in the Greek Anthology was written in honour of the dead, introducing their names and characters, or occupations; or as tributes to beauty, in gratitude for acceptance, or in complaint on account of rejection; some of them are panegyrics on living and illustrious virtue; others contain brief records of remarkable events; others again consist of observations on human life, for the most part in a dark style of colouring. The weariness of old age, the shortness and unsatisfactory tenor of human life, the murmurs of sickness, and the miseries of poverty, are favourite topics. Bacchanalian poetry is mixed up with exhortations to eat and drink, for to-morrow we die. This prevailing tendency must be ascribed to the vague notions, undefined prospects, and differently sustained hopes respecting our transition into some other state of existence by which the philosophers, poets, and ordinary men of these times were equally perplexed. But, however gloomy this view of things might be, it was compatible with a not unpleasing pathos, and raised their amatory and convivial effusions above vulgar voluptuousness, or mere festive riot.

Meleager the Syrian, whose exact date seems difficult to fix, lived probably somewhat less than a century before the Christian æra, and is generally understood to have first collected the scattered fragments of the Grecian inscriptive muse. More than one person bearing the name of Meleager has been mentioned by Diogenes Laertius and by Athenæus. but the internal evidence of two epigrams seems to determine the epoch of that Meleager to whom we owe this beautiful collection. Its interest mainly arises from its being a record of the intellectual vigour of Greece in its declining days, when her energy, whether in arms or in arts, had become less active, but had not entirely died away.

To criticize, or even to name, the host of authors comprised in this collection would be tedious: we shall barely mention the successive forms in which it re-appeared. Philip of Thessalonica continued the work about the time of Tiberius. The additional compositions were less interesting, but still pleasing. In the sixth century, Agathias collected the miscellaneous fragments of his time, and added his own contributions to the expiring muses of Greece. The bent of his own mind towards poetry seems to have been strong; in early youth he had produced a collection of amorous poems, entitled *Daphniaca*, which would have done honour to better times. He had a coadjutor in his friend Paul the Silentiary, an officer in the court of Justinian, corresponding to the modern gentleman-usher, whose topics were desultory, and his style that of the courtier and the voluptuary. From the decay of manuscripts, and the zeal of the clergy in the dark ages against all works of imagination or of gaiety, our present collection, although large, has lost many of its brightest and earliest ornaments; and it so happens, that it retains more pieces from the compilation of Agathias, than from that of his two predecessors conjointly.

In the tenth century, Constantinus Cephalas saved these manuscripts from oblivion by re-editing them. Maximus Planudes, a monk of the fourteenth century, was the last collector. His selection was marked by a want of discrimination. The first printed edition of the *Anthologia* was that of Lascaris, accompanied with some Greek verses by the editor, and a Latin epistle to Pietro de' Medici. It bears the date of Florence, 1494. Claude de Saumaise, better known to the world by the Latin name of Salmasius, and to Englishmen as the antagonist of Milton, who lived in the sixteenth and the first half of the seventeenth centuries, detected the unfitness of Planudes for the duties of an editor, by the discovery, in 1606, of a MS. in the library of Heidelberg. The history of this MS. may be seen in Schoell, (iii. 42, &c.) During the eighteenth century, Suidas and the manuscripts in the public libraries of Europe were ransacked, and a valuable booty of epigrams, undiscovered or rejected by Planudes, enriched the *Analecta* of Brunck and the *Anthologia* of Jacobs. The former work, *Analecta Veterum Poetarum Græcorum*, is contained in three volumes, octavo, Strasburg, 1772-6: the latter in thirteen volumes, octavo, Leipzig, 1794-1814. Jacobs was partly led to his undertaking by the motive of excluding the extraneous matter in Brunck's edition, picked up from fragments of the minor Grecian poets, which did not come properly within the definition of an anthology: but Jacobs himself retained the lyrics and elegiacs of Simonides, the remains of Archilochus and Bacchylides, and the hymns of Proclus. The edition of Jacobs is the latest, and best. But there is much matter strictly applicable to this purpose still left unedited. There are some inscriptions, for instance, in the Elgin collection of the British Museum, that ought to be added to any future edition.

A volume of translations, chiefly from the Greek *Anthology*, was published in 1806 by Messrs. Bland and Merivale, with contributions from other gentlemen. This has been twice republished; once in 1813, with a considerable mass of extraneous and irrelevant matter in the shape of notes and illustrations, both in prose and verse; and again in 1833. In the last edition, the superfluities of the preceding one are removed, and a number of additional specimens, many of them by younger translators, are introduced: and in this state the work may be recommended as presenting a very elegant and faithful specimen of the original Greek Anthology, and one which is not likely to be surpassed. (For a full account of the editions, &c. of the Anthology, see Schoell, *Geschichte der Griech. Litt.* vol. iii.)

ANTHONY, ST., the first institutor of the monastic life, was born at a village in Upper Egypt, in the year 251. His parents, who were wealthy, are said to have prevented him, when young, from acquiring any other language than his native Coptic. Having understood some passages of our Saviour's precepts in their literal sense, he distributed the property which came to him by inheritance, at an early age, partly among his neighbours and partly to the poor; and having placed a sister who was committed to his charge in a house of virgins, retired to a solitude in the neighbourhood of his native village, where he is represented to have been tempted by the devil in a great variety of shapes. In this retirement he was reputed to have received the gift of miracles. A great number of disciples, in consequence, crowded about him, at whose importunity he erected various monasteries, where they passed their time in acts of devotion and in manual labour. He is said to have erected his first monastery at Phaium, near Aphroditopolis, about the year 305.

In 312, during the persecution under Maximinus, he went to Alexandria to encourage and give consolation to the Christians, who were suffering martyrdom; and about the same time, built a second monastery called Pispir, near the Nile.

After a long residence in the place of his first retreat, he withdrew farther from his native village, to Mount Colzum, near the Red Sea, where he made a ruined sepulchre his residence. Here also followers flocked to him, and fraternities for seclusion and mortification were formed under his example; and here he was again assailed by the devil.

Toward the close of life, about the year 355, St. Anthony again went to Alexandria, at the request of Athanasius, to defend the faith against the Arians. At this time he is said to have converted many to Christianity. Declining to accept an invitation from the Emperor Constantine to visit Constantinople, he returned to his cell, where he died in the year 356. The most antient martyrologies naming him on the 17th of January, it has been concluded that that was the day of his death.

Seven of St. Anthony's letters, written originally in Coptic, but translated into Latin, are extant in the *Bibliotheca Patrum*. His life was written by his friend St. Athanasius. St. Anthony left one of his sheep-skins, with the cloak in which he lay, to Athanasius; his other sheep-skin to the bishop Serapion; and his hair shirt to Macarius and Amathas, two brethren, or disciples, who were with him at his death.

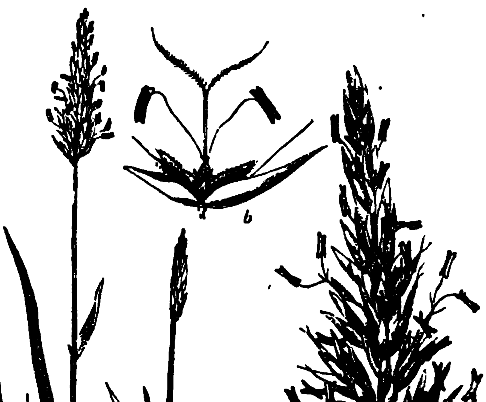
Among the miracles believed to have been wrought by his intercession, was the cure of the distemper called the sacred fire, since that time called St. Anthony's fire, and in modern days erysipelas. In 1095, a religious order was founded in France, called the Order of St. Anthony, the members of which were to take care of persons afflicted with this disorder.

The temptations of St. Anthony were favourite subjects with the early engravers; probably from the scope which they afforded for invention and imagination. Vasari says that Michael Angelo, when a boy, was so struck with Schongauer's print of St. Anthony tormented by devils, (the earliest of these productions,) that he copied it in colours. (See the *Acta Sanctorum* by the Bollandists, January 17; Alban Butler's *Lives of the Saints*; Moreri: and Cave's *Historia Literaria*.)

ANTHONY, ST., FALLS OF, are in the Mississippi River, in 45° N. lat., immediately above the junction of St. Peter's River. [See MISSISSIPPI.]

ANTHONY'S, ST., FIRE. [See ERYSIPELAS.]

ANTHOXANTHUM, a genus of grasses, one species of which (*A. odoratum*) is well known to farmers under the name of the *sweet vernal grass*. It is a small annual plant, bearing its flowers in short heads, which are not very compact, and broader at the bottom than the top. The flowerets of which it is composed are a pale, yellowish green; each consists of two sharp-pointed, smooth glumes, within which are two other dark-brown, hairy paleæ, each having an awn at its back; the stamens are only two in number. This grass is of little importance for its nutritive qualities, but it is much esteemed for the sweet smell of its leaves, which causes much of the well-known fragrance of new-mown hay



Anthoxanthum odoratum.
a, a flower-head magnified. *b*, a floweret more magnified.

ANTHRACITE, a black, light, mineral substance, resembling coal; so named from *ἄνθραξ, anthrax*, charcoal. It is also called *blind* coal, because it burns without flame; and *glance* coal, from the German word *glanz* (lustre), because it has often a shining surface like graphite, or blacklead, as it is improperly called, the substance of which pencils are made, and to which it is very closely allied in composition. In some systems of mineralogy it is divided into *massive*, *slaty*, and *columnar* anthracite; but these are mere accidental varieties of structure, and are all of the same chemical composition, when the pure anthracite is separated from the matrix, or from the foreign matter with which it is mechanically mixed. Its specific gravity is about 1400, water being 1000; it is slowly combustible, but without flame, and according to the analysis by Schaub of a specimen from the Meisner, it contains 96 per cent. of pure carbon: it is, in fact, a mineral charcoal. Naphtha may be considered as one extremity of the mineral carbonaceous substances, and anthracite as the other; and from the highly-inflammable fluid naphtha, we have numerous varieties of mineral tar, or petroleum, bitumen, asphaltum, cannel coal, caking coal, slaty coal, &c., all diminishing in inflammability, until at last we come to the blind coal, or anthracite. If asphaltum, or indurated mineral pitch, be subjected to distillation, at a certain stage of the process, when it has lost a part of the bitumen which it contains, it resembles caking Newcastle coal; continuing the distillation, it passes into a substance which is identical with anthracite, both in appearance and composition. It very often happens that the coal strata in our mines are traversed by dikes of basalt; and it is a frequent occurrence in such cases, that the coal, where it comes into contact with the basalt, is converted into anthracite, often to a considerable depth, and it sometimes acquires a columnar structure. From these circumstances, geologists have drawn two inferences: first, that the basalt, when it came in contact with the coal, must have been in a melted state like lava, the heat driving off the bitumen of the coal; and, secondly, that anthracite, when found in other strata than the coal-measures, may very probably be coal altered by heat. Small quantities of anthracite are found in the primary strata of most countries, as, for instance, in the old slate of Cornwall, Devon, and Cumberland, where the appearances led to borings and other works in search of coal. It has been frequently met with in the rocks of the transition series, but it was never known to exist in rocks of that period in considerable quantity, until Mr. Weaver, three years ago, in a paper on the geology of the South of Ireland, described beds of anthracite occurring in clay-slate and grauwacke, so thick as to be regularly worked for the purpose of burning the lime of the district. He says that the most considerable collieries have yielded 25,000 tons annually, and adds, that all the coal of the province of Munster, with the exception of that of the county of Clare, is of the same sort. It is remarkable, too, that this anthracite coal, and a slate highly charged with pyrites, which accompanies it, are full of impressions of plants of the fern tribe, such as equiseta and calamites, analogous to those found in the true coal-formations; this is an important circumstance with reference to the history of anthracite, and gives strong countenance to the opinion that this substance, even in the oldest of the stratified rocks, is of vegetable origin. It is found in many of our coal-mines, but generally in those situations where the coal comes in contact with basalt. It is also met with where basalt comes into contact with carbonaceous deposits of more modern date, as at the Meisner, a mountain near Eschweg, in Hesse.

ANTHROPO'GRAPHY, a term designed to express the object of one branch of physical geography.

The object of anthropography, which literally signifies *man-description*, is, to describe the actual geographical distribution of the human race; to classify it according to the varieties of physical character and language; to distinguish between nations or tribes which have the same general physical character and speak the same language, and nations or tribes which seem to belong to one stock, and have from circumstances adopted the language of another stock; to describe briefly the religious and domestic usages which constitute the basis of national character.

The term ethnography (nation-description) is sometimes used by German writers in the sense which we have given to anthropography; though, as far as we have observed, when so used, the word ethnography is rather more limited in its signification than that which we have assigned to anthropography. Some German writers use also the word *Völkerkunde* (people-knowledge) as an equivalent to ethnography. But ethnography has of late years been rather used to express an historical investigation into the origin and migrations and connexion of various peoples. Taking it in this sense, ethnography is purely of an historical character, and may be considered as distinct from anthropography. A series of anthropographies, of different epochs, would form the true basis of ethnography.

ANTHROPO'LOGY, derived, like most of our other terms in science, from the Greek, implies the science or theory of man. It has been little cultivated among us as a separate study, notwithstanding its obvious importance, and has never, we believe, been made the subject of an especial course at our universities. It is otherwise, however, in Germany, where various professors have read lectures on it, and subsequently published their treatises. Of these, by far the most distinguished is that of Kant, the last, and from its nature, as divested of abstruse speculation, the most popular of his works. It was published by him about the year 1798, from his text book, having been for thirty years accustomed to give a winter course of lectures on this subject, and another during the summer on physical geography, to a mixed audience, as a relief from his more severe duties as professor of pure philosophy. His observations supply the best notion of that which ought to constitute such a science, and the uses to be drawn from it, when properly executed.

A theory of the science of man, systematically executed, may either be directed to explain the phenomena and principles of our corporeal nature—and in that case it would be properly called *physiological;* or it might be calculated to furnish instruction for the cultivation and improvement of our intellectual and moral powers, and the knowledge of man, both as an individual and a species, in which case it might be termed pragmatical anthropology. The former, it is evident, turns on the investigation of what nature makes of man—the latter on what man, as a free agent, either makes, or can and ought to make of himself. If the cause of memory in man is assumed to be impressions left behind in the brain, he must be content to remain a mere spectator of Nature's mechanism, and can turn his observations to no account: whereas, if he applies his experience of what has been found useful or prejudicial to memory, in order to acquire greater power or facility in its exercise, the knowledge thus obtained, being formed into a system, would constitute that branch of anthropology which we have called pragmatical, and which it would be useful for him to cultivate.

Such an anthropology, considered as knowledge of the world, is subsequent in its cultivation to the period of academical studies; it considers man as a citizen of the world, and has nothing properly to do with the natural varieties of the human race: neither does it invade the secluded circle of what is called the great world, the individuals of which are too near to each other, and too remote from the rest of their species, to be observed with advantage. Among the best means for cultivating it, after laying in a proper store of that general information which takes precedence of all local and partial knowledge, is travel, and the reading of travels—to which may be added as aids, if not direct sources of anthropology, history, biography, the drama, and even novels and romances.

The chief obstacles to its acquirement, and attaining the rank of a science, are, in others, the unwillingness to be observed—*in ourselves*, the counter check, that while we are under any emotion, we cease to observe, and when we observe, the emotion ceases: lastly, the force of habit, which perplexes our judgment, both as to what by nature we ourselves are, and what our neighbour is.

A systematic, and yet popular anthropology, such as is described in the following outline of Kant's work, illustrated with examples accessible to all readers, is calculated to be of great utility, by affording, in the copiousness of the tabular heads under which our active qualities are arranged, so many occasions and inducements to select any one for special study and classification in its proper department. In this manner, the separate labours of individuals, and even casual contributions, would, in the unity of the plan, acquire a spontaneous distribution and progressive concentration towards a whole—thus forwarding and accelerating the growth of so useful a science.

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(See Kant's *Anthropologie in Pragmatischer hinsicht.* Fourth edition. Pp. 323. By J. F. Herbart. *Leipzig*, 1833.)

ANTHROPOPHAGI. [See CANNIBALS.]

ANTHROPOMORPHISM, a compound Greek word, literally signifying 'the representation of human form:' but it is properly used to signify the 'representation of divinity under a human form;' and the nations or sects who have followed this practice have been sometimes called Anthropomorphites. The Egyptians represented deities under human forms, as well as those of animals, and sometimes under a combination of the two. The antient Persians, as Herodotus tells us, (i. 131,) adored the Supreme Being under no visible form of their own creation, but they worshipped on the tops of mountains, and sacrificed to the sun and moon, to earth, fire, water, and the winds. The Hebrews were forbidden (Exodus xx. 4, 5) to make any image or the representation of any animated being whatever.

The Greeks were essentially anthropomorphists, and could never separate the idea of superior powers from the representation of them under a human form: hence, in their mythology and in their arts, each deity had his distinguishing attributes and a characteristic human shape. Perhaps no nation has made any progress in the arts of sculpture and painting without applying their skill to the representation of deity. Thus painters in modern times have represented the Supreme Power, and our Bibles have sometimes been illustrated with engravings of this character. In one of the latest editions of the Bible (Mant and D'Oyley's), which is illustrated by engravings, the editors have omitted all representation of God, though there are earlier English editions of the Bible in which the Supreme Being is represented as a man. It might be worth while considering if some improvement could not be made even on Mant and D'Oyley as to the choice of illustrations.

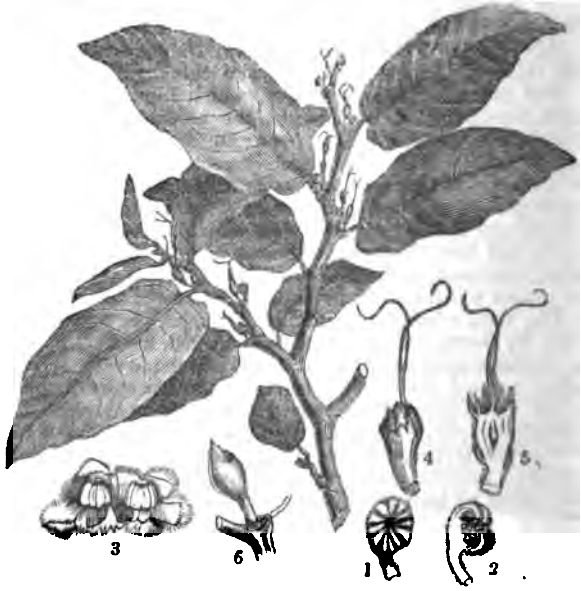
Anthropomorphists is also the name of a sect of early Christians [See HERETICS and SCHISMATICS.]

ANTHUS, (Bechstein,) the Pipit, a genus of birds separated by Dr. Bechstein from the Linnæan genus *alauda*, a separation followed by Temminck, Cuvier, Lesson, and Selby, and justly, for though the pipits have a long hind claw, and are usually coloured, like the larks, their bill is more slender, in consequence of which they never, like them, feed on grain. In the form of the head, in the movement of the tail, and their mode of life, they resemble the wagtails (*Motacilla*) on the one hand, and on the other the bluebreast (*Sylvia Suecica*).

Adhering, then, to the distinction of Bechstein, we characterize pipits by the bill being straight, slender, somewhat awl-shaped towards the point, having the base of the upper mandible keeled, the tip slightly bent downwards, and notched. The nostrils, situated at the sides of the base of the bill, are oval, and partly concealed by a membrane: Feet, with the shank (*tarsus*) generally exceeding the middle toe in length; toes, three before and one behind, and with the outer toe adhering to the middle one as far as the first joint; the hind claw rather long The wings have the first quill very short; the third and fourth the longest in each wing.

We shall give particular details of each species under *Pipit.*

ANTIARIS is the botanical name of the half-fabulous upas-tree, of which so many idle stories were propagated some years since by travellers. It was said to be a large tree, growing in the island of Java, in the midst of a desert caused by its own pestiferous qualities; its exhalations were reported to be so unwholesome, that not only did they cause death to all animals which approached the tree, but even destroyed vegetation for a considerable distance round it; and, finally, the juice which flowed from its stem, when wounded, was said to be the most deadly of poisons. To approach the upas-tree, even for the momentary purpose of wounding its stem and carrying away the juice, was stated to be so dangerous, that none but criminals under sentence of death could be found to undertake the task. As is usual in such cases, this fable is founded upon certain natural phenomena which occur in Java. There is such a tree as the upas, and its juice, if mixed with the blood in the body of any animal, is speedily fatal; and there is also a tract of land in the same island on which neither animal nor plant can exist. But the two circumstances have no relation to each other: the poisoned tract is a small valley completely surrounded by a steep embankment, like the crater of a volcano, and is continually emitting from its surface carbonic acid gas, which is alike fatal to animals and plants; on the other hand, the poisonous upas-tree is not an inhabitant of the valley, for nothing can live there, but it flourishes in the woods, in the midst of other trees which are unharmed by its vicinity. (For particulars concerning this fable, see



Antiaris macrophylla (a diminished figure).

1. a head of male flowers in the involucrum; 2. the same divided perpendicularly; 3. a couple of the male flowers; 4. pistillum; 5. the same divided perpendicularly; 6. a fruit.

Darwin's *Botanic Garden*, and the *Penny Magazine*, vol. ii., p. 322; for an account of the Valley, consult the *Journal of the Geographical Society*, vol. ii., p. 60.)

In the eye of a botanist, the upas is a species of the genus Antiaris, which belongs to the natural order *Artocarpeæ*, a group of plants all of which abound in a milky juice, and many of which are extremely poisonous. (See ARTOCARPEÆ.) Of the original species, *A. toxicaria*, we have met with no scientific figure; it is, however, cultivated in the botanical garden, Calcutta, whence we have a leaf or two. They are very much like those of the following plant, *A. macrophylla*, which has been found on the north coast of New Holland.

The genus Antiaris has its stamens and pistilla in separate flowers. The former are collected in little heads in the centre of a minute three or four-leaved calyx, of which a considerable number is inclosed in a hairy involucrum formed of several fleshy divisions, which are rolled inwards. The pistillum is surmounted by a calyx of several leaves, terminating in a long, two-parted style, and contains a single suspended ovulum. The pistilla and the antheriferous flower-heads stand in pairs, side by side, in the axillæ of the leaves.

ANTIBES, a fortified town and port of France, on the Mediterranean, in the department of the Var, very near the frontier of the Sardinian dominions, 587 miles S.E. by S. of Paris, and about 19 miles S.W. of Nice, 40° 33′ N. lat., 7° 7′ E. long. from Greenwich.

It is a place of great antiquity, having been founded by the Greeks who had settled at Massalia, now Marseilles, as a barrier against the incursions of the Salyes, and the Ligurians who inhabited the Alps. (Strabo, p. 180.) Some accounts state that the Marseillois took it from a tribe of Ligurians; but however this may be, the place probably owed its importance, as well as its name, ('Αντίπολις, Antipolis,) to the Greeks. It was taken from under the jurisdiction of Marseilles, and placed in the rank of an Italic city (Strabo) in the time of Augustus; and appears to have been a flourishing place, to which the tunny fishery may have contributed. The remains of a theatre and some other antient buildings attest its former importance. During the Roman dominion there was an arsenal, and the town was protected by fortifications, of which two strong towers yet remain. After the downfall of the Roman empire, Antibes became subject to successive nations of barbarians, Visigoths, Ostrogoths, and Franks. It was destroyed by the Saracens in the ninth century, rebuilt and repeopled in the tenth, and again plundered by Spanish and Moorish pirates. In 1746, it stood a siege against the Austrians, aided by England and Savoy. It signalized itself in 1815, by shutting its gates against Napoleon on his return from Elba.

It is built on the eastern side of a small peninsula, dividing the gulf of Juan from that into which the Var falls; in a district fertile in wine and fruits, especially oranges, but little productive of the other necessaries of life. The harbour, which is nearly circular, is so choked up with the sand brought by the Var, the mouth of which is only a few miles distant, that, in all the extent of the basin, there is only a space of less than 300 feet by 950 feet where vessels can anchor; and to approach the mole they must not draw above fifteen feet of water. The trade of Antibes, which is but small, is chiefly in oil, olives, dried fruits, and especially salt fish. The inhabitants, who amount to about 5000, are considered very skilful in preparing anchovies.

Antibes is a place of considerable strength, though not in the first class of fortresses. There is a citadel and several batteries and forts for the protection of the harbour. The fortifications appear to have been erected in the times of Francis I. and Henry IV., and improved by Vauban in the days of Louis XIV. Their erection has served to drain the surrounding marshes, and render the air healthy. (*Encyclopédie Méthodique*; *Dict. de la France*; M. Brun; Balbi.)

ANTICHRIST ('Αντίχριστος) means, literally, the opponent of the anointed, or of the Messiah. The name of Antichrist (אנתקרישטס) was given by Jews and Christians to the great enemy of true religion, who shall, according to the Holy Scriptures, appear before the coming of the Messiah in glory. The general woe effected by Antichrist is called by the Jews חבלי משיח or *the pangs* of the birth of the Messiah.

The name of Antichrist occurs in the New Testament only in the first two epistles of St. John: 1 Epist. ii. 18. 22; iv. 3; 2 Epist. 7. In some of these passages false teachers are called Antichrists, and every spirit that confesseth not that Jesus Christ is come in the flesh is not of God: and this is that spirit of Antichrist, whereof ye have heard that it should come; and even now already is in the world. St. Paul calls Antichrist that *man of sin*, the son of perdition; who opposeth and exalteth himself above all that is called God, or that is worshipped; so that he sitteth in the temple of God, showing himself that he is God. That wicked whom the Lord shall consume with the spirit of his mouth, and shall destroy with the brightness of his coming: whose coming is after the working of Satan, with all power and signs and lying wonders. 2 Thess. ii. Emblematical descriptions of Antichrist occur in the twelfth and thirteenth chapters of the Revelations. One of the newest German novels bears the title *Antichrist*.

ANTICOSTI, an island lying in the mouth of the river St. Lawrence, between 49° 5′, and 49° 55′ N. lat., and between 61° 54′, and 64° 30′ W. long.

This island does not possess a single harbour. Its shore on the north side is high, and the water close to the cliff is deep; on the south the land is low, and the water shoal. Some rocky reefs extend to a considerable distance from the shore, and are the cause of numerous shipwrecks. The island is uninhabited, with the exception of two families who have been established here by the governor of Newfoundland, one at the east, the other at the west end, for the purpose of giving help to persons cast away upon the coast. The surface is covered with white cedar, birch, fir, poplar, and dwarf spruce trees, all of which are stunted in their growth. Bears, foxes, hares, and sables are numerous, as well as partridges, curlews, plovers, and snipes The interior has never been explored by Europeans. Such Indians as have visited it in search of game describe it as being mostly swampy.

The Indian name of this island is Natiscoti, of which its present name is evidently a corruption. It is included within the government of the Island of Newfoundland. (Anspach's *History of Newfoundland*; M'Gregor's *British America*.)

ANTIDICOMARIANITES. [See HERETICS.]

ANTIDOTES, from two Greek words, signifying, *given against*; the means of counteracting the effects of poisons. The term *antidote* had formerly a much wider signification, and was applied to the remedies for diseases occurring from natural causes, as well as to the remedies for the derangements of the functions arising from the direct introduction into the system of a known and material poison. Doubtless every disease may be looked upon as springing from some poison; as fevers from an altered and unhealthy state of the atmosphere; or eruptive and contagious diseases from the vitiated fluids or breath of one individual communicated to another, as small-pox, and hooping-cough. This opinion is expressed by the employment of the term *virus*, or *poison*, to signify the immediate cause of such diseases; as when we speak of the small-pox virus, or the vaccine virus.

But as, in the present day, the word antidote is used only to signify the means of counteracting the effects of poisons, strictly so called, we shall confine our observations to what is properly comprehended under the term, when employed in this sense. While thus limiting its signification, it is equally necessary that we should limit the application of the word *poison*. It is, however, extremely difficult to define what a poison is. Foderé considers poisons to be 'those substances known to be capable of rapidly altering or destroying some or all of the functions necessary to life.' This must be understood to apply to their introduction (whether accidentally, intentionally on the part of the person suffering, or criminally on the part of others) into the body when in the usual state of health; for there are certain diseased conditions of the system, which seem to render it incapable of being injuriously affected by doses of medicines which at another time would speedily destroy life; and other states, such as when the body is under the influence of one poison, where another proves the most effectual remedy or antidote. This latter state is strikingly exemplified in the case of the bite of the *Coluber carinatus*, a species of snake common in the West Indies, during the state of stupor or insensibility occasioned by which, a large quantity of arsenic may be given, not only with safety, but with such advantage that the recovery of the patient may be considered as owing solely to it.

To acquire a correct idea of the different ways in which poisons operate in destroying life, we must be made aware that what we commonly regard as an *individual*, is made up of a number of distinct organs, which, though in some respects independent of each other, yet exert a reciprocal influence, the harmonious play of the whole being necessary to the continuous exercise or display of the principle of life, and that a cessation of the functions of any one of the more important organs necessitates the successive suspension of the rest. The most essential of these are consequently denominated the *vital functions*, viz., the circulation, respiration, and innervation. The circulation of red or *arterial* blood through the system, but especially through the nervous matter of the brain and spinal chord, is essential to the existence of the vital properties, and due performance of the functions, of the different organs—which circulation is effected by the action of the *heart*,—while, to render the blood arterial, respiration is necessary, and this is effected by the *lungs*, assisted by a great number of muscles, the co-operation, or simultaneous action of which, is occasioned by the influence of the *spinal chord*, directed or influenced by the *brain*. Now, certain poisons act either solely on one of these organs and functions, or upon two or three, but always in an ascertained order or uniform succession. Oxalic acid, (or the acid of sugar, as it is popularly called,) for example, in a small dose, acts first on the brain and spinal chord, but in a larger dose, also affects the heart: in the former case, the respiration will be perceptibly interfered with, while the heart will go on acting for some time; in the latter case, both will cease at the same moment. Recovery, therefore, is much more probable in the first instance than in the second: for we can carry on *artificial* respiration till the brain and spinal chord have resumed the exercise of their functions; but if, as in the second instance, the heart also has ceased to act, recovery is impossible.

An arrangement of poisons according to their mode of action, *i. e.* according to the order in which the vital functions are successively affected and destroyed by them, would be of great utility in regulating our treatment, teaching us when to be content with the employment of antidotes alone, and when to employ supplementary means,—as artificial respiration, blood letting, &c. At present we can only make an approximation to such an arrangement.

Another point of consequence is the settlement of the question,—Do poisons act solely on the sentient extremities of the nerves of the part to which they are applied, and influence remote organs, only by sympathy, or are they absorbed into the circulating fluids, and by them carried to the organs, whose impaired or suspended functions show them to be markedly affected by them? Without entering into this dispute, it may be stated that some poisons act in the one way, some in the other way, and a few in both. Of these, the first set are the most formidable and the most speedy in their action, allowing little time for the employment of antidotes.

Some poisons act, but with different degrees of violence and speed, whatever part of the body they are applied to; others, again, only when received into the stomach or intestines; while some, such as the poison of the viper, are quite powerless when swallowed. Of all parts of the body, the brain and nervous substance are the least susceptible of the action of poisons, when applied directly to them, though acted upon by so many poisons when applied elsewhere.

With respect to the local operation of poisons, *i.e.* their direct action on the part to which they are applied, some decompose chemically, or alter the structure of (corrode) the part which they touch, and hence they are called *corrosive* poisons; such are the mineral acids, of which sulphuric, or oil of vitriol may serve as an example. Besides this local effect, many of the corrosive poisons act speedily upon remote organs, the impaired function of which may become a source of greater danger than the destruction of the part first attacked.

Other poisons, without immediately altering the structure of the part, irritate it so that inflammation ensues, by which it is altered, and the general system affected, as it would be by inflammation of the same part arising from any other cause—even when the poisonous substance does not produce any immediate or powerful effect upon a remote organ—which is not often the case, as most of them influence some of the vital functions, and thus prove fatal. These are termed *irritant* poisons, such as arsenic; but they are frequently also termed corrosives, though inaccurately.

Lastly, there are poisons which neither corrode nor irritate the part, but cause a peculiar impression upon the sentient extremities of the nerves, which is conveyed along these to some remote organ or organs, the function of which they impair or suspend. Many of these should be termed sedatives, in the strictest sense of the word [see SEDATIVES]; others are narcotics; and those which produce some degree of local irritation, are termed narcotico-acrids. But often one and the same article, according to the dose and mode of administration, acts in all the three ways; tobacco for example.

The selection of appropriate means to counteract the effects of poisons must be determined by a knowledge of the manner in which each particular poison acts; but as we cannot enumerate or specify these here, we shall give only general rules to this effect. These may be reduced to three, viz., 1, to remove the poisonous substance: 2, to prevent or limit its local effects: 3, to obviate its effects on remote organs, supporting their action by appropriate measures, till the injurious impression has subsided. The first of these is to be accomplished mostly by mechanical means. If the poison has been applied to any external part, as by the bite of a viper, or rattle-snake, a cupping-glass, or what will answer as well, a wine-glass, tumbler, or cup of any kind, from which a part of the air has been expelled, by holding within it a lighted candle for a second of time, should be immediately applied. If the poison has been taken into the stomach, and is not of a kind to arrest instantly the action of the heart, its removal is to be attempted by the stomach-pump, or by exciting vomiting. The stomach-pump cannot well be used without introducing into the stomach a considerable quantity of water, which, by diluting the poison, lessens its violence, in all cases, except that of oxalic acid. The stomach-pump is also to be preferred in the case of narcotic poisons, as the insensibility which they occasion prevents the stomach from being affected by emetics. But should a stomach-pump not be at hand, nor any one be present skilled in the use of it, we must attempt to produce vomiting by every means in our power. For this purpose, a table-spoonful of flour of mustard, which is mostly to be found in every house, may be put into a tumbler of warm water, and given to the patient; or a scruple of sulphate of zinc (white vitriol) dissolved in a pint of distilled water; or ten grains of sulphate of copper dissolved in half a pint of any distilled water, as cinnamon, may be drunk by the patient, and the disposition to vomit encouraged by tickling the throat with a feather, and pressing on the pit of the stomach. Neither ipecacuanha nor tartar emetic should be given, as their action is always preceded by much nausea, during which the absorption of the poison is often facilitated.

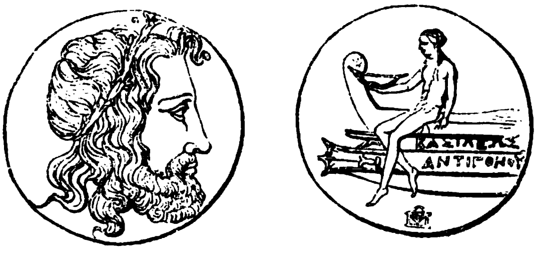
Where the poison is of a corrosive or irritant nature, instead of losing time in seeking the means of causing vomiting, it is in general advisable to adopt the second rule, and attempt to prevent or limit its local, and thereby its remote, effects. To accomplish this, we must ascertain what the poisonous substance was from which the patient is suffering, and must also know how it acts, as upon this depends the success of our treatment. The objects we must have in view are either to dilute, and so weaken it; to supply from an external source the particular principle, which the poison would abstract from the coats of the stomach; or by adding something to it, so change its nature as to render it comparatively or altogether harmless, which last will always be effected if we can succeed in forming an insoluble compound. The first may be done by giving plenty of warm water; and when we know the particular poison, if the warm water can be made the vehicle of an antidote, the second or third object will also be ensured. Suppose sulphuric acid (oil of vitriol) has been swallowed, add to the water, chalk, magnesia, or soap: the chalk will make, with the acid, sulphate of lime, which being insoluble, will do no harm, while with the magnesia the acid will form sulphate of magnesia (Epsom salts), and with the soap sulphate of potash, both of which are purgative salts, and will, by their action on the bowels, assist in lessening the inflammation caused by the poison before it was decomposed. So when sugar of lead (acetate of lead) is swallowed, by giving Epsom salts we form an insoluble sulphate of lead, which will be discharged by the bowels, operated upon by the magnesia, which has been freed from the sulphuric acid. Corrosive sublimate (bi-chloride) of mercury abstracts from the coats of the stomach the albumen which they contain, by which it is converted into proto-chloride, or calomel; now, if by giving white of egg, which is pure albumen, we supply it with the principle which it would otherwise obtain from the coats of the stomach, we shall preserve these entire.

Such means, then, are antidotes, properly speaking; for the means by which the secondary or remote effects are to be combated, deserve rather to be termed counter-poisons. The counter-poisons are of no small value in cases of poisoning by the corrosive and irritant, while they are of the utmost importance in the treatment of the sedative and narcotic poisons. To administer these appropriately, we must know which of the vital organs the poison most speedily affects. When it affects the heart, the symptoms greatly resemble syncope (or fainting), and as such poisons are the most dangerous, agents which act as rapidly as the poisons are alone to be trusted to: such agents are to be found among the diffusible stimuli, ammonia, or its carbonate, *i. e.* smelling salts, applied to the nostrils, or dissolved in water and taken into the stomach, warm brandy and water, &c. Where it chiefly affects the spinal marrow, there occur spasms and difficulty of breathing; and when the brain, there is partial or complete insensibility (coma), often with, at first, full pulse, flushed face, and laborious breathing, resembling apoplexy. In such a state of affairs, artificial respiration, and afterwards bleeding, with the subsequent administration of coffee or vinegar, greatly contribute to save the patient.

We have not spoken here of gaseous poisons, which would lead to unnecessary details. They act either by excluding the common atmospheric air, in which case removal into pure air is required; or by producing inflammation, like the irritant, or oppression of the brain, like the narcotic poisons, and are to be combated on similar principles. It will be more useful to append a list of the poisons which act on the brain, and of those which act on the heart. Of poisons which act upon the brain, the most common are alcohol, *i. e.* spirituous liquors, opium, henbane, hemlock, camphor, and the essential oil of almonds, and of tobacco. Of those acting on the heart, the chief are, infusion of tobacco, and large doses of prussic acid, foxglove, strychnia (principle of nux vomica), oxalic acid, arsenic, preparations or salts of antimony and of baryta, and several animal poisons.

From what has been said on this subject, the great necessity of an acquaintance with it must be sufficiently clear, not only to insure our doing right, but to prevent us from doing wrong. By administering an ill-timed antidote (as we conceive it to be), we often hasten the fatal event: as where vinegar is given when opium has been swallowed, before it has been ejected from the stomach; and by throwing tobacco smoke into the bowels of a person apparently drowned, we extinguish the feeble spark of life which might have sufficed to reanimate him but for such injudicious interference.

It is to be hoped that more just principles of treatment will be diffused among the people, as well as among medical men, by which many lives may be preserved to their families and to the community. [See Poisons.]



Silver Coin, British Museum.

ANTI'GONUS, one of the officers of Alexander the Great, a Macedonian by birth, who took a leading part in the scramble for kingdoms which ensued among that prince's generals after his death, B.C. 323. From that time till his own death, B.C. 301, the history of Antigonus is in great measure the political history of western Asia. It comprises a long and intricate series of wars, in which extensive provinces rapidly changed their masters; but it is chiefly interesting as connecting the rise of the two great dynasties of the Ptolemies and the Seleucidæ with the establishment of the Macedonian empire in the east.

For the immediate consequences of Alexander's death, we refer to Antipater and Perdiccas. In the general distribution of provinces, or satrapies, to the chief Macedonian officers, Antigonus received the greater Phrygia, Lycia, and Pamphylia. But as soon as Perdiccas conceived the project of rendering himself the real master of all the Macedonian conquests, he sought the ruin of Antigonus, as the most likely person to thwart his views. Antigonus saw his danger, and fled with his young son, Demetrius, to Antipater. It does not appear that he took an active part in the short contest which ensued between the European and the Asiatic chieftain: but Antipater, on making a fresh distribution of the Asiatic provinces, added Susiana to Phrygia and Lycia, which Antigonus already held, (we find no mention of Pamphylia in the second division,) and declared him general of the king's forces in Asia, with a special commission to prosecute the war against Eumenes, one of Alexander's best officers, satrap of Paphlagonia and Cappadocia, who had espoused the party of Perdiccas, and still refused to acknowledge Antipater as protector. Antigonus gained a victory over him by bribing one of his chief officers to desert in the hour of battle. Eumenes, unable to keep the field, shut himself up in the strong fortress of Nora; and his antagonist, after drawing lines of circumvallation round him, and leaving a sufficient force to maintain the blockade, marched into Pisidia, and soon overthrew Alcetas, the brother, and Attalus, the brother-in-law of Perdiccas, the only persons except Eumenes now openly hostile to Antipater.

There is some difficulty in settling the chronology of this period, since Diodorus, as our copies now stand, passes at once from B.C. 322 to 319, omitting to mark the intervening years. But the expedition of Antigonus against Alcetas is placed by him in the latter half of 319; and his arrival in Macedonia may be determined to the beginning of 321, in which year Perdiccas died. If therefore we suppose that the winter of 321-20 was spent in arranging affairs upon Antipater's accession to the regency, and that Antigonus commenced his operations against Eumenes in 320, two years will be left for those operations, for the proceedings against Alcetas and Attalus, and for the siege of Nora, which ended after the death of Antipater, and therefore in the course of 318. This seems more time than these transactions require.

Antigonus, on hearing of the death of Antipater, began to attempt the establishment of an independent kingdom in Asia. For this undertaking he was qualified, not only by his talents and skill in war, in which he was inferior to none of the generals trained under Philip and Alexander, but also by the possession of four provinces and a powerful army of 60,000 foot, 10,000 horse, and 30 elephants, and by the commission of the late regent Antipater, constituting him general of the royal forces. This, in the unsettled state of affairs, might be considered almost as good a warrant as any derived from the son of Alexander by Roxana, who, under the tutelage of his grandmother Olympias, had now nominally succeeded Arrhidæus on the Macedonian throne. Considering it of high consequence to gain over Eumenes, he sent the most flattering invitations to that general, while still cooped up in Nora; and Eumenes so far assented to his terms as to take an oath of fidelity to him, conjointly with Olympias and the children of Alexander. Meanwhile he expelled the satraps of Lydia and Hellespontine Phrygia, or Mysia, from their provinces, and took possession of Ephesus, and of four ships laden with 600 talents of silver, on their way to Macedonia.

The state of things in Europe favoured his views. Cassander, son of Antipater, dissatisfied with the inferior station assigned to him by his father, sought, by the assistance of Antigonus, to supplant Polysperchon, and obtain the protectorate. This Antigonus readily promised, hoping that, while the attention of the government at home was distracted by these contests, he should easily establish his own power in Asia. But he found a formidable enemy in Eumenes, who was no sooner at large than a considerable body of his Cappadocian friends and followers collected round him; and receiving from Olympias and Polysperchon a large sum of money, with the command of 3000 of the Argyraspidæ, or Silver-shields, a select body of Macedonian veterans, with the commission of imperial general in all Asia, he declared himself openly in support of the royal authority. He soon collected a strong army; but, unable to make head against Antigonus, he retreated through Cilicia and Cœle-Syria into Babylonia, where he wintered in 317-6, The following summer was spent by the contending generals in a series of marches in Persia and Media: Antigonus being supported by Python, satrap of Media, and Seleucus, satrap of Babylonia; Eumenes by the satraps of the upper provinces, as they were called, lying to the north, and towards India, who were united by a common fear of Python. After a doubtful campaign, closed by an indecisive battle, in which the fortune of war preponderated on the whole against Antigonus, the armies separated; Antigonus taking up his winter quarters at Gamarga, or Gadamala, in Media, Eumenes in Gabiene. A district of nine days' journey separated the two. Crossing this by a forced march in mid-winter, Antigonus endeavoured to surprise the enemy; but his wary adversary was not off his guard. A pitched battle ensued, which in the critical moment was lost by the cowardice or treachery of one of Eumenes' officers, and on the next day that brave and faithful general was delivered up bound to Antigonus by the Argyraspidæ. This completed the ruin of the royal party in Asia, which Eumenes alone upheld. (B.C. 315, early.)

Antigonus returned to Media, and went into winter-quarters near Ecbatana. He made a savage use of his victory, putting to death several officers whom he knew to be ill affected towards himself. Eumenes he retained some time in prison, earnestly desiring to secure his services; but finally apprehension, or the importunity of his Macedonian followers, prevailed on him to consent to that great general's death. His friends now began to experience how much more ambition weighed with him than gratitude. Python, satrap of Media, was sacrificed to his jealousy, another of the best and bravest of Alexander's officers. On quitting Media, he directed his march towards Susa; the citadel of which containing treasures stored there by Alexander, to the amount of 15,000 talents, was delivered up to him by order of Seleucus; in addition to which he had amassed 10,000 talents in gifts and valuable booty in Media and elsewhere. Returning towards the Mediterranean through Babylonia, he took occasion to quarrel with Seleucus, of whom he required an account of the revenues of his province. The Babylonian satrap declined to render it, alleging that he held the government as a free gift from the Macedonians, on account of his services during the life of Alexander; and indeed his title, and that of Antigonus, to their respective dominions, stood on the same ground. But finding that his dangerous ally would by no means admit this answer, and warned by the fate of Python, Seleucus fled betimes to Egypt; seeking to engage Ptolemy in a combination against Antigonus, who now aimed openly at uniting all the Macedonian conquests under himself.

Cassander, and Lysimachus, governor of Thrace, readily joined with Ptolemy and Seleucus to check the power of their dangerous rival; and in concert they sent demands which they could not expect to be granted, requiring him to resign Cappadocia and Lycia to Cassander, Hellespontine Phrygia to Lysimachus, Syria to Ptolemy, and Babylonia to Seleucus; and to divide with them the ample treasures which he had acquired in the war against Eumenes. Antigonus replied by menaces against Ptolemy, and prepared for the struggle. He sent ambassadors to gain Rhodes and Cyprus to his party, and dispatched Aristodemus the Milesian into Peloponnesus to raise soldiers, and cultivate the friendship of Polysperchon; who, having lately been the common enemy of Cassander and himself, was now united to him by their common jealousy of Cassander. Aristodemus succeeded in both his objects Meanwhile Antigonus had been diligently employed in Phœnicia in building ships, the chief naval power of the Mediterranean being in the hands of his enemies. It is said by Diodorus that 8000 men were employed in felling and sawing timber in Mount Libanus: and Antigonus boldly declared, that before the summer was over, (B.C. 314,) he would command the sea with a fleet of 500 vessels. In that summer, the Rhodian fleet in his service had been defeated by Ptolemy's lieutenant on the coast of Cilicia; but this misfortune was more than counterbalanced by his success in Syria, where the strong cities of Joppa, Gaza, and Tyre fell into his hands. He then left his son Demetrius, surnamed Poliorcetes, or Taker of Cities, a young man of high promise, to command in Syria, and himself repaired to the western coast of Asia, in the winter of 314-3. During the next year, the greater part of Caria fell into his hands, and he was further occupied in exciting the Thracian tribes to annoy Lysimachus, and in forming a party in Greece against Cassander. In that, and in the following year, most of Peloponnesus, Eubœa, Thebes, and the greater part of Phocis and Locris, were gained to his alliance; and a prudent appearance of moderation in re-establishing, as independent states, the cities from which he expelled Cassander's garrisons, added greatly to the good feeling entertained towards him. These successes, however, were clouded by the ill-fortune of Demetrius, who was defeated by Ptolemy in a great battle at Gaza, in consequence of which the coast of Syria, as far as Sidon, returned into the victor's possession (B.C. 312, after midsummer). Seleucus, encouraged by this success of his ally, and trusting to his popularity among his former subjects, returned to Babylonia with only 2000 followers, and with that small force regained possession of his satrapy. From this time the æra of the Seleucidæ commences. The fortunes of Antigonus were restored, partly by a victory gained by Demetrius over one of Ptolemy's lieutenants, and partly by his own return to Syria, upon which Ptolemy, unwilling to risk all in a pitched battle against so able a general supported by a superior army, fell back into Egypt. Antigonus then employed his son in a fruitless attempt to take Petra, the chief city of the Nabathæan Arabs. This place, of which a very curious and interesting account has been published by Captains Irby and Mangles, lies about fifty miles in a south-westerly direction from the southern end of the Dead Sea, and was then a caravan station and a great depôt of Arabian merchandise; the hope of plunder seems to have been the chief object of the enterprise. Demetrius failed in this project, and also in an attempt to expel Seleucus from Babylonia, B.C. 311. A peace was concluded between Cassander, Lysimachus, and Ptolemy, on the one part, and Antigonus on the other, upon condition that Cassander should be president (στρατηγὸς) of Europe until the nominal king, Alexander, son of Alexander the Great by Roxana, attained his majority; and that the other parties should remain in possession of what they each had; and that the Grecian cities should be free.

We may here briefly trace the history of the royal family of Macedon up to this time. After Antipater's death, Polysperchon brought forward Alexander, the son of Roxana, supported by Olympias, as a rival to Arrhidæus. Arrhidæus fell into the hands of Olympias, who put him to death, B.C. 317. In the following year, Olympias being taken prisoner, together with Roxana and her son, suffered the same fate at the hands of Cassander, who retained the young king and his mother in close custody. On the conclusion of this peace, he added the murder of them both to the long list of flagrant iniquities which pollute this history, moved partly by the fear that the Macedonians would be inclined to favour the cause of Alexander's son, partly by the desire of obviating that article which provided that his own government should expire when the young prince came of age. Two only of the descendants of Philip now remained. Hercules, the son of Alexander by Barsine, (see ALEXANDER,) was brought forward by Polysperchon as a claimant to the crown; but his treacherous guardian was bribed to murder him by Cassander (B.C. 309). Somewhat later, Cleopatra, Alexander's sister, having engaged herself in marriage to Ptolemy, was secretly poisoned by Antigonus, who durst neither detain her forcibly at Sardes, her place of residence, nor was willing to let her go to Egypt, to strengthen Ptolemy by her claim to the succession. Thus was the house of Philip and Alexander cut off root and branch, not reaching even to the fourth generation. 'and it was extinguished by the hands of such as thought upon nothing less than the execution of God's justice, due unto the cruelty of these powerful, but merciless, princes. Wherefore the ambitious frames, erected by these tyrants upon so wicked foundations of innocent blood, were soon after cast down, overwhelming themselves or their children with the ruins, as the sequel will declare.' (Raleigh, *History of the World.*)

To return to the order of events: the alliance did not last more than a year, and Ptolemy was the first openly to break it, alleging that Antigonus had transgressed the conditions by interfering with the Grecian cities. During the years 310, 309, 308, hostilities continued, without any marked events, but somewhat to the disadvantage of Ptolemy. In June, 307, Demetrius, being sent to Greece by his father with a powerful fleet to set free the Grecian cities which were still held by Cassander, appeared before the Piræus, and having made himself master of that important place, was gladly entertained as a friend by the Athenians, to whom he guaranteed the independence of their state.

He completed their deliverance by besieging and demolishing the fortified port and suburb of Munychia, which the Macedonians had used as a citadel to hold Athens in subjection. He thus restored the democracy, fifteen years after it had been put down by Antipater, at the end of the Lamian war. Extravagant honours were paid to him and to Antigonus on this occasion. Gilded statues were erected to them near those of Harmodius and Aristogiton; golden crowns were voted to them; they were worshipped as deities; and two new wards were added to the ten existing ones, and called after their names. Demetrius also took Megara, which was held by Cassander; but he was hastily recalled to Asia, to make head against Ptolemy. He gained all Cyprus to his father's cause, first defeating Ptolemy's lieutenant by land, and then Ptolemy himself, who came with a great fleet to relieve the island, by sea, B.C. 306. On hearing of this great success, which was expected to bring forth more important consequences than the event proved, Antigonus assumed the diadem, the ensign of regal dignity in Persia, with the title of king, and his example was followed by Ptolemy, Lysimachus, Seleucus, and Cassander. In this year, Antigonus founded the city of Antigonia, in Syria, on the river Orontes. [See Antiocheia.]

In the following year, 305, Antigonus invaded Egypt with a powerful army both by land and sea, the fleet being commanded by Demetrius. But the mouths of the Nile were so strongly fortified, that no entrance could be forced by sea; the army could do nothing without the co-operation of the fleet; and Antigonus was obliged to return to Syria, with some loss, and no glory. In 304 he turned against Rhodes, which, after flourishing in a neutral state for several years, now found itself obliged to embrace his cause, or to defend itself by arms. The Rhodians resisted bravely, and though pressed by Demetrius with his utmost skill and vigour, held out for a year; at the end of which Antigonus required his son to make peace on the best terms he could with the besieged, and repair to Greece, where Cassander, during his absence, had regained much power. Demetrius found no difficulty in replacing things on their former footing. Cassander was driven beyond Thermopylæ (B.C. 303), his garrisons were expelled from Sicyon, Corinth, and other important places, and Demetrius assembled a general council at the Isthmus, at which he was chosen captain-general of Greece. Cassander, alarmed at the turn which things were taking, endeavoured to conclude peace with Antigonus; but failing in this, he engaged Lysimachus, Ptolemy and Seleucus, who felt that if Antigonus should gain possession of Macedonia, their own safety would be endangered, to make a diversion by invading Asia Minor. This was done by Lysimachus, B.C. 302. Antigonus hastened to meet him, but could not force him to battle; and on the approach of winter, and the arrival of Seleucus from Upper Asia, the three kings went into winter quarters. In the spring, Antigonus recalled Demetrius from Greece. About August 301, the armies met at Ipsus, in Phrygia; they were well matched both in number and in the qualities of their generals, of whom Lysimachus, Seleucus, and Antigonus, had all acquired experience and fame under Alexander, while Demetrius, though young, had gained high reputation in his varied services by sea and land. Antigonus had about 70,000 foot, 10,000 horse, and 75 elephants. The allied kings mustered 64,000 foot, 10,500 horse, with 400 elephants, and 120 armed chariots. Antigonus, grown old in arms and success, and commonly most cheerful before the hour of battle, is said on this occasion to have been haunted by apprehensions of misfortune. The battle was lost, owing in part to the impetuosity of Demetrius, who charged and routed Antiochus, the son of Seleucus; and pursuing him too eagerly, gave opportunity to Seleucus to interpose his elephants and cavalry between his own victorious division and the main body of his father's army. Antigonus fought bravely to the last, replying to those who counselled him to fly, 'Demetrius will come and help me.' He was slain, his army was routed, and Demetrius fled into Greece.

Thus perished Antigonus, at the age of 81, leaving the character of a brave, able, and successful soldier, a faithless, merciless, insatiable, and insolent man. His best qualities were to be found in the private relations of life, especially in his cordial affection and full confidence towards his heir Demetrius. The empire, which he had spent so much labour and blood to consolidate, was divided among the victors [see Seleucus], and his son, after experiencing many revolutions of fortune, died in captivity. The fortunes of the house were partially revived in

ANTI'GONUS GONA'TAS, so named from being born at Goni, or Gonnos (Strab. p. 440.), in Thessaly, son of Demetrius Poliorcetes. After the death of his father, there were various claimants to the Macedonian throne, which was finally seized by Ptolemy Ceraunus, to the exclusion of Antigonus (B.C. 281). Ceraunus was slain in battle against the Gauls. After the great overthrow of the barbarians in Thessaly, Antigonus defeated another division of them in Macedonia, and soon after gained possession of his paternal kingdom, B.C. 277, in spite of the opposition of Antiochus; whose sister, Phila, he soon after married. He was driven out of Macedonia by the celebrated Pyrrhus, king of Epirus, in 272, and fled into Peloponnesus, where, like his father, he possessed a powerful interest. On the death of Pyrrhus before Argos, in 271, he recovered Macedonia; but was again expelled by Alexander, son of Pyrrhus, and reinstated by his own son Demetrius. During the latter part of his life, he held his own dominions in peace; but he was continually employed in extending his influence in Peloponnesus, both by force and fraud, and was brought into frequent collision with the Achæan league. [See Aratus.] He died B.C. 243, or 239 (Clinton), leaving a son, Demetrius II., who reigned ten years.

ANTI'GONUS DOSON (about to give), so named, because his promises were more ready than his performance, is said to have been the son of a Demetrius, who was the son of Demetrius Poliorcetes, and of course the brother of Antigonus Gonatas. Being appointed guardian to Philip, the infant son of Demetrius II., he was called to, or usurped the throne, B.C. 229; but he acted the part of a kind of protector to Philip, who succeeded him. He enlarged the limits of the Macedonian monarchy, and took an important share in the affairs of Greece, for the most part in concert with Aratus and the Achæan league. [See Aratus, and Cleomenes.] He died B.C. 221 (Feb. 220, Clinton), regretted by the friends of Macedonia, and leaving a fairer character than belonged to most of the princes of that age.

ANTI'GONUS CARYSTIUS, probably a native of Carystus in Eubœa, is the reputed author of a work, intitled a *Collection of Wonderful Histories* (*Ἱστοριῶν παραδόξων συναγωγή*). Antigonus is generally supposed to have lived in the age of Ptolemy II. of Egypt. This collection, which on the whole is of very little value, was last edited by J. Beckmann, Leipzig, quarto, with a commentary.

ANTIGUA, one of the Caribbee Islands. The town of Saint John, the capital of the island, is in 17° 10′ N. lat., and 61° 57′ W. long. Antigua was discovered by Columbus in 1493, and was named by him after the church of Santa Maria de la Antigua, in Seville.

The first settlement that was made on Antigua was by a few English families in 1632. Thirty years from that time the island was granted by Charles II. to Lord Willoughby; in 1666, it was invaded by a French force, which laid waste all the settlements. A few years afterwards Antigua was again settled by Colonel Codrington, who was appointed its governor, and whose family still possesses considerable estates on the island.

Antigua is about twenty-one miles long, and is nearly of the same breadth. The land in cultivation amounts to 59,623 acres. Rather more than half of this area is occupied by sugar plantations, the remainder being employed for raising provisions. In 1832, there were exported from the colony equal to 11,010 hogsheads of sugar, 7342 puncheons of molasses, and 1238 puncheons of rum. A considerable quantity of cotton was formerly produced, but its cultivation is now discontinued. Two descriptions of soil are prevalent in the island: one a rich black mould on a substratum of clay; the other a stiff clay on a substratum of marl, which is not so fertile as the former description of soil. It contains a large proportion of level land, and is not in any part mountainous. The shore is in general rocky, and surrounded by dangerous reefs, which make it difficult to approach, but there are several excellent harbours, in one of which—English Harbour, situated on the south side of the island—is a dock-yard belonging to government, with every convenience for careening and repairing vessels: this harbour is capable of receiving the largest ships in the British navy, and here, during the war, the king's ships on the West India station were usually moored during the hurricane months.

The island does not contain a single river, and the few inconsiderable springs it has are so brackish, that the inhabitants are forced to collect rain-water, and preserve it in cisterns for domestic use. It was probably owing to this deficiency that Antigua was not inhabited by the Caribbs, the aborigines of these islands, and that the settlement of it by Europeans proceeded for a long time but very slowly. The island is now divided into six parishes, each of which has a town or village, and eleven districts. It contains six churches, the same number of chapels, and nine other places of worship belonging to Methodists and other dissenters. The Moravian United Brethren have an establishment on the island for communicating religious instruction to the slaves.

The town of Saint John, on the north-west side of the island, is built at the bottom of the bay of the same name, which is defended by a fort, and forms an excellent harbour. The town is on the side of a hill, and its streets are in some parts very steep. This town is considered to be one of the most healthy in the Leeward Islands; it is exposed to the sea-breeze, and from its situation is freed from all impurities by every shower that falls.

Willoughby Bay, on the south-east side, has its entrance much contracted by a reef, but is secure within, and affords good anchorage in four to five fathoms water.

On the north side of the island is the small town of Parham, built on the south side of a spacious harbour, which, however, has not depth of water sufficient for large vessels. A little island, called Prickly Pear, lies off the west point of the entrance to Parham Harbour. Falmouth Harbour is to the westward of English Harbour, already mentioned. The town of Falmouth is built on the western side of this harbour, which is defended by a battery on an islet within, and affords good anchorage in from three to six fathoms of water. Five Islands Harbour, on the western side of the island, is a large harbour so called from five remarkable islets, which lie nearly in a line from east to west about half a mile off the point on its south side.

The executive government of Antigua is vested in a governor, whose jurisdiction extends to the islands of St. Christopher, Nevis, Montserrat, and the Virgin Islands. Its legislature consists of a council nominated by the crown, and a house of assembly composed of twenty-four members, who are chosen by the freeholders of the island. The public revenue of the colony amounts to about 16,000*l.* per annum, and the value of its exports, which are principally made to Great Britain, amounts to about 300,000*l.*, employing between forty and fifty sail of shipping. Antigua has also a considerable trade with the neighbouring British and foreign colonies, in the prosecution of which trade upwards of 300 small vessels annually enter and leave the different ports of the island.

The population of Antigua comprises 35,714 souls, of whom 5875 are whites and free coloured people, and 29,839 are slaves. It contains nineteen schools, in which about 1200 children are educated. In seven of these schools, which are in the towns, about 500 pupils are instructed according to the National System. There are besides several Sunday schools, which are numerously attended; and nine estate schools in different parts of the country, where the children of slaves are taught to read. In the course of the last year (1832) two laws were passed in the colony of great importance to the black and coloured population; one of these is 'an act for relieving free coloured and black persons from all political restraints and disabilities, and for securing to them an equal and unqualified participation in all political rights and privileges;' the other is 'an act for declaring the evidence of slaves admissible in criminal courts of the island.'

Antigua is forty-four miles east of Nevis, twenty-five miles south of Barbuda, and about forty miles north of Guadaloupe. (Purdy's *Colombian Navigator;* Alcedo's *Dictionary; Government Statistical Tables.*)

ANTILIBANUS. [See Libanus.]

ANTILITHICS. [See Lithonthryptics.]

ANTILLES, a term applied to portions of the West India islands, but with regard to its exact limitation geographers differ widely. Hoffman confines it solely to the Caribbean group, and says,—'they are called the Antilles of America (quasi ante insulæ Americæ), from lying in front of the larger islands of the Mexican Gulf.' Rochfort and Du Fertre explain the term nearly in the same manner; but D'Anville, qualifying it by the addition of the words Greater and Lesser, applies the former to Cuba, Hispaniola, (or Hayti,) Jamaica, and Porto Rico, and the latter to Aruba, Curaçoa, Buen Ayre, Margarita, and others along the coast of South America, thus entirely excluding the Caribbean group Some derive the term from the words Ante Ilas (Forward Islands); while others assert that, in maps constructed before the existence of a new continent was known, the name Antilla was assigned to a supposed country westward of the Azores, and that when Columbus first saw the Antilles he gave them that name in consequence. By a recurrence to the early Spanish historians, it appears at least that the word Antilla was applied to Cuba and Hispaniola previous to the discovery either of the Caribbean islands or the continent of America; thus Peter Martyr, who wrote his work in Latin only eight months after Columbus's return from his first expedition, says, 'he gives it out that he has discovered the island Ophir, but after carefully considering the world, as laid down by cosmographers, those must be the islands called Antillæ; this island (of which he is speaking) he called Hispaniola.' It is here proposed, however, to adopt the classification of Greater and Lesser, the former comprehending Cuba, Hayti, Jamaica and Porto Rico; and the latter, all the Caribbean group, with those lying along the coast of South America. This definition of the term is now adopted by the best Spanish authorities.

With the exception of Hayti, which has established its independence, the islands are subject to the following European powers:—

Greater Antilles.—*England.* Jamaica.

Spain. Cuba, and Porto Rico.

Lesser Antilles.—*England.* Antigua, Barbadoes, Barbuda, Anguilla, Dominica, Grenada, Grenadines, Virgin Islands (part), Montserrat, Nevis, St. Christopher, Saint Lucia, St. Vincent, Tobago, Trinidad.

Spain. Margarita, Testigos, Tortuga, Blanquilla, Orchilla, Rocca, Aves.

France. Guadaloupe, Martinique, Marie Galante, All Saints, Deseada, Saint Martin (north part).

Holland. Buen Ayre, Curaçoa, Aruba, Saint Martin (south part), Saba, Saint Eustatius.

Denmark. { Saint Thomas, } part of the Virgin Islands
Saint John, } group.
Saint Croix,

Sweden. Saint Bartholomew,

Their geographical position is between 10° and 23° 30′ N. lat. and between 59° 30′ and 85° W. long.

These are again subdivided into windward and leeward, terms which are purely conventional, having necessarily local reference, and differing with different nations according to the position of their respective possessions. In English maps the Caribbean chain has generally been divided into two classes, the windward and leeward, but this distinction seems useless and improper, as, with reference to the trade-wind, the whole group constitutes the Windward islands, and under this appellation they are now commonly all included, while those lying along the coast of Colombia are called Leeward islands. In short, the Antilles is but another name for the West Indies generally, exclusive of the Bahamas;' the term West Indies having been bestowed on them near the time of their discovery from the supposition of their belonging to the continent of Asia.

There is great difficulty in treating of the Antilles as a group, as they differ so widely in many respects: the Greater appear to be of primitive formation, with lofty granitic mountains, but most of the Lesser exhibit manifest proofs of their volcanic origin. Craters are still visible in some, though no volcanoes have been in active operation since their discovery. They are all subject to violent shocks of earthquakes, and there is scarcely one in which some memorial of disaster from this cause does not exist. The memorable earthquake which destroyed Lisbon, on the 1st Nov. 1755, was felt in these islands, the shock occurring four minutes later than at Lisbon.

Between August and the latter end of October, the islands, except Trinidad and Tobago, which lie farthest to the south, are subject to the most violent hurricanes; the fury of the wind on these occasions is inconceivable by those who have not witnessed it. Happily, however, these hurricanes are not of very frequent occurrence, and they are never experienced except during the short period of the year already mentioned. Were their visits more frequent, these fertile islands would soon be converted into deserts since no one would be willing to employ capital and labour for their cultivation when every moment might deprive him of the fruits of his industry.

The general aspect of this archipelago is mountainous: the summits of the elevated lands are sometimes pointed and naked, and sometimes rounded and wooded. The volcanic islands have isolated conical and pyramidal mountains, whose tops are often above the clouds; their surface is intersected with deep ravines and bristled with rocks; the soil is mostly argillaceous and watered by numerous streams. In islands of such an extent as the Greater Antilles, harbours exist on all sides; the coast of Cuba particularly is deeply indented with safe and landlocked ports. But among the Caribbean, the best and generally the only anchorages may be looked for in bays on the west or lee side; the greatest elevations are nearer the eastern shore, which is bold and precipitous and exposed to the whole force of the Atlantic current, setting through the various passages at the average rate of about a mile an hour; this current is more rapid towards the main, but decreases in velocity among the more northern islands. All the Antilles are more or less surrounded by, or interspersed with, coral formations of reefs or islets called cayos or keys, which render the navigation intricate and dangerous. There are some islands of calcareous formation, probably with a volcanic base; these present undulating plains, and do not attain half the height of the volcanic mountains: they are but scantily watered by small brooks, the soil is dry, with few trees, but the air is more salubrious. In the Antilles, moisture and heat combined produce a surprising luxuriance of vegetation: the soil is in general productive far beyond that of most parts of Europe, but in many islands it has been greatly impoverished by the short-sighted policy of the proprietors. These islands are infested with myriads of insects, mosquitos, sand-flies, &c., which are the cause of constant annoyance to the inhabitants.

The Caribbean islands have the appearance of a continuous chain; but with a line of 100 to 150 fathoms, which is the greatest length commonly used, except for scientific purposes, no bottom is found between the larger islands of the group, nor on either side east or west of them.

The year, as in most tropical climates, may be simply divided into two seasons, the *dry* and the *wet*, yet sufficient variation exists to mark the four seasons of more temperate regions. The spring may be said to commence with April, when a bright and beautiful verdure, with a rapid and luxuriant vegetation, make their appearance; and during the month of May, gentle showers (as compared with the autumnal rains) fall generally every day about noon and break up with thunder-storms. From May till October, the tropical summer reigns in full glory; and before the sea-breeze or trade-wind sets in, the heat is scarcely supportable. This refreshing wind, whose advance is visible over the sea for some time before it reaches the shore, begins between 10 and 11 in the forenoon, and blows with great regularity, increasing in force till about 3 in the afternoon, and then dies away entirely about sunset. The medium height of the thermometer at this season is about 80°. The nights are transcendently beautiful and tempered by a land-wind, which (especially in the mountainous islands) blows gently off the shore from about 10 till daylight. With October commence the autumnal rains, when the water literally pours down in torrents, from 60 to 65 cubic inches being about the medium for seasonable years, but at Barbadoes in 1754 no less than 87·1 cubic inches was ascertained to have fallen. This continues till the middle of December, between which time and April, which is in fact the winter, serene and pleasant weather prevails with a reduced temperature. The climate, more especially of the Greater Antilles, is justly considered unhealthy; the yellow fever rages as an epidemic with great violence, and carries off annually numbers of Europeans, nor do the native negroes themselves altogether escape its fatal effects.

Most of the islands produce sugar, coffee, and cotton; many tobacco and cocoa; and some indigo, lignum vitæ, pimento, &c., which, with rum and molasses, constitute their commerce with the mother countries; in return they take articles of luxury and plantation stores. The land is cultivated entirely by the labour of slaves, who form more than four-fifths of the whole population.

The Lesser Antilles have little communication with the other islands owing to the great difficulty of returning; indeed only very fast vessels can work their way back against the wind and current. The intercourse between themselves is partly carried on in small vessels called droggers.

The islands under the British dominion have their own colonial governments, consisting of an elective legislative assembly, who enact all local laws for the internal regulation of their respective islands, subject, however, to the veto of a governor appointed by the crown. St. Lucia and Trinidad have no legislative assembly, but are administered by resident governors, acting under the orders of the Colonial Secretary in England. Those belonging to foreign powers are governed by the laws of the states to which they belong.

The tides are irregular and uncertain, varying much in the different islands; for instance, at Jamaica the rise is scarcely perceptible, amounting at the maximum to eight inches, while at Trinidad it reaches six feet. The flood sets to the eastward, but on the open shore its effects are counteracted by the current which sets through the whole group to the westward.

Having thus given a slight sketch of the general character and appearance of this archipelago, we refer to other parts of this work for a more particular description of the islands which compose the group. (Edwards's *History of the West Indies*; Purdy's *Colombian Navigator.*)

ANTILOGARITHM, as used in this country, means the *number to the logarithm*. Thus, in Brigg's system, 100 is the antilogarithm of 2, because 2 is the logarithm of 100. We have introduced this term, because the French *Encyclopædia*, followed by Dr. Hutton, have defined the word to mean what is more usually called the *complement* of the logarithm, viz., the remainder produced by subtracting the logarithm from the next higher term in the series, 1, 10, 100, &c. This is not the most commonly received meaning of the word in this country.

It is becoming usual to express the number to a logarithm by writing the logarithm in brackets. There is, however, another notation much more consistent with received symbols. In the same manner as $\sin^{-1}x$ stands for the *angle whose sine* is x, $\log^{-1}x$ should mean the *number whose logarithm is* x. Thus, we might write either

$$\log 100 = 2$$
$$\text{or } 100 = \log^{-1} 2$$

ANTI-MILO. [See MELOS.]

ANTIMONY, a metal sometimes called *regulus of antimony* to distinguish it from *crude antimony*, the name by which the sulphuret is sometimes called. Antimony was probably known early in the fifteenth century; it occurs, though rarely, native, and is generally procured from the sulphuret, which is the only abundant ore of the metal. When this is heated in contact with iron, the sulphur, on account of its greater affinity for that metal, is separated by it from the antimony, which is consequently reduced to the metallic state. Thus procured, however, it is not pure, but it may be rendered so by mixing it, when reduced to fine powder, with about an equal weight of peroxide of antimony (antimonic acid): the oxygen supplied by this, during fusion, oxidizes and separates the metals mixed with the antimony, which then remains in a pure state.

The properties of antimony are as follows:—its colour is silver white, lustre considerable, and the fracture fine laminated when pure; but the antimony of commerce is broad laminated. When slowly cooled after fusion, it crystallizes in the octahedron or its varieties; it is brittle and easily powdered. Brisson states the specific gravity to be 6·702, Dr. Thomson, 6·436, and Hatchett found the antimony of commerce to be 6·712. When it is exposed to the air, this metal tarnishes, but does not oxidize; if kept under water it suffers no change; at a red heat it melts, and, according to Berzelius, when subjected to a white heat, it volatilizes and distils. Thenard, however, asserts that it is not vaporized even at an intense white heat.

Oxygen and Antimony may be combined in several modes and in different proportions, forming the protoxide or sesquioxide, the deutoxide or antimonious acid, and the peroxide or antimonic acid. If the metal be heated in the open air, it unites with oxygen, and the oxide formed rising in a white vapour, and condensing in brilliant white crystals, was formerly called *argentine flowers of antimony*. When the heat is raised to whiteness, and the metal suddenly stirred, it burns, producing the same oxide; when also steam is passed over ignited antimony in a tube, it is decomposed with explosion, oxide of antimony being formed. According to Berzelius, the oxide of antimony obtained by the above processes consists of nearly

Three atoms of oxygen	8 × 3 = 24	or	1½ atom	= 12
Two atoms of antimony	64 × 2 = 128	„	1 „	= 64
	Atomic weight 152		Combining weight	76

It is therefore a sesquioxide. The most convenient method of preparing this oxide is to dissolve sulphuret of antimony, reduced to powder, in muriatic acid; sulphuretted hydrogen is evolved, and a colourless solution of muriate or chloride of antimony is obtained; when water is added to this, submuriate of antimony is precipitated in the state of a very white powder, from which the muriatic acid may be separated by heating it in a solution of carbonate of potash. After washing and drying, a dingy white powder remains, which is the protoxide or sesquioxide in a state of purity. This oxide is insoluble in water, but dissolved by dilute nitric acid, and by strong nitric acid it is converted into antimonious acid. Muriatic acid also readily takes it up; the same effect is produced by bitartrate of potash, and the solution on cooling deposits octahedral crystals, which have been long known and employed in medicine under the name of *tartar emetic*, or *tartarized antimony*. It is soluble also in the alkalis, potash, soda, and ammonia; if the submuriate precipitated by water be mixed with potash, a portion of the oxide is dissolved, the greater part, however, diminishes rapidly in volume, and is reduced to a fine greyish crystalline powder, which is a neutral compound of the oxide and potash, and is but slightly soluble in water. It appears, therefore, that this oxide acts as a base with acids, and as an acid with some bases. It operates violently as an emetic, and though now seldom used as such by itself, it is the basis of all emetic antimonial preparations.

Antimonious Acid. This acid, sometimes called *deutoxide of antimony*, may be procured by oxidizing antimony by acting upon it with nitric acid, this yielding oxygen; the mass is to be evaporated to dryness and calcined. Its colour is white, but it is yellowish when hot. According to Berzelius it is composed of nearly

Two atoms of oxygen	8 × 2	=	16
One atom of antimony		=	64
	Atomic weight		80

This acid is neither fusible nor volatile at a red heat; the only change which it suffers by it is that of being less soluble in acids, and combining less readily with bases. When heated with charcoal, it is not easily reduced to the metallic state as the oxide. Its saline compounds are termed *antimonites*, as antimonite of potash, &c.; if it be fused with this alkali the salt formed dissolves in water, from which the acids throw down a white precipitate of antimonious acid, combined with water; in this state it reddens litmus paper, like other acids, but if the water, which amounts to 5·26 per cent., be expelled by heat, it no longer acts as an acid upon vegetable blues. It is insoluble in nitric acid, but slightly dissolved by concentrated sulphuric acid. The antimonites are not an important class of salts.

Antimonic Acid is the peroxide of antimony. This acid is prepared by heating powdered antimony in aqua regia; the solution is to be evaporated to dryness, and the residue treated with nitric acid; it is to be again heated, but not to redness, to expel the nitric acid. The antimonic acid then remains in the form of a pale yellow powder. It is composed of nearly

Five atoms of oxygen	8 × 5 = 40	or	2½ atoms	= 20
Two atoms of antimony	64 × 2 = 128	„	1 „	= 64
	Atomic weight 168		Combining weignt	84

Its action on the animal economy is but slight. Antimonic acid is precipitated by water from solution in aqua regia, in the state of white hydrate, and when thus combined with water, it acts like other acids upon vegetable blues. The water amounts to 5·09 per cent., and is expelled by a gentle heat; the acid then becomes yellow and ceases to redden vegetable blues. This acid may be procured by detonating a mixture of one part of powdered antimony with four parts of nitre. water added to the residue dissolves the antimonite of potash formed, and nitric acid poured into the solution combines with the potash and precipitates the acid in the state of hydrate.

Antimonic acid is tasteless and insoluble in water; it does not decompose the alkaline carbonates in the moist way, but when heated with them it combines with the alkali and expels the carbonic acid.

When antimonic acid is subjected to a strong red heat, it loses oxygen and is reduced to antimonious acid, like which, it has but little medicinal power. Neither antimonic acid nor the antimonites are much employed.

Neither nitrogen, hydrogen, nor carbon combine with antimony.

Chlorine and Antimony unite to form two compounds, *viz.*, the proto or sesqui-chloride and the perchloride.

The sesquichloride has long been known under the name of *butter of antimony*; it may be prepared by mixing one part of antimony with two parts of bichloride of mercury (corrosive sublimate) and subjecting the mixture to heat in a retort. By the action of the heat the antimony takes chlorine from the mercury, and the chloride of antimony being volatile distils and has the following properties:—it is a soft and nearly colourless solid; at a moderate heat it liquefies, and it absorbs moisture from the air; when mixed with water it suffers decomposition, and the results are, muriatic acid, the greater part of which remains in solution, and a white powder, which is a compound of protoxide of antimony and a small portion of muriatic acid; it is the submuriate of antimony, formerly employed in medicine under the name of *pulvis Algarotti*. It is dissolved by strong muriatic acid; and by nitric acid the protoxide of antimony is converted into antimonious acid. It has been already mentioned, that when this submuriate is heated with a dilute solution of carbonate of potash, the muriatic acid is separated and protoxide of antimony remains. The same chloride may also be procured by throwing powdered antimony into a jar containing chlorine gas; the antimony burns during combination with the chlorine.

It appears to be composed very nearly of

Three atoms of chlorine	36 × 3 = 108	or	1½ atom	= 54
Two atoms of antimony	64 × 2 = 128	„	1 „	= 64
Atomic weight	236			118

Perchloride of Antimony is formed by passing dry chlorine gas over heated antimony. The antimony burns vividly, and a volatile liquid distils which is the perchloride of antimony. It is a colourless or slightly yellow fluid, has a strong disagreeable smell, and emits white fumes. It attracts moisture from the air, and when mixed with water it is decomposed, and converted into muriatic acid and antimonic acid. It is composed of

Five atoms of chlorine	36 × 5 = 180	or	2½ atoms	= 90
Two atoms of antimony	64 × 2 = 128	„	1 „	= 64
Atomic weight	308			154

Bromine and Antimony form bromide of antimony; these substances combine with the evolution of light and heat, and the compound, being volatile, is easily procured by distillation. At common temperatures it is solid, colourless, crystallizes in needles, attracts moisture from the air, and is decomposed by water. It melts at about 206° Fahrenheit, and boils at 518°. It is composed of 64·3 of bromine and 35·7 of antimony. Iodine also combines with antimony to form an iodide; it consists of 74·7 iodine, and 25·3 antimony. But neither this nor the bromide is applied to any use.

Sulphur and Antimony combine to form several compounds; the first to be noticed is a native compound, frequently called *crude antimony*, which is the principal ore of the metal. It is found in many parts of the earth; it is of a lead grey colour, possessing considerable splendour, and is met with compact, in acicular crystals, and in rhombic prisms of considerable size and variously modified: when it is heated in close vessels, it melts without decomposition and crystallizes in striated masses. It is decomposed by nitric acid, which, when strong, converts the antimony into antimonious acid, and when dilute into protoxide. Muriatic acid, when concentrated and hot, decomposes it, dissolving the antimony and evolving sulphuretted hydrogen gas of great purity. It appears to be composed of

Three atoms of sulphur	16 × 3 = 48	or	1½ atom	= 24
Two atoms of antimony	64 × 2 = 128	„	1 „	= 64
Atomic weight	176			

It is therefore a sesquisulphuret. It is much employed in preparing metallic antimony, glass of antimony, crocus of antimony, James's powder, and some preparations in the London and other pharmacopœias.

The sesquisulphuret of antimony may be formed artificially by fusing together a mixture of sulphur and antimony; it has the colour and lustre of the native sulphuret. When also a current of sulphurretted hydrogen gas is passed into a solution of antimony, of tartar emetic for example, an orange precipitate is thrown down, which appears to be a compound of sulphuret of antimony and water; and when the water is expelled, it has the usual appearance of sulphuret of antimony. It may be here observed that the formation of this coloured precipitate is highly characteristic of the presence of antimony.

It appears from the experiments of Rose, that a bisulphuret of antimony may be formed by passing sulphuretted hydrogen gas into a muriatic solution of antimonious acid; and also a persulphuret, by the action of sulphuretted hydrogen upon antimonic acid. These, however, are unimportant compounds.

Sesquisulphuret of antimony is soluble in a hot solution of potash or soda; on cooling, an orange-red substance is deposited, called *Kermes mineral*; this was formerly much used in medicine. When an acid is added to the remaining cold solution, a further portion of a similar precipitate is formed: this is sometimes called the *golden sulphuret of antimony*, and in the *London Pharmacopœia*, *sulphuretum antimonii præcipitatum*. These substances appear to consist of sulphuret and protoxide of antimony combined with water.

The only salt of antimony, strictly speaking, of any great importance, is the double tartrate of potash and antimony, usually termed tartar emetic, or tartarized antimony,—the *antimonium tartarizatum* of the *London Pharmacopœia*. Various processes have been proposed for preparing it: the London College directs *glass of antimony* (which is the protoxide of the metal, mixed with some sulphuret and silica, prepared by roasting sulphuret of antimony) to be boiled in water, with an equal weight of bitartrate of potash (cream of tartar). The excess of acid in this salt dissolves the protoxide, and a double tartrate of potash and antimony is formed, which crystallizes in octahedrons. Of all the preparations of antimony this is the most valuable. According to Dr. Thomson, it consists of one atom of tartrate of potash = 114, one atom of bitartrate of antimony = 218, and two atoms of water = 18: its atomic weight is consequently 350. The Pharmacopœias also contain a preparation in imitation of James's powder, called *pulvis antimonialis*; they are both inert mixtures either of antimonious or antimonic acid and phosphate of lime.

Antimony is susceptible of combining with all metals. It makes them very brittle; and this is especially the case with gold, a thousandth part of antimony rendering it unfit for the uses to which it is generally applied.

The principal alloys of antimony are that with lead, employed as *type metal*, and the alloy of antimony and tin, used for plates on which music is engraved.

ANTIMONY (MEDICAL USES OF). Though the introduction of antimony into the number of medicinal agents was very violently opposed, and even decrees by the Parliament of Paris were passed against its use, it is now justly regarded as a most valuable remedy in many diseases. As antimony cannot produce any effect on the human system, unless when so prepared as to be capable of decomposition by the fluids of the body, the tartarised form, being the most soluble, has properly superseded the others. Its action varies according to the dose, the mode of administration, and the state of the system when it is exhibited. In very small doses, it seems to increase the activity of the function of secretion, particularly of the mucous membranes; hence it occasions a flow of thin fluid from these surfaces, which form the inner lining of the lungs, and intestinal canal; and also an increased action of the skin, and flow of perspiration, if the patient be kept warm. In a larger dose it causes vomiting, with all the phenomena of that action; and from being commonly employed for this purpose, it is designated *Emetic Tartar*. Compared with other emetics it may be said to be distinguished by the ease with which it causes vomiting, as well as by the certainty, though, in this latter respect, it is surpassed by sulphate of zinc (white vitriol). It may be given to persons of any age, except to very young children, for whom ipecacuanha wine is preferable. It ought not to be given in cases of poisoning, for reasons stated under the head ANTIDOTES, and least of all should it be given in cases of narcotic poisons, since in large doses it is itself a poison, unless vomiting take place; and as, by narcotic poisons, the sensibility of the stomach is so lowered or destroyed as not to occasion the rejection of anything received into it, the impropriety of exhibiting tartar emetic in such cases is manifest. From the extremely small quantity of this substance which is sufficient to occasion vomiting, there is one state in which it is to be preferred to every other means of causing vomiting. By whatever channel tartar emetic is introduced into the system, it invariably excites the stomach to perform the act of vomiting, unless the person be in a state of insensibility or coma; a solution of two grains of it, in three ounces of warm distilled water, may, by a skilful operator, be injected into a vein, when the gullet is obstructed by any extraneous body lodged in it. In the same way it may be sometimes tried in tetanus, or lock-jaw, when the teeth are so firmly clenched together, that nothing can be made to pass them.

As tartarized antimony is decomposed by most bitter or astringent vegetables, which contain tannin, (except oak-bark,) and an insoluble, and consequently an inert, tannate of the protoxide of antimony is thereby produced, such vegetables, in the form of infusion, decoction, or tincture, furnish the best antidote in cases of over-dose, or poisoning by this article, should it not, by inducing vomiting, prove its own antidote. Under these circumstances, we should administer decoction or tincture of yellow cinchona bark, or, when these cannot be easily procured, a strong infusion of tea.

Employed in appropriate doses, its action as an emetic is seldom violent, while it certainly acts more powerfully than other emetics in promoting the secretion of the fluids of the stomach, as well as of the bile and pancreatic juice, with those of the lungs, and indeed all the secretions external as well internal. Now, as the suppression of the secretions is one of the most common occurrences in the early stage of fever, and the restoration, and improved character of these, one of the most favourable signs of its abatement, antimony is employed with great advantage in the treatment of fever, and it cannot be used too early. Indeed many a fever is stopped or prevented by the employment of this or some other emetic, as ipecacuanha, upon the first intimation of the disease being felt. It is also suited to the beginning of each paroxysm of intermittent or remittent fevers (see AGUE). It may also be advantageously given about the period of the expected crisis in continued fever. When the disease is of a highly inflammatory type, it should be combined with, or followed by, saline medicines, but when there is great depression of the vital powers, as in typhus, the salines must be soon laid aside, and stimulating medicines cautiously substituted.

Antimony is also used in some eruptive or exanthematous fevers, such as measles and scarlet fever, being less suited for those in which the eruption is of a vesicular or pustular character, and which affect the deeper layers of the skin. (See Craigie's *Pathological Anatomy*.) Antimony is well suited for rheumatic fever and erysipelas, as in these diseases the liver is deranged, and furnishes an unhealthy biliary secretion. It is also useful in what are sometimes termed mucous and bilious fevers, which are attended with very depraved secretions from the intestinal canal, which may be removed and improved by repeated small doses of an antimonial.

It is also in daily use for the cure of catarrhal affections, *i.e.* colds affecting the mucous membrane of the lungs.

Tartrate of antimony, when intended to act as an emetic, is generally given in the dose of a quarter or half a grain dissolved in distilled water, and repeated every ten or twenty minutes till vomiting occur; but when merely intended to cause nausea, or to act gently on the secretions of the intestinal canal, of the lungs or that of the skin, it is given in even smaller doses, and at the interval of two, four, or six hours. Lately, however, a mode of employing it in much larger and more frequent doses has been practised with marked benefit in several diseases of an inflammatory character, particularly in pneumonia, or inflammation of the lungs. According to this plan, from two to three grains dissolved in water, are given, and repeated every two hours or so, for a considerable time, even for two or three days. The early doses cause vomiting and purging, but these effects soon cease to appear, while the pulse is found to have fallen to fifty beats, or even less, in a minute. When pursued with caution and managed skilfully, it often enables us to overcome the disease; and to dispense with the removal of so much blood from the system, as might otherwise have been necessary. It ought not to be tried, however, if the mucous membrane of the stomach be in a state of irritation or subacute inflammation, a condition which often occurs during pneumonia. This state of the stomach must be removed by general or local means before we venture upon the exhibition of the antimony.

This plan of administering tartar emetic is generally believed to have originated with the Italian physicians Rasori and Tommasini; but whatever merit it possesses is justly due to Dr. Marryat of Bristol, who proposed it in 1790, many years before its employment in Italy.

Tartrate of antimony is applied externally as an ointment and plaster; and in either way it excites an action of the part, leading to the formation of a vesicular eruption, similar to that of vaccinia or cow-pox; and it is consequently used as a means of counter-irritation, often with great advantage. The ointment and plaster may be prepared of different degrees of strength, but care must be taken not to make them too strong, as the antimony may be absorbed from the ulcerated surface, and produce violent vomiting, which in some cases has been so serious as to cause death.

ANTINO'MIANS, from the Greek, signifies *against the law*. It is applied by theologians to those, if any there be, who hold that faith in Jesus Christ dispenses with, and renders unnecessary, so far as a future state is concerned, the observance of morality and the performance of good works. We say, if any there be, because there is reason to suppose that the accounts of earlier antinomians contain much exaggeration, and that there never was any body of men, worthy to be called a sect by numbers and duration, which professed the above opinion.

So far as avowed abandonment of morals, we find various antinomian sects in the first three centuries; but the name was first applied to the followers of John Agricola, a townsman and contemporary of Luther, born at Isleben in Saxony. His opinions had the tendency above mentioned, and were attacked by Luther, who, with the assistance of the elector of Brandenburg, obliged him to publish a retractation. It must, however, be observed, that Bayle points out (in the article *Islébiens*) the exaggerations which have been made of Agricola's opinions and their source, and that Agricola himself was employed with others in drawing up the *Interim*, a provisional confession of faith, promulgated by the emperor Charles V., at Augsburg, in 1548, which Dupin (and catholic writers are, in general, fair judges between one protestant and another) admits to be perfectly orthodox on the article of justification.

This sect has obtained very little notice from continental writers, and its followers appear rather to have been distributed among other persuasions. The assembly of divines in 1643 condemned several writings which appeared to them antinomian; and the parliament in 1648, in what ought to be called the Presbyterian persecution act, among other provisions, enacted that any one convicted, on the oaths of two witnesses, of maintaining that the moral law of the Ten Commandments is no rule for Christians, or that a believer need not repent or pray for pardon of sin, should publicly retract, or, on his refusal, be imprisoned till he found sureties that he would no more maintain the same.

The little importance of this sect renders it unnecessary to dwell further upon its history; but as the name, like others, is bandied about as a term of reproach by many who do not understand its meaning, we cite from an old English account of sects some of the peculiar opinions which were called antinomian by the orthodox, before the revolution of 1688. The source of the whole is the List of Heresies of Pontanus; certainly not a work to trust to in any other respect than as shewing what opinions it pleased some to attribute to others.

Pansebeia, &c., by Alexander Ross, sixth edition, 1683. 'The antinomians are so called from their opposing and rejecting of the law, which they say is of no use at all under the Gospel, neither in regard to direction, nor correction, and therefore ought not to be read or taught in the church. They say that good works do neither further, nor evil works hinder, salvation. That the child of God could no more sin than Christ could, and therefore it is sin in him to ask pardon for sin. That murder, adultery, drunkenness, are sins in the wicked, but not in the children of grace, nor doth God look upon them as sinners, and, consequently that Abraham's lying and dissembling was no sin in him. That no man should be troubled in his conscience for any sin. That no Christian should be exhorted to perform the duties of Christianity.'

ANTI'NOUS, a native of Bithynia, and favourite of the Emperor Hadrian, the extravagance of whose attachment was shown by the institution of divine honours to Antinous after his death. Respecting the circumstances of his death there are many stories, but it seems generally agreed that he was drowned in the Nile while Hadrian was in Egypt. The town near which he died was rebuilt by the emperor, and called *Antinoe* or *Antinopolis*, instead of Besa, its former name. Its remains exist under the name of Ensené. A new star was said to have been discovered in the heavens, which was called the *soul of Antinous*. Oracles were delivered by him, which must be taken as forgeries invented by Hadrian himself, or according to his order. That courtiers should have lent their countenance to this absurd and profane homage, in compliment to their master's weakness and blind partiality, may easily be credited; but that the worship of this new divinity should have outlived the prince who established it, when no longer enforced either by interest or fear, can only be accounted for by the stubborn credulity of a people over whom superstition had gained the ascendency. It still prevailed in the time of Valentinian; but it was turned to account by the fathers of the Christian church, to whom it furnished an argument against the pagan system of worship, and the means of exposing the absurd principles of their religion. Among the remaining treasures of ancient sculpture, the statues of Antinous, nearly as numerous as those of the Venus, and very similar to each other, rank among the most beautiful. That originally in the collection of Cardinal Alexander Albani, the most perfect perhaps of those executed for the Roman nobles, for the purpose of paying their court to the emperor, is a standing figure in marble. The head looks downwards, with a melancholy expression, which they all bear: the hair in all of them is arranged in the same manner, covering the forehead nearly as low as the eyebrows. The busts of Antinous are also very fine. (See Xiphilinus; Bayle, *Dict. Hist.*, and the authorities there quoted; also Winkelmann. ii. p. 464, &c. French trans.)

ANTI'NOUS (CONSTELLATIONS). [See AQUILA.]

ANTIOCHEI'A (Ἀντιόχεια), commonly called Antioch, and Antaki, or Antakieh, a town in Syria on the left bank of the Asy, the antient Orontes, 36° 12′ N. lat., 36° 12′ E. long., forty-six geographical miles west of Haleb (Aleppo), and twenty-two due south of Scanderoon or Alexandretta on the gulf of the same name.

[Silver, Brit. Mus.]

Antioch belongs to the Pashalick of Haleb. It stands in the valley of the Orontes, which here forms a fertile plain, about ten miles long and five or six broad (Brown). On the west side of the river is part of the mountain-range of Amanus, and on the east, to the south of Antioch and bordering close upon it, is the northern termination of the mountains called Jebel Akra, the antient Casius. The river at Antioch is from 100 to 150 feet wide, and is crossed by a substantial bridge. The Orontes in antient times was navigated up to the city, a distance of about twenty geographical miles from its mouth, and might again be made navigable for sailing boats if cleared out below. A large part of the immense walls of antient Antioch still remain, but authorities vary as to the circuit enclosed by them. Mr. Buckingham gives them a circuit of nearly four miles; but this is much less than the amount assigned by antient authorities. They run along the river on the N.W., ascend the steep hill on the S.W., on the S.E. run along its summit, and on the N.E. run down the hill to the river. The walls are from thirty to fifty feet high, fifteen feet thick, and flanked by numerous square towers. It seems not unlikely, from the quantity of Roman tiles found in the towers, and the mode of their disposition, that the existing walls of Antioch are chiefly Roman work: possibly there are but few parts of the original walls erected under the Seleucidæ. It appears indeed most probable that the present walls are those which were erected by Justinian, after the town had been ruined by the Persians. Mr. Buckingham says that one portion of the wall and towers in the S.W. quarter is perfect.

Antioch, though fallen from its antient importance, is still one of the large towns of Syria: the population is stated at about 10,000, but it does not appear to be well ascertained. It has no good public buildings. The houses are chiefly built of stone, pent-roofed, and covered with red tiles. The streets are narrow, with a raised pavement on each side for foot passengers. The bazars are numerous, and contain a good supply of such articles as are in demand in the country about Antioch. The manufactures of the place are coarse pottery, cotton cloth, silk twist, leather, and saddlery. The language of the Mohammedans at Antioch is generally Turkish; there are a few Christian families there, and some Jews. The air of Antioch is reputed to be more salubrious than that of Haleb. The view of the plain of Antioch from the towers above is described as highly interesting: 'The northern portion within the antient walls is now filled with one extensive wood of gardens, chiefly olive, mulberry and fig trees; and along the winding banks of the river, tall and slender poplars are seen.' (Buckingham.) The chief street seems to have run from S.W. to N.E.; following its direction towards the *Bab Boulous*, or 'gate of St. Paul,' which leads to Aleppo, a part of the antient pavement is observed, and on the right of the road within the enclosure, are numerous caves or excavations in the hill, which appear to have been the antient Necropolis or cemetery. The remains of an aqueduct exist to the south of the city.

Antiocheia was founded by Seleucus Nicator, and received its name from his father Antiochus. Antigonia, which Antigonus had previously built near the site of the future Antioch, sunk into insignificance and disappeared before the city of Seleucus. Antioch became the residence of the Syrian monarchs, and one of the largest cities of the world. It probably grew still larger under Roman dominion, when it was the residence of the governor of Syria, the seat of pleasure, and the centre of an extensive commerce. Strabo (p. 750) describes Antioch in his time as consisting of four distinct quarters, each having a wall of its own, and the whole surrounded by a common wall. These quarters marked the successive additions that the city received from the time of Seleucus the founder to Antiochus Epiphanes. The geographer says it was little inferior in extent and wealth to Seleuceia on the Tigris and Alexandria in Egypt. Several of the Roman emperors were fond of spending some time here, in a city where the games of the circus and the amusements of the theatre were so much cherished by the prevailing taste of the inhabitants. Under Libanius, a native of the place, it became in the fourth century a celebrated school of rhetoric. But before this period Antioch had also become the chief station of the Christian religion, which had been firmly established here by Barnabas and Paul; and here we are told (Acts xi. 26) that the name of Christians was first given to the disciples.

Antioch continued to be a city of great importance, notwithstanding the frequent and terrible visitations of earthquakes, till Chosroes, the Persian, took it and nearly levelled it with the ground. It was rebuilt by Justinian and again became a considerable place, and continued so till the time of the Crusades, to which epoch some assign the remains of a wall or fort on the hill to the south of the city. Antioch, after it was taken by the Crusaders under Godefroy and Boemond, (A.D. 1098,) became a Christian principality under the European conquerors of Syria. The sultan Bibars, in 1269, took it from the Christians and destroyed its churches. It afterwards passed under Turkish dominion, but has never recovered its commerce and importance, which were transferred to Aleppo. Mr. Buckingham says that the Christians of Antioch have not at present a single church, and that they assemble for prayer in one of the excavations mentioned above. Antioch was taken possession of by Ibrahim Pacha Aug. 1, 1832, but was subsequently restored to the Porte.

The neighbourhood of Antioch is peculiarly rich in medals and engraved stones: great numbers have been collected at different times after the earth has been laid bare by heavy rains in winter. The most interesting are those of the Seleucidæ, and next to them, those of the period of Julius Cæsar and Augustus: one, of the date of Augustus, is given at the head of this article. Phœnician coins are also found in great quantities.

The last great earthquake at Haleb, in 1822, extended also to Antioch and did some damage. (See Strabo; Mannert's *Syrien;* Brown's *Travels;* Buckingham's *Travels among the Arab Tribes; Journal of Education,* No. II., p. 249; *Itinéraire,* &c. Paris, 1816, without the author's name.)

To the north-east of Antioch is a small lake, called Antakieh or Bahr Agoulé, which communicates with the ORONTES.

ANTIOCHEIA of Pisidia, a town of Asia Minor, where Paul, accompanied by Barnabas, preached the Gospel (Acts xiii.) It seems, that at this time Antioch had some Jews among its population. The position of this town is not accurately known, unless it has been very lately discovered, as some journals inform us. (See Strabo, p. 577.)

ANTI'OCHUS, a name best known from its being borne by many Syrian monarchs of the Seleucidan dynasty; but otherwise not uncommon in antient history. We shall devote this article to giving a brief sketch of the history of the Syrian empire under these princes.

I. **ANTI'OCHUS**, surnamed Soter, or Preserver, was the son of Seleucus Nicator, who after the death of Alexander raised Syria into an independent kingdom (see ANTIGONUS). There is a romantic story told, how he fell desperately sick for love of Stratonice, his father's young wife, the daughter of Demetrius Poliorcetes; and how Seleucus, on learning the cause of his son's disease, resigned her to him, and caused them to be crowned king and queen of Upper Asia.

[Silver, Brit. Mus.]

Upon the murder of Seleucus, while engaged in his expedition to subdue Macedonia, B.C. 280, Antiochus succeeded to the throne and reigned nineteen years, during which few events of much importance occurred. He prosecuted his father's claim to the kingdom of Macedonia against Antigonus Gonatas, son of Demetrius, and his own brother-in-law; but the dispute was accommodated by a marriage between Antigonus and Phila, daughter of Seleucus and Stratonice, in consideration of which the Macedonian prince was allowed to retain the peaceable possession of his throne. Demetrius, the son of Antigonus, also married Stratonice, the daughter of Antiochus. The reign of Antiochus is distinguished by his wars against the Gauls, who had crossed into Asia and obtained a settlement in the province named after them Galatia. Issuing thence they harassed the neighbouring provinces with predatory excursions, until Antiochus defeated them, and obtained the appellation of Soter. He was subsequently engaged in an unsuccessful war with Eumenes, king of Pergamus. Returning to Antioch he found, or took, occasion to put to death one of his sons charged with having excited disturbances in his absence: the other, named also Antiochus, he proclaimed king of Syria. He died soon after, B.C. 261. (Appian, *Syriaca;* Justin, book xxvii.; *Anc. Univ. Hist.* vol. viii.)

II. **ANTI'OCHUS**, surnamed Theos, or God, son of the former, succeeded to the throne upon his father's death. His reign is chiefly memorable for the revolt of the Parthians, B.C. 250, under Arsaces, who succeeded ultimately in expelling the Macedonians, and thus became the founder of the formidable Parthian empire. The remote province of Bactria, and others lying eastward of the Tigris, followed this example: and Antiochus, apprehensive of the final loss of those regions, concluded a treaty of peace with Ptolemy Philadelphus, B.C. 252, by which he agreed to repudiate his wife Laodice, and to marry Berenice, daughter of the king of Egypt, settling the crown upon his children by the latter. These conditions were fulfilled: but on the death of Ptolemy, two years afterwards, Antiochus restored Laodice to her conjugal rights, and in return was poisoned by her, B.C. 247, with the view of securing the succession to her eldest son, Seleucus Callinicus. He left another son by her, Antiochus, surnamed Hierax, the Hawk; who for several years waged war with his brother Seleucus for the possession of Asia Minor, but being finally overthrown, was forced to fly into Egypt, where he died. (See Schlosser's *Remarks on the Reign of Antiochus II.*, *Universalhistorische Uebersicht*, &c.)

III. **ANTI'OCHUS**, surnamed the Great, was the son of Seleucus Callinicus, and succeeded his brother Seleucus Ceraunus, B.C. 223, who was poisoned by two of his chief officers, while engaged in war with Attalus, king of Pergamus. Antiochus owed his safety and his throne to the honesty of his cousin-german, Achæus; who, though pressed by the army to assume the crown, retained it in obedience to the legitimate heir, and by his good generalship kept Attalus in check. The first care of the young king, or his advisers, was to appoint governors to preside over the several districts of the Syrian empire, which during preceding reigns had lost much of its original greatness. The kingdom of Pergamus had especially profited by the weakness of the Seleucidan dynasty: but under the able management of Achæus, those provinces which had been wrested from the Syrians were recovered, and Attalus was again confined within the limits of his proper kingdom. Antiochus was less fortunate in the choice of Molo and Alexander, two brothers, who were appointed governors of Media and Persia. Trusting to the weakness of a youthful reign, they endeavoured to raise their provinces into independent kingdoms, B.C. 221: and it was not until they had defeated two armies sent against them under subordinate officers, that they were reduced by Antiochus in person, in the second campaign.

Returning into Syria, he found abundant matter to engage his attention. Achæus, who had formerly so signalized his fidelity, now found that his distinguished successes had excited jealousy, and that plots were laid against his life by those who were in the king's confidence. Sacrificing his sense of duty to his personal safety, he proclaimed himself king of those provinces in Asia Minor, which he had recovered, and which had been entrusted to his charge. Thus shorn on the west, the Syrian empire was equally mutilated on the south, where Ptolemy Philopator still held Cœlesyria and Palestine, which had been conquered by his predecessor, P. Euergetes. By the advice of his council, the young monarch turned his arms first against Egypt. He marched into Cœlesyria, and assisted by the defection of Theodotus, the governor of that province, gained possession of the greater part of it, including the capital, Damascus. The campaign was terminated by a truce for four months, to which the contending parties were induced to agree; Antiochus, by the necessity of returning northwards to oppose Achæus, who, not satisfied with his possessions in Asia Minor, aimed at extending them to the eastward of Mount Taurus; and Ptolemy, by the reverses which he had suffered, and the necessity of gaining time to prepare for fresh exertions. Negotiations for a treaty of peace were set on foot: but each party claiming Cœlesyria and Palestine, in virtue of the partition of Alexander's conquests made after the battle of Ipsus, (see SELEUCUS) the truce expired before anything was agreed to. War was resumed, B.C. 218. At first, Antiochus carried all before him: he penetrated into Phœnicia, forcing the passes of Mount Libanus; gained possession of Galilee, and subdued the inheritance of the tribes beyond Jordan. But these advantages he lost in the following year in a great battle fought at Raphia, near Gaza, in which he was defeated with great slaughter, and obliged to retreat to Antioch with the wreck of his army. Cœlesyria and Palestine returned to their allegiance to Ptolemy: and the Syrian king, pressed at the same time by Achæus, was compelled to sue for peace with Egypt, which he obtained on condition of resigning his claim to the contested provinces. Being now at leisure, Antiochus turned his whole attention to the destruction of Achæus, whom he overpowered and put to death: by this act the provinces of Asia Minor were again annexed to the Syrian empire, (B.C. 213.)

Having secured his western at the expense of his southern dominions, Antiochus turned his attention towards the east, where the growing power of Parthia threatened serious danger. Arsaces, the son of him who established the Parthian empire, had overrun Media while Antiochus was engaged in the wars against Ptolemy and Achæus. He was unable to withstand the attack of Antiochus in person, and was soon driven out of his new conquest. The Syrian monarch in his turn invaded Parthia, and after several campaigns, a treaty was concluded, by which Arsaces was left in quiet possession of Hyrcania, on condition of his assisting Antiochus to recover the rest of the revolted provinces. After an unsuccessful attempt to recover Bactria from Euthydemus, with whom he at last concluded a treaty, he crossed the mountains of Paropamisus (also called Caucasus) into India, formed a treaty of alliance with the king of that portion of the country, and directing his march homeward through the provinces of Arachosia, Drangiana and Carmania, intermediate between the Indus and Persia, re-established the supremacy of Syria in those distant regions. He returned through Persia to Antioch, having been employed for seven years in these eastern campaigns. This was the most flourishing period of the Syrian empire since the revolt of Parthia in the reign of Antiochus Theos; and it was at this time that Antiochus had earned by his successes the most specious claim to the title of Great.

Soon after or about the time of the return of Antiochus, Ptolemy Epiphanes, a child of five years old, succeeded to the throne of Egypt, (B.C. 205,) on the death of his father, Ptolemy Philopator. Antiochus and Philip king of Macedonia united in a design to expel him, and share the Egyptian dominions between themselves. The unfortunate provinces of Palestine and Cœlesyria were the bone of contention, the favourite battle-field on which their more powerful neighbours fought out their differences. Antiochus regained possession of them in the course of two campaigns. On his being called away to Asia Minor, Judæa was overrun by Scopas, the Egyptian general; but it was soon reconquered by Antiochus, who, upon entering Jerusalem, (B.C. 198,) was received by the Jewish people with great joy, and with every demonstration of respect; in return, he granted many privileges to them, especially ordaining that no foreigner should be permitted to demand access into the interior of the temple. But, finding the power of Egypt still unbroken, and his own resources incompetent to wage war on two sides of his empire at once, and being anxious to recover all that had belonged to the first Seleucus in Asia Minor, Antiochus now proposed a treaty of marriage between his daughter and the young king of Egypt, to be consummated when both came of age, by which Cœlesyria and Palestine were to be given with the princess as a dowry. Having thus purchased the neutrality of his most powerful enemy, he proceeded with a powerful fleet round Asia Minor, reducing, in his way, many of the maritime Greek cities. He crossed the Hellespont, and took possession of the Thracian Chersonese, (B.C. 196,) which he claimed for his inheritance, as having been conquered by Seleucus Nicator from Lysimachus; and here he came in contact, for the first time, with the power before which his own was compelled to retire. The Romans had already reduced Macedonia to the condition of a subject kingdom, thus indicating the extent of their ambition, and the probable consequence of their success in the second Punic war, when Antiochus crossed into Europe, and wrested the Chersonese from the impaired power of Philip. Jealous of this new interferer in the affairs of Europe, the Romans sent ambassadors to require restitution, not only of all that Antiochus had taken from Philip, but of all that he had taken from Ptolemy, whose guardians, soon after his accession to the throne, had placed him under the wardship of the Romans, as a protection against the ambition of his Syrian neighbour. Antiochus replied to these requisitions in terms as haughty as those in which they were made; and it was evident that the quarrel would soon end in an appeal to arms. (See Polybius, xviii. 33.)

In the following year, (B.C. 195,) Hannibal, driven from Carthage, came to Ephesus to seek the protection of the king of Syria; and his representations, joined to the known value of his services, fixed the wavering determination of Antiochus, and induced him to match his strength against the redoubted power of Rome. A period of negotiation elapsed, in which neither party would abate from their pretensions, and neither probably was sincerely desirous of peace. It was both the misfortune and the fault of Antiochus, that he suffered his confidence to be alienated from Hannibal, and allowed him no share in the direction of affairs. In the winter of 192 B.C., Antiochus was invited by the Ætolians to pass into Greece. He crossed over with an army, posted himself in the town of Demetrias, and was chosen by the Ætolians as their commander-in-chief. Antiochus appears to have managed affairs badly. He might have made the king of Macedon his friend instead of his enemy; and after his capture of Eubœa, instead of pushing on his conquests, he spent his time at Chalcis, and in negociating with the petty states around him. The Roman consul, Acilius Glabrio, with Cato for his legate, now advanced against the Syrian king, who made a stand at Thermopylæ, but was utterly routed and compelled to retire to Asia, (B. C. 191.) The next year L. Cornelius Scipio was elected consul, and appointed to conduct the Syrian war, and his brother, the celebrated Africanus, served under him in the quality of lieutenant. Under their able guidance the war was soon terminated; and its end was hastened by the unskilful conduct of Antiochus. Disheartened by his reverses, and especially by a second defeat at sea, he withdrew his forces from Lysimachia, in Thrace, and from the strong cities on the Hellespont, which would at least have retarded the progress of the Romans for some time; and thus he gave them free access into Asia. Yet they had no sooner crossed the Hellespont, than, struck with terror, he sent ambassadors to endeavour to negotiate a peace. The terms he offered, though tolerably humiliating, were not such as satisfied the ambition of the Romans, who required that he should defray all the expenses to which they had been put during the war, set at liberty all the Greek cities, and evacuate the whole of Asia Minor west of Mount Taurus. These conditions Antiochus, thinking that no harder could be imposed on a conquered enemy, refused to accept, and collecting his whole force, he met the consul Scipio, (B.C. 190,) in a pitched-battle near Magnesia of Sipylus, in which he was defeated with immense slaughter. This was decisive: he retired hastily to Syria, and again sent to negotiate for peace, which he obtained on terms not materially harder than those before offered, yet such as must have been very galling to the haughty monarch, and hitherto successful conqueror. He was to resign the provinces west of Mount Taurus; to pay 18,000 Euboic talents for the expenses of the war; to deliver up to the Romans his elephants and ships of war; and, a yet more disgraceful stipulation, to place in their hands Hannibal, and other foreigners who had taken refuge at his court from the hatred of that grasping and revengeful people. Hannibal, with another, preserved his safety by timely flight; the rest were delivered up, together with hostages for the observance of the treaty, of whom Antiochus Epiphanes, the king's younger son, was one.

Antiochus did not long survive this humiliating treaty, which was, in some degree, the cause of his death. In collecting means to pay the heavy burden imposed upon him, he was led to plunder a wealthy temple in the province of Elymais. Indignant at the sacrilege, the people of the place rose in arms, and massacred him and his attendants, (B.C. 187,) in the thirty-seventh year of his reign, and fifty-second of his age. He merited the title of Great, only as being the most eminent of a series of princes of the same name, none of whom were distinguished either for talent or goodness. He did more, however, to restore the greatness of the Syrian kingdom under the first Seleucus, than any other of his dynasty; but he was unfortunate in meeting the first shock of that iron power before which all the great monarchies of the known world were destined to fall. (Polybius, lib. 5, &c.; Appian, *Syriaca;* Liv. lib. 36, 37; Ralegh, *Hist. of World; Anc. Univ. Hist.*, vol. viii.)

IV. **ANTIOCHUS**, surnamed Epiphanes, or Illustrious, the second son of Antiochus the Great, succeeded his elder brother Seleucus Philopator (B.C. 175 or 176). Antiochus was, at the time of his brother's death, on his way from Rome, where he had been detained as a hostage for the observance of the treaty concluded with his father after the battle of Magnesia.

[Brit. Mus.]

The first events of his reign which require notice, are his hostilities with Egypt, which then reclaimed the provinces of Palestine and Cœlesyria, wrested from her by Antiochus the Great. In the first campaign, (B.C. 171,) he routed the Egyptians between Mount Casius and Pelusium, and took advantage of his success to fortify the frontiers of Palestine against farther aggression. Pursuing his success, in the next year he overran all Egypt, except the strong city of Alexandria, and gained possession of the person of Ptolemy Philometor, the young king. In the same year he sacked Jerusalem, and profaned and plundered the temple, as related in Maccabees i. c. 1, and ii. c. 5; after which he appointed Philip the Phrygian governor of Judæa. After the capture of the reigning prince, the Alexandrians raised Ptolemy Euergetes, commonly called Physcon, his brother, to the throne. This induced Antiochus to undertake a third expedition to Egypt (B.C. 169); in which, under pretence of restoring the kingdom to Ptolemy Philometor, he renewed the war, defeated the Egyptians, and laid siege to Alexandria. Being unable to reduce that city, he left Philometor as the nominal king of the country, retaining in his own hands only the strong city of Pelusium, the key of Egypt on the side of Syria. He hoped that the quarrels of the rival brothers would exhaust the strength, and facilitate the entire reduction of that country; but here he was disappointed; for seeing through his ambitious designs, they agreed to hold the kingdom in common, and Egypt was restored for a time to its former tranquillity. Hereupon Antiochus undertook a fourth expedition (B.C. 168), entered and subdued Egypt, and was on the point of laying siege to Alexandria, when he was met by ambassadors from Rome, who peremptorily required him to depart from Egypt, and the imperious mandate was obeyed. Returning through Palestine in the same year, he vented his spleen by ordering that great persecution of the Jews related in the second book of Maccabees, in which the temple was polluted, and its service broken off, until, after the lapse of more than three years, it was restored by Judas Maccabæus. Of the Maccabæan wars we shall give an account under the article MACCABEES: the cruelties perpetrated on the insurgent Jews in the course of them, by the agents, and under the command of Antiochus, have rendered his name deservedly hateful. The steady and successful resistance of that high spirited people drained Syria of army after army: and the difficulties of the king were increased by revolts in Armenia and Persia. Dividing his disposable force into two parts, he sent one under the command of Lysias into Judæa; and led the other himself into the revolted provinces, which he soon brought back to their allegiance. While thus employed, he received tidings of the total defeat of his armies in Judæa. Transported with passion, he hastened towards Antioch, devoting the Jewish people to destruction, when, in the midst of his imprecations, he was seized with violent internal pains. Still he continued to pursue his journey with precipitation, until he fell from his chariot, and was so much injured as to be obliged to halt at a town called Tabæ, the situation of which is not certainly known. There he died, B.C. 165, in dreadful agony both of body and mind. He was a prince of dissolute and undignified character, as well as stained with the darker vice of cruelty. Given up to drunkenness, to low debauchery, and to gross buffoonery, he received from his subjects the nickname of Epimanes, or the Madman, in parody of his assumed title of Epiphanes, or Illustrious. (Livy, xlii., &c.; Polybius.)

V. **ANTIOCHUS**, surnamed Eupator, or well fathered, son of A. Epiphanes, a child nine years old, succeeded to the throne, under the guardianship of Lysias, well known in the Jewish wars. After a nominal reign of nearly two years he was dethroned, and put to death by his cousin-german, Demetrius Soter, son of Seleucus Philopator, who succeeded to the crown, B.C. 162.

VI. **ANTIOCHUS**, was the son of Alexander Balas, who, being deposed by Demetrius Nicator, son of Demetrius Soter, and perishing in Arabia, left a son, A. Theos; who was raised up by Diodotus, surnamed Tryphon, as a stalking horse, by the help of which he might displace Nicator, and make his own way to empire. The young pretender was at this time but seven years old; but he was readily raised to the throne, for the excesses of the reigning prince had alienated his subjects. After a nominal reign of two years he was put to death by Tryphon, who assumed the crown. (B.C. 144-2.)

VII. **ANTIOCHUS**, surnamed Sidetes, or the Hunter, (so named from a Syriac word, signifying to hunt, according to some authorities, but more probably from the town of Side,) was a younger son of Demetrius Soter, and brother of Demetrius Nicator. The latter, when expelled by A. VI. and Tryphon, experienced various fortunes, and fell at last into the hands of the Parthians. A. Sidetes then married his brother's wife, Cleopatra, laid claim to Syria, and expelled Tryphon, (B.C. 138,) who had held it since the murder of A. VI. His reign was prosperous and tranquil, compared with the weak and turbulent governments of his immediate predecessors. He reduced many cities, which had taken advantage of the civil wars to assume independence, and among them Jerusalem (B.C. 134): and he engaged in a war with Parthia, which had profited by the distractions of Syria to usurp much of her eastern dominions. He defeated Phraates, king of Parthia, in three battles, compelled him to retire within the limits of Parthia itself, and recovered all which had been wrested from Syria, except that province; but his life and reign were brought to an untimely close in a sudden onset made by the enemy upon his winter quarters. He perished, B.C. 129 or 128, leaving a fairer character for justice, generosity, and bravery, than belongs to most of the princes of this most profligate age.

VIII. **ANTIOCHUS**, surnamed Grypus, or Hook-nosed, from *γρύψ*, a vulture. After the death of A. Sidetes, Syria was again distracted by civil wars. Demetrius Nicator escaped from Parthia, and resumed the crown; but he was soon dethroned by Alexander Zebinas. Cleopatra, the wife successively of Balas, D. Nicator, and A. Sidetes, retained possession, however, of a portion of Syria; and Seleucus, her son by D. Nicator, regained some districts contiguous to those held by his mother, and proclaimed himself King of Syria. This raised her jealousy, and she murdered him with her own hand. Still thinking it necessary to have some one of royal blood to give countenance to the sovereign power which she was bent on acquiring for herself, she recalled from Athens, her son Antiochus Grypus, (named also Philometor, and, on his medals, Epiphanes,) B.C. 125. Supported by Egypt, Grypus soon expelled Alexander Zebinas. Cleopatra then became jealous of him also; and perished, being compelled to drink a poisoned draught, which she herself had offered to her son. Grypus then reigned in peace for eight years; at the end of which a fresh competitor for the throne started up in the person of his half-brother.

IX. **ANTIOCHUS**, surnamed Cyzicenus, from being educated at Cyzicus, the son of Cleopatra by A. Sidetes. After a sharp contest the brothers agreed to divide the empire, B.C. 113 or 112: A. Cyzicenus occupied Cœlesyria and Palestine; A. Grypus, the rest of the empire. Both led a dissolute and careless life, and several great cities, as Tyre, Sidon, &c., profited by their supineness to assume a short-lived independence. Grypus was assassinated, B.C. 96. A. Cyzicenus was defeated and slain by Seleucus, the son and successor of A. Grypus, B.C. 95. Seleucus perished, after a short reign, if a period of contest may be called such, of seven months.

X. **ANTIOCHUS**, surnamed Eusebes the Pious, son of A. Cyzicenus, proclaimed himself King of Syria upon his father's death. For a time he disputed the throne with his cousins, Philip and Demetrius Eukæros, sons of A. Grypus: but (B.C. 88) he was compelled to fly into Parthia. He returned (B.C. 86), Eukæros being dead or banished: and while he was engaged in war with Philip, another Antiochus, surnamed Dionysius, full brother to Philip, seized upon Cœlesyria. The latter was soon slain in a war against the Arabians. After a brief period, the Syrians, wearied by the desolating feuds of the Seleucidan princes, invited Tigranes, king of Armenia, to take possession of the country. Eusebes then fled into Cilicia, (B.C. 83,) and passed the remainder of his life in obscurity. The events of this reign are very confused.

XI. **ANTIOCHUS**, surnamed Asiaticus, was the son of A. Eusebes. Tigranes being obliged to withdraw his troops from Syria to make head against the Romans, A. Asiaticus gained possession of part of the kingdom, B.C. 69. He retained it for four years, at the end of which Syria was reduced by Pompey to the condition of a Roman province, B.C. 65. In Antiochus Asiaticus, the Seleucidan dynasty ended, having ruled Syria for 247 years, reckoning from the time when Seleucus Nicator began his reign in B.C. 312. (For the chronology of the Syrian kings the reader should consult Clinton's *Fasti Hellenici.*)

ANTIOCHUS OF COMMAGE'NE. [See COMMAGENE.]

ANTI'PAROS, called also by the antients Olearos, one of the group of the Cyclades, is situated between Siphnos and Paros, and separated from the latter by a dangerous channel one mile and a half wide. It is seven miles long, north and south, and three miles broad, and contains one small village, with about 300 inhabitants; its productions are trifling, consisting only of a small quantity of poor wine, and a little cotton and barley. The island is a mass of white marble, and is only celebrated for its grotto: the entrance to it, which is on the side of a rock, is by a low arch formed of rough craggy rocks, about thirty paces wide, and divided into two by several natural pillars. This passage continues about twenty yards, at the end of which is a precipice that must be descended by the aid of ropes, fastened to the masses of stalactites; after advancing a little farther under a ridge of rugged rocks, there is another descent, but not so precipitous as the last. Another passage about nine feet high and seven wide, whose walls and arched roof, composed of glittering white and red marble, are as smooth as if wrought by art, leads to a third precipice, the sides of which appear like a sheet of amethysts. Then follows a sloping passage of about 200 yards, on each side of which the petrifactions assume the appearance of a ragged curtain partially drawn, and occasionally of snakes coiled up in folds; this conducts to the fourth and last descent. At the bottom of this is the grotto 120 yards long, 113 wide, and 60 feet high; it is an immense arch of white marble, from the roof of which depend large stalactites ten feet long, and as thick as a man's waist, with a thousand festoons and leaves of the same substance; the floor is rough and uneven, with various coloured crystals and stalagmites rising up; and in the midst is one, twenty feet in diameter, and twenty-four feet high. It was this pyramid of stalagmite that served as an altar when M. de Nointel visited the grotto, and celebrated mass on it. When lighted up, the whole presents a most brilliant and magnificent scene, but the smoke from the torches of the numerous visiters has somewhat dimmed its effulgence. In some places the stalactites have partitioned off portions of the cavern into cells. The difficulty of reaching the grotto has latterly been much diminished by the provision of rope-ladders, torches, &c., for which the guides make a small demand on the purse of the traveller. It is not certain that the extremity of the grotto has ever been explored. The highest point of the island is in 37° N. lat., and 25° 3′ E. long. (See also Tournefort's *Voyage au Levant: Encyclopédie Method. Géog. Physique.*)

ANTI'PATER, a Macedonian of high birth and high reputation, the chosen and trusted officer of Philip and of Alexander the Great. He was the pupil and friend of Aristotle; he was learned himself, and the patron of learned men. When Alexander left Europe for Asia, he entrusted the government of Macedonia and the regulation of Greece to Antipater. During the year B.C. 331, an attempt was made by Lacedæmon, Achaia, Eleia, and the greater part of Arcadia, to deliver Peloponnesus from the supremacy of Macedonia. Antipater, marching into Peloponnesus to quell the disturbance, was met by Agis, king of Lacedæmon: and a battle ensued in which the latter was slain, and his army defeated and broken. The victor summoned a congress to meet at Corinth, at which a fine of 120 talents was imposed upon the Eleians and Achaians; the Lacedæmonians were obliged to submit at discretion, referring their punishment to the arbitration of Alexander. It does not appear that any severe measures were taken against them.

Well acquainted with the dangerous temper of his mother Olympias, Alexander had abstained from allowing her any share in the administration of Macedonia during his own absence. She did not bear this exclusion patiently, and succeeded in raising jealousies between her son and Antipater, insomuch that Alexander determined to remove his viceroy to a less independent situation. Shortly before his death he sent home Craterus, a distinguished officer, in command of a large body of Macedonian veterans who had earned their discharge; and commissioned him to assume the government of Macedonia, while Antipater was ordered to conduct fresh levies to Babylon. A report was current, but it is not corroborated by the best authorities, that Antipater, fearful of a like fate to that which had overtaken Parmenion, and others of his master's followers, administered poison to Alexander, by means of his sons Cassander and Iolas, who held the office of cup-bearers.

We do not give credit to this story: but it is certain that Alexander did die at a critical time for the fortunes of Antipater, before Craterus had reached Greece. The late king's brother Arrhidæus, a bastard son of Philip, was raised to the throne by the Macedonian generals, and the army in Asia; and Perdiccas was appointed viceroy over the king, who was a young man of weak intellect, with the same sort of power as the Maires du Palais exercised in old times in France towards the end of the Merovingian dynasty.

In the distribution of provinces among the chief officers of Alexander, to be held nominally in subordination to the Macedonian crown, though in fact, and speedily in name, converted into separate and independent kingdoms, Antipater was confirmed in the possession of Macedonia, and the adjacent countries. He was soon provided with employment. The Athenians, impatient of the superiority of a nation whom they hardly acknowledged to be of pure Hellenic blood, had already made some preparation for war with Macedonia before the death of Alexander was fully known. A vote was passed, that the state would take charge of the common freedom of Greece, and liberate the cities held in check by Macedonian garrisons; a powerful armament was put in preparation, both by land and sea, and ambassadors were sent to invite all the people of Greece to join in the undertaking. Athens was soon at the head of a powerful confederacy, comprising the Ætolians, Thessalians, and almost all the Greeks north of the Isthmus, except the Bœotians; and of Peloponnesus, the Argeians, Eleians, Messenians, and Sicyonians. Leosthenes, the Athenian general, posted the allied army at Thermopylæ, the celebrated pass commanding the entrance into Greece from the north. Antipater, drained of troops by Alexander's frequent demand of reinforcements, was unable to collect more than 13,000 foot and 600 horse, with which he advanced against Leosthenes. A battle ensued, in which the Macedonians were defeated, somewhere between Pylæ and the town of Lamia in Thessaly, to which Antipater retreated, meaning to abide a siege until assistance, for which he had already sent, should arrive from Asia.

Leonnatus, one of Alexander's generals who had obtained the satrapy of Mysia, otherwise called Hellespontine Phrygia, was the first who came to help Antipater. The Hellenes (as Diodorus distinguishes them) broke up the siege and marched to meet Leonnatus; a battle ensued, in which the Macedonians were beaten and their general killed. Meanwhile Antipater evacuated Lamia, and formed a junction with the defeated army; by the help of which he kept the field, though he dared not venture on another battle. But Craterus arrived from Asia with 12,500 veteran troops, which he placed under the command of Antipater; who, thus reinforced, found himself at the head of 48,000 men, while the Athenians, weakened by the return home of a considerable part of their ill-cemented army, could only muster 28,000 men. An indecisive battle ensued, in which the excellence of their Thessalian horse, which had won the first battle, now saved them from complete defeat; but they felt their inferiority too much to risk another encounter, and sent to treat of peace with Antipater. This, called the battle of Cranon, occurred in August, B.C. 322. Antipater refused to treat with the confederates collectively, but expressed his willingness to come to terms with them severally. This policy was justified by the event, for though the Greeks refused at first to dissolve the alliance, yet the several members of it dropped off by degrees, and left the Athenians and Ætolians, the most obstinate enemies of Macedonia, to secure their safety as they could. Antipater marched with his whole force against Athens; and the citizens, utterly unable to resist, sent Phocion and Demades to sue for peace. They obtained it upon easier terms than were always allowed in Grecian warfare; for he only required two obnoxious persons, the orators Demosthenes and Hyperides, to be delivered up, and granted full security both to person and property, on condition that a Macedonian garrison should be henceforth quartered in Munychia, to guard against a counter-revolution, and that a complete change should be made in the form of government, the democracy being abolished, and all political power vested in a body of about 9000 citizens, who were possessed of property up to a certain amount. He removed a large number of the poorer class (apparently with their own consent) into Thrace, where lands were assigned them. Thus ended the Lamian war, as it is called, in the autumn of B.C. 322, the year after its commencement. Antipater returned to Macedonia

The Ætolians were the only members of the confederacy who still held out. In the same autumn, Antipater and Craterus marched against them. They abandoned their indefensible towns; deposited their women and children in their rugged mountains; and collecting their able-bodied men, prepared to hold out in their fortresses, and in those cities which were capable of being maintained. In the first encounters the Macedonians sustained considerable loss; but the superiority of force by degrees prevailed; and the Ætolians, shut up in the mountains, and exposed to the severity of a mountain winter, almost without shelter or food, except that which they won at the sword's point, were almost reduced to despair, when they were relieved by unexpected news from Asia.

For the proceedings in Asia after Alexander's death, we must refer to PERDICCAS: it is enough here to state that the ambition of that general led him to aspire to be Alexander's successor in the throne of half the known world. One of his first steps was to rid himself of Antigonus, whose acuteness and activity he feared; but the latter, fathoming his designs, fled hastily to Antipater, and apprised him of the danger to which he, in common with others, was exposed. To check Perdiccas in time was more important than to punish the Ætolians; and consequently, after concluding a hasty peace with the brave mountaineers, Antipater and Craterus led their army into Asia. They separated: Craterus took the field against Eumenes, satrap of Cappadocia and Paphlagonia, by whom he was defeated and slain; while Antipater marched into Cilicia to meet Perdiccas. But he found no enemy, Perdiccas having been slain in Egypt; and the Macedonian troops, after a short interval, elected Antipater to the office of regent, or protector. These transactions seem to have taken place in the year 321, but there is some confusion as to the chronology. [See ANTIGONUS.] In this new capacity he made a fresh distribution of the provinces: after which he returned to Macedonia, taking with him the king and queen, Arrhidæus and Eurydice, and leaving Antigonus to conduct the war against Eumenes. This seems to have been in 320.

Antipater held the regency undisturbed till his death, which took place in 318. We hear no more particulars of him, except that he fell into a dangerous illness, and that one of his last actions was to put to death the orator Demades and his son, who had been sent ambassadors by the Athenians to request that the Macedonian troops might be removed from Munychia. Demades had always been on good terms with Antipater, till the Macedonian found, among the papers of Perdiccas, letters written by the orator, exhorting Perdiccas to carry the war into Europe. The regent had not forgotten this: he returned no answer to the address of Demades, but merely made a signal to his ministers of punishment (*τοῖς τεταγμένοις ἐπὶ ταῖς τιμωρίαις*), who put the ambassadors to death without further ceremony.

Dying soon after, Antipater left the regency to Polysperchon, one of the oldest of Alexander's surviving generals. He appointed his son Cassander to be chiliarch,—a term originally meaning captain of a thousand men, but transferred by the Persians to some high officer at court, and adopted in that sense by Alexander, with many other of the Persian customs. Cassander, however, contested the possession of Macedonia with Polysperchon, and finally became master of that kingdom. The last advice which Antipater gave to his successors was, 'never to let a woman interfere in affairs of state.' This was expressly directed against Olympias, and her subsequent conduct fully proved the wisdom of it. Antipater died in his eighty-first year, having enjoyed a high reputation for his talents as a minister, and leaving a character less stained by cruelties and excesses than most of the contenders for empire who sprang up after the death of Alexander. (Diodorus, book xviii., &c.)

ANTI'PATER, son of Antipas, the governor of Idumæa, was himself a native and governor of that province during the high-priesthood of Alexander Jannæus. After that prince's death, his sons, Hyrcanus and Aristobulus, disputed the succession. Antipater was a zealous partizan of the former, who, after a bloody contest, was established in the high-priesthood by Pompey the Great. This favourable issue was very mainly owing to the prudent management of the Idumæan, and he was rewarded by the confidence of his weak master, under whose name he ruled in Judæa

When Cæsar, during the celebrated siege of Alexandria, was himself besieged in his camp by the inhabitants of that city, Antipater came to his help, and found opportunity to perform good service, and signalize his own courage. Cæsar, in return, obtained for him the citizenship of Rome, and appointed him to the administration of Judæa, which enjoyed tranquillity and prospered under his care. He was poisoned by a Jew named Malchus, B.C. 49, through jealousy of his influence with Hyrcanus. The guilt of the crime was heightened by the ingratitude of the murderer, who had been indebted for his life to the man whom he poisoned, and had received other benefits at his hands. Antipater left four sons, of whom two are known in history: Phasael, governor of Jerusalem, and the infamous Herod, king of the Jews.

These are the two most remarkable persons bearing the name of Antipater; but it is one of common occurrence in antient history. Moreri has articles upon eighteen.

ANTIPATER, L. COELIUS, a Roman historian of the Second Punic War. [See Coelius.]

ANTI'PATHY, (from the Greek *ἀντιπάθεια*, compounded of *ἀντὶ contrary*, and *πάθος feeling*,) properly signifies an involuntary dislike or aversion entertained by an animate being for some sensible object. Thus a man may have an antipathy to particular smells or tastes—a turkey-cock to the colour red, or a horse to the smell of raw meat, &c. There is no doubt that many antipathies are natural, and do not arise from any accidental circumstance: such as the aversion in mankind to the tastes and smells of many drugs, and of bodies in a state of putrefaction. Such natural antipathies may, however, in many cases, be overcome by habit: as in the case of surgeons, who soon learn to conquer the disgust occasioned by the effluvia arising in the dissection of the human subject. Some nations constantly eat food which the rest of mankind would nauseate, as the Esquimaux, who live on whale blubber and train oil. When the Cossacks were in London and Paris, in 1814, they sometimes drank the whale oil from the lamps in the streets: probably an Englishman or Frenchman would, if starving, reject the draught which the Cossack considered as a luxury. It is moreover quite conceivable that individuals may have such physical peculiarities as will cause them to feel pain from impressions on the senses which, to the generality of mankind, are indifferent, or even pleasurable: thus some persons are painfully affected by the smells of certain flowers or perfumes, which are commonly considered agreeable, and are sold as means of sensual enjoyment. Many antipathies, however, are not natural, but acquired, and arise from our associating certain objects with the idea of something terrible or dangerous. Thus people acquire antipathies to spiders, earwigs, wasps, snakes, rats, and other animals, from forming exaggerated notions of their powers of harming mankind; and by encouraging such aversions, they may acquire so great sensitiveness and acuteness in distinguishing these animals by the smell, sight, or hearing, that they may be aware of their presence when other people are unconscious of it. Persons may acquire antipathies to certain kinds of food by having been surfeited with them, or by having been accustomed to eat them for long periods of time, as under a medical regimen during an illness; or because they are made of substances which they consider as unclean, or because they are unfashionable, as being eaten by people whom they think less refined and delicate than themselves. This may not unfrequently be observed in persons of narrow and feeble minds, and more especially in children, in whom such fanciful dislikes ought to be carefully but not harshly corrected. (See Locke's *Essay on the Understanding*, b. ii. c. 33, § 7 and 8.)

Antipathy properly means, as we defined it, a dislike of an *animate* being for some *sensible* object. Its meaning, however, is sometimes improperly extended to *inanimate* beings—a phraseology now nearly obsolete, but which was much used by the antient naturalists, who would, for example, have said that an alkali had an antipathy to an acid, or that water had an antipathy to oil. At other times the word is restricted to animate beings, but is applied to things which are not objects of the senses. Thus it has been said that the mind has an antipathy to certain classes of actions, by which it is meant that it is endued with an innate faculty of distinguishing between right and wrong. [See Moral Sense.]

It is sometimes stated that *antipathy* is the contrary of *sympathy*: but this is not strictly true, at least as respects the use of those two words in modern language. Sympathy means *joint sensibility*, or the feeling of pain or pleasure in consequence of pain or pleasure felt by another sentient being. Thus a person who pitied the misfortunes of another, or who felt delight in the same pursuits, amusements, or studies, as another, would in either case be said to sympathize with him. Sometimes sympathy is applied to the simultaneous irritability of different parts of the body: thus one eye is said to sympathize with the other, when an injury inflicted on one is felt by both. [See Sympathy.]

ANTI-PAXO. [See Paxo.]

ANTIPHLOGISTIC TREATMENT, (from two Greek words, *ἀντὶ against*, and *φλόγωσις inflammation*,) is the means of removing, or lessening, inflammation, and of obviating its effects. As it would be out of place here to consider fully either inflammation, or its causes, we shall merely state that these last are, either mechanical, as wounds, bruises, &c., or of a more general nature, as atmospheric changes operating on the body from without, or altered conditions of some of the organs or functions of the body, operating within, and influencing, more or less, the rest of the system. The effects of the first set of causes are, primarily, always local, but sooner or later become general, i.e., affect the whole system; the effects of the second set of causes may be, primarily, either local or general; but when local, having a much greater tendency early to become general. The local effects seem to consist in an alteration of the vital action of the part, accompanied with *pain*, *swelling*, and increased *heat* and *redness*. The general effects are disturbance of various functions, most usually a diminution of the functions of secretion, exhalation, and nutrition, or assimilation: the heart's action, the respiration, and functions of the nervous system are also affected, but in different degree and order in different cases. The change of the vital action of the part appears to produce a quickened movement of the blood in the extreme vessels, or capillaries, as they are termed, which are sometimes slightly contracted, though more commonly dilated, so that the blood presently begins to move more slowly, and at length stagnates in the part, as we may see in the white of the eye when inflamed. The blood, too, in the neighbouring capillaries, seems to incline towards the part, while the large arteries leading to it, and ultimately the heart, assume an increased action, which occasions greater frequency and, generally, force of pulse. The consequences of these alterations of the action of the vessels are, the effusion either of some of the constituents of the blood, as the serum or albumen, in their natural state, or their change into substances not found in blood, or any other fluid of the body, in its healthy state. These become the source of further change of structure, as suppuration, ulceration, &c., and the cause of disturbance in the functions of the system, varying with the seat of the inflammation, its intensity, and other circumstances.

The means of preventing or moderating these constitute collectively the antiphlogistic treatment and regimen. We shall here briefly notice the chief of these.

Blood-letting.—We have just stated that one of the effects of inflammation is to produce effusion of the serum or lymph of the blood, the extent of which depends on the quantity of blood which goes to the parts affected. The processes of inflammation, in its earlier stages, may be very certainly restrained or arrested by diminishing that quantity. This is done by abstraction of blood, either local or general. If the inflammation be allowed to proceed, suppuration, ulceration, or other changes, and destruction of parts, according to the texture affected, will ensue. Now abstraction of blood, though it may prevent the extension of suppuration and ulceration to parts not yet affected, is rarely found effectual in checking the formation of pus or *matter*, where that has been already established. We see then the necessity of the early employment of bleeding, and the other antiphlogistic means, if we desire them to be productive of the greatest amount of benefit. The prejudices and prevailing habits of the people are, however, generally in direct opposition to such beneficial measures; and too often timid practitioners allow their judgment to be overborne by the importunate requests for delay of the well-intending but ignorant relations. Thus the time when these measures would have proved most serviceable is allowed to pass over; and when at last put into practice, their good effects not being so conspicuous, they are not so highly appreciated as they would be, if employed at an earlier period. Indeed, at a very late stage, far from being useful, they are decidedly hurtful. (See the case of a physician mentioned under the article Abstinence.)

During inflammation of shut sacks, or cavities, *i.e.*, those cavities of the body which do not communicate with the external air, and which are lined with *serous* membranes, the disposition to effusion of much lymph, or the albumen of the blood, is greater than in other cases. To prevent this, more prompt and vigorous measures must be used. Modern physicians have ascertained that mercury, especially in combination with opium, has a powerful influence, not only in preventing the effusion of lymph, but in removing it soon after it is effused: an example of this is witnessed when, in the inflammation of the eye, called *iritis*, the pupil is filled up, and vision prevented by the lymph effused; yet this is speedily removed if a sufficient quantity of mercury be early introduced into the system. This, then, constitutes another valuable antiphlogistic means.

Purgatives.—The quantity of blood in the system, and the amount of serum, may be greatly lessened by the use of purgative medicines, especially the saline purgatives, which generally produce very liquid motions, consisting of a large proportion of serum. These are not only proper, but constitute an essential part of the antiphlogistic treatment.

Nauseants, i. e. such doses of emetic medicines as occasion a constant feeling of sickness, without causing vomiting, reduce the action of the heart, and lessen the tendency to effusion, while they promote the absorption of the fluid already effused. They are, consequently, very valuable auxiliary agents in subduing inflammatory diseases.

Diaphoretics.—The quantity of blood may be diminished, and its acrimony lessened, by increasing the perspiration, or discharge from the skin, which in most cases of inflammation is lessened, and in some altogether suppressed. By this diminution or suppression of perspiration not only more blood is retained in the system, but also those salts and acids which in a healthy state find an outlet by this channel. The means of increasing perspiration are termed diaphoretics, or sudorifics. These, however, seldom produce the desired effect, if there be much heat of surface, *i.e.* of the skin. This must previously be moderated by the use of the means already stated, viz., bleeding and purgatives, and also by the use of

Refrigerants.—These consist of cooling drinks to be taken internally, and cold applications, as cloths dipped in iced water, or vinegar and water, or even ice itself, or evaporating lotions laid upon the part affected. The cold *affusion* is often very serviceable in reducing the temperature and procuring sleep, during which a flow of perspiration, which frequently proves critical, is apt to occur.

It is self-evident that no good can follow the use of any or all of these means of lessening the quantity of blood in the body, if we continue to supply the means of forming it as fast as we remove it. The *diet* of the patient is, therefore, *a*, we might almost say *the*, most important point in the treatment.

During inflammation, as stated above, the functions of secretion and exhalation, as well as of nutrition, are lessened or entirely suspended; there is, therefore, no means of consuming or disposing of the nutritious matter already contained in the blood. How inconsiderate then, and how absurd it is, if life be valued at all, to use means which greatly increase this? Persons do not die of inanition, or from the effects of the absolute privation of food, under many days or weeks, (see the two cases narrated under Abstinence,) while thousands, millions, die of inflammatory diseases, in a period varying from a few days down to a few hours. At the beginning of all severe inflammations, there is a failure of the appetite; this intimation on the part of nature, ever watchful for the preservation of her works, cannot be slighted with impunity. Reason and experience strictly enjoin an immediate attention to the diet. Its quantity should be lessened, and in most cases its quality changed. In respect to the reduction of quantity no limit need be placed at the commencement, as it can never be reduced too low; but during convalescence careful regulation of it is necessary, that it may not be insufficient on the one hand, or excessive on the other. Still there is much less likelihood of erring on the side of deficiency, than of excess. The vessels of the part being much weakened, are again easily distended, and the inflammatory process renewed; hence the frequency of relapses. Dr. Baillie has recorded it as the result of his experience, 'that he never observed a person having a relapse of *fever* where it has not been caused by eating animal food.' It may be well to explain here in what way animal food proves hurtful. During its use the blood requires more frequent purifying by exposure to the air in the lungs, or by respiration. To effect this, not only is more frequent respiration necessary, but also the heart's action is increased, so that the blood is propelled with greater frequency and force, and consequently the distention of the vessels of the inflamed part is increased. The greater frequency of the respiration, occasioned by the greater demand for oxygen, during the use of animal food, is illustrated by the experience of the workmen in diving-bells, who require the air to be renewed much more frequently when living upon animal food and drinking spirituous liquors, than when living on vegetable food and drinking water. For this reason, the pearl-divers of Ceylon, who live exclusively on rice and other vegetables, can remain much longer under water, without requiring to come to the surface to breathe, than any Europeans who live on a mixture of animal and vegetable food. Animal food and spirituous or fermented drinks must be strictly interdicted at the commencement of inflammation, and their use be avoided till the permission of the medical attendant be deliberately and voluntarily given; previous to which mild, farinaceous food, and diluent drinks, should constitute the only diet.

Rest.—A person in a horizontal position respires less frequently than when in an upright position; the heart also pulsates less frequently. In every case of inflammation affecting the system generally, the patient should be confined to bed; and as there is mostly diminished power of the muscular system, all unnecessary exertion should be avoided. Numerous visiters should not have access to the sick-room; for speaking, which requires the exercise of the respiratory organs, fatigues the patient, and quickens the circulation. Besides this, the air is vitiated by the respiration of visitors. A supply of pure and cool air is requisite in all inflammatory complaints, but especially fevers, both for the benefit of the patient and the safety of others.

The repose of the mind is as essential as that of the body. All causes of anxiety should, when possible, be removed, and cheerful looks be put on before the patient, both by the physician and the attendants, in order that, as far as practicable, he may be inspired with confidence and entertain hopes of recovery.

This is a very brief outline of the means termed antiphlogistic, by which we attempt to restore both the part affected and the system generally, to the natural and healthy state, when labouring under an inflammatory attack. The special application will be given as each disease falls under notice, and we need not here do more than endeavour to impress upon every one a conviction of their importance. 'Under favourable circumstances inflammation is more completely under the control of remedies than any other disease; and nevertheless, it is more or less concerned in producing a very large share of the mortality in every part of the world.' (See Alison's *Outlines of Pathology*.)

ANTIPHON, the son of Sophilus, and the oldest of the Athenian orators, who are generally known under the denomination of the 'ten,' belonged to Rhamnus, a *demos* or township of Attica, and was born about B.C. 480, the year of the great victory over the Persians. He was a contemporary of the famous Gorgias who visited Athens, and somewhat younger than this sophist, but there is no distinct proof that he was his pupil, though it is sometimes asserted; nor are we told who was his master. In course of time he opened a school of rhetoric, and numbered among his pupils Thucydides, the historian of the Peloponnesian war, who, in a passage of his eighth book (chap. lxviii.), has commemorated the talents of his master, and recorded almost the only completely trustworthy event in his life. The opinion that Thucydides was the master of Antiphon appears to us untenable. (See Van Spaan). It was the profession of Antiphon to write speeches for persons who had either to defend themselves in courts of justice, or wished to proceed against others, and also for those who had to address the public assemblies. According to tradition, he was the first who became a hired advocate of this description, though he merely wrote speeches, and never delivered any except on one occasion, when he was himself concerned. According to several authorities, he is the oldest writer who composed speeches for the courts of justice; no speeches of this character of higher antiquity being preserved. (Diodorus, Photius, &c.) There is no distinct proof, that is satisfactory, of his being early engaged in public service.

the silence of Thucydides, as to all his life previous to the events related in his eighth book, proves that he was not engaged in any important military capacity, at least during the Peloponnesian war. It has been conjectured that he is the archon Eponymus, or chief archon of Athens (Ol. xc. 3. or B.C. 418) mentioned by Diodorus (xii.) In the year B.C. 411, and in the latter part of the Peloponnesian war, a revolution was effected by which the Council of Five Hundred was abolished, and all political power was vested in a body of four hundred. [See ALCIBIADES, i. p. 279; PELOPONNESIAN WAR]. Antiphon, who never had come forward as a public man, did not show himself on this occasion, though he was the real author of the revolution, and Pisander, who appeared as spokesman, was merely his agent. Shortly after this change, Antiphon and Phrynichus with ten others were sent to Lacedæmon to make peace on any terms that were tolerable. The ambassadors returned without effecting their object. Discontent grew stronger; Phrynichus was assassinated in the public place, a counter-revolution was immediately effected, and Alcibiades was recalled from exile. Immediately after the event, Antiphon, now seventy years of age, was tried for his life on a charge of treason to the state; he made, according to Thucydides, an admirable defence. His sentence (see the decree quoted by *Cæcilius in the Life of Antiphon*, attributed to Plutarch) was death; his property was confiscated, his house was pulled down, and the site was marked by stones bearing the inscription, Antiphon the Traitor. Antiphon, says Thucydides, was inferior to no Athenian of his time in virtue; he had also the greatest talents for conceiving any plan, and equal talent in expressing his conceptions. It is singular that Thucydides says nothing about the sentence or the death of Antiphon.

There were at least five or six other persons in antiquity who bore the name of Antiphon. Several of these different persons have been confounded in the rambling life of Antiphon attributed to Plutarch. One of them was a sophist, and appears to have been the author of a work on *Truth*, in which it is conjectured, from a few references to it in extant writers, that some of the leading doctrines afterwards promulgated by Epicurus were announced by Antiphon. The orator, according to some accounts of very little credit, was executed under the tyranny of the Thirty after the close of the Peloponnesian war. (See Xenophon, *Hellenic.* ii. 3, 40; and Van Spaan, *Dissertatio de Antiph. Orat.*)

Antiphon wrote a treatise on *Rhetoric*, which is lost. Sixty orations were once extant under the name of Antiphon, but Cæcilius considered twenty-five of them to be spurious. At present there are fifteen extant, three of which are on subjects which were matters of judicial investigation, and are well worth reading. The other twelve are distributed into *tetralogies*, or fours, each set of four being on the same subject; they are merely rhetorical exercises, such as those to which Cicero alludes when speaking of Antiphon. (*Brutus*, chap. xii. 6.) The language of this writer is often obscure, and the style does not appear to us to merit the praise bestowed on it by some of the Greek critics. The orations of Antiphon are in the seventh volume of Reiske's collection, and in the first of Bekker's edition of the *Orators*. They are also in Dobson's collection, vol. i., with Van Spaan's *Dissertation*, &c. The text of Bekker is the best.

ANTIPHONARY, ANTIPHONARIUM, in music, the book wherein the *antiphonies* were written. (See ANTIPHONY.) By an order of Archbishop Winchelsey, made in 1305, every church in the province of Canterbury was obliged to be furnished with an *antiphonary*, among other equally expensive books; and Spelman states, that in 1424 two *antiphonaries* cost the little monastery of Crabhuse, in Norfolk, twenty-six marks, which he says was equal to 52*l*., according to the value of money in his time. We may, therefore, calculate the expense of a single one at not less than from 90*l*. to 100*l*. of our present money.

ANTI'PHONY, in music, (*ἀντιφωνία*, alternate singing,) the antient name for a kind of anthem, the verses of which were chanted by each side of the choir, alternately.

The fathers of the church pretend that the method of antiphonal singing was revealed to St. Ignatius in a vision, who taught it to the Greeks. St. Ambrose introduced it in the western churches about the year 374. The chanting of the psalms in our cathedrals is a close imitation of the antient antiphony.

ANTI'PODES, a term from the Greek, meaning literally those who stand feet to feet, as is the case with the inhabitants of two opposite points of the globe. Previous to the establishment of the rotundity of the earth, and during the centuries of discussion which took place upon this point, the existence of antipodes was the theme of constant ridicule in the mouths of the opposers of the globular figure. The sentiments of Lactantius, *De Falsâ Sapientiâ*, cap. 23, may be taken as a fair specimen of the common objections. He asks, 'Is there any one foolish enough to think, that there are men whose feet are higher than their heads? with whom those things that we place *upon* the earth hang downwards *from* the earth? who have trees and vegetables turned upside down, and rain and snow falling the wrong way? Will any one henceforward place the hanging gardens among the seven wonders of the world, when the philosophers make hanging seas, and fields, and cities, and mountains?' The confusion that here takes place between the words upwards and downwards will be now universally apparent, but was not so in the time of Lactantius, who lived A.D. 311; who, had he simply confined himself to the assertion, that the existence of antipodes could not be demonstrated, and treated it as a philosophical speculation, possibly true, but probably false, would have been justified by the general state of knowledge then existing. But not so when he asserts that he can prove the thing to be impossible, and professes that he sees no alternative, but supposing its defenders to be either joking, or intentionally lying. The French *Encyclopædia* is incorrect in stating that he appeals to the sacred writers as deciding the point.

Two *antipodal* points of the earth have the same number of degrees of latitude, one north and the other south, unless one of the points be on the equator, in which case the antipodal point is the opposite point of the equator. Their longitude differs by 180° or 12 hours, if we reckon longitude all round the globe; but if we use east and west longitude, the two longitudes must together make up 180° or 12 hours, one east and the other west. For example, the antipodes of a point in 22° *north* latitude and 60° *east* longitude, are in 22° *south* latitude, and 120° *west* longitude. We here insert, in opposite columns, the names of a few places which are nearly antipodal.

London	Antipodes Island, S.E. of New Zealand.
Nertchinsk	Falkland Islands.
Nankin	Buenos Ayres.
Mouths of the Amazon	Moluccas.
Bermudas	Swan River.
Quito	Middle of Sumatra.
Lima	Siam.
Timbuctoo	Friendly Islands.
Azores	Botany Bay.
Spain	New Zealand.

Antipodal places have the same climate, so far as that depends merely on latitude, but have all the seasons, days and nights completely reversed. Thus, noon of the longest day at the Bermudas is midnight of the shortest day at the Swan River. The remark as to the seasons of course does not apply to antipodal places on the equator.

When it is noon at any one place, it is midnight at the antipodes, and sunrise and sunset are reversed in the same manner. But we may ask, when it is noon on Friday at London, is it *Friday* night or *Thursday* night at Antipodes Island? There is no rule to determine this; we might call it either one or the other with perfect consistency. If two travellers were to set out from London for Antipodes Island, one of whom should go eastward through Europe and Asia, and the other westward through America, whatever time they might respectively take for the voyage, they would not agree in naming the day of their meeting. If they meet at the moment when Saturday morning begins at *London*, that is, at midnight between Friday and Saturday, in which case it will be noon at Antipodes Island, the eastern traveller will call it Saturday, and the western Friday. The reason is as follows: the traveller who goes east, sets out to meet the sun in the morning, and will therefore have that luminary on the meridian (that is, he will have noon) sooner than if he had remained stationary. He therefore shortens his day a little, or, to him, the same absolute time is a larger proportion of the interval between two noons, and by thus gaining a little each day, he is 12 hours before London when he reaches the antipodes. The western traveller, on the contrary, turns his back on the sun in the morning, which is therefore on his meridian later than it would have been had he remained stationary. Before he reaches the antipodes, he has lost twelve hours; but the other traveller has gained as much, which together makes a whole day's difference in their reckoning. The reader who examines this question will find that, the day always beginning at noon or midnight, it is impossible that the whole world should have the same reckoning. We see, therefore, that the reckoning of a place will depend upon the direction from which the first settlers approached it, and any one who should afterwards join them from the contrary direction would differ from them by a day. Thus, when Dampier reached Mindanao from the *west*, he was a whole day behind the Europeans he found there, whose ancestors had travelled from the east. And Varenius, a Dutch physician, who travelled in the east about A. D. 1670, states that the Portuguese at Macao were always a day in advance of the Spaniards at the Philippines. The fact was, that the Portuguese came by the Cape and India, and the Spaniards from their American possessions.

Before we conclude this article, we must remark that it would be useful in teaching geography, if the maps of the southern hemisphere had the northern hemisphere drawn upon them in faint outline, *reversed*, in such a way that any one might perceive, at a glance, to what point of the northern hemisphere any point in the southern is antipodal. There is comparatively so little land in the southern hemisphere, that such an addition would not crowd any part of the map too much.

ANTIQUARIES, SOCIETY OF. Mr. Gough, in the introduction to the *Archæologia*, fixes what he considers to have been the earliest foundation of the Society of Antiquaries to the fourteenth year of the reign of Queen Elizabeth, A. D. 1572; when a few eminent scholars, under the auspices of Archbishop Parker and Sir Robert Cotton, united their efforts for the preservation of the antient monuments of their country. The members met for near twenty years at the house of Sir Robert Cotton, and as early as 1589 determined to apply to Queen Elizabeth for a charter of incorporation; a manuscript still remaining in the Cottonian collection (Titus, b. v. fol. 184) preserves the reasons which were urged at this time in support of the petition. But whether the petition was ever presented, or what was its success, does not appear. The writer of the life of Carew, the Cornish antiquary, says, their hopes were frustrated by the queen's death. This society, however, admitted members till 1604; about which time King James I., alarmed for the arcana of his government, and as Hearne conceived for the Established church, thought fit to dissolve it. An attempt to revive the society was made in 1617, in an application for a charter, through the Marquis of Buckingham; but this also appears to have failed.

From this time to the beginning of the eighteenth century the society ceased to exist; or as Mr. Gough expresses it, remained in abeyance.

In 1707, a number of gentlemen, attached in a similar manner to the study of our national antiquities, agreed to meet weekly for the same purposes as the former society, on a Friday evening, at the Bear tavern in the Strand. Among these were Humphrey Wanley; Mr. John Talman; John Bagford; Peter Le Neve, Norroy; Mr. Holmes, the keeper of the Tower records; Madox, the Exchequer antiquary; Mr. Batteley; Mr. William Elstob; Stebbing, the editor of Sandford's *Genealogical History;* and Mr. Sanderson, clerk of the Rolls. Le Neve was at this time president. In 1708 they removed their meetings to the Young Devil tavern, in Fleet-street, and soon after to the Fountain tavern over against Chancery-lane. Here they were joined by Samuel and Roger Gale, Dr. William Stukeley, Mr. T. Rymer, Browne Willis, and Anstis. The plan of their pursuits, comprising every thing which such a body of men might be expected to do for the illustration of their national antiquities, appears to have been drawn out for them by Humphrey Wanley.

In 1717 the members re-founded, or rather re-constituted, their society, and made their first election of officers; Peter Le Neve, Esq., was president, Dr. William Stukeley, secretary, Mr. Samuel Gale, treasurer, and Mr. John Talman, director. At this time also George Vertue, the engraver, became an active member. The number of members was limited to a hundred, and no honorary members were allowed. The minutes of the society begin January 1, 1718; whence it appears that every member, or whoever was admitted to be present, brought from time to time whatever they had of their own, or their friends,' that was curious or uncommon: as coins, medals, seals, intaglios, cameos, manuscripts, records, rolls, genealogies, pictures, drawings, printed books, extracts, or even memoranda; a few produced dissertations. In 1727 the society removed to apartments in Gray's-Inn, and afterwards to the Temple; and, for a very short period, seemed to decline. In 1728, however, they renewed their meetings at the Mitre tavern in Fleet-street, fixing them to Thursday evenings, after the Royal Society had broken up. In 1753 they removed from the tavern to a house of their own in Chancery-lane.

In 1750, it was unanimously resolved to petition the king for a charter of incorporation on the plan formed in 1717, with improvements. This, by the concurrence of the Earl of Hardwicke, then lord chancellor, was obtained in the following year, when his majesty having declared himself 'Founder and Patron,' the society became incorporated by the name of 'President, Council, and Fellows of the Society of Antiquaries of London;' they were empowered to have a body of statutes and a common seal, and to hold in perpetuity lands, &c., to the yearly value of 1000*l*. The council to consist of twenty-one persons, including the president, and to be elected yearly with the other officers. The first council named in the charter, bearing date November 2, 1751, pursuant to the powers therein given them, re-elected as members the other persons not particularly specified. In 1754 the society determined to have two secretaries. In 1781 the society removed from Chancery-lane to Somerset-place, where his majesty King George III. had been graciously pleased to grant to them, as well as to the Royal Society, appropriate apartments. The Society of Antiquaries held its first meeting there on January the 11th that year.

The anniversary of the society is held on the 23rd of April, when ten of the twenty-one persons of whom the council consist are annually changed. The election of members is by ballot; a certificate having been signed by three or more fellows, is previously exhibited for six successive meetings (including those of proposition and election), except in the cases of peers, members of the privy council, and judges, who may be proposed by a single member, and balloted for upon the same evening. The election is determined by a majority of two-thirds. Every member pays an admission fee of eight guineas, and four guineas a year; or an additional sum of forty guineas to the admission fee, to be constituted a member for life. The society's meetings are held on Thursdays from seven o'clock in the evening till nine, in apartments adjoining to those of the Royal Society, in the front building of Somerset-place. The Royal Society's meetings succeed those of the Antiquaries on the same evenings; and the sessions of the two societies coincide as to time, beginning with the third Thursday in November, and ending with the third Thursday in June. The total number of members of the Society of Antiquaries, A. D. 1833, is 753. The presidents, since the incorporation of the society by charter, have been:—1751, Martin Folkes, Esq.; 1755, Hugh Lord Willoughby, of Parham; 1765, Charles Lyttelton, LL.D., Bishop of Carlisle; 1768, Jeremiah Milles, D.D., Dean of Exeter; 1784, Edward King, Esq. (temporarily elected by the council); 1784, George Ferrars Townshend, Baron de Ferrars of Chartley, afterwards Earl of Leicester and Marquis Townshend; 1812, Sir H. Charles Englefield, Bart. (temporarily elected by the council); 1813, George Earl of Aberdeen, who is still president.

By an act of parliament, 5 Geo. IV., chap. 39, the President of the Society of Antiquaries for the time being is declared to be an official trustee of the British Museum.

The publications of this society as a body have been:—1. *Vetusta Monumenta*, 4 vols. folio, 1746—1815, vol. v. not completed; and vol. vi., commencing with seventeen coloured plates of the Baieux tapestry. 2. *Five Dissertations:* one on Doomsday Book, and one on Danegeld, by P. C. Webb, Esq.: two on the Heraclean Table, by Mr. Webb and Dr. Pettingal: one on the Tascia, by Dr. Pettingal: quarto 1756-63. 3. Folkes's *Tables of English Silver and Gold Coins*, with plates, quarto, Lond., 1763. 4. *Archæologia; or Miscellaneous Tracts relating to Antiquity*, 25 vols., quarto, Lond., 1770—1833. 5. *Liber Quotidianus Contrarotulatoris Garderobæ, anno regni Regis Edwardi primi vicesimo octavo*, A. D. 1299, 1300 (from a MS. in the society's possession), quarto, Lond., 1788. 6. *A Collection of Ordinances and Regulations for the Government of the Royal Household, made in divers reigns, from King Edward III. to King William and Queen Mary*, quarto, Lond., 1790,

7. *The Military Antiquities of the Romans in Britain*, by the late Major General Roy *accompanied with Maps, Plans of Camps and Stations*, &c., folio, Lond. 1793. 8. *Some Account of the Collegiate Chapel of St. Stephen at Westminster*, by John Topham, Esq., folio, 1795, *with additional Plates*, described by Sir H. C. Englefield, folio, 1811. 9. *Account of the Cathedral Church of Exeter, with Plans, Elevations, and Sections*, by Dean Lyttelton and Sir H. C. Englefield, folio, 1797. 10. *Account of the Abbey Church of Bath, with Plans*, &c., folio. 11. *Some Account of the Cathedral Church of Durham*, folio, 180 . 12. *Some Account of the Cathedral Church of Gloucester*, folio, 1809. 13. *Some Account of the Abbey Church of St. Alban*, by the late Mr. Gough, *with Plans, Elevations*, &c., folio, 1813. 14. Cædmon's *Metrical Paraphrase of Parts of the Holy Scriptures, in Anglo-Saxon, with an English Translation, and Notes*, by Benj. Thorpe, F.S.A., octavo, Lond. 1832. This last work is the first of a series of publications of Anglo-Saxon and early English literary remains, intended to be edited under the superintendence of a committee of the Society. Layamon's *Translation of Wuce's Chronicle of the Brut*, to be edited by Sir Frederick Madden, in two volumes, will form the second work of the series.

Besides the works above-mentioned, the society have published seven historical prints of large size, accompanied by five historical dissertations. The prints are, 1. *Le Champ de Drap d'Or; or, the Royal Interview of Henry VIII. and Francis I. between Guisnes and Ardres*, A.D. 1520. 2. *Francis I.'s attempt to invade England*, 1545. 3. *The Embarkation of Henry VIII. at Dover*, 1520. 4. *The Procession of King Edward VI. from the Tower to Westminster.* 5. *The Departure of King Henry VIII. from Calais, July* 25, 1544. 6. *The Encampment of King Henry VIII. at Marquisson, July*, 1544. 7. *The Siege of Boulogne by King Henry VIII.* 1544. Also two sets of historical, and some miscellaneous prints, (including Aggas's *Plan of London*,) engraved by Mr. George Vertue, now the property of the Society: with a portrait of *Sir John Hawkwood;* and four views of the *Rui at Stanton Harcourt in Oxfordshire*, drawn and etoned by Simon Earl Harcourt

ANTIQUES, (from the Latin *antiquus*, antient,) a term used in the English language to designate 'antient works of art.' But this definition may be objected to as not sufficiently precise (see ANCIENTS). The term properly refers to works of Grecian art in sculpture, bas-relief, engraving of gems, medals, &c. As these arts flourished in the states of Greece, and also under the Roman Empire, (though most probably they were always successfully cultivated chiefly by Greeks,) it is not possible to find any precise chronological limits that shall determine whether a work of art belongs to the *antique* or not. Still, as there was under the Roman Empire a great and progressive deterioration in the arts above alluded to, until in more recent times they have been again improved, it is clear that many works of considerable antiquity cannot be classed under the head of *antiques;* for by the term antiques we understand, in general, works that have decided merit, and may serve as models for imitation; or they are at least works of art that serve to illustrate and explain those antient authors whose writings, by common consent, are allowed to be deserving of study.

ANTIQUITIES. This term seems not to have its meaning very accurately fixed in our language. It is sometimes used as synonymous with antiques; but generally it has a wider signification. Books that treat of Greek and Roman antiquities, to which the term is commonly confined, treat not only of works of art, but of political constitutions, judicial and legislative forms, religion, architecture, domestic manners, naval and military affairs, weights and measures, mode of reckoning time, &c. Some of these branches of inquiry are capable of illustration, both from antient writings that remain, and from existing works of antient art; some can only be known to us from the study of antient writings. This extensive signification of the word *antiquities*, though certainly not very precise, still keeps up a distinction between antiquities, as thus understood, and the *political* history of the Greeks and Romans, and the study of the Greek and Roman *languages*. Yet we think the common use of the word antiquities in this country a bad one, and we should prefer seeing it limited more closely.

The study of *antiquity* is generally understood to mean the study of all that belongs to the Greeks and Romans, of all the knowledge concerning them that has been transmitted to our times. the word philology is used in this sense in Germany. Under the general term *antiquity*, then, we may class all the several subjects which it comprehends; such as antient forms of polity, antient systems of philosophy, of astronomy, with political history, antient architecture, sculpture, poetry, &c.

With the increase of our knowledge of the durable memorials which man has left behind him in various parts of the earth, we have applied the term *antiquities* to the monumental remains and to the works of art of numerous nations. We now speak of Egyptian, Persian, Hindoo, Peruvian, and Mexican antiquities, when referring to the works of art existing in these countries, or collected in European museums. The terms Egyptian and Hindoo antiquities, when not specially used with reference to works of art, are also understood as comprehending history, mythology, &c. But unless some qualifying word is prefixed to the term antiquities, we generally understand by it, Greek and Roman antiquities.

ANTI'QUITY. [See ANCIENTS and ANTIQUITIES.]

ANTIS. A portico is said to be *in antis* when columns stand in a line, in front, with the antæ or projecting ends of the side walls of the temple or other building. If in the plan of the temple of Ægina [see ÆGINA] the external peristyle or surrounding range of columns were removed, the pronaos and opisthodomus, as there indicated, would be porticoes *in antis*,—not prostyles. There is a very good example of the portico *in antis* in North-Audley-street, London, forming the entrance to an episcopal chapel there.

ANTI'SCII, an old astronomical term derived from the Greek, signifying those whose shadows are in opposite directions. It is applicable, during part of the year, to any two persons, one or both of whom reside within the tropics; and during the whole year, to any two persons, neither of whom lives within the tropics, and both in different hemispheres.

ISCORBUTICS, from *anti*, against, and *scorbutus*, a barbarous word, intended as the Latin for *scurvy:* the remedies, real or reputed, against scurvy. The term scurvy is popularly, but incorrectly, given to two distinct diseases, which arise under different circumstances, spring from different causes, present few symptoms in common, and are cured by means not only unlike, but diametrically opposite. The confusion has crept in owing to the skin in true scurvy occasionally, but by no means invariably, peeling off in scales or *scurf;* while in the other disease or diseases, improperly termed scurvy, desquamation, or other affection of the skin, is an essential and invariable symptom, the portions or scales of which being commonly called *scurf*, the adjective *scurfy* has insensibly come to be used as a substantive, and to be applied indiscriminately to the two diseases. The one occurs mostly at sea, hence called sea-scurvy, and is owing to temporary causes, capable of affecting persons of any constitution; the other occurs mostly on land, is owing to more permanent causes, and is always connected with a peculiar constitution. The necessity of making this distinction is manifest, since the remedies for the one disease are few and certainly efficacious, the medicines for the other are multifarious and generally very inefficacious. This circumstance points out an essential difference between the two disorders; and it is of the means of curing the former of these that we here chiefly intend to speak, adding only a few remarks upon those for the latter.

The importance of the naval force to the safety, commerce, and maritime strength of this country, would justify a very lengthened inquiry into the causes of this disease and the means of prevention and cure, if it now prevailed among seamen to the extent that it once did, and if it still continued to impair the strength of the main bulwark of our national defence. The almost total eradication of this malady, however, renders such investigation altogether unnecessary, farther than as a subject of interesting and instructive contemplation.

Of the degree to which this complaint existed, a few instances will serve as proofs. In 1593, Admiral Hawkins stated it to be consistent with his personal knowledge that 10,000 men had perished of scurvy; at a much later period, Commodore Anson, in the course of his voyage round the world, lost above four-fifths of his men, and when he arrived at Juan Fernandez, of the two hundred men then surviving, eight only were capable of duty. An entire crew has sometimes fallen a victim to it, and the ship been left without a single hand to guide it through the waters. This happened in the case of the Spanish ship Oriflamma, in which the whole crew perished, and in this state she was discovered with the dead bodies on board.

As a means of contrast it may be stated that, in the year 1780, there were admitted into the Royal Haslar Hospital at Portsmouth, under the care of the physicians, 8143 cases of disease, of which scurvy formed 1457; while, during four years, namely, 1806, 1807, 1808, and 1809, into the Royal Naval Hospital at Plymouth, there were admitted under the care of one of the physicians 1984 cases of disease, of which two only were scurvy. During nine years of warfare, namely, between 1778 and 1795, the number of men voted by parliament for the naval service was 745,000; of these, 189,730, a large proportion of which number consisted of men affected with scurvy, were sent sick to hospitals or on shore; while, during nine consecutive years of warfare, namely, from 1796 to 1806, the number of men voted for the naval service was 1,053,076, of whom there were sent sick only 123,949, a difference mainly owing to the disappearance of scurvy.

Let us inquire what were the causes which produced this dreadful disease, and formerly rendered it so frequent; and what are the circumstances which have contributed to its abatement or disappearance, and which now secure to our seamen so gratifying an immunity from it. Before doing this, it will be proper to give a short detail of the symptoms. Under the influence of the concurring causes, an individual began to lose his natural and healthy colour: the skin, first of the face, and afterwards of the rest of the body, became pale, and assumed a bloated appearance; the lips, instead of a rich vermilion, acquired a greenish tinge: indeed, the countenance in this disease is always very much depressed, indicating a corresponding state of mind. The patient is conscious of weariness, and is averse to exertion; and when that of a bodily kind is attempted, his unfitness for it is seen by the weakness of the knees (which often become stiff and contracted) and of the whole muscular system, greatly increased frequency of breathing following the least effort. The skin is dry, sometimes rough, but more generally smooth and shining, with spots of a red, blue, or black appearance, according to the length of time that the blood has escaped from the vessels, which is the cause of these stains. The limbs become dropsical, the gums spongy and swollen; ulcers or any sores, cuts or scratches, bleed profusely, and cannot be healed; even old ulcers break out anew, and broken limbs, apparently firmly united, separate again, and cannot be reunited so long as the disorder continues. The blood when drawn scarcely coagulates, but remains loose and flabby; yet during the whole of this state the appetite generally continues good. These symptoms all denote great debility, which is occasioned by a peculiar alteration of the blood, and is produced by the causes we have now to mention.

One of the most extensive and powerful causes of debility is constant exposure to a cold and damp atmosphere. The construction of ships was formerly such that the sailors were continually exposed to the operation of this cause, which was further aided by the unwholesome exhalations from the bilge-water, the sand used for ballast, and the remains of animal and vegetable matter which were strewed about the ship: no means of removing or lessening these causes existed, from the utter absence or imperfect nature of the means of ventilating the ship, or washing it, without increasing the dampness. The sailors were also very inattentive to personal cleanliness, were unprovided with soap, and were too insensible of the advantage of changing their dress when wet, and were also without the opportunity of changing or washing and airing their bedding. The measures adopted by Captain Cook, on the occasion of his second voyage round the world, were very similar to those since universally pursued. Out of 318 men, during a voyage of three years and eighteen days, throughout all climates, from fifty-two degrees north to seventy-one degrees south, he lost only one. For this, in the year 1776, he received from the Royal Society the Copley medal. (See Kettler's *Life of Cook*, 1788, p. 315.)

By the change effected by Sir Robert Seppings in the construction of ships, and the substitution of iron instead of sand for ballast, and of iron tanks instead of casks for water; by the efficient means he has devised for ventilating the ship, without exposing the persons of the sailors to cold; and by the employment of portable iron fire-places in different parts of the ship, as well as by a change of bedding, and a proper allowance of soap to each sailor—these debilitating causes no longer exist, or are rendered powerless.

Another cause of debility was either excessive fatigue or deficiency of proper and regular exercise; the former cannot always be avoided, as in the case of much bad weather, when the labour of all hands is increased, or great sickness among the crew, which requires more exertion on the part of the healthy. But deficient exercise can always be avoided by the officers finding employment, or inventing amusing occupation, for the sailors, and above all for the marines, who, having less active duty in the ship, were the most frequently attacked by scurvy. Intemperance also greatly contributed to prepare the system for a scorbutic attack, but this vice is now much repressed.

None of these causes singly, nor indeed all of them combined, are adequate to produce scurvy, unassisted by some specific cause, which cause is to be found in the *diet*. The diet of seamen during long voyages was formerly merely salted meat and biscuit; fresh animal food or recent vegetables formed no part of it. It was also often deficient in quantity.

Salt, if taken in moderation, facilitates digestion, but if in excess, hinders the digestion of the food, even of fresh meat and vegetables; when employed as a means of preserving meat, it hardens it, and impairs its nutritive power, as well as renders it more difficult to digest. Such meat is less nourishing, but more stimulating, than fresh meat, and its long-continued use produces what may be termed the *disjunctive* inflammation, owing to which old wounds and ulcers break open, and fractured bones separate after reunion. The salt seems to be pernicious in a two-fold way, first, by lessening the nutritious power of the meat; and secondly, by its stimulating properties. The former of these, unaided by the latter, is sufficient to produce scurvy, if the predisposing causes of cold, moisture, and imperfect or excessive exercise be in operation. The diminution of the *quantity* of food, and not its *quality*, was the principal exciting cause of scurvy in the Milbank Penitentiary in 1819. [See ABSTINENCE.]

In what way the absence or inadequate supply of fresh vegetables operates has not been ascertained. That the deficiency of this article of nutriment has a large share in producing scurvy is established by the facts, that before the extensive introduction of esculent vegetables into Britain, scurvy was almost as common on land as at sea; and also by the rapid disappearance of scurvy from among the crews of ships, so soon as they procure a supply of vegetable articles of diet of any kind, but more particularly those belonging to certain tribes of vegetables,—as the hesperideæ or aurantiaceæ (the orange tribe), the grossulariaceæ, or gooseberry tribe, which are all acid vegetables; and the cruciferæ, or mustard tribe, containing cabbages (whence sour-kraut is prepared) and the well known scurvy-grass, which are alkalescent vegetables; the coniferæ, some of which yield spruce; &c.

These vegetables, or the articles prepared from them, constitute the *antiscorbutics*, or means of preventing and curing sea-scurvy; but they are not all of equal value, some far surpassing the others in efficacy. Those are the least valuable in which no vegetable acid greatly predominates, so as to impart to them an acid or acidulous taste. Hence the cruciferæ are not so useful in their natural state, as the name of *scurvy*-grass, bestowed on one of them, would seem to indicate; but when by their fermentation, as that of cabbages to form sour-kraut, a vegetable acid (acetic acid? or vinegar) is produced, they rise in the scale of antiscorbutic power. But at the head of all, the hesperideæ deserve to be placed, the members of which contain citric acid: accordingly any of the species may be employed; but the most powerful belong to the genus *citrus*, especially the citrus limonum (Risso), the well-known lemon, since the introduction of which into the navy, in 1796, scurvy has almost ceased. It may be used in various ways; the best is in the form of the fresh fruit, sucked by the patient: but in the absence of this, lemon-juice may be employed, and this is the usual mode in the naval practice. Several gallons of it, having a tenth-part of spirit of wine added to preserve it, are supplied to each ship, and in about a fortnight after leaving port, its use is begun; each sailor is allowed one ounce of it and one ounce and a half of sugar to mix with the grog, or in many instances with wine, a stated quantity of which is granted in lieu of a certain quantity of spirits, which is withdrawn. This has the effect of almost invariably preventing scurvy affecting any of the crew; but should symptoms of the disease begin to show themselves, they quickly disappear by an increase of the quantity of lemon-juice. Citric-acid, which has been crystallized and again dissolved in water, is not so efficacious; neither is vinegar, nor any other vegetable acid, such as tartaric, or malic, so useful, though the fruits containing them (unripe gooseberries, tamarinds) are the best substitutes for lemons, when these cannot be procured.

No one, as far as we know, has attempted to explain how these vegetable acids produce their beneficial effects. It may be remarked, however, that all acid fruits have a very cooling and soothing effect in many complaints; they are among the most useful refrigerants, and often sit on the stomach and restore its power, when in a very irritable or weakened state. This is particularly the case where the powers of the stomach and nervous system have been much impaired by intemperance, especially from the abuse of spirituous liquors, in which tartaric acid is eminently serviceable; even during a fit of intoxication, a draught of vinegar will restore the drunken man to his senses more speedily than any other means. These acids appear to exert a very considerable vital action on the system generally, but especially on the nervous centres. Further, lemon-juice and vinegar exercise a chemical influence on many articles of food difficult of digestion, as veal; hence the practice of serving these articles to table, accompanied by one or other of these acids. If the salt has rendered the meat hard and difficult of digestion, may not these acids produce some change in it, rendering it less so by their chemical properties, as well as by their general action, heightening or increasing the vitality of the stomach, and consequently its power of extracting the nourishment? Some local effect is produced by the direct application of lemon-juice, as slices of lemon placed on the ulcers hasten the healing processes.

Mineral acids, such as elixir of vitriol, are found less useful, though they and other strengthening medicines, such as sulphate of quinine, may occasionally prove serviceable, when lemon-juice is wanting, or fails in effecting a cure, which has happened in some very rare instances. An instance occurred in 1822, on board his majesty's ship Leander, where, however, probably some undiscovered cause of scurvy existed about the ship; for we cannot suppose the want of success to have depended on peculiarity of constitution where so many men resisted the curative influence of the medicine. (See also Bampfield on *Tropical Dysentery.*) Chloride of soda appears to have some claim to a favourable regard; but at present we have too little experience of it, in this respect, to speak positively of its antiscorbutic power.

In addition to the lemon-juice, ships intended to be sent on long voyages are supplied with animal food so prepared, as to be almost as fresh at the end of six years, as if it had been killed but a few days and dressed the day previous to its being used. This valuable discovery, which tends so greatly to lessen the inconvenience of a sea-life, as well as to secure the health of those devoted to it, was made by Mr. Appert: the mode of effecting it, and the principle on which it depends, will be explained under ANTISEPTICS.

After every fair degree of merit is assigned to other means and articles, the main instrument of banishing scurvy from among the number of diseases incident to a sea-life has been the liberal use of lemon-juice. The nation owes a deep debt of gratitude to those who effected its universal introduction into the naval service, and who yet live to witness the beneficial effects of their enlightened views; these are Earl Spencer, who was first lord of the Admiralty in 1795, and the benevolent, and now venerable, Sir Gilbert Blane, physician to the fleet, and at the head of the Navy Medical Board in 1795. But for their exertions our navy could not, during the twenty years of the war which followed that date, have achieved those victories which have rendered our country so illustrious. Had the mortality in the navy, throughout these twenty years, been equal to what it was in 1779, the whole stock of seamen would have been exhausted. (See paper on the comparative health of the British navy, by Sir Gilbert Blane, in his *Select Dissertations on Medical Science*, London, 1822; also in vol. vi. of *Transactions of the Medico-Chirurgical Society.*)

The historian of Anson's voyage, speaking of scurvy, says, 'the cure seems impossible by any remedy or by any management that can be employed.' In the present day, instead of the remedy being unknown, it is, happily, the disease: a fact which suggests the most important subject for contemplation, and justifies the reflections and language of Sir Gilbert Blane: 'does it not afford a cheering and consolatory prospect, "amidst the thousand shocks that flesh is heir to," that there may be still in store for us, in the boundless progression and endless combinations of knowledge, other hidden means of advancing human happiness, of mitigating human misery, and of making accessions to the dominion of man over nature which have not yet been dreamt of in our philosophy.'

The other diseases to which the name of scurvy has been improperly given, and some of the remedies for which are termed antiscorbutics, have no connexion with sea-scurvy, or its remedies. These various affections of the skin are more or less connected with a scrofulous constitution, to which are owing the disordered functions of the digestion, whence these eruptions spring. Acidity in the stomach is a concomitant and characteristic symptom of these diseases, for the cure of which vegetable acids are unavailing, though the mineral acids, by their strengthening virtues, are often serviceable. These so-called scorbutic affections are of very frequent occurrence among persons subject to gravel and gout, which are, at the commencement, caused by acidity in the stomach: the appropriate means of cure for both complaints are alkalies (see ANTACIDS), the very opposite of the means useful in true scurvy.

The nostrums vended under the name of antiscorbutics, and intended for these cutaneous diseases, though varying in their composition, mostly contain, as their active principle, some preparation of mercury, often a very poisonous one, which is always hurtful in sea-scurvy, and can only be serviceable in particular cases of the other kinds. Its use requires the greatest caution, directed by the utmost skill; the employment of such articles should, therefore, be carefully avoided.

ANTISEPTICS, from ἀντὶ *against*, and σήπομαι *to putrefy*, the means of preventing those changes in organized matter which are comprehended under the term putrefaction. All organized bodies consist of different materials, which are designated their *proximate principles*, and these again are formed by the union or combination of certain *ultimate principles*. An organized body, therefore, is always a compound one, and the tendency of its original or natural proximate principles to form others, and, at last, to be resolved into the ultimate elements of which they are formed, is the occasion of putrefaction, which takes place in all bodies, sooner or later, according to the circumstances in which they are placed. To give an example of each: flour, prepared from what was once a living and organized body, called a seed, contains two proximate principles, gluten (bird-lime) and starch: each of these is resolvable into definite combinations of what are termed simple or *elementary* bodies, of the same nature as the constituents of inert or inorganic matter; the most common of these are *oxygen*, *hydrogen*, *carbon*, and *nitrogen*. The first or proximate principles are only met with in organized bodies; the latter equally in organized and inorganic matter. Oxygen, for instance, forms a portion of the air which we breathe, and also of water; hydrogen forms a portion, or is an element, of water; nitrogen is found in the atmospheric air; and carbon exists in the diamond, in the charcoal obtained from wood, or from animal matter.

All organized bodies spring from parents similar to themselves, possessed of, or endowed with, a vital principle. Every such body possesses the power of assimilating to itself matter introduced from without, whether inorganic, as table-salt, or organized matter, as dead animal and vegetable substances, in the case of man and some other animals, or merely inorganic matter, as in the case of vegetables. After being received into the interior of the body, these matters undergo changes previous to being distributed to that part of the frame destined for the reception of the different proximate principles which are formed out of them by the vital processes of digestion and assimilation. When deposited in the part intended for them, they would speedily enter into fresh combinations, were not their tendency to do so controlled by the agency of the living principle, which counteracts the usual chemical affinities of the constituent or elementary principles. When this principle is weak, or does not act with sufficient energy, either through the whole frame or in any particular part of it, the elementary principles manifest a disposition to exert their ordinary affinities, which would lead to the decompoition of a part or the whole. Partial decomposition occurs when a limb or other part of the body has been the seat of such violent inflammatory action that its structure is changed, and its vitality destroyed, so that it *sloughs*, as it s technically called, that is, becomes dead: complete decomposition occurs when the vital principle quits the entire frame, *i. e.* when death of the whole body takes place, and putrefaction begins. But the presence of the vital principle does not always hinder the commencement of putrefaction, as we see the tendency to it manifested in the worst kinds of fevers several days before dissolution: on this account they were termed *putrid* fevers, and were conceived to be owing to putrescency of the fluids, a doctrine common during the prevalence of the *humoral* pathology. But more correct views of fever have taught us that the changes in the fluids, both as respects their properties and chemical constitution, are consequent upon a change in the vital action of the system, resulting from the impression of a powerfully morbific agent on the nervous or circulatory systems. This impairs the vital force or energy of the frame, and lessens the power by which the chemical affinities were controlled; and hence the early tendency to putrefaction in persons affected with fevers of a typhoid type or character.

The complete departure of the vital principle is not sufficient to occasion the commencement or ensure the continuance of the processes of putrefaction: the concurrence of several other circumstances is necessary. These are air, heat, and moisture: if any one of these be wanting, decomposition will in general be prevented. If the air has an admixture of certain particles or principles, the tendency to putrefaction will be greatly increased; and, on the other hand, impregnating the air with certain other principles, greatly lessens the disposition to decomposition. These circumstances have so large a share in the production or prevention of disease and death, that a thorough understanding of them is of vast importance to the welfare of the community.

The atmospheric air, considered in reference to its chemical composition, is a mixture of nitrogen and oxygen gases, in fixed and uniform proportion, with carbonic acid gas in a small and variable proportion. But close to the surface of the earth, it receives an admixture of particles or principles of different kinds, by which it is contaminated, and rendered less fit for the support of animal and vegetable life. By the respiration of animals, particularly of warm-blooded animals, as man, a portion of the oxygen is withdrawn, and a corresponding portion of carbonic acid gas is substituted in its place. By the respiration of plants, the carbonic acid gas is withdrawn, and an equivalent portion of oxygen substituted. By the mutual action of the members of the animal and vegetable kingdoms, the balance of the constituent elements of the atmosphere is maintained. But by a preponderance of the members of either of these kingdoms, an excess of the one principle and a deficiency of the other will be occasioned. Hence, where there is a large assemblage of men, the air is less fit for respiration, as happens in close apartments: the most melancholy example of this is to be found in the narrative of the Black Hole at Calcutta; of one hundred and forty-six persons confined in this dreadful place, *one hundred and twenty-three* perished during one night. Trees crowded together in plantations suffer more from deficiency of carbonic acid and oxygen, both of which are required for respiration, than from deficient nutriment by the roots—a fact of which proprietors and managers of timber-plantations are either not aware, or at least they neglect the practice to which it should lead. It may be remarked by every one that on the coast, where animal life acquires an accession of strength from the purity of the air, which abounds in oxygen, vegetable life languishes from the deficiency of carbonic acid. In addition to these sources of deterioration, the air is contaminated by various other means, some occasional and limited in their operation, others more constant and extended in their influence. A brief review of these will here be proper; but, before proceeding to enumerate them, it will afford conclusive evidence of their importance to adduce one example of the influence of even a slight admixture of a deleterious principle with the ordinary constituents of the air. 'This gas (hydro-chloric acid, or muriatic acid gas) must therefore be very injurious to vegetable life, since so small a quantity as a fifth of an inch, though diluted with 10,000 parts of air, destroyed the whole vegetation of a plant of considerable size in less than two days. Nay, we afterwards found that a *tenth part of a cubic inch in* 20,000 *volumes of air* had nearly the same effects.' Drs. Turner and Christison, in *Brewster's Journal*, vol. viii. p. 145.

These are principles with the chemical qualities of which we are well acquainted, and the sources of which we can easily ascertain, and often remove; but there exist others, of the nature and origin of which far less is known, though their effects are very conspicuous: such are the exhalations from decaying vegetable matter, termed marsh miasmata, or malaria, and the exhalations from the bodies of men and animals, when crowded together, or from that of men labouring under certain diseases, as fevers, called the matter of contagion, or from dead animal matter, in a state of putrefaction, termed putrid effluvia. These are the fertile sources of fevers, whatever their form, type, or appellation; and though it is commonly thought that the fevers from vegetable matter are always of an intermittent or remittent character, yet they often assume the continued form (see AGUE); while the effluvia from animal matter mostly give rise to fevers of a continued and typhoid character.

What the precise nature of this deleterious principle is cannot be stated, but whatever it be, when received in sufficient quantity into the human system, it seems to act as a ferment or yeast, and produces a series of changes, the ultimate object of which is to reduce the body attacked to a state of putrefaction. We have no test of its presence beyond its effects, but we know the sources whence it springs, and the circumstances which favour its concentration, and occasion the human frame to become more susceptible of its influence. It is only by removing or lessening these that we can escape this insidious foe, and the success which has attended the enlightened measures proposed by physicians and chemists should lead to their extended application.

Long-continued calms, in which there is a stagnation of the air, and during which fresh and purer particles of the atmospheric principles do not descend from the higher regions to replace the heated and contaminated air near the surface of the earth, conduce much to the concentration and virulence of these agents. For several weeks before the plague broke out in London, in 1665, there was an uninterrupted calm, so that there was not even sufficient motion in the air to turn a vane. And at the season in which the last plague visited Vienna there had been no wind for three months. To produce agitation in the air, fires were formerly lighted, and pieces of artillery discharged, means altogether inefficient to cause a considerable commotion in the atmosphere at large, though a fire is extremely serviceable in renewing the air of apartments in houses: the only means adequate to this end are beyond our control, though they frequently take place at the moments of the utmost need; these are storms and hurricanes, which, however desolating in their immediate effects, are instruments of great, though less obvious, good. After the hurricane which proved so destructive to the inhabitants of the West Indies in 1780, less disease occurred than had been known before; even those who laboured under sickness at the time were benefited by it; fever, diarrhœas, and dysenteries, but, above all, disorders affecting the lungs, were cured. Cases of intermittent fever were observed to be cured by an earthquake at Caracas in March, 1812. (See Brande's *Quarterly Journal of Science* for 1817, vol. ii. p. 401.) After the excitation of a storm, plants give out more oxygen, which accounts for the delightful and life-giving freshness of the air, of which every one is sensible, who walks out into the fields immediately afterwards.

We may imitate nature, and employ ventilation on a small scale, but with the best effects, in our dwelling-places, hospitals, and sick-rooms. The evils of neglecting this salutary measure contrast strikingly with the beneficial consequences of attending to it. It is remarked by Dr. Macculloch, in his *Account of the Hebrides*, that while the inhabitants had no shelter but huts of the most simple construction, which afforded free passage for currents of air, they were not subject to fevers; but when, through the good intentions of the proprietors, such habitations were provided as seemed more comfortable and commodious, but which afforded recesses for stagnating air and impurities, which they had not the means, or had not a sufficient love of cleanliness, to remove, febrile infection was generated. The mortal fevers which have occurred from crowding human beings together in small ill-ventilated apartments are numerous. They were termed jail and hospital-fevers, from their infesting these places: the survivors of the night in the Black Hole of Calcutta were, almost without a single exception, attacked by fever; and the unhappy victims of the mercenary actors in the slave-trade were often released from suffering by the fevers which resulted from crowding so many into a confined space. To avert such calamitous diseases, we must have recourse to measures which will lessen or remove their causes; such as dispersion of the inhabitants or patients over a larger space; enforcing cleanliness of the apartments and of their persons, and freely ventilating every room. Formerly, in the hospital at Leeds, no patient suffering from compound fracture or other severe accident survived, till the ventilation of the wards was improved. One of the most convincing proofs of the different influence of foul and pure air is to be found in the *Report of the Lying-in Hospital of Dublin*. In the space of four years, ending in 1784, in a badly-ventilated house, there died 2944 children out of 7650. But after freer ventilation, the deaths in the same period of time, and in a like number of children, amounted only to 279. Attention to this point will prove a protection from numerous causes of disease. The annual mortality of Manchester in 1757 was 1 in 25, and in 1770, 1 in 28; but in 1811 it was 1 in 74, a change mainly attributable to the improvements in ventilation effected by Drs. Percival and Ferriar.

Stagnant water, and the mud which remains after it has evaporated, marshes and places occasionally overflowed, emit exhalations not less noxious than those from decaying animal matter, or the bodies of human beings. These are the more powerful in proportion to the heat; hence, in tropical and warm countries, they give rise to the yellow-fever and the jungle-fever, which are rapid in their course, and generally fatal in their close: in colder countries they produce continued remittent and intermittent fevers. The exhalations are always less hurtful in proportion to the activity of the vegetation. The inhabitants of that part of the town of Batavia which is nearest the mud and slime left by the tide suffer more from fevers than those who dwell next the marshes, unhealthy as these are. In the marshes of Anké, a great number of different kinds of grasses, rushes, &c., grow, and the spaces between these plants are covered with large quantities of the *Pistia stratiotes*, the leaves of which float on the surface of the water, and absorb a great quantity of the noxious vapours as fast as they are exhaled, and change them, by the aid of the sun's rays, into respirable air. This change is effected by the pistia more than by any other plant; for it is known from experiments to be so powerful a preventive of decomposition of stagnant water, that if fishes be put into a small quantity of water, in which they would otherwise perish in the course of a few days, they may be preserved alive for a long time by covering its surface with these singular plants. The utility of a piece of moss introduced into the vase where gold fishes are kept is well known; and the *lemna* or duckweed, and other plants which cover the surface of ponds in summer, render a similar service to the air here, which the pistia does to that around Batavia. Where marshes cannot be drained, the planting them with marsh and aquatic plants, and such trees as alders and poplars, is the best mode of mitigating the evils which result from them. The beneficial effects of draining and forming under-ground sewers are shown in the perfect immunity which London enjoys from ague as an epidemic, contrasted with former times. Dr. Caius, the most eminent physician in England at that period, states, that the mortality of London from ague in 1558 was such, that the living could hardly bury the dead.

When these natural means of preventing animal and vegetable exhalations cannot be employed, we must have recourse to artificial means of disarming them of their potency. Of the measures formerly resorted to for this purpose, some were useless, while others were hurtful to the sick, and could not be practised without the removal of the patients, which can rarely be accomplished. All of them, in point of efficacy and facility of application, fall short of two agents, which bid fair to render every other superfluous: these are the chlorides of soda and of lime. In these preparations chlorine is combined with the bases in such a way as to be susceptible of decomposition, and is evolved with more or less rapidity according to the ingredients or impurities it meets with in the air. The most common of these impurities is carbonic acid gas, which is produced both by the respiration of living animals, and by the decomposition of their bodies when dead. Another product of putrid animal matter is ammoniacal gas, which generally unites with the carbonic acid, and forms carbonate of ammonia, the presence of which may be recognized by the pungency of the air impregnated with it, which affects both the eyes and the organ of smell. Now it is interesting to remark, that carbonic acid gas has the greatest tendency to unite with the soda or the lime, and to liberate the chlorine. Again, chlorine decomposes ammoniacal gas by abstracting the hydrogen from the nitrogen, and forming hydro-chloric or muriatic acid. One example of its beneficial action will prove its utility. Air was passed through blood, which had been left to putrefy for eight days; being then passed through a solution of the chloride of lime, carbonate of lime was deposited, and the air was rendered inodorous and completely purified. These agents can only be productive of benefit within a limited range of atmosphere, yet they may be employed successfully to purify the air of hospitals, sick-rooms, &c.

Quick-lime, or charcoal recently prepared, has been employed to absorb fetid and noxious exhalations, and though inferior to the chlorides, may be used in some cases, such as when the patient cannot bear the smell either of the chloride of soda or of lime. When the matter of contagion is supposed to be attached to woollen or cotton clothes, we may expose these to a high temperature, 212° of Fahrenheit, for some hours, by which it will be dissipated.

An equally important means of warding off the effects of exposure to a contagious atmosphere, is to put the body in a posture of defence by strengthening it, and regulating the general health. Increasing the vital force of the system renders it less susceptible of being acted upon by impure air; hence nourishing food and tonic medicines may be regarded as indirectly antiseptics. It is a wise precaution not to visit the sick without previously taking food. But useful as a supply of proper nourishment is, still it is of inferior efficacy, as a protective means, compared with ventilation and cleanliness, as is demonstrated by the instructive fact, that in Great Britain, we were 200 years later in getting rid of pestilence than of famine. Most of the medicines which were formerly termed antiseptics are either tonics or refrigerants: of which cinchona bark may serve as an example of the first class, and the mineral and vegetable acids, as dilute sulphuric acid, and tartaric acid or citric acid of the second. Tonic antiseptics cannot be employed with propriety or safety at the *beginning* of fevers or inflammatory complaints, but in many diseases a period arrives when they may be usefully administered. The period when their employment becomes safe requires the nicest discrimination on the part of the medical attendant; and too numerous are the instances where their premature employment has rekindled the disease which might otherwise speedily have subsided. We are, however, justified in having recourse to them at an earlier period in those diseases which we know to have a great tendency to lead rapidly to the death of some part; such as in the malignant or putrid sore-throat of scarlet fever; or in continued fever of a very typhoid character.

The refrigerating antiseptics may be beneficially used from a very early period of inflammatory diseases, especially of the young and robust: in such diseases as scurvy (*i. e.* sea-scurvy) they surpass all other remedies.

As the operations of nature in regard to organized matter seem to consist in reducing to their elementary state each individual, or part, when it ceases to live, and in reconstructing others, it forms an interesting and important subject of investigation to inquire in what way the former of these may be prevented, when it is desirable to preserve the whole or a part of organized matter from putrefaction; by what means can the tendency to putrefaction be so modified, that the result of it, though leading to the formation of a substance having a very different character, shall yet be of a kind which may be preserved for a longer period, than the original substance; and how the process of putrefaction may be rendered a useful, instead of a noxious, operation. The first two questions concern the preservation of food, so that the produce of a period of plenty may be stored up as a provision for a time of scarcity, and the super-abundant productions of one country may be transmitted in a sound and wholesome state to a distant land. It also concerns the provisioning of our ships, so as to ensure the health of the crews, as far as depends upon a proper supply of animal and vegetable diet. The last question relates to the beneficial application of putrefying materials to the soil as manures.

All organized substances do not putrefy with equal rapidity, nor under all circumstances. Decomposition goes on fastest in substances which contain nitrogen; most slowly in substances which contain carbon: hence animal matters putrefy quickly; vegetable, especially of a woody texture, gradually: the decomposition of the former is characterized by an unpleasant odour, and the formation of ammonia; that of the latter is rarely unpleasant, except it be of vegetables which contain nitrogen, such as cabbages and fungi. The conditions necessary for the process of putrefaction to take place are, the presence of air, of a certain temperature, and moisture. If any one of these be excluded, the process is prevented. The moisture may either be external, or it may be the fluids of the body itself. The bulk of the animal frame is made up of fluids the preponderance of which over the solids is strikingly illustrated by an entire, but perfectly dry, natural mummy of a full-grown native of the island of Teneriffe; though all the solid parts of it are preserved, it does not exceed seven pounds and a half in weight. The fluids must either be dissipated by heat, abstracted from the body by some chemical process, or rendered solid by a very low temperature, if we wish to preserve any animal substance in the state most near that of its natural constitution. For the sake of clearness, we shall here speak of the modes of preserving food under two heads, the natural and the artificial.

The former modes comprehend those which effect this end by abstracting or excluding one or more of the chief agents,—heat, moisture, and air,—and furnishes the answer to our first question; the latter comprehend those methods of preparation or mixture which may be considered to be the answer to the second question.

1st. Abstraction of heat. The presence of heat is essential to the exertion of those chemical affinities which take place during, or constitute the process of, decomposition; abstracting it, therefore, checks or suspends them; most articles of food keep better in cold than in warm weather. When the heat has been so completely abstracted that the juices are frozen, *i.e.*, become solid, the preservation of the substance is more effectually accomplished. Indeed they may thus be preserved for a time almost beyond belief. In the year 1779, on the shores of the Frozen Ocean, near the mouth of the river Lena, an animal of immense size was discovered imbedded in ice, which, as it melted, gradually disclosed him to view. His hair, skin, and flesh were in so good a state of preservation, that dogs and many wild animals preyed upon it. (Some of the hair may be seen in the museum of the Royal College of Surgeons, Lincoln's-inn-fields.) In the opinion of Cuvier, this animal differs from every known species of elephant, and is, therefore, considered by him as *antediluvian*, and to have been preserved from the remote period of the deluge in the mass of ice which enveloped him.

On this principle the Russians preserve their poultry, which they kill in October, and pack in tubs with layers of *snow* between. The markets of St. Petersburg are supplied with veal brought from a great distance in this state, as well as with whole hogs, sheep, and fish. The Canadians preserve their provisions in the same way. Almost the only instance in which we adopt this practice is in sending fish from Scotland to London; but it might be employed for the preservation of many other articles, eggs for example.

A precaution is necessary in thawing them; for this end, they should always be put into *cold* water first. Indeed, in the case of persons lost in the snow, recovery is much more likely to be brought about by plunging the individual into cold water, than by placing him in a warm bed.

This method of preserving food is not applicable to vegetables, but when these are frozen they should also be first put into cold water.

2nd. The abstraction of moisture by heat is employed in drying fish and other animal substances, as beef, bacon, &c., though in these the rapid tendency to putrefaction makes the employment of a certain quantity of salt, &c., along with desiccation necessary, unless the process be carried on with great rapidity, which may be effected by a high temperature and a free circulation of air. Hence in many places, where turf or peat is burnt, hams are hung within the wide kitchen-chimney; but, by this means, the juices are dissipated, and, consequently, the flavour, as well as nutritious property, of the meat is lessened, and its indigestibility is increased. This method is better suited for the preservation of vegetable substances, such as grain, hay, &c. It is by this means that botanists preserve plants to form a hortus siccus, or herbarium, and many plants are preserved for medical use. But in the case of these last, a high temperature should never be applied, as it dissipates their active principles.

3rd. The exclusion of sources of oxygen-gas constitutes another means of effecting the end in view; and as the atmospheric air is the most common, as well as universal, source of oxygen, we shall limit our remarks to the means of excluding it. The influence of this is very great. Réaumur varnished some eggs, and found that at the end of two years, they were yet capable of producing chickens; and Bomare mentions an instance where three eggs were inclosed within the walls of a church in the Milanese, and when found at the end of 300 years, they had not lost their flavour. On this principle butter is rubbed by careful housewifes over their eggs; lime-water, however, is the best medium in which to place eggs for long keeping. But more valuable articles than eggs are preserved by this means; and in a condition nearly equal to their fresh state. We allude to the method of preserving animal food and vegetables, promulgated by M. Appert. This consists in boiling the articles (if meat, the bones must be first taken out) to nearly as great a degree as if intended for immediate consumption; they are then put into jars, or now generally into tin canisters, which must be completely filled with a broth or jelly prepared from portions of the same meat. The jars are then corked and covered with a luting formed of quicklime and cheese, or if canisters be used, these are carefully soldered down. After this, they are placed in a boiler of cold water, to which heat is then applied till the water boils, and the boiling of which is continued for an hour; the fire must then be instantly extinguished, and the water soon drawn off, but the boiler must not be uncovered, or the bottles taken out for one or two hours after.

By this method meat may be kept sound and well-flavoured for six years, or even longer, and sent to any part of the globe. (See Appert, *Art of Preserving Animal and Vegetable Substances*, London, 1811.)

The natural methods of preserving organized substances are few and simple; the artificial more numerous, as well as more complex. They consist either in causing such changes in the elementary constitution of a body as shall form a new and less destructible article, or by introducing some additional principle which shall hinder the exercise of the natural tendencies or affinities of the elements of the substance.

The first set of means constitute the various kinds of fermentation, of which this is not the place to treat, but with respect to which we may remark that the products of them are not only little disposed to undergo decomposition, but have also a powerful effect in preventing other substances from undergoing it; the most remarkable of these are acetic acid or vinegar, and alcohol. The mode of action of vinegar or pyroligneous acid in preventing the decomposition of animal and vegetable substances has not been determined, but alcohol is supposed to act by abstracting the elements of water. The formation of sugar, which is another product of fermentation, is a powerful means of preserving fruits, in which it is formed spontaneously, or to which it is afterwards added. Fruits are ripened by the conversion of the acid which they contain into sugar, and as this requires the aid of light and heat, fruits gathered in the afternoon are less acid than if gathered in the morning, and keep much better. The addition of sugar is practised in forming syrups, jellies, and preserves.

Those parts of plants which contain much carbon last the longest, whether dead or alive: many vegetable structures have been preserved entire, embedded in charcoal, in the most antient coal formations; and in bogs and mosses, trees are met with, having a perfect integrity of structure. Even in trees cut down and exposed to air and moisture, the bark, which contains most carbon, endures after the rest has perished. The seed also contains much carbon, and owing to this retains its vegetative power often for a hundred years or more. When seeds are sent from India to England, they are always wrapped in recently prepared charcoal. When stakes or piles of wood are to be driven into the beds of rivers or marshes, they are previously charred; and to preserve water sent to sea, the inner side of the cask is also charred. A more perfect mode of preserving water from becoming putrid, is to saturate it with fresh lime, (and in this lime-water, eggs for use at sea may be kept:) when the water is needed, the addition of a few drops of sulphuric acid (oil of vitriol) will precipitate the lime, and leave the water pure and wholesome. But for this purpose it must be carefully closed against the admission of the air, otherwise the lime will be precipitated by abstracting carbonic acid from the air.

There are many substances which when added to animal matter prevent for a longer or shorter time their decomposition, such as salt-petre (nitrate of potass), and common salt (chloride of sodium), which last is supposed to act by abstracting the elements of water; certain it is that meat is rendered by salting much drier, harder, less easily digested, and consequently less nourishing. [See ANTISCORBUTICS.] Many aromatic substances have a similar power of preventing putrefaction for a time. They were extensively employed in embalming in antient as well as modern times, as the Egyptian mummies prove. Oils and resinous substances long resist putrefaction, and preserve other substances from it; bitumen, naphtha, and empyreumatic oils, are examples of this. Russia leather, which is dressed with the empyreumatic oil of the birch, not only does not become mouldy, but also preserves the books which are bound with it. The process of decomposition is greatly hastened by the agency of fungi, such as those which cause mouldiness, and the more formidable destroyers which occasion the dry-rot. The fungi which cause mouldiness are generally prevented from developing themselves by the presence of some aromatic oil; and the others which occasion the dry-rot in timber, may be prevented from developing themselves by the process invented by Mr. Kyan. This consists in combining the albumen of the wood with bi-chloride of mercury (corrosive sublimate), which it converts into the proto-chloride, in the same way that animal albumen combines with, and converts into the proto-chloride, the same compound (see ALBUMEN); the wood is thus rendered insusceptible of the attacks of the fungi. Fungi often attack and destroy the cereal grains, particularly wheat: the worst of these, viz., the uredo fœtida, (pepper-brand,) may be prevented from farther developing itself by steeping the seeds for twelve hours in lime-water. (See Paper by Mr. Bauer, in *Penny Magazine*, No. 64.)

Insects are frequent agents of nature in forwarding the processes of decomposition. Some penetrate growing trees, and either injure them by opening a passage to air and moisture, or by depositing their eggs, the larvæ from which feed upon the juices and organs of the trees. Such is the destructive power of some insects in this latter way, that some years ago a million and a half of pine trees, in the Hartz mountains, perished from the ravages of the *bostrichus typographus*, 80,000 larvæ of which were found in one tree. About fourteen years ago, the elm-trees in St. James's Park, and the environs of London, suffered greatly from a small insect called the *hylesinus destructor*. The only means yet known of stopping these, is the expedient suggested by Mr. M'Leay, of cutting down the trees and burning them, when the eggs have been deposited, before they turn to larvæ or winged insects.

The collections of entomologists and botanists suffer much from the depredations of insects. Those which infest collections of insects may be driven away by placing camphor in the cases, or by introducing a solution of bi-chloride of mercury into the blood-vessels of larger animals previous to stuffing them. Dried plants, for botanical specimens, may be preserved from the attacks of the *ptinus fur*, by applying to them, when perfectly dry, a solution of bi-chloride of mercury, of the strength of two drachms to a pint of rectified spirit of wine, to which a little camphor has been added. It must be applied to the whole specimen by means of a camel-hair pencil.

The last question proposed to be answered, was how to render the process of putrefaction of bodies useful, instead of pernicious. The obvious answer to this is, to bury them under the surface of the earth. Animal bodies should be buried sooner than most vegetable substances; but cruciferous plants, such as cabbages, when exposed to the air, are as pernicious as any, and should be buried; some years ago a severe fever originated at Cambridge, owing to a quantity of cabbages having been thrown over a garden-wall. Such matters should always be buried as manure. 'In this case the food of plants is prepared where it can be used; and that which would offend the senses, and injure the health, if exposed, is converted by gradual processes into forms of beauty and usefulness; the fetid gas is rendered a constituent of the aroma of the flower, and what might be poison, becomes nourishment to men and animals.' (See Davy's *Lectures on Agricultural Chemistry*.)

ANTISPASMODICS, from ἀντὶ, *against*, and σπασμὸς, *spasm*, the means of removing spasm. The state called spasm, or cramp, occurs only in muscular structures, and consists in an irregular, and often excessive, action of particular fibres of a muscle, of an entire muscle, or of several muscles. The muscles of an animal of the higher degrees of organization, such as man, are divided into two classes, the one set comprising those which are concerned in carrying on the functions most essential to life, viz. the circulation, respiration, and digestion, which act independently of the will, and are therefore called *involuntary* muscles; the other, which are organs of motion, and subject, in a certain degree, to the control of the will, are termed *voluntary* muscles. Each set act in consequence of the application to them of some stimulus; and their action is only uniform or natural when their appropriate stimuli are applied. The heart, for example, contracts from the stimulus of the blood; and the intestines are so constructed as to have proper motions excited in them by the food which we take, and the secretions which are mixed with it; which actions, in the healthy state, go on, not only without our willing it, but also without our consciousness. The stimulus to the other set is either a sensation felt in the part and communicated to the chief nervous centres, viz. the spinal chord or brain, or a spontaneous effort of volition proceeding from the brain, and originating in some thought, and connected with some purpose or design, to be executed by the muscles thrown into action. Of the motion of such muscles we are always more or less conscious, and when the system is in its perfect or usual state of health, we can repeat their action for a considerable length of time, and regulate its degree by repeated and distinct efforts of the will; as when a man walks, and quickens or slackens his pace according to his inclination. But a variety of circumstances influence the action both of voluntary and involuntary muscles, and render it irregular: when influenced by any of these, the action of the involuntary muscles becomes sensible and painful, and the voluntary muscles cease to be under the control of the will, and act not only without its stimulus, but often against its consent. These disordered actions would appear to be owing to some improper stimulus, instead of the appropriate one, being applied to the organ or part affected. Venous blood, circulating in the arteries, is productive of great disturbance; and if much of it be conveyed to the brain, it will act as a poison to that organ, for which arterial blood is the natural stimulus as well as source of nourishment. In like manner there are bodies which, though perfectly mild, such as alimentary substances of difficult digestion, yet excite more violent commotions of the stomach than other substances which are of a very acrimonious nature. Undigested food, or unhealthy secretions, in the intestines, excite more disturbance and spasmodic contractions (*i.e.* cholic, in different degrees of severity) than foreign substances, which we might expect to prove very hurtful; such, for instance, as the poison of the viper, which is perfectly innocent when received into the stomach.

Both voluntary and involuntary muscles, and the organs of secretion, are very much influenced by emotions of the mind. Under the influence of hope or joy the heart beats vigorously, while under the depressing passions its action is slow and laborious, and accompanied with such oppression as to have given origin to the phrase, 'a heavy heart.' Fear excites to irregular contraction and relaxation many of the voluntary muscles, whence comes trembling; and produces relaxation of certain muscles, called sphincters, which are usually contracted; it also augments several of the secretions. Grief, when not excessive, increases the secretion of the lachrymal gland, producing a flow of tears; if extreme, it hinders secretion, and forms the state truly characterized by our great poet·

> 'A misery too deep for tears.'

Anger often causes the bile to be secreted in greater quantity, to be altered in its quality, and often absorbed into the blood, thus producing jaundice. The state of mind which may be termed *vexation* often lessens the secretion of bile, but augments that of the kidneys; and every attack of hysteria terminates in a profuse flow of limpid urine, which is destitute of the usual admixture of bile.

These mental emotions, either directly, or indirectly through the altered and unhealthy secretions, occasion in many persons spasmodic contractions of some muscular organs, which are so violent as to produce alarming and often fatal diseases. Of this, ANGINA PECTORIS furnishes an example; and so powerful are the effects of excessive joy in some instances, that the heart *bursting* is not a mere figure of speech, and of grief in other instances, that the heart *breaking* is not a metaphor, but a reality. Many spasmodic actions, such as the cough of hooping-cough, are kept up by habit; others, such as the strange gesticulations of St. Vitus's Dance, are acquired from imitation, as stuttering or stammering is occasionally; and both may become a habit, difficult, if not impossible, to lay aside.

What is termed sympathy is even more powerful than imitation, which implies a voluntary adoption of the peculiarities of others: scarcely any persons in a company can avoid yawning if one sets the example. Now, yawning is an involuntary spasm of the muscles of the jaw, which is thus propagated through a large assemblage of persons; so hysterical and even epileptic spasms are communicated from one to another, often to a frightful extent, if an individual subject to these complaints suffer an attack in theatres, churches, or private apartments. Such an occurrence is sometimes merely the result of affectation, but more frequently it is the consequence of an irresistible impulse. No one was ever seized with tetanus from witnessing the spasms of a person affected with that excruciating disease; a circumstance which can only be accounted for by observing that in it the mind is in no degree implicated, the mental faculties remaining clear and undisturbed to its termination: and there is reason to believe that in this complaint some inflammation or peculiar state of irritation exists about the origin of the nerves, which no one can induce at will, and which neither primarily nor secondarily happens in the others, which are more strictly nervous affections, *i. e.* merely disorders of the functions of nerves without alteration of structure. The development of tetanus is slow, often not showing any sign of its intended attack till some days after the cause of it began to operate on the system. The others are mostly instantaneous, unexpected, and rapid in all their stages. The impression they make on the by-standers is increased by the surprise felt at their unlooked-for occurrence, often without any obvious or sufficient cause. The more sensitive of those around are therefore most apt to fall into a similar state or train of actions. Of the persons so affected, the greater number will be found to be females. What causes render them more subject than others to such attacks? Females, from the larger size of their nerves, are more *mobile*, as it is technically expressed, *i. e.* more easily operated upon by slight causes than others, and their habits of life and education have often a great tendency to increase this sensibility. Whatever diminishes the strength, whether of mind or body, markedly predisposes to such complaints. The female children of the higher and middle ranks, feeble by birth, are rendered more so by the improper modes of education, physical as well as mental, to which they are subjected. After emancipation from the nursery and school-room, their minds and bodies are further enervated by an injudicious course of reading, and an early devotion to the prevailing habits and usages of fashionable life. Such pursuits preclude the possibility of applying themselves to solid studies, or the acquisition of any knowledge of the human system, and of the necessity of maintaining a regular action of every organ and performance of every function.

By a neglect of one of the most important of the natural functions, viz. regular and complete evacuation of the bowels, the tone of the intestines is lessened. Now, when the muscular fibres of any particular part are under a state of more or less tension than the rest of the system, this is communicated by sympathy to every other part of the body. This is particularly observable in the blood vessels and intestines, both of which are muscular tubes; for a relaxation in any part of these will produce a like affection in every other part of the system. And as irritability and sensibility are very much affected by the degree of tension, a want of it in the vessels constitutes what is called a *nervous habit*, such as is most commonly met with in the female sex, and weak, effeminate members of the other sex: such persons will generally be found to be of a costive habit. The peculiarities of the female system have a large share in increasing the disposition to be powerfully acted upon, at times, by trifling causes. Exhausting discharges, to which they are very subject, greatly augment the irritability; and all diseases of a very weakening nature will produce a similar effect in the individuals of either sex: during convalescence from these, a disposition to irregular distribution of the blood exists, and a slight excess sent to one part, or a deficient supply of it to another, will cause disorder of the functions of that part. If it be any portion of the nervous structure which is subjected to these errors, spasmodic action is almost surely the consequence. Nothing is more clear or open to proof, than that convulsive motions result from two opposite conditions of the circulatory system, as relates to the quantity of blood, or rapidity of its flow. An animal while bleeding to death suffers violent convulsions, and an excess of blood sent to the head, or its stagnation in the vessels, will produce the same effect; which, indeed, often follows mechanical pressure of the brain, from a portion of depressed bone of the skull, or from effusion of the serum of the blood, in inflammation of the membranes of the brain. The fulness and distension of the vessels of the brain which precedes apoplexy often occasion vomiting, which is a convulsive action of the stomach and some other muscles, and is a warning sign, often unhappily neglected, of the approach of this disease. The more extensive and violent convulsions of epilepsy are, in all probability, the result of a temporarily deranged state of the circulation within the brain, as the loss of consciousness at the time of the attack, the progressive impairment of the intellectual powers, and the usual termination of the disease in apoplexy, palsy, fatuity, and death, attest.

The nature of the causes of the different diseases of which spasm forms, in general, a feature, the complication of these with other diseases or morbid states, and the manner in which each terminates, should all be taken into consideration, if we hope to make a beneficial selection of a remedial agent from among the number of antispasmodic medicines. But such a judicious preliminary measure is rarely adopted; and these articles are often administered in a manner truly empirical, by many professional as well as all unprofessional persons. A brief review of the diseases in which antispasmodic medicines are employed, and which agree only in having spasm for one of their symptoms, while they often differ widely in their causes, nature, and termination, will convince every one how needful is a knowledge of these points to guide us in the choice of the means of cure. The following is not given as a perfect classification or even as an approximation to one, but is merely intended to show the diversified nature of spasmodic diseases, and to furnish an argument for caution in the management of them. The treatment must vary greatly, according as the particular disease is attended with inflammation or not, or according as there is a risk of its occurring, either in the natural progress of the disease, or in consequence of the employment of improper means of treatment. The selection of remedies must be determined also according to the stage of the complaint, and according to the mode in which it is connected with the state of the mental faculties, or its tendency to involve these in the train of morbid actions, if it be not cured before such a calamitous termination take place. Keeping these points in mind, we may arrange spasmodic diseases, in some degree, as follows.

Unattended with inflammation, primarily, or disturbance of the mental faculties:

Simple Cramp. Cholic.—These generally proceed from some undigested substance, or hardened fæces, irritating the bowels: but in the latter disease inflammation is apt to come on; and in the worst forms of cholic, called Ileus, or Iliac-passion, and painter's cholic, it seldom fails to supervene, and then becomes the chief source of danger, as well as most important object of the treatment.

Diarrhœa, or simple looseness, and Cholera.—In these the cramps or spasms are never the first signs, but seem to result from the exhaustion occasioned by the profuse liquid discharges. Inflammation may occur during, or from, diarrhœa, and fever is the most common consequence of cholera, *i. e.* of epidemic cholera; the occurrence of which in either case must lead to a modification or alteration of the plan of treatment.

Angina Pectoris. Asthma.—Affecting the organs of respiration and circulation.

Attended with inflammation, primarily, but causing no disturbance of the mental faculties:

Dysentery.—Affecting the organs of digestion.

Croup, Hooping-cough.—Affecting the organs of respiration.

Unattended with inflammation to an appreciable degree, perhaps in no degree

Hysteria.—Not affecting the mental faculties, except the volition.

Chorea. St. Vitus's Dance.—Unattended with loss of consciousness; and—

Epilepsy.—Attended with loss of consciousness.

These two diseases sooner or later affect the mental faculties, and have a tendency to a common termination, viz., fatuity, unless they subside spontaneously, or are cured by medical treatment. Chorea generally originates from, or is connected with, accumulations of the bowels, and epilepsy frequently from a similar irritation of these parts, such as worms, but its causes are numerous, and its cure, in most cases, difficult.

Spasmodic diseases, of an obscure nature, chiefly affecting the organs of respiration:

Tetanus and Lock-jaw. Hydrophobia.—These may at some period become attended with inflammation, or rather fever; but this appears to be the result of the constant suffering, and is seldom the direct cause of death, which seems to be the consequence of that depression of the heart's action which long-continued pain or unpleasant sensations produce.

Diseases in which inflammation is the primary affection, spasm the secondary:

Inflammation of the Brain—acute, *Phrenitis.*

Acute or chronic, *Hydrocephalus*, i. e. *Water in the brain*, occurring mostly in children of a scrofulous habit.

Fever.

The treatment of these diseases is as diversified as their causes; and, to be successful, requires a degree of judgment and knowledge which few possess. To comprehend the nature of those spasmodic diseases which are unaccompanied by inflammation, and for which antispasmodic medicines are chiefly employed, we must be made aware that, in the human system, there are two distinct sets of nerves, having different origins, and fulfilling separate functions; the one set are called nerves of sensation, the other nerves of motion. The former receive impressions, and convey the sensations from all parts of the body *to* the brain; the latter execute the dictates of the brain by conveying an impulse *from* it to the organs of motion. The organs of motion—*i.e.* the muscles—are so adjusted, and in the healthy state so equally supplied with nervous energy, as precisely to balance or antagonize each other (see ANTAGONIST MUSCLE); and one muscle, or set of muscles, can only overbalance another, or several muscles, when it receives an additional supply of nervous energy, from an effort of volition. Thus the hand is opened and shut at will: when opened, the extensor muscles overpower the flexor muscles; when shut, the flexor muscles overpower the extensors.

In diseased conditions of the nervous system, this fine balance is lost from various causes: the nerves of sensation may become preternaturally sensitive; the nerves of motion may become paralysed; the power of voluntary motion may be perverted in various ways and degrees; the flexor muscles, independent of volition, may overpower the extensors, or the extensors the flexors. When affected with tetanic spasm, the extensor muscles of the back of a delicate girl could not be replaced in the natural state of equilibrium by any effort of the will, nor by a weight of eight hundred pounds: and under the influence of hysterical or epileptic excitement, a delicate person cannot be controlled by three or four robust men. The action of the muscles is so violent, that the fibres are sometimes torn across, or even the bones fractured.

Some of these spasmodic diseases give, at times, an intimation of their approach, generally by a peculiar sensation being experienced in some part of the body—often the thumb in epilepsy, or between the stomach and throat in hysteria; the spasmodic actions not commencing till these sensations have reached the brain. At other times no warning sensation is felt; yet often, on careful examination, some tender spot will be discovered, of which the patient was not in the least degree previously aware. In hysteria this tenderness is generally felt at some point along the course of the spine or back-bone; and in no case of spasmodic disease should we ever omit a minute examination of this part. Should drawing the finger along the course of the spine, and making firm pressure as we proceed, not reveal its existence, a sponge, dipped in water as hot as can be borne, will, in its progress along the spine, cause the patient to start when it reaches the tender spot. The discovery of this will often furnish a key to all the strange symptoms and spasmodic actions, as well as explain the capricious conduct, of the sufferer, which has alarmed the friends, and puzzled the medical attendant. When appropriate treatment is directed to this point, most of the troublesome symptoms abate, or cease altogether.

As most spasmodic diseases, especially if connected with affections of the mind, have a great tendency to recur and become habitual, it is of the utmost importance to stop them at an early period.

The remedies which have been found most efficacious in stopping or preventing these, are either such as make strong and new impressions on the organs of sense, and thereby diminish the effect of sensations already existing, or such as blunt the sensibility in general, and thereby diminish all effects of sensation; or else such as raise the whole of the system to a level with the part spasmodically excited, and so establish the equilibrium, from which forced state all muscles may simultaneously subside.

The fibres of each muscle act generally in concert: if a few act independently of the others, these are in a state of cramp. Particular sets of muscles act in concert, as all the flexors, or all the extensors: one or more of these acting independently of the rest cause spasm. Now we often relieve this by calling the others into action; and as volition simply is not equal to this, we use mechanical or medicinal means. Cramp of the limbs is often removed by pressing the toes or fingers against a resisting body, by which all the muscular fibres are brought to the same level. This example of a mechanical process is the only one worthy of mentioning, and is only applicable in slight cases, as cramp of the limbs is generally merely a symptom of some internal derangement of the bowels, of the spinal chord, or of the brain.

The medicinal means constitute the antispasmodic remedies, and are of different kinds. Very few articles are, strictly speaking, merely antispasmodics, *i.e.*, used solely to allay spasm, and incapable of being employed for any other purpose. On the contrary, this is only a particular application of substances capable of serving other, and more general, ends. Consequently, many of the so-called antispasmodics belong to other classes of medicines, such as the stimulants, particularly diffusible stimulants, as alcohol, (brandy,) sulphuric ether, camphor, &c., or to the narcotics, such as opium, belladonna, &c.; or to the tonics, such as metallic salts, viz., of iron, zinc, and silver; or vegetable bitters, as cinchona bark. The first set or stimulating antispasmodics act, apparently, by rousing the nervous energy of the system, and raising the neighbouring muscles to a level with the part in a state of spasmodic excitement. The second set act by rendering the nervous system torpid, and insensible to every sensation; in large doses producing complete insensibility, even to the extent of coma and death. These two are administered when an attack is threatened or actually begun; the tonics are administered while the patient is free from an attack, and act by strengthening the system, so as to render it less susceptible of being acted upon by slight causes, particularly the irritating cause, known, or supposed, to excite the paroxysm or fit. The substances which are more especially considered as antispasmodic are *volatile oils*, such as mint, lavender, &c., derived chiefly from the tribe of the labiatæ; or cajeput oil, from myrtaceæ; or dill, anise, fennel, &c., from the umbelliferæ, from which tribe also are derived the fœtid gums, as they are improperly termed, being gum-resins, such as assafœtida, galbanum, &c. These, with valerian and myrrha from the vegetable kingdom, and musk and castor from the animal kingdom, are the most valuable antispasmodics. All the volatile oils seem to act in the same way as the purely stimulating antispasmodics; while the fœtid gum-resins act by substituting new and powerful sensations instead of the morbid ones, and must be administered generally when the attack is threatened or begun.

These kinds of antispasmodics differ in value, not only as relates to their mode of action, but to their safety. The stimulating antispasmodics are only admissible when a fit is threatened, or may have begun; and as they greatly excite the vascular system, *i.e.*, quicken the circulation, if upon their being given once they fail to remove the spasm, they should not be repeated. This caution is more especially necessary in respect to brandy, which is too commonly resorted to on every threatening or attack of spasm, such as cholic. So many of these diseases being connected with, or disposed to end in, inflammation, the free use of brandy, or other stimulant, is decidedly injurious. The inflammation in croup, hooping-cough, and dysentery must first be removed by appropriate means, when the spasm will generally subside or disappear entirely: if it should remain, in hooping-cough, in a great measure from mere habit, antispasmodics may be used, but even then the narcotic antispasmodics, such as Prussic acid, paregoric, or henbane, are to be preferred. The propriety of employing belladonna extensively in this disease is very questionable. (See Golis on *Hydrocephalus*, translated by Dr. Gooch.) The external employment, in the form of embrocations, of the stimulating antispasmodics, is more allowable in cholic or hooping-cough; but here they act on a different principle, viz., that of counter-irritation. This is, in itself, a most valuable means of curing spasmodic diseases. An irritating application to the spine is of much service in hooping-cough: tartrate of antimony ointment or plaster (see ANTIMONY) applied to the tender spot, which we have said often exists in hysteria, and other similar diseases, will be productive of more good than all the antispasmodic medicines which can be tried. (See Teale on *Neuralgic Diseases*.) Stammering, or other difficulties of speech, might be materially diminished by repeated irritating applications, as blisters, tartrate of antimony ointment, &c., to the nape and sides of the neck. Severe hiccup, continuing for several days, and which resisted all internal remedies, has yielded to a blister applied along the side of the neck. Every physiologist will understand how this happens.

The means which may be employed to intercept the passage of the peculiar sensation to the brain are merely mechanical; for example, tying a string tightly round the thumb prevents the *aura epileptica*, in epilepsy, reaching the brain, and wards off the attack. A cupping-glass would answer as well if applied to any large spot whence the sensation arose.

Free scarification of the gums in children, when teething, is much more efficacious in allaying convulsive affections than internal medicines, except mild purgatives.

The medicines which may be administered while the patient is free from a fit, or in the intervals of the paroxysms, are much more likely to effect a cure than the others. These are tonics and purgatives. For the reasons already stated, purgatives are of primary importance, as they unload the bowels, improve the secretions, and impart vigour to the whole muscular system. Many cases of severe spasmodic disease have been cured by the use of purgatives only, and none can be cured without their free and daily use for some time. (See Hamilton on *Purgative Medicines*, sixth edition.) Aloetic purgatives are, in general, the best; but where, as in epilepsy, there is reason to suspect the existence of worms, oil of turpentine is to be preferred.

After purgatives have been administered for some time, should the disease not have yielded, metallic or vegetable tonics may be employed with great advantage, particularly in hysteria, chorea, epilepsy, and stammering. In hysteria, chorea, and stammering, the preparations of iron are in general best; in epilepsy, preparations of zinc, of copper, but above all of silver, are preferable: sulphate of quinine is also very serviceable.

For the cure of hydrophobia, or tetanus, nothing has yet been found to succeed. There is some reason to hope that, for tetanus, a powerful vegetable compound from South America, called the *woorali*, may be beneficial, if we may judge by its effects on animals affected with tetanic spasm. (See cases by Mr. Sewell, in *Morgan's Lecture on Tetanus*, Appendix, London, 1833.)

Several of the diseases of which we here speak being connected with mental emotions, and some of them originating from imitation or being kept up by habit, mental agency has sometimes been employed to effect a cure, and occasionally with success.

Upon a threatened attack of hysteria or epilepsy, powerfully attracting the mind to a different object than that which occupies the attention of the patient may ward off the fit. But this requires great judgment and discretion. Formerly the most disgusting means were resorted to, and the sufferers were made to swallow animals of a forbidding kind, or other equally repulsive measures were tried. These cannot be too much reprobated; and we should bear in mind that chorea, or epilepsy, may be brought on by a sudden fright. The separation of a person subject to chorea, or hysterical and epileptic fits, from among others, is often necessary; and when we know that the spasmodic actions are the effects of imitation, the employment of fear may be justifiable; but in any other case it would be criminal to have recourse to it and thereby, perhaps, add a mental disorder to a bodily one, already sufficiently afflicting.

Our endeavours to lessen the tendency to nervous diseases will be most successfully directed to regulating the education, physical and moral, of children, especially of female children. This subject has been already treated of under the article AGE, to which we refer, as well as to Number XXIII. of the *Foreign Quarterly Review*, Art. v. 'Hypochondriasis and Hysteria;' also to the excellent chapters on Spinal Irritation, Chorea, Hydrocephalus, and Convulsions, in Burns' *Principles of Midwifery*.

ANTI'STHENES, the pupil of Socrates, the master of Diogenes, and commonly reputed the founder of the Cynic school. The time of his birth, as well as that of his death, is uncertain; but he was the contemporary of Socrates, Plato, Aristotle, Xenophon, &c., and may be said in general terms to have flourished about 380 B.C. Diodorus Siculus mentions him as still alive in the third year of the 103rd Olympiad, corresponding to B.C. 366. (See Clinton's *Fasti Hellenici*, p. 107.) According to Diogenes Laertius, who has given a life of him in his sixth book, he was born at Athens, of which his father, named also Antisthenes, was a citizen. His mother was a native of Thrace, or, as Plutarch says, of Phrygia. He first attended the school of the Rhetorician Gorgias; but, leaving him after some time, he became a follower, and eventually one of the most distinguished disciples, of Socrates. He afterwards established a school of his own, in a place a short distance from the city, called Cynosarges. Whatever may be the origin of the word Cynosarges, it is not impossible that this term may, as some writers assert, have given birth to the appellation Cynics, by which the followers of Antisthenes came to be known. We prefer, however, the more obvious derivation which deduces the epithet directly from *κύων*, a dog, and regards it as simply expressive of the popular notion respecting the character of the sect of philosophers so designated. The opinions of the Cynics will be discussed under that word. We may here merely remark, that it is certainly a mistake to rank them as ascetics. The antipathies and invectives of Antisthenes, and especially of his more celebrated follower Diogenes, appear to have been fiercely directed against the elegancies and ornamental superfluities of life; but by no means against such gratifications of the senses as could be obtained without much trouble or expense. The vice of these pleasures, according to their notion, lay not in the indulgence, but in the cost. Anything more thoroughly opposed than all this both to the spirit of general civilization and to the elevation of individual character, it would not be easy to conceive; but the system is very susceptible for all that of a plausible outside representation. It was a not unnatural perversion of the penetrating, sagacious, and sarcastic philosophy of Socrates, by a person of the moral and intellectual construction of Antisthenes. He seems to have been endowed with strong natural powers, but is said to have held all learning and mental cultivation in contempt. It may be supposed, therefore, that his views would be more remarkable for their clearness than their extent. He appears, in fact, to have had more wit than wisdom. He was famous for the brilliancy of his conversation; but although his written works, as Diogenes Laertius tells us, extended to ten volumes (or perhaps treatises, *τόμοι*), they have all perished. From the list of their titles given by the biographer, they appear to have been mostly rhetorical or sophistical declamations; and, like other such compositions, they had probably plenty of point and smartness, but not much sterling value. Indeed, the only judgment as to their merits which Laertius records is that of a critic of the name of Timon, who thought their author an ingenious trifler Laertius has enumerated many of the sayings of Antisthenes; but, like the witticisms of the antients in general, most of them have an elaborate and ponderous air to a modern taste. One which has been often quoted is his sarcasm on the foolish choice of their magistrates and other public officers frequently made by his fellow citizens. He advised them one day, with a serious air, to set to work and make their asses horses; and when they stared at the absurdity of the proposal, and exclaimed that the thing could not be done, he answered, It will be done if you merely command it; do you not in this way every day do what is quite as wonderful, turning incapables and blockheads into generals and admirals? Another, which illustrates his religious opinions, is his answer to the priest of the Orphic mysteries, when he was assured by that personage that all who should be initiated therein would enjoy eternal felicity after death; Why then, said he, do not you die? He was himself probably sceptical on the subject of a future state. When Diogenes came to visit him a short time before his death, as he lay ill in bed, he eagerly expressed his impatience under his sufferings. Here, said his decisive and unceremonious pupil, offering him a knife, this will relieve you in a moment. Ah! answered Antisthenes, it is not my life I want to get rid of, but my pain. Cicero (*De Naturâ Deorum*, i. 13.) has preserved a theological dogma of this philosopher, which has been often quoted to his honour—*Esse populares deos multos, sed naturalem unum:* That the popular gods are many, but the God of nature is one. It has, however, been acutely remarked by Cudworth, (*Intellectual System*, i. 4, 22,) that by the expression, *populares deos*, here, we are to understand, not the gods of popular superstition, generally, or the multitudinous deities of the pagan system, but merely the different names given to the same supreme ruler of the universe by different cities and nations. The meaning of Antisthenes is more clearly expressed in the version of Lactantius, *Unum esse naturalem Deum, quamvis gentes et urbes suos habeant populares:* 'There is one God of nature, though nations and cities have their own popular (peculiar) deities.' Cudworth is of opinion that the philosopher had no design to take away all the inferior gods of the pagans, which, had he attempted, he would have been accounted an atheist, but only to point out the great truth which indeed was acknowledged by all superior minds among the antients (with some exceptions), that there was one God who was supreme over all the rest, and that he was the same whom the Greeks worshipped as Zeus, the Latins as Jupiter, the Egyptians as Hammon, the Babylonians as Bel, the Scythians as Pappæus, &c.; as likewise that the Jupiter of the heavens, and the Neptune of the sea, in the popular mythology, were only so many names for this one deity.

The moral maxims of Antisthenes sound, in general, very lofty. He regarded all actions as being either virtuous or vicious, and virtue as the only thing worthy of desire or esteem. Before giving him credit, however, as the teacher of a pure and elevated system of ethics, on the strength of these imposing generalities, it would be necessary to know exactly what he meant by virtue. Diogenes certainly carried the principles of Cynicism to much greater length than his master. The fullest and perhaps the fairest picture we have of Antisthenes is given by Xenophon, who has introduced this philosopher as one of the speakers in his *Συμπόσιον*, or Banquet, and put into his mouth, among other things, a very striking discourse on the wealth of poverty. Altogether he is here represented in a very engaging light.

A few additional particulars respecting this philosopher may be collected from Laertius and other sources. He is said to have had few pupils, and to have treated them with great harshness. Antisthenes has the credit of having set the example to his followers of wearing his beard long, and carrying the staff and satchel, or wallet, (*πήρα*,) which afterwards became the distinguishing badges of the sect. He is also stated to have first worn the cloak doubled, (*ἐδίπλωσε τὸν τρίβωνα* and *διπλῶσαι θοιμάτιον* are the expressions of Laertius,) whatever that may have meant. It was a fashion likewise practised by his followers, and appears to have consisted in bringing the right end of the cloak a second time over the left shoulder, so as to leave the whole of the right arm, shoulder, and a part of the breast exposed. When the cloak was worn in this manner, the tunic or lower garment was dispensed with; and in this principally seems to have consisted the economy or convenience which recommended the fashion to the Cynics. (See Octavius Ferrarius, *de Re Vestiaria*, part ii., lib. 4, cap. 19, p. 194, edit. Batav., 1654, quarto.) The peculiar name for the philosophic cloak is *τρίβων*, or in Latin tribonium, which signifies literally, a worn or threadbare garment. Antisthenes professed to dislike the haughtiness of Plato; and on one occasion, when the latter had expressed his admiration of a horse, distinguished by its noble bearing, 'You, Plato,' said Antisthenes, 'would have made an excellent horse.' The father of the Cynics, however, is affirmed on high authority to have had pride enough too, although it might not have been of so elevated a character as that of the founder of the Academy. One day, we are told, when Antisthenes, being in the company of Socrates, had ostentatiously displayed a ragged part of his garment, by way of showing his philosophical contempt for those things of which other men were vain, 'Ah, Antisthenes,' said Socrates, 'I perceive your pride through the holes of your cloak.' Antisthenes is said by Laertius to have had a principal share in bringing Anytus and Melitus, the accusers of Socrates, to punishment. But it has been doubted whether such punishment ever took place at all. (See Barthelemy, *Voyage du Jeune Anacharsis*, chap. 67, note.) Two short orations, entitled *Ajax* and *Ulysses*, attributed to this philosopher, are printed in the *Oratores Græci* of Henry Stephen and of Reiske; and also in Dobson's *Collection*, vol. iv. They are two puerile rhetorical declamations, and, if written by Antisthenes, which we may reasonably doubt, do him no credit.

ANTISTROPHE. [See Strophe.]

ANTITACTES. [See Heretics.]

ANTI-TAURUS. [See Taurus.]

ANTI'THESIS, a Greek word (*ἀντίθεσις*) literally signifying 'opposition.' It is used in various senses by the Greek writers: sometimes it means merely 'objections,' or 'opposite arguments;' sometimes it is used to denote the contrasting of one set of circumstances with another; as, for instance, when an orator or other person attempting to place the conduct of an adversary in the worst light, first states what the accused *ought* to have done, and then what he *has* done.

But the term antithesis is most commonly used to express contrast of ideas; and the term is equally applied whether the contrast is effected by single words, or by single clauses. (See Quintilian, *Inst. Orat.*, lib. ix. cap. iii.) The following example from the oration of Demosthenes against Æschines, entitled the Crown, is, in part, quoted by Demetrius Phalereus (Treatise Περὶ *Ἑρμηνείας*, § 262), and by Hermogenes: it is a sample of antithetical invective, in which Demosthenes attempts to show his superiority over his opponent:—'You were employed in teaching, but I was taught: you were a mere menial in the service of religion, but I participated in the sacred rites: you were one of the chorus, but I was the choragus (director of the chorus): you were a petty clerk, but I was a public speaker: you were an actor and played a third-rate part, but I was a spectator: you failed in your part, and I hissed.' This taste for antithesis shows itself very strongly in the Greek language, both in poets and prose writers, and more especially in some of the orators and rhetoricians; but it is generally and justly condemned by the Greek writers on style. The antithesis does not necessarily imply contrariety between the things which are brought together; for example, one of the rhetorical exercises of Gorgias, entitled the *Encomium of Helen*, begins with the following antithesis:—'The ornament of a state is the courage of its men; of the body, beauty; of the mind, wisdom; of action, virtue; of words, truth.' Quintilian (ix. 3) expresses the Greek term *ἀντίθετον* (which is equivalent to *ἀντίθεσις*) by the Latin word *contrapositum*; and he remarks, that the antithesis does not always contain contrarieties or opposites. He gives the following example from the rhetorician Rutilius: 'To us first the immortal gods gave the fruits of the earth: what we alone received, that have we diffused over the whole earth. To us our ancestors transmitted a commonwealth: we have rescued from servitude our allies also.' Cicero has the following example of antithesis, which may be compared with similar examples in our own language:—'Quod scis, nihil prodest: quod nescis, multum obest,' which may be very imperfectly translated—'What you know, does no good; what you do not know, does much harm.' When antithesis is used sparingly and judiciously, it sometimes gives force to expression, and helps to fix distinctions in the memory; but its frequent and indiscriminate use tends to draw the mind from a true perception of the subject, and to fix it on the play of words more than on the real meaning of the sentence.

ANTI-TRINITARIANS. [See Arians, Socinians, Unitarians.]

AN'TIUM, now called Porto d'Anzo, a sea-port on the coast of Latium, or the Campagna of Rome, once a city of the Volsci, and noted in Roman history as the place of refuge of Coriolanus. Antium, after having been often the enemy and at times the ally of Rome, was finally taken by the Romans in the year B.C. 337, and became a Roman colony. On this occasion, the *rostra*, or metal beaks with which the prows of the galleys of Antium were armed, being taken as a trophy to Rome, were placed in the forum, as an ornament to the hustings from which the orators pleaded before the magistrates and the assembled people, and which, in consequence, took the name of rostra. Horace mentions the Temple of Fortune which rose on the bold promontory within shelter of which the present Anzo is situated. Nero, who was born at Antium, excavated a port and adorned it with fine buildings. He also built here a palace for his wife Poppæa. Remains of ancient masonry are yet to be seen on the point of the cape, and partly in the water. The port having been filled in after-times, Pope Innocent XII. built a mole which serves to shelter vessels of light burthen. There is also a small fort, and a prison for the convicts who are sent here from Rome to be kept at hard labour. The native population of Porto d'Anzo does not exceed 300 inhabitants, and it is altogether a miserable place. The malaria prevails all about the country around in summer, but is not quite so fatal within the place itself, on account of its situation projecting into the sea. From October to June the air is wholesome, and the climate remarkably mild and pleasant. This, together with the beauty of the coast and the fine sea view which extends on one side to the Circean Cape and the island of Ponza, and on the other to the mouths of the Tiber, induced several Roman noblemen about a century since to build palaces and villas near the shore, which now appear neglected and deserted by their descendants. Anzo exports a great quantity of charcoal made from the wood of the neighbouring forests. It is also frequently resorted to by coasting vessels, it being the only place of shelter in bad weather between Gaeta and Civita Vecchia. About two miles S.E. of Anzo is the town of Nettuno, on the sea-coast, with a population of 1200 inhabitants, chiefly sailors and fishermen. The women of Nettuno still retain their old Greek costume. The malaria does not seem to affect the people who live within the walls of Nettuno. Porto d'Anzo is thirty miles S. by E. of Rome; the Alban hills are seen rising to the north about fifteen miles inland. The plain between is divided into enormous farms, one of which, that of Campomorto near Porto d'Anzo, measuring above 17,000 acres, has been visited of late years by various travellers, whose attention had been attracted to its peculiar economy by Chateauvieux in his *Letters from Italy*.

ANTIVARI, a town in Albania, in European Turkey, on the coast of the Adriatic. It is a little to the N.W. of the mouth of the river Boiana, which forms the outlet of the lake of Skodré (Scutari), and has a good harbour. It was peopled during the middle ages by Italian colonists, and is still the see of a Catholic archbishop. It was taken from the Venetians in 1573; and the inhabitants are now chiefly Mohammedans. They amount to about 4000, and are for the most part seamen, being among the few Albanians who venture on that element; they enter into the naval service of the Barbary states.

Antivari forms the port of Skodré, (from which it is distant about 20 miles,) and is the depôt of the valley of the Drin, the chief manufacture of which is shoe leather. It is defended by a fortress: 42° 4′ N. lat., 19° 9′ E. long. (Hobhouse, Balbi.)

A'NTLIA PNEUMA'TICA, the air-pump, a constellation in the southern hemisphere, named by Lacaille. It is bounded by Centaurus, Crater, Hydra, Pixis Nautica, and Argo. The magnitudes and numbering of its principal stars are as follows:

Mag.	Letter.	Piazzi.	Ast. Soc. Cat.
6		39	1226
4·5	α	82	1243
5·6		90	249
6	δ	91	1251
6		123	.262
6	θ	166	1176
5		199	1299

ANTŒCI, from the Greek, signifies those who live over against each other, and is applied to designate the inhabitants of two places which have the same longitudes and latitudes, only differing in one latitude being north and the other south. For example, Malta and the Cape of Good Hope are nearly Antœci. Two antœcial places have the same hour of day or night, but opposite seasons of the year.

ANTOINE DE BOURBON, Duke of Vendome, married, in 1548, Jeanne d'Albret, only child of Henry II., king of Navarre. Henry Prince of Béarn, afterwards Henry IV. of France, was the offspring of this marriage. Antoine assumed the title of king of Navarre in right of his wife. The Bourbons were collaterals of the Valois dynasty, being descended from Robert Count of Clermont, a younger son of Louis IX. As such, Antoine de Bourbon aspired to be at the head of the administration of France after the accession of the youthful king Francis II., but being himself of an indolent, wavering disposition, he was supplanted by the more enterprising and ambitious Guises, uncles to the young Queen Mary Stuart. After the death of Francis II., in 1560, the king of Navarre was named Lieutenant General of the kingdom, and adviser to the queen mother (Catherine de Medicis), during Charles IX.'s minority. When the civil and religious war broke out in 1562, the king of Navarre commanded the king's troops, and received a wound at the siege of Rouen, of which he died in November of the same year. [See BOURBON, and HENRY IV.]

ANTOINETTE, (MARIE,) queen of France. [See MARIE.]

ANTO'NIA MAJOR, the elder daughter of Antonius the triumvir, by Octavia, the half-sister of Augustus, born 39 B.C. She married L. Domitius the son of Cn. Domitius, who supported the interests of Antony in the disputes with Augustus, until a short period before the battle of Actium, and the grandson of L. Domitius, who fell in the flight from Pharsalia. Among the descendants of Antonia were some of the most illustrious personages in Rome. One of her daughters, Domitia Lepida, was the mother of Messalina, afterwards married to the Emperor Claudius; and her son Cn. Domitius, marrying Agrippina, became the father of the Emperor Nero. We have called this Antonia the *elder* in agreement with Suetonius and Plutarch. Tacitus, on the contrary, speaks of her as the younger daughter. (Ann. IV. 44; XII. 64.)

ANTONIA MINOR, the sister of the preceding, born B.C. 38 or 37. She married Drusus Nero, the brother of the Emperor Tiberius, by whom she became the mother, 1. of the celebrated Germanicus; 2. of Livia or Livilla, who was first married to Caius Cæsar, the grandson of Augustus, and after his death to her cousin Drusus, the son of Tiberius; and 3. of the Emperor Claudius. Caligula, being the son of Germanicus, was her grandson.

Antonia was not fortunate in her domestic relations: she lost her husband B.C. 9, before she was thirty years of age, by a fall from his horse. Early in the reign of Tiberius (A.D. 19), she saw the widowed Agrippina return from the east with the ashes of her son Germanicus. In 23, her daughter Livia, corrupted by Sejanus, assisted in the murder of her own husband Drusus, but her guilt remained unknown to the world until eight years after, when Antonia herself became indirectly the cause of the discovery. Sejanus was then preparing to execute his final schemes for the destruction of Tiberius, when his intrigues became known to Antonia, who communicated her information through the freedman Pallas to the emperor. The ruin of the favourite brought many past crimes to light, among others the murder of Drusus; and Livia met the fate which she deserved, her own mother, if we may believe one of the accounts given by Dio, opposing herself to the pardon offered by the emperor. Under the reign of her grandson Caligula, she was at first highly honoured, receiving every distinction which had formerly been conferred on the celebrated Livia. But respect soon changed to coldness and ill-treatment; and at last her death was supposed to be hastened by his neglect, if indeed it was not brought about by more direct means. If we place her death in the first year of Caligula, she was about seventy-five years of age. The Emperor Claudius had experienced from her when a child little of maternal affection, but he honoured her memory when he came to the throne in every way that the flattery of the age permitted. Pliny speaks of a temple dedicated to her. Of the private life of Antonia little is known. She was celebrated for her beauty, and still more for her chastity, in an age too when that virtue was not common; and Pliny has recorded the singular fact, that during her whole life she was never known to spit, which he accounts for from the more solid nature of her bones, and the want of marrow. The beautiful head of Antonia is taken from a gold medal in the British Museum, which is exactly one half the diameter of our drawing, and in most complete preservation.

ANTONIN (SAINT), a small town in France, in the department of Tarn and Garonne, on the right, or north bank of the river Aveyron, which unites with the Tarn. The inhabitants, who are given in the *Dict. Géographique de la France* (1804) at 5606, and by Balbi (1833) at 5000, manufacture serge and leather. It is about 24 miles N. E. of Montauban, the capital of the department: 44° 10′ N. lat., 1° 46′ E. long. (*Dict. Géog. de la France:* M. Brun.)

ANTONINE COLUMN, a lofty pillar which stands in the middle of one of the principal squares of the city of Rome. It was raised by the senate in honour of the emperor Marcus Aurelius Antoninus, and in memory of his victory over the Marcomanni and other German tribes. It was one of the principal ornaments of the Forum of Antonine. In an inscription which has been found near it, and which is now in the Vatican, it is styled 'Columna centenaria Divi Marci.' It was also called 'the greater Antonine column,' to distinguish it from another and a smaller one, made of a solid piece of granite, which had been raised in honour of Antoninus Pius. (Nardini and Nibbi, *Roma Antica*, and Vignola, *De Columnâ Antonini Pii.*) During the ages of barbarism which followed the extinction of the western empire, this pillar, and especially its pedestal, suffered greatly from the hands of the various invaders, as well as from the fires which frequently occurred at Rome; the historian Poggio says also from lightning. Pope Sixtus V. repaired it at the expense of 10,000 scudi, and placed the inscription which is now seen on the pedestal, the original one having been probably defaced. He also raised on the summit of the pillar a bronze statue of St. Paul: that of Marcus Aurelius, which formerly stood there, had been removed it is not known when or by whom. The shaft of the pillar is 13 feet 1 inch in diameter at the bottom, and one foot less at the top, its height, including the pedestal and capital, is 136 feet, of which 13 are under ground; and the statue on the top and its pedestal are 27½ feet more, making the whole height 163½ feet, (Taylor and Cresy's *Architectural Antiquities of Rome.*) The pedestal of the Antonine column is disproportionate to the shaft. The capital is Doric. The shaft is made of twenty-eight blocks of white marble placed one above the other, a spiral staircase of 190 steps is cut through the interior of the marble, and leads to the gallery on the top, which is surrounded by a balustrade. The exterior of the shaft is covered with bassi-rilievi placed in a spiral line around, which represent the victories of Marcus Aurelius over the Marcomanni and other hostile nations. One of the most remarkable facts recorded in these historical sculptures is that of the unexpected and abundant shower which came opportunely to quench the thirst of the Roman soldiers, while fighting under their emperor in a remote part of Germany, and suffering from heat, fatigue, and the repeated attacks of the surrounding barbarians, A. D. 174. The style and execution of these sculptures are inferior to those of the Trajan pillar, which the artists evidently purposed to imitate. The sculptures of the Antonine column have been engraved by Santo Bartoli, and illustrated by Bellori. The pillar itself is still one of the most striking monuments of antient Rome and one of the principal ornaments of the modern city. It has given to the square in which it stands the name of Piazza Colonna. The palace Ghigi forms one side of the square, and the street del Corso forms another. A handsome fountain by Giacomo della Porta also adorns the square.

ANTONI′NUS PIUS, or, with his full name, according to Capitolinus, Titus Aurelius Fulvus Bojonius Antoninus Pius, was the son of Aurelius Fulvus and Arria Fadilla. He was born September 19, A.D. 86, in the reign of Domitian, at Lanuvium now *Lavinia*, a town of Latium, a few miles south of the Alban Lake. His ancestors, on his father's side, were of Nemausus, now Nismes, in Languedoc. His youthful years were spent at Lorium, (a town on the north side of the Tiber, not far from its mouth,) under the care of his paternal and maternal grandfathers, T. Aurelius Fulvus, who had twice been consul, and Arrius Antoninus, who also had twice attained the same honour. It seems probable, from his character in after life, that he had been brought up with great care, and probably in the principles of the Stoical philosophy, which, as emperor at least, he certainly encouraged.

[Gold, Brit. Mus. diam. doubled.]

Through his extensive family connexions he inherited great wealth, and was speedily raised to the successive dignities of quæstor, prætor, and consul. His taste, however, was for a country life. When Hadrian entrusted the administration of Italy to four men of consular rank, he gave to Antoninus the government of that part in which his possessions lay. During his consulship and his subsequent government of the province of Asia as proconsul, there were, as his credulous biographer informs us, many strange presages of his future elevation. On his return to Rome, he was often consulted by Hadrian on public matters; and finally he was adopted as the emperor's successor, on condition of adopting himself, Marcus Antoninus, the son of his wife's brother, and Lucius Verus, the son of Ælius Verus, who had been adopted by Hadrian, but had died prematurely. He then became associated with the emperor in the government of the Roman world. On Hadrian's death, A.D. 138, he became emperor with the title of Antoninus Augustus, to which the name of Pius is added on his medals. As to the origin of the name Pius, his biographer gives various conjectures (see Capitolinus, chap. ii.): the title of Pater Patriæ, 'father of his country,' was subsequently conferred (chap. vi.), and recorded on his medals after the titles of Augustus and Pius. It is unfortunate that the only history of this emperor's life, his *Biography* by Julius Capitolinus, is altogether deficient in that precision and chronological arrangement which would enable us to form a just judgment of the public events of his reign. He seems never to have left Italy after his elevation, but his officers maintained the security of the provinces and protected the frontiers from aggression. In Britain, Lollius Urbicus confirmed the former conquests (see ANTONINUS, VALLUM); the Moors of Africa were compelled to sue for peace; and the attempts at rebellion in Germany, Greece, Judæa, and Egypt, were checked by the vigour of his governors. One of the most curious events in the foreign affairs of the reign of Antoninus is his helping the Olbiopolitæ, or inhabitants of Olbia, a Greek colony on the Borysthenes, against a nation called the Tauro-Scythæ, probably a Nomadic race of the Dnieper and the Don. The Tauro-Scythæ were compelled by the Roman emperor to give hostages to the people of Olbia. The emperor died at Lorium in the seventy-fifth year of his age, (seventieth, according to Capitolinus,) B.C. 161, and was succeeded by Marcus Aurelius, commonly called Antoninus the philosopher. Antoninus was buried in the tomb of Hadrian, one of the architectural monuments with which he adorned Rome.

Antoninus married Annia Faustina, the daughter of Annius Verus, by whom he had four children, one of whom, Faustina, became the wife of M. Aurelius. The conduct of Antoninus's wife gave occasion to scandal, but the good-natured emperor had philosophy enough to endure what he could not prevent. On her death, in the third year of the emperor's reign, the senate paid her the usual compliment of divine honours: a temple, with statues of gold and silver, was decreed by the senate, and accepted by the husband, to the memory of a wife not altogether faultless. A temple erected to Antoninus and Faustina still exists in part in the Campo Vaccino at Rome. Antoninus even created an establishment for young females, who were called Faustinianæ, in honour of the deceased empress. This institution is commemorated in medals that still exist with the inscription Puellæ Faustinianæ—the Virgins of Faustina. The general character of the policy of Antoninus was beneficent and just, and the Roman world perhaps never had a more indulgent and amiable master. He continued the governors of provinces for many years in office when their conduct was satisfactory; and the provinces themselves enjoyed under his reign freedom from all exorbitant taxation. He surrounded himself with a council of chosen friends, without whose advice he took no public measure of any kind. Their counsels directed him in drawing up the imperial decrees (*formæ*), which were to have the force of law. Judges who discharged their duty faithfully were never removed. In his elevated station the emperor maintained the simple character of his early life, mingling in the society of his friends like one of the same rank, and using his unlimited power more like a private citizen entrusted with it by his fellow-countrymen than as the undisputed master of the empire. The practice of giving pensions or allowances had grown up under preceding emperors, and had become a part of the imperial system of patronage. Antoninus continued it, and gave, as Capitolinus informs us, salaries and honorary distinctions to the professors of rhetoric and philosophy in all the provinces. Apollonius the Stoic was specially invited from Chalcis to superintend the education of M. Aurelius. But the idle and worthless who had obtained public allowances felt the effect of the prudent emperor's reforms, who remarked, 'that nothing was more disgraceful, nothing more cruel, than for a man to feed on the public property who had done nothing to improve it.' The people and the soldiery participated in the bounty which the policy or generosity of the emperor distributed: he relieved distress in time of scarcity, and for their amusement filled the amphitheatre with animals from all countries. The elephant, the hyæna, and the antelope, with the crocodile, the unwieldy hippopotamus, and the tiger, were exhibited for the gratification of the people. On one occasion a hundred lions at once were let loose into the amphitheatre.

Under the reign of Antoninus, the lawyers, Umidius Verus, Salvius Valens, Volusius Metianus, Ulpius Marcellus, and Diabolenus, were employed by the emperor in improving the laws. One of the emperor's regulations of sanitary police is worth recording: he forbade the burying of dead bodies in cities. With respect to his regulations about physicians, see the article ARCHIATER. His policy towards the Christians was mild, but the authenticity of a rescript which would show him to have been completely tolerant, appears not to be proved. (Neander, *Allgemeine Geschichte der Christlichen Religion*, &c., i. 151.)

[Gold, Brit. Mus. diam. doubled.]

Of casualties in his reign, which Capitolinus, like a good chronicler, does not omit, we find enumerated a famine, the fall of a circus at Rome, an earthquake in Rhodes and the province of Asia, and a fire at Rome which destroyed three hundred and forty houses. Narbonne, Antioch, and Carthage also suffered from fire. The emperor's bounty was on such occasions always actively employed in relieving human suffering. He embellished the imperial city with various edifices, and extended his liberality also to remote cities of the empire. Antoninus was tall, and of a handsome person, as his biographer tells us, and his medals still show. His habits were abstemious and regular. He was honoured with the name of *Divus* (God; at his death, and all the tokens of respect paid to the best emperors. According to the fashion of the times, a special priest, public games, a temple, and a college of priests, as was usual on such occasions, were designed to perpetuate the memory of one of the most amiable princes whom history has recorded. Whether he owes too much to the favourable history of Capitolinus, and the general absence of other evidence, we cannot decide. (See the *Life of Antoninus* by J. Capitolinus; and Schlosser, *Universalhistorische Uebersicht*, vol. iii. pt. i.)

ANTONI'NUS, THE ITINERARY OF, one of the most valuable works, in a geographical point of view, which has descended to us from the antients. It is merely what its name imports, an itinerary, but it extends over the whole Roman empire in its widest sense, embracing all the main roads in Italy and the provinces, in each of which the different stations are named with the intervening distances. There is also attached to the above a brief maritime itinerary of the distances from port to port. This work, with the Peutingerian Table and the Jerusalem Itinerary, is of great use in constructing the maps of the Roman and Grecian world. In a work of such value it has been an object of some interest to determine the date of its publication and the name of its author; for the name of Antoninus, under which it now passes, has been retained perhaps more from the convenience of having some conventional author to refer it to, than from any good reason for believing that such was really the author's name. In the different MSS. of the work it is variously ascribed to Julius Cæsar, Antonius Augustus, Antonius Augustalis, and Antoninus Augustus. On a consideration of all the arguments adduced by Wesseling in the preface to his excellent edition of the work, there seems to us reason for thinking that some share in the authorship may be ascribed to the three distinguished names, Julius Cæsar, M. Antonius, and Augustus, though such is not the opinion, it should be stated, of Wesseling himself. The main, though not the only argument of Wesseling, seems to be that, had such a work existed in the age of Pliny, it must have been mentioned by him. Negative reasoning of this kind is not of great weight, especially in relation to a writer so incorrect as Pliny. That itineraries of some sort must have existed in the time of Pliny can scarcely admit of doubt. Even in the history of Herodotus we find Aristagoras, the tyrant of Miletus, possessed of a map of the whole world on copper, 'containing every sea and every river'; and this historian himself has given a rough kind of itinerary of the road from Ephesus to Susa, apparently from personal knowledge of the route. Alexander in his march to India was provided with a corps of officers called Bematistæ (βηματισταί), whose especial duty it was to measure the roads and record the different distances. As early as the time of Polybius, the Romans had laid down mile-stones from the Rhone to the Pyrenees; and Strabo says that the great Egnatian road from Apollonia on the Adriatic to the Hebrus was similarly marked by a column at every eight stadia, or Roman mile. Agrippa, among other ornaments of the Roman capital, designed a noble geographical monument in a representation of the whole world on a portico, a design which was completed by Octavia and her imperial brother in the Octavian portico. Even the provincial city of Augustodunum (Autun) had porticoes of the same kind, where maps of every part of the known world with all the names were exhibited to the youth of Gallia. Now if any period were to be selected at which it was probable that the grand work of measuring all the roads in the empire would be undertaken, it would be the moment when the victories of Cæsar in Greece, Egypt, Asia, Africa, and Spain, had at last consolidated the Roman conquests; and he who conferred on his country the great blessing of a well constituted calendar, would naturally direct his mind to the scarcely less important object of a general survey of the empire. But we are not left to conjecture. Æthicus (a geographical writer of uncertain date, but not later than the fourth century, if it be true that St. Jerome translated his *Cosmographia* from Greek into Latin) states in as many words that Julius Cæsar, the author of the bissextile year, ordered a general survey of the empire under a decree of the senate. This was undertaken in three parts, he tells us, the east by Zenodoxus, the north by Theodotus, the south by Polycleitus; they began their labours in B.C. 44, the year in which Julius Cæsar and M. Antonius were consuls, and finished them respectively in B.C. 30, 24, and 19, when Augustus, now sole master of the Roman world, gave the sanction of the legislature to the results by a second decree of the senate. This passage of Æthicus, which certainly bears on the face of it no evidence of forgery or fraud, will well account for the various names prefixed, as above stated, to the MSS. of the *Itinerary*, and it is not impossible that Æthicus himself may have been the editor of the work in the form in which it has come down to us. The *Itinerary* has been found forming part of the same MS. with his *Cosmographia*, and indeed even the authorship of the work has been assigned to Æthicus by more than one writer of the middle ages.

That the *Itinerary*, supposing it to be founded originally upon the above-mentioned public documents, afterwards received many additions and modifications, cannot and need not be disputed. The roads of Britain could not have been all added until the time of Severus, whose *vallum*, or great wall of protection against the Pihts, (erected A.D. 209,) is more than once mentioned. The name Diocletianopolis (p. 330) carries us to a period between 285 and 305, and the expression '*Porsulis quæ modo Maximianopolis*,' (p. 321, see also p. 331,) 'Porsulis, which has been recently changed to Maximianopolis,' leads to the same date. The insertion of the name *Constantinopoli* after that of *Byzantio* affords but weak ground for any argument, as the words *quæ et Constantinopoli*, (p. 139,) and *quæ Constantinopolis* (p. 323) are not found in the Vatican MS. So again the words *a Constantinopoli usque Antiochia* (p. 140) are omitted in the same MS. and condemned by Wesseling himself. These three omissions cannot be accidental. And besides these, there is not a trace of any name marking a period later than the reign of Diocletian, for the station *Candidiana* (p. 223) has no connexion with the son of Galerius, but may rather be compared, as to its termination, with similar forms in pp. 55, 88, 89, 94, &c. On the other hand Cirta, the great city of Numidia, is not called Constantina; Antaradus on the Phœnician coast is not called Constantia. Nor is there any the slightest allusion to the Christian religion which might well have been made in speaking of Antioch; while, on the contrary, we find the names of Juno, (p. 524.) Minerva, (p. 525,) Venus, (p. 526,) Apollo, Diana, and Latona (pp. 527, 529).

As a specimen of the work, we quote a few lines which may be interesting to the reader of Horace's amusing journey to Brundisium. In this extract it will be seen that little regard is paid to the grammatical cases; but this is not an evidence of a very late age, for even before the time of Constantine it had become not uncommon to consider the names of places as indeclinable, and the case selected to serve for all was generally the accusative or ablative. The numbers within brackets mark a variation in the MSS., some of which admit of easy explanation, but the occurrence of these errors in the number of miles is the chief drawback from the value of the work. The road commences from Rome.

Aricia	M. P. XVI.
Tribus tabernis .	M. P. XVII.
Appi Foro . . .	M. P. X. [XVIII.]
Tarracina . . .	M. P. XVIII. [XXVIII.]
Fundis . , . .	M. P. XIIII. [XVI.]
Formis	M. P. XIII.
Minturnis . . .	M. P. IX.
Sinuessa . . .	M. P. IX. [XIIII.]
Capua . . , .	M. P. XXVI.
Caudis	M. P. XXI.
Benevento . . .	M. P. XI.
Equo tutico . . .	M. P. XXI.
Ecas	M. P. XVIII.
Erdonias . .	M. P. XVIIII. [XVIII.]
Canusio . . .	M. P. XXVI.
Rubos . . .	M. P. XXIII.
Butuntus . . .	M. P. XI.
Barium	M. P. XII.
Turribus . . .	M. P. XXI.
Egnatiae . . .	M. P. XVI. [XXI.]
Speluncas . . .	M. P. XX.
Brundisium . .	M. P. XVIIII. [XXIII.]

ANTONINUS, WALL OF. This was an entrenchment raised by the Romans across the north of Britain under the direction of Lollius Urbicus, legate of Antoninus Pius, about the year A.D. 140, and is supposed to have connected a line of forts erected by Agricola, A.D. 80. Of antient writers, it is noticed by Julius Capitolinus only, and by him is termed a turf wall (*murus cespititius*). The work was composed of a ditch, a rampart with its parapet, made of materials promiscuously taken from the ditch, and a military way formed with much skill, running along the whole line of the entrenchment at the distance of a few yards on the south side. It extended from Dunglass Castle on the Clyde to the heights above Caer Ridden Kirk, a little beyond the river Avon on the Frith of Forth, or probably to Blackness Castle two miles farther on, though it cannot now be traced so far. In its course are nineteen forts, the eighteen distances between which amount to 63,980 yards, or 36 English miles, and the mean distance from station to station is 3554 yards, or rather more than two English miles. In the position of the forts, the Romans chose a high and commanding situation from whence the country could be discovered to a considerable distance, contriving, as far as circumstances would permit, that a river, morass, or some difficult ground should form an obstruction to any approach from the front. Forts were also placed upon the passages of those rivers which crossed the general chain of communication. From inscriptions discovered in Scotland, it appears that the entrenchment was made by the second legion, by vexillations of the sixth and the twentieth legion, and the first cohort of the Tungri. A very considerable portion of the entrenchment may still be traced. The modern name is Grimes Dyke; Grime, in the Celtic language, signifies great or powerful. (See General Roy's *Military Antiquities of Britain*; and Horseley's *Britannia*.)

ANTONI'NUS LIBERA'LIS, probably lived under the Antonines. He is the author of a work in Greek entitled *A Collection of Metamorphoses* (Μεταμορφώσεων συναγωγή); this collection is borrowed from a variety of authors, and is curious for containing many passages of poets who are now lost. The best edition is said to be that of H. Verheyk, Leiden, 1774. 8vo. See Bast's *Epistola Critica*.

ANTONIO, MARC. [See RAIMONDI.]

ANTONIO, one of the claimants to the throne of Portugal after the death of King Sebastian, was the natural son of the Infante Don Luiz, son of King Manuel. Antonio accompanied his cousin, King Sebastian, in his unfortunate expedition to Africa, and was there taken captive in 1578. He had the ability to conceal his real name and rank, and consequently had less difficulty in obtaining his deliverance.

On his return to Lisbon he found his uncle, Cardinal Enrique, who had been appointed regent by Sebastian, in possession of the throne. Antonio immediately claimed the crown on the plea that his father had secretly married his mother. Enrique ordered him to produce the proofs, which were found to be forgeries. By the advice of the pope's nuncio, Antonio excepted against the judgment of the king, and appealed to the Archbishop of Lisbon, reserving the final decision to the pope. The cardinal-king declared Antonio a traitor, degraded him from his rank, and exiled him from Portugal. Antonio fled to Spain, where, however, he did not remain long. He there solicited an interview with the Spanish minister, and offered to give up his claim to the king of Spain, Philip II., for an annual pension of 300,000 ducats and the regency of Portugal during his life. This extravagant proposal was naturally rejected. In the mean time the cardinal-king assembled the cortes of the realm at Lisbon, in April, 1579, to decide the question of the succession. He also appointed a council of eleven judges to examine the rights of the respective claimants, and named a regency to govern the kingdom in case his death should take place before the cortes had come to a final decision. All the candidates bound themselves upon oath to abide by the resolution of the cortes, but before they had pronounced their judgment, the king died, on the 1st of January, 1580.

The cortes was at this time at Almerin. Antonio, who had already returned from Spain, hastened immediately to Lisbon, where he summoned the authorities to receive him as king. Not succeeding here he repaired to Santarem, where the deputies of the third estate had removed from Almerin; and he flattered their vanity by telling them, that the power of appointing the successor rested in them alone. He then invited the inhabitants of the towns in the vicinity of Santarem to repair thither, and proposed to them to recognize him as governor of the kingdom. One of his own servants put a rag on the point of his sword, and hoisted it, crying, *Real, real por Dom Antonio*; the word was caught by the multitude, and he was proclaimed king.

Antonio now proceeded to Lisbon. The regents fled at his approach, and he was proclaimed king in the capital also. The regency went to Setubal, where they found that the people had declared in favour of Antonio. The new government proclaimed the regents as rebels, and a detachment of cavalry was sent in pursuit of them. But the Duke of Alba at the head of the Castilian army, in the mean time, invaded the kingdom to take possession of it in the name of Philip, and reduced Elvas, Villaviciosa, Estremos, Montemor, and other places. Alcazar do Sal also opened its gates to the Spaniards, and Setubal afterwards followed its example. The Marquis of Santa Cruz with the Spanish fleet had also taken possession of other places on the coast. Antonio, at the head of 12,000 men, courageously opposed the invaders, but he was defeated, and the duke entered Lisbon by capitulation. Antonio retreated to Coimbra, and on the inhabitants refusing to admit him, he went to Aveiro, plundered the town, and proceeded to Oporto, where he knew he had some adherents. The success of the Castilian arms, however, had so changed the dispositions of the inhabitants, that they had offered to surrender the town to Philip, and openly refused to admit Antonio. But some of his partisans having opened one of the gates, he entered the town like an enemy, and his soldiers committed the most violent excesses. The Spaniards soon arrived before Oporto. Antonio had only 3000 men, chiefly recruits, who fled before the Spanish veterans, and both conquerors and conquered entered Oporto together. In this hurry and confusion, Antonio escaped to Viana do Minho, where he embarked; but the sea was so rough that he was forced back to land. He was now placed in a very perilous situation. A large body of cavalry was in pursuit of him, and the sum of 80,000 ducats was offered for him dead or alive. In this situation he disguised himself in a sailor's dress, and by mixing only with the lower orders, he was able to remain for some months in Portugal, going from one town to another, until at last he escaped to France.

At Paris, he published a manifesto in Latin, French, and Dutch, and sent it to Holland and England, from which quarters he expected some assistance. This document bears the date of 1585. In 1588 he came to England, soon after the destruction of the Spanish Armada. He was favourably received by Queen Elizabeth, and though she at first refused him any effectual assistance in invading Portugal, she was at last persuaded to equip a fleet in which she sent the exile back to his country. If we are to believe the Portugueze and Spanish historians of the period, the proposals of Antonio were most monstrous. They say that he offered, among other things, to receive English garrisons into all the principal places of Portugal, and to maintain them at his own expense; to abandon the city of Lisbon to twelve days' pillage, and even to bestow the principal offices in the kingdom on Englishmen. In 1589, the expedition, consisting of 120 vessels with about 20,000 volunteers, sailed from Plymouth under the command of Sir Francis Drake and Sir John Norris. After having attempted in vain to take Coruña or Corunna, they anchored at Peniche, about twelve miles from Lisbon. The troops were safely landed, and part of them marched under their commander Norris towards Lisbon, while the admiral went up the river with the remainder. The land forces in their march found that the people, instead of joining them, as Antonio had promised, fled at their approach. They advanced, however, as far as the capital, without opposition, and assailed the outworks; but the garrison making a vigorous sortie, the English general commanded his men to retreat; some of them were cut off, and he saved himself, with the remainder, in the fortress of Cascaes. Here, both from want of provisions, and from feeling that they had been disappointed by Antonio, whose cause they now considered desperate, the English determined to return home. Antonio retired to France, where he ended his days in obscurity and indigence, on the 26th of August, 1595, deserted by his friends, and neglected by all the sovereigns who formerly had espoused his cause. (See Lemos, *Historia General de Portugal*, vol. xvii.; Antonio de Herrera, *Historia de Portugal*; Mariana, from the year 1578 to 1590.)

ANTONIO (NICOLAS or NICOLAO), a Spanish writer, born at Seville, in 1617. He received his early education at the Dominican school of that city, where he also studied divinity two years. In 1636 he went to the university of Salamanca, where he studied civil and canon law under the celebrated jurist Ramos del Manzano. In 1639 he was made a bachelor of arts. He returned afterwards to Seville, and devoted his time entirely to collect materials for his *Bibliotheca*. In 1646 he was created a knight of Santiago, and in 1659 Philip IV. appointed him general agent for the court of Spain at Rome, which office he held with honour until he was recalled by Charles II. He was then made a canon of Seville, and created a counsellor of Castile. He resided afterwards for some time at Seville; subsequently, he went to Madrid, where he died of epilepsy on the 13th of April, 1684. He has left behind him the following works:

1. *De Exilio, sive de Exilii pœnâ antiqua et nova, Exulumque conditione et juribus. Libri tres; cum indice:* Antwerpiæ, 1641 and 1659.—*Of Banishment, or of the Punishment of Exile, Antient and Modern, and on the Condition and Rights of the Exiled:* Antwerp. Antonio was twenty-three years of age when he wrote this work.

2. *Bibliotheca Hispana*, the best and most complete edition of which bears the following title: *Bibliotheca Hispana, vetus et nova, sive Hispanorum Scriptorum, qui ab Octaviano Augusti ævo ad Annum Christi* MDCLXXXIV. *floruerunt, Notitia. Curante Francisco Perezio Bayerio.* Matriti, Joachimus Ibarra. 1788. 4 vols. folio.—*Bibliotheca Hispana, Antient and Modern, or an Account of the Spanish Writers who have flourished since the age of Octavianus Augustus to the year* 1684.

3. *Censura de Historias Fabulosas. A Criticism on Fabulous Histories.*

The principal work of Antonio is his *Bibliotheca.* Baillet says that he prefers it to all the works of the kind in existence, not excepting that of L'Alegambe. 'The criticism of the author,' adds he, 'is correct, his Latin pure, his style elevated, though now and then it is obscure on account of his long parenthetical phrases.' This judgment is, in our opinion, correct, and, for Spanish literature, there is certainly neither a better nor a safer guide.

Antonio was a man of a liberal and charitable disposition: notwithstanding the lucrative offices he had held, he died so poor that he did not leave his heirs sufficient property to enable them to print part of the works which he left unpublished. Cardinal Aguirre, the author's friend, defrayed the expenses of the work. (See the author's own book; the *Biogr. Univ.*; and Bayle's *Dictionary*.)

ANTONIO, ST., the most northerly of the Cape Verde islands.

ANTO'NIUS, MARCUS, the orator, was born 142 B.C.; in 99 he was the colleague of C. Postumius Albinus in the consulship; and in the following year he defended M. Aquilius on a charge of extortion during the servile war in Sicily. In 97 he was censor, and he fell a victim to the fury of Marius and Cinna, when they took forcible possession of Rome in 87. His eloquence is celebrated by Cicero in his *Brutus*, chap. 37. 38. Two of his sons appear prominently in the history of Rome.

ANTONIUS, MARCUS, son of the orator, and father of the Triumvir. When the short-lived power of Mithridates over the Grecian islands had been put an end to by the successes of Sulla and his lieutenants, in the absence of a controlling fleet a general system of piracy arose in the Grecian seas and the adjoining coasts. This evil proceeded to such a degree, that in the year 75 B.C., through the influence of the Consul Cotta, Antonius was intrusted with the extraordinary province of protecting all the coasts of the Mediterranean. Crete was the chief scene of his operations, and though his successes for a time gained him the honorary title of Creticus, the outrages and extortion of which he was guilty, led at last to an insurrection in which he lost his life, about B.C. 69; and the credit of reducing the island was reserved for Metellus.

ANTONIUS, CAIUS, surnamed Hybrida, another son of the orator, was the colleague of Cicero in his consulship (B.C. 63). It became his duty, under the orders of the senate, to conduct the war against Catiline; but on the day of the battle he was prevented, or pretended to be prevented, by illness from appearing on the field, and the command devolved upon his lieutenant, Petreius. On the termination of the war, he proceeded (B.C. 61) as proconsul to the lucrative province of Macedonia, which had originally fallen to Cicero's lot, but had been transferred by him to Antonius, from a patriotic desire to attach him to the cause of his country. Such, at least, is the assertion of Cicero. Antonius, on the contrary, gave out that it was a matter of mere bargain and sale, and that Cicero had stipulated for the payment in return of a large sum of money, a charge which Cicero's ambiguous language and conduct on the occasion seem not to discountenance. To raise this money, Antonius was guilty of great extortion, and his conduct gave such general dissatisfaction, that at the end of the first year Pompey threatened a motion in the senate for his recal. Cicero, who avows in his private letters that he could not defend Antonius without injury to his own character, nevertheless exerted his eloquence most powerfully and successfully in his defence. Accordingly, Antonius held the province for a second year; but on his return (B.C. 59) he was formally brought to trial by Cœlius on a charge of extortion, and of carrying on war out of his province without the authority of the state. Though again defended by Cicero, he was found guilty, and condemned to perpetual exile. The trial took place on the very day that Clodius was adopted into a plebeian family, and thus enabled to direct his attacks successfully against Cicero.

ANTONIUS, MARCUS, the Triumvir, was the son of M. Antonius, surnamed Creticus, and Julia, a member of the patrician house of the Cæsars, sister of L. Julius Cæsar, the consul of 64 B.C. The year of his birth is somewhat uncertain, being assigned by different authors to 86, 83, and 81 B.C. His father dying while he was yet young, he received the greater part of his education under the direction of his mother Julia, who was at that time married to Cornelius Lentulus.

[Gold, Brit. Mus. diam. doubled.]

In his very outset into life Antony had the misfortune to form an acquaintance with young Curio, and the two friends entered upon such a course of extravagant dissipation that Antony was soon deeply involved; but Curio, being surety for the debt, prevailed upon his father, by the intercession of Cicero, to discharge it. Among the Roman nobles who were put to death by Cicero as accomplices of Catiline, one of the most distinguished was Antony's step-father, Cornelius Lentulus, then prætor of Rome. He was probably guilty; but the consul and the senatorian party had still more certainly violated the laws in putting citizens to death without trial. It was natural, then, that Antony should attach himself to Clodius, when that powerful tribune (whose character, it may be observed, should not be taken from his unscrupulous enemy) was employed in bringing Cicero to punishment. But Antony did not approve of the violence to which Clodius resorted. Accordingly, he went over to Greece, where he diligently applied himself to the two pursuits most important to a Roman, oratory and military science. From thence he was invited to join Gabinius, who, as proconsul of Syria, was engaged in protecting his province from the ravages of Aristobulus and his son Alexander (B.C. 57, 56). Antony in this war commanded the cavalry, and evinced great spirit and military talent. In the course of the following year, Gabinius undertook to restore Ptolemy Auletes to the throne of Egypt, and again the credit of his success was chiefly due to Antony, who secured the only road from Syria into Egypt, and made himself master of Pelusium. Here he showed a goodness of disposition, for which history has rarely given him credit, in saving the inhabitants from the furious revenge of Ptolemy. Gabinius returned to Rome in the autumn of 54, but Antony, who had now established his reputation as an officer, as soon as hostilities ceased in Egypt, hastened at once to Gallia, the theatre of a still more important war. In the year 52 we find Antony acting as one of Cæsar's lieutenants at the siege of Alesia. He now became a candidate for the quæstorship, and even aspired to the place in the college of augurs, then made vacant by the death of Crassus. His pretensions to the latter office he withdrew in favour of Cicero, who, at the intercession of Cæsar, was reconciled to Antony, and promoted his election to the quæstorship, while he in return opposed the turbulent conduct of Clodius. No sooner was Antony's election completed than he hastened back to Gallia, where, at the close of the year, he was left by Cæsar at the capital of the Ædui in the command of the troops there quartered. The following year he was employed under Cæsar in extinguishing the last embers of the Gallic war; and so fully had he gained the support of the general, that through his interest and that of Curio he was elected early in 50 B.C. into the college of augurs.

The senatorian party meanwhile had withdrawn Pompey from his friendship with Cæsar, but the tribunitial power was still a check upon their arbitrary proceedings, and through the influence of the same powerful friends Antony was raised to that dignity. The tribunes entered upon their office on the 10th of December, whereas the consular authority commenced upon the first day of the year. Antony employed this interval in advocating the just rights of Cæsar with the people. When the kalends came, however, the senatorian party put to the vote the fatal motion that Cæsar should disband all his troops by a given day, or be treated as a public enemy. Antony and his colleague Cassius interposed their tribunitial *veto*, but the senate was now prepared to break down all the popular barriers of the constitution; the two tribunes were allowed but six days to consider their *veto*, and on the 7th of January the decree was passed which at once suspended all the laws of the state, and gave to the senatorian party despotic and irresponsible power over all the citizens. The tribunes, thus at the mercy of tyranny, fled in disguise to Cæsar, whose army in a few weeks drove the authors of the late revolution from Italy. On the first expedition of Cæsar into Spain, Antony was left in the military command of Italy, which was again intrusted to him in the winter of the same year, when Cæsar crossed into Epirus. In the performance of this duty he distinguished himself by his able defence of Brundisium and its port against a Pompeian fleet under Libo, and soon after he crossed the Adriatic with reinforcements for Cæsar. In this campaign he on many occasions rendered the most efficient service, particularly at the battle of Pharsalia, where he commanded the left wing. In the following year, Cæsar, being appointed dictator, selected Antony as his master of the horse, an appointment which again gave him the chief authority in the absence of the dictator. During this period he showed his firmness in checking the violent proceedings of Dolabella. Plutarch, indeed, attributes his conduct to a mere feeling of revenge, in consequence of a supposed intrigue between Dolabella and his wife Antonia, for he had married his own cousin, the daughter of C. Antonius Hybrida. He accordingly divorced Antonia, and gave way to the most open licentiousness, about which Cicero's second *Philippic* abounds with scandalous anecdotes, exaggerated however most probably by the malice of the orator. One of the most outrageous acts, recorded by Pliny, was his appearance in public with an actress named Cytheris in a car drawn by lions. When Pompey's property was confiscated, Antony had purchased his house and grounds in the street called Carinæ at Rome, under the idea, says Cicero, that the money would never be demanded, and when Cæsar insisted on the payment, he was obliged to sell a large portion of his property, including a patrimonial estate at Misenum, to raise the required sum. To the fact that Antony occupied Pompey's house, there are frequent allusions in Cicero's speeches and the anecdotes of Plutarch. Antony soon broke off his connexion with the Grecian actress, which had been the cause of so much scandal, and married Fulvia, the widow of Clodius. During the second war in Spain (45 B.C.) against the sons of Pompey, when Cicero was induced by some exaggerated accounts of their successes to meditate an escape from Italy, he was checked by the interference of Antony, whose letter on the occasion still exists. The next year Antony was the colleague of Cæsar in the consulship, but the senatorian party again dreamed of recovering their power, and the idle affair of the Lupercalia was seized as a pretext for the conspiracy against Cæsar. At one time there was a desire on the part of the conspirators to admit Antony into their body, but this was prevented by Trebonius, on the ground that he had himself made some advances to Antony the very preceding year on his subject, which had been decidedly rejected. This fact is one proof of the little foundation which Cicero thought necessary for the grossest charges. He has not scrupled to accuse Antony of joining Trebonius in a conspiracy to murder Cæsar, when we have the authority of Trebonius himself, as reported by Plutarch, for the opposite statement. As Antony was not likely to join in the crime, it was next proposed to make him also a victim, but this was prevented by M. Brutus; and it was finally determined to engage him in conversation outside of the senate-house while the assassination of Cæsar was committed within.

Antony, a man of spirit, but of prudence, saw that it was necessary to act guardedly with men who accomplished their ends by assassination. He amused them, therefore, for a time with the most conciliatory conduct, knowing, perhaps, that the people would soon recover from their first alarm and rise against the murderers of their benefactor, more particularly the veterans who now feared to lose again the rewards of all their past labours. We omit to enumerate a number of acts on the part of Antony, such as his receipt of Cæsar's treasures from Calpurnia, his speech over the body of Cæsar, his publication of decrees, real or pretended, as in the name of Cæsar, because a much greater effect was attributed to these acts than they could of themselves have produced. The real power of Antony lay in the detestation in which the senatorian oligarchy was held. The self-styled patriots were soon afraid to appear in Rome, and Antony, supported by his two brothers, Caius and Lucius, who happened at this time to hold the offices of prætor and tribune respectively, had a prospect of establishing himself in a station scarcely inferior to that from which Cæsar had been thrown down. But he found his most powerful opponent in young Octavius (afterwards Augustus), the great-nephew and adopted son of the late dictator, who, with a duplicity beyond his years, managed to unite the support of the most opposite parties, the oligarchy and the veterans. Utterly unscrupulous about his means, he made an attempt, at least Cicero gives his authority to the report, to remove Antony by assassination. After numerous intrigues on all sides, Antony left Rome in October to meet at Brundisium four of the veteran legions from Greece; but Octavius, or, as he now called himself, Cæsar, found other veterans in the colonies of Campania ready to support one who bore so auspicious a name; and two of the four legions from Greece suddenly passed over to him from Antony. Before the year was closed, hostilities commenced in the north of Italy, where Antony besieged Decimus Brutus in Mutina. On the 14th of April, B. C. 43, the first battle was fought, when Antony, after defeating Pansa, was himself the same evening defeated by Hirtius. A few days after, he was again defeated in a twofold attack from Hirtius and Cæsar on the one side, and D. Brutus on the other, and compelled to cross the Alps.

The senatorian party were already enjoying their triumph, when the scene unexpectedly changed. The two consuls had fallen in the late contest. Decimus Brutus, though relieved from the siege, was without cavalry or commissariat, and unable to pursue; and Cæsar, never sincere in the cause of the senate, and himself supported by the senate only for their own purposes, at last threw off the mask. Ventidius had joined Antony with three legions, and the presence of the latter was sufficient to gain over the troops of Lepidus, then stationed in the south-eastern angle of Gallia, even if Lepidus was earnest in opposition to him. Finally, Plancus on the Isara and Pollio in Spain, after a long hesitation, declared themselves likewise in favour of the more powerful party. Thus Antony, who had fled from Mutina, with a strong body of cavalry indeed, but with not more than a single legion, if we exclude the unarmed, now retraced his steps across the Alps at the head of seventeen legions, the greater part veterans, leaving behind him six others to guard the important province of Gallia. Decimus Brutus, on the other hand, had only ten legions to oppose him, and of these eight were from the recent levies and all of doubted fidelity. In the mean while, Cæsar had put an end to the equivocal conduct of the senate by marching upon Rome, and extorting the consular fasces.

In the autumn of this year the celebrated triumvirate was established between Antony, Lepidus, and Cæsar, sometimes called the second triumvirate, but without sufficient reason, as the private understanding between the first Cæsar with Pompey and Crassus never assumed a public character. Antony and his colleagues, on the contrary, received their title under a public vote at Rome, and made use of it in all their public acts. In the proscription, which was one of the first acts of the triumvirate, Antony, whose conduct on so many occasions was distinguished for clemency and generosity, must bear his share of the guilt, more particularly in relation to Lucius Cæsar and Cicero. The former of these, his maternal uncle, was saved indeed by the bold interference of his mother, Julia; but Cicero, who had escaped from Rome when Cæsar appeared there with his army, was overtaken by his pursuers on the coast, and his head and right hand were cut off and fixed on the rostra of the Roman forum. But it is no slight palliation of the crime of proscribing this orator, that he had more than once in his life advocated the principle of assassination, and particularly had expressed, in language of the most brutal ferocity, his regret that Antony had not been murdered with Julius Cæsar. His private letters, as well as his public speeches, contain repeated assertions to that effect in all the various figures which his oratorical skill could supply. But Antony felt soon after the natural consequence of his crime, when his brother Caius, who had been some time a prisoner in the power of Marcus Brutus, was put to death in revenge of the murder of Cicero.

In the division of the provinces between the triumvirs, Antony received the whole of Gallia Citerior and Ulterior, with the exception of Gallia Narbonensis. To him and Cæsar was assigned the conduct of the war against Brutus and Cassius; and in the following year this war was brought to a close by two battles in the neighbourhood of Philippi, in both of which the success was due almost exclusively to Antony. Among the distinguished Romans who fell into his power on this occasion was the son of the orator Hortensius, who had been the instrument of Brutus in putting his brother to death. He ordered the prisoner to be slain upon his brother's tomb,—an act of revenge which, however criminal in itself, the Roman notions of piety perhaps required. Antony remained some time in Greece, particularly at Athens, where he ingratiated himself with the citizens. He then crossed into Asia, and Ephesus became the scene of more than Asiatic luxury. At Tarsus he* saw the fascinating Cleopatra, whose influence so fatally affected his fortunes. He had summoned her to answer some accusations brought against her of assisting Cassius in the late war; and the queen, in obedience to the command, appeared in her gorgeous barge upon the Cydnus attired as the goddess Venus. Antony was led captive to Alexandria, where he lost sight of all that was going on in the world around him. He was at last roused from his voluptuous revels by a Parthian invasion on the one side, and a war in Italy on the other. A Parthian army under the guidance of Labienus, a Roman of the senatorian party, who had accidentally been absent from the battle of Philippi, had overrun all the provinces from Syria to Asia. Antony set out to oppose them, but had scarcely arrived in Phœnicia when he was induced by the urgent solicitations of Fulvia to proceed with a fleet of two hundred sail towards Italy to oppose Cæsar. But the war in this quarter was at an end before his arrival: Perusia had fallen. The death of Fulvia, who, with Antony's brother Lucius, had been the chief cause of the war, led to a speedy reconciliation between Antony and Cæsar, which was cemented by the union of Antony with Octavia, the half sister of Cæsar, herself but recently a widow by the death of Marcellus. On this occasion a new division of the empire was made, in which Antony received as his portion all the provinces east of the Adriatic. In the following year, another step was gained towards securing the peace of the empire by a treaty with Sextus Pompeius, whose fleet had given him the command of Sicily and other islands.

Leaving the management of affairs at home to Cæsar, Antony proceeded with Octavia to Greece. Here he heard that his lieutenant Ventidius, to whom he had left the conduct of the Parthian war, had been highly successful, that the invading army had been defeated, and that Labienus had fallen in the battle. In the following year (38) the same able officer gained a still more decisive victory over the Parthian prince Pacorus, who had invaded the Syrian province,—a victory the more gratifying to the Romans because it occurred on the same day of the year as the defeat of Crassus fifteen years before. As these successes had been obtained by a lieutenant under the auspices of Antony, the latter was entitled, by the established principles of Roman warfare, to the honour of the triumph; but Antony, guided by a more generous feeling, sent Ventidius to Rome to enjoy this honour. Another of his lieutenants, Sosius, was scarcely less successful in a Jewish war against Antigonus, for which he likewise triumphed a few years after (34 B.C.); and a third, Canidius, had recovered Armenia, and carried the arms of Rome to the foot of the Caucasus. On the other hand, the siege of Samosata, which was partly conducted by the general in person, rather detracted from than added to his military fame by the long and determined defence of the Commagenian prince Antiochus. But Antony was again called to Italy by the suspicious conduct of Cæsar. On his approach to Brundisium he was refused admittance into the harbour, on the ground that he was accompanied by Domitius, who, it was pretended, had been a party in the murder of the dictator. After much angry discussion and some hostile movements, a second reconciliation was effected by the mediation of Octavia, and Julia, the mother of Antony, who at the same time belong to the House of Cæsar. This new arrangement took place at the end of 37, or in the following spring. The most important article was the renewal of the triumviral power for a second period of five years, commencing from the last day of the year 38, the day on which the first period of their triumvirate terminated. Cæsar now conducted the war against Pompey, while Antony directed his arms against the Parthians. On his approach to Syria he sent for Cleopatra, on whom he conferred the provinces of Phœnicia, Cœlesyria, Cyprus, and part of Cilicia, Judæa, and Arabia. His preparations for the invasion of the Parthian empire were on the largest scale, but the influence of the Egyptian queen produced the most disastrous effects. The army commenced their march too late in the season, and after a campaign in which the soldiers showed the greatest spirit, and the general, on some occasions, no little military talent, the retreat was effected with great loss, partly through the eagerness of Antony again to meet Cleopatra.

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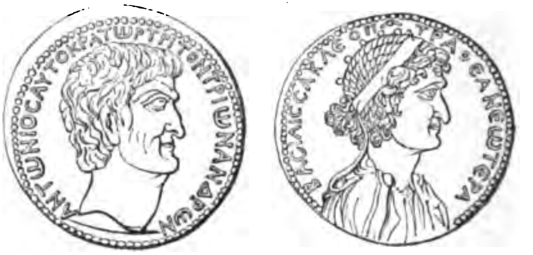
* It is almost certain that he had previously seen her at Rome, where she was residing at the time of Cæsar's death. Antony was at that time consul.

The failure of this campaign had been in a great measure owing to the treacherous desertion of the king of Armenia. Accordingly, in the following year, Antony was anxiously looking out for an opportunity of revenge, and a quarrel between the king of Media and the Parthians seemed to offer a favourable opportunity. The prospect of a war at any rate afforded him a pretext for avoiding an unwelcome visit from Octavia, whom he directed to remain at Athens, while he added to the insult by still dallying with Cleopatra at Alexandria. The following year, the invasion of Armenia took place, and by treachery, in his turn, Antony got the king into his power. In the mean time, Cæsar, by the overthrow of S. Pompeius and the usurpation of the provinces assigned to Lepidus, was at last prepared for a contest with Antony himself, who afforded him more than a pretext by the neglect of his sister and his conduct at Alexandria, where he seemed wholly to have exchanged the character of a Roman citizen for that of an eastern monarch.[*] In 33, Antony again commenced an invasion of Parthia, but as soon as he had reached the Araxes, he retraced his steps to prepare for the war that now threatened him from the west. Still a second year was passed in preparations; and in 31, the possession of the Roman world was decided by the victory off Actium. (See ACTIUM.) From that day the fate of Antony was fixed. In August, 30 B.C., Cæsar appeared with a fleet and army before Alexandria, to which Antony had retreated; and the desertion of his fleet and of his cavalry before his eyes left him only the poor hope of sustaining a siege. A false report of the death of Cleopatra completed his despair, and he killed himself with his own sword. Cleopatra likewise saved herself by suicide from adorning the triumph of the conqueror. It was a singular coincidence that the account of Antony's death was laid before the senate by M. Tullius Cicero, the son of the orator, who assumed the consular fasces on the ides of September. Antony's age at his death was a little more than 50; that of Cleopatra 39. He was four times married, or indeed, five times, if we may admit his marriage with Fadia, on the authority of Cicero. Of his two children by Fulvia, Antyllus the elder was put to death; and the younger, Iulus Antonius, to whom Horace has addressed an ode, after long enjoying the favour of Augustus, suffered for his intimacy with Julia, the emperor's daughter. By Octavia, he had at least two daughters (see ANTONIA); and by Cleopatra, a daughter of the same name, and two sons, Alexander and Ptolemy Philadelphus. Of these, the daughter married the learned African prince Juba. (See Cicero's *Letters and Orations*; Cæsar; Velleius; the *Epitomes* of Livy; Plutarch's *Life of Antony*, *Dion*, *Appian*, &c.; and Clinton's *Fasti*.)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The heads of Antony and Cleopatra are taken from a silver coin in the British Museum, in which the expression of Cleopatra's face fully agrees with the assertion of Plutarch, that her fascinating powers depended not so much on her beauty, in which she was inferior to Octavia, as on the charms of her manner and conversation. Plutarch also mentions the remarkable aquiline nose of Antony.

ANTONIUS MUSA. [See MUSA.]

ANTRIM, a county in Ireland, bordering on the coast at the N.E. extremity of the island, and in the province of Ulster. It is bounded on the N. by the Atlantic, on the E. by the north channel, (which forms the northern entrance into the Irish Sea, and separates Ireland from Scotland,[*]) on the S.E. by Belfast Lough, on the S. by the county of Down, on the S.W. by Lough Neagh, and on the W. by the county of Londonderry, from which it is separated for the most part by the river Bann.

This county extends from N. to S. 56 miles, and from E. to W. 30¼ miles; and contains, according to the trigonometrical survey now making under the direction of the Board of Ordnance, 758,808 acres, of which only 483,048 are arable, 225,970 being mountain and bog, and 49,790 under water. The sea-coast is romantic and picturesque. Near the western extremity of that part of it which belongs to this county, is the 'Giants' Causeway,' an immense pile of perpendicular basaltic columns, varying in their number of sides, but chiefly hexagonal, touching each other on every side without intervals or void spaces, and forming a huge mole or pier which extends far into the sea. (Hamilton's *Letters concerning the Coast of Antrim.*) [See GIANTS' CAUSEWAY.] Other specimens of columnar basalt are found along the coast, as at the promontory of Bengore in the neighbourhood of the Giants' Causeway, and at Fairhead, a headland about eight miles east of the last; also in some places inland. From Fairhead, the coast, which runs so far nearly W. and E., turns to the southward to the entrance of Belfast Lough, and presents to the eye a succession of precipitous cliffs projecting boldly into the ocean, and broken by a few bays and creeks. Off the coast lie the islands of Skerries, and Rathlin or Raghery. The Skerries are small islands W. of the Giants' Causeway. Rathlin is larger, being seven miles in length, and containing about 2000 acres, of which about 500 are arable. It is crescent-shaped, with the horns turned towards the main-land, from which it is separated by the strait of Slunk-na-marra:—the passage of this strait is often dangerous from the heavy swell. The inhabitants, who amount to 1080, are engaged in fishing, raising barley, or manufacturing kelp. At Doon Point, in this island, are some singular basaltic columns, horizontal, perpendicular, and curved. The eastern side of the county is mountainous, but the mountains form irregular groups rather than a continuous chain, and are intermixed with bogs, which also prevail in the western and flatter part of the county. The principal heights are Slemish, about the middle; and Knocklayd or Knocklead, in the northern part of the county. There is a popular opinion that Belfast is subject to much rain; but this opinion is owing rather to the frequency of the showers than to the actual quantity of rain that falls, which in the years 1795-98 was much below that at Londonderry in the adjoining county to the west.

There are no rivers or streams of any importance running through the county. The largest are the Bush, which, rising in the mountainous district to the N.E., near Knocklayd, flows first to the west and then to the north, and falls into the ocean at Ballintrea near the Giants' Causeway, after a course of about 20 English miles; and the Main, which has a southerly course of nearly 30 English miles from Lough Gule into Lough Neagh near Randal's Town, and receives the waters of several tributaries. The Bann, a far more important stream, which flows through Lough Neagh, forms the boundary of this county towards the west, separating it from the county of Londonderry [see BANN]; and the Lagan, which rises in the county of Down, and has a course of nearly 40 English miles into the Belfast Lough, divides the counties of Antrim and Down.

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[*] On one of the medals given in this article we see the face of Antony and Cleopatra on opposite sides; the characters on the medal are Greek. As Antony here calls himself one of the triumviri, it was probably struck before the downfall of Lepidus.

[*] The distance from the Mull of Cantire, in Scotland, to the N.E. point of the county of Antrim, is less than fifteen miles.

Antrim is divided into fourteen baronies, Upper and Lower Dunluce and Carey in the north; Upper and Lower Glenarm, stretching along the east coast; westward, Kilconway, Upper and Lower Antrim, and Upper and Lower Toome; Upper and Lower Belfast, inclosing the county of the town of Carrickfergus, and Upper and Lower Massarene, occupy the south, and comprehend the most beautiful, improved, and populous parts of the county. These baronies include 74 parishes; one in the bishopric of Dromore, the rest in the bishopric of Connor, both which bishoprics are in the ecclesiastical province of Armagh.

The estates, with the exception of land held under the see of Connor, are freehold; either immediate from the crown, or held by lease from the grantees. The fee of the greater part of the county belongs to the Antrim family, and the Marquises of Hertford and Donegal. The other principal proprietors are the Countess Massarene, Lords O'Neil and Templeton, and Colonel Packenham. Agriculture is in a very backward state, the land being very generally occupied in small holdings by the farmers, who are also engaged in linen weaving. In the flat parts of the county, along the shore of the Belfast Lough, the farms rarely exceed ten acres, part of which is devoted to raising potatoes, the quantity thus appropriated being regulated by the quantity of manure, which latterly has been much increased by the use of lime; a small part to raising flax, the ability to purchase seed here guiding the occupier; and the remainder to oats, which crop is repeated two or three years; and when the land is exhausted, it is left to lie fallow, or 'turned to rest,' until, by receiving the manure saved, it is fitted for raising potatoes again; after which come the oats (sometimes wheat) or flax. Barley is frequently sown, but seldom in large quantities. Beans are grown in one or two parishes on the coast, chiefly for export to Scotland. Clover has lately come to be an object of attention; but turnips, vetches, or kale are little regarded. The small size of these farms, if such they may be termed, and the rockiness of the soil, lead to the use of spade husbandry; or if the farms are somewhat larger than ordinary, neighbours unite their horses, bullocks, or milch cows to form a team for the plough. Sometimes the 'dry cotters,' (occupiers of a house without any land,) or small occupiers, take what are termed 'corn acres,' or 'con acres,' *i. e.*, ground hired to raise a single crop of potatoes or oats. In the northern part of the county, the tillage is even worse than that above-described. The cattle consist chiefly of milch cows belonging to the small farmers, who cannot give the price for a good heifer; they are, therefore, of an inferior breed. The gentlemen farmers have, however, been desirous of improving their stock by importation. There is, on an average, a cow to each family, without reckoning the population of the towns. Butter is the chief object of the dairy: 82,000 firkins from this county and those of Down and Armagh were, in 1827, exported from Belfast. Cheese is made also; that of Carrickfergus is much esteemed. Sheep are little attended to; very little wool is produced for sale, there being no more than is required for domestic purposes. Goats are continually seen round the cabins; they are tethered by a cord fastened to the horns, and put to graze on the tops of the banks. The dog and the pig are inmates of almost every cabin, and may be considered alike as domesticated animals. The number of pigs reared is very great. In the three winter months of 1826-7, upwards of 71,000, averaging 200 lbs. each, were sold in Belfast, fetching from 1*l.* 12*s.* to 2*l.* 14*s.* per cwt. The small farmers depend on them for payment of their rents; and eight or ten are a common appendage to a small farm-yard. (Wakefield's *Account of Ireland;* and *MS. Communication from Ireland.*)

There is a coal mine at Ballycastle in this county, but the coal is of an inferior sort; and one of fossil wood or wood coal at Killymorris near Ballintoy on the same coast. English coal is imported into Belfast. Gypsum, marble, beautiful crystal pebbles, and different sorts of ochres are also found.

The great manufacture of the county is that of linen. Flax was once grown to a considerable extent, more acres (viz., 11,000[*]) having been devoted to this crop in Antrim than in any other Irish county, except Armagh; but the cultivation of flax has diminished of late years. The seed is almost entirely brought from Holland. It is spun into yarn by the poor females, who are very expert in this branch of industry: yarn spun by the hand is preferred to that spun by machinery, which has been introduced for this purpose, and has caused a great reduction in the price of yarn. The weavers work on their own account, purchasing either spun yarn, or unspun, and weaving it in their own families. Some of them employ journeymen. Others have in their houses two or three looms (costing 4*l.* to 5*l.* each) which they let at about 10*s.* per annum. The weavers sell their fabrics to the bleachers, by whom they are finished, and generally sent to Dublin or London. Some are exported to England unbleached, in order to be completed there. The linens made in the county of Antrim are narrow, not exceeding when bleached thirty-two inches; those of the width of three quarters of a yard are all made here, for certain widths are peculiar to certain districts. In the neighbourhood of Belfast and Lisburne fine yard-wide linens or cambrics, lawns and diapers, are made; and at the latter town is also a manufactory of damasks. The linen manufacture, however it may have enriched the middling classes, has by no means raised the condition of the actual manufacturer, whose earnings are commonly below those of an agricultural labourer, so that many have left the loom to go to field labour. The cotton manufacture has flourished considerably in and around Belfast, and affords to the working man far greater advantages. It was introduced by Messrs. Joy and M'Cabe, in 1777, and is not carried on by the weavers on their own account, like the linen, but by men of large capital, for whom the weaver works either at his own house or in a factory. The goods manufactured are muslins, calicoes, wrappings, thicksets, corduroys, and velveteens. The number of persons employed in Belfast, Lisburne, Carrickfergus, and the neighbouring districts, is estimated at 26,000, having about doubled since 1800. To the introduction of the cotton manufacture, and to the commercial importance of Belfast, may be ascribed the improvement observable in the condition of the people who live in the neighbourhood of that town; in which are concentrated nearly all the other manufactures carried on in this county, as well as most of the foreign commerce. [See BELFAST.] There are some salmon fisheries at Custendal, Tor Point near Fairhead, Ballycastle, Carrick-a-rede, and the Bush-foot. The more important one in the Bann near Coleraine rather belongs to the county of Londonderry. Belfast is supplied with oysters and other fish from Carrickfergus.

The population of the county in 1831 (the last census taken) was 323,306: in 1790, Dr. Beaufort (*Memoir of a Map of Ireland*) estimated the inhabitants at 160,000. According to the returns of the Commissioners of Education in 1824-26, the number of children receiving education in schools was 20,050, of whom 11,800 were boys and 8250 girls: 3865 were of the established church, 11,640 were presbyterians, 430 dissenters of other denominations, 3785 Roman Catholics, and of 330 the religious profession could not be ascertained. The shire town is Carrickfergus, once the first sea-port in the north of Ireland, and then defended by a strong castle, where a small garrison is still kept. The population of the county of the town of Carrickfergus was, in 1831, 8698. Belfast is, however, the place of greatest importance (population 53,287). Both of these are on the north shore of Belfast Lough. Lisburne, on the river Lagan, has a population of 5218; and Antrim, near Lough Neagh, of 2655. [See the Articles on those places.]

The other towns are Larne, on a lough or inlet of the same name, on the east coast, (population 1551,) an inconsiderable place with a poor harbour: Ballymena, (population 4063,) and Ballymony, (population 2222,) a neat little town, with stone houses, and slated roofs, and having a decent inn; (both these are on the road from Antrim to Coleraine;) Ballycastle, (population 1683,) with its coal mine, on the north coast; and Randal's Town, a little to the N.W. of Antrim, and near the shore of Lough Neagh. The other places called towns in the population returns have under 700 inhabitants, and are not worth mentioning, except Connor, which contains the ruins of a cathedral, and gives name to the diocese.

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[*] This return refers to the year 1809, and does not seem to include patches of less than one acre, which are very numerous. It is probable that the acre is the Irish acre, which is equal to more than an English acre and a half.

The chief antiquities are the above-mentioned cathedral; the round tower at Antrim [see ANTRIM TOWN]; the remains of two other towers, one at Armoy near Ballycastle, and the other on Ram Island in Lough Neagh; Dunluce Castle, on the coast, not far from the Giants' Causeway; and the ruins of a castle on Rathlin island, which is said to have given shelter to Robert Bruce when driven from his native land. A cromlech and a rocking stone are to be seen in island Magee near Larne.

The county returns two members to parliament; Belfast two; Carrickfergus and Lisburne each one. The number of electors for the county under the Reform Bill of 1832 amounted to 3487, of whom 561 were 50*l.* freeholders; 462 were 20*l.*, and 2209 were 10*l.* Of these 3026 voted at the last general election (of 1832). Antrim gives the title of Earl to the family of Macdonnel. (Wakefield's *Account of Ireland;* Beaufort's *Memoir of a Map of Ireland;* and *MS. Communication from Ireland.*)

ANTRIM, a town in Ireland, in the county of the same name, about 105 miles north of Dublin, and about 15 miles N.W. from Belfast. 54° 43′ N. lat., 6° 6′ W. long. of Greenwich. It is near the N.E. extremity of Lough Neagh, the largest lake in Ireland, and on the Six-mile Water, a small stream which flows into the Lough. Although Antrim gives name to the county, it is not the shire town, and had, in 1831, a population of only 2655. It was once, however, a place of great consequence, as appears from its having, before the Union, returned two members to the Irish House of Commons, from the mayor being admiral of a considerable extent of coast, and from the corporation having been entitled to the customs paid by all vessels within the limit of the jurisdiction thus enjoyed by the mayor. This grant was repurchased by the crown, and the custom-house was transferred to Belfast. Antrim consists of one long street, with the market-house in the middle. The parish church is a modern Gothic structure, with a steeple and spire. and there are a Catholic chapel and several dissenting meeting-houses. The linen manufacture furnishes employment to many of the inhabitants. In the neighbourhood are Shane Castle, the antient seat of the O'Neils; and Antrim Castle, once the seat of the Skeffingtons, Viscounts and Earls of Massarene, and now of Skeffington Foster, Earl of Ferrard. The living is a vicarage in the diocese of Connor.

At Antrim is one of the antient round towers found in many parts of Ireland: it is perfect, and is 95 feet high. The origin of these towers has been keenly disputed by antiquarians; most of them, however, agreeing that they are the work of the Ostmen or Danes. Mr. Ledwich (*Antiquities of Ireland*) supposes them to have been the belfries of antient churches. Other opinions have been broached of late, and by some people received.

This town was the scene of one of the severe contests which occurred during the unhappy civil disturbances in the year 1798; in it Viscount O'Neil, father of the present Earl O'Neil, received a mortal wound. The insurgents were entirely defeated.

ANTWERP, called by the natives Antwerpen, by the Spaniards Amberes, and by the French Anvers, is situated on low ground on the right bank of the Schelde, where the river makes a considerable bend, in 51° 14′ N. lat., and 4° 22′ E. long. It is about 25 miles in a straight line, nearly due north of Brussels, the capital of Belgium, about 9 miles above Fort Lillo, and 45 miles reckoning to Flushing, at the mouth of the Schelde, where vessels bound to Antwerp must take a Dutch pilot as far as Lillo. The average breadth of the river opposite to the city is about 440 yards, and the ordinary rise of the tide is stated at 10 feet. For the two miles in front of the city of Antwerp the depth at low water is from 32 to 42½ English feet.

Antwerp is a strongly fortified city on the land side, and has, in addition, a large citadel on the south, built by the Duke of Alba in 1568. The houses are generally of a sandstone called *kareelsteen*, brought from Boom, a few miles south of Antwerp. This still magnificent, and once still richer and flourishing town, has 26 public places, 70 public buildings, and 162 streets, or, according to other accounts, 212. The great glory of Antwerp is its cathedral, the finest building in the Low Countries; it is said to be 500 feet long, 240 wide, and has a spire of stone, generally said to be above 400 feet high But accounts differ as to the exact height of this steeple, some making it as much as 451 feet, and even more of the two spires originally designed, only one is finished. By the kindness of a friend, we are enabled to rectify the height of the spire of Antwerp cathedral, which must be reduced to 366 feet at the outside; consequently it is lower than the spire of Salisbury cathedral, if the height of this English spire can be depended on. The observations on the height of Antwerp spire were made with a mountain-barometer by Jones, and were repeated in order to insure accuracy. Being warned by this example, we will not undertake to vouch for the accuracy of the other dimensions of the cathedral. With a small telescope, objects may be seen pretty clearly from the spire of the cathedral for 40 miles round. The interior is adorned with two of Rubens' finest pictures, one of which, the Descent from the Cross, is almost unrivalled in its masterly grouping. The Hotel de Ville, or Town House, is a large and handsome building, with a front of about 260 feet; and the Bourse, or Exchange, which rests on marble pillars, was the finest building of the kind in Europe, and is said to be the model on which those of London and Amsterdam were built. St. James's church, which contains the tomb of Rubens, a native of the city, the church of St. Michael, the hall of the Hanse Towns, and the imperial palace, built by Napoleon, in the *Meer*, which is the chief public place, are also fine edifices. The new quay and the great basin of Antwerp were begun by Buonaparte, when he intended to make this city one of his strong naval stations. The area of the great basin is 17.16 English acres, and of the small one, seven. On each side of the great basin are two careening docks, made during the empire of Napoleon for repairing the ships of war constructed here. The new custom-house is at the head of the great basin. Along the whole line of the new quay a row of elms has been planted, for the purpose of ornament and to form a pleasant walk in the heat of summer. In such modes of decorating their chief streets and the environs of their towns, the people of the continent are much superior to ourselves.

Antwerp contains a great military arsenal, dock-yards, and an extensive rope-walk. The citadel is a regular pentagon, surrounded by a wet ditch 90 feet broad: it has five bastions, each containing a casemate capable of holding 400 men. Some years ago it contained the great prison for felons, where (in 1817) about 1000 were in confinement for various periods, none for less than five years, for various offences. They were kept hard at work, but their employments are described as sedentary, and some of the apartments as ill ventilated and disagreeable.

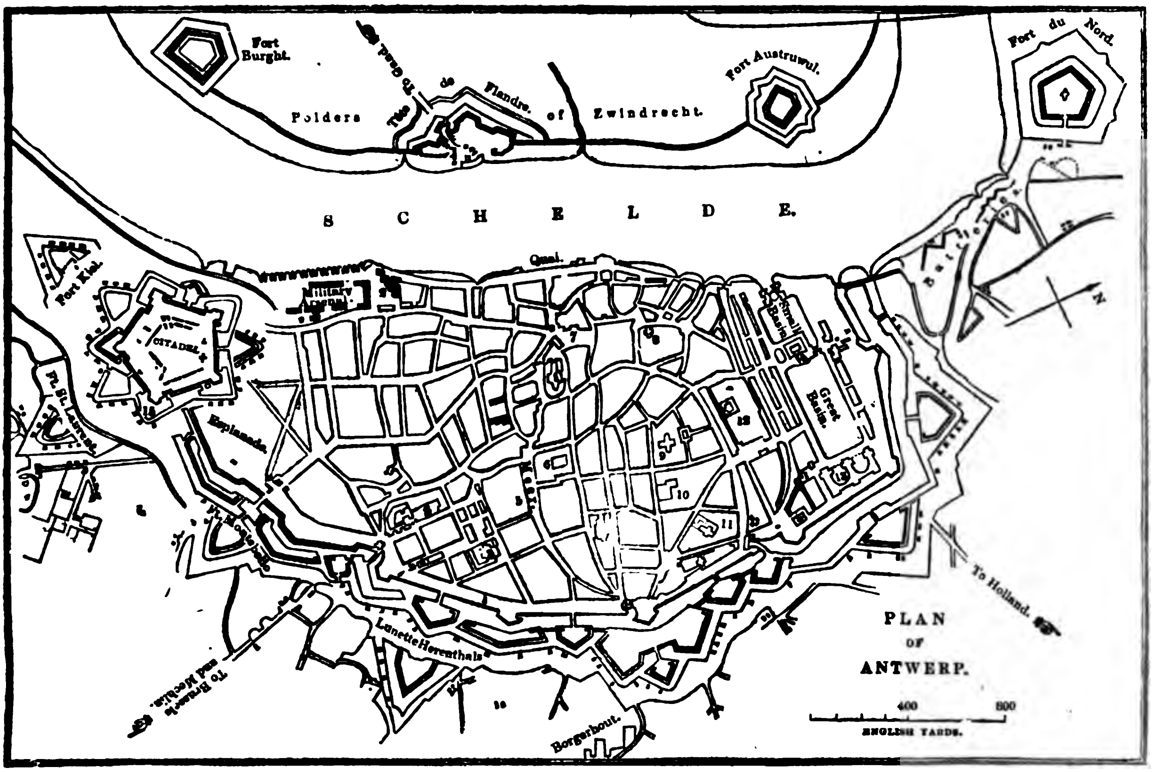
Travellers cannot fail to be struck with some appendages of Catholicism to be seen in the streets of Antwerp. Pious individuals erect, at their own expense, a Madonna with the child Jesus at the corner of the streets, the former exhibited in glaring colours, and the latter with a gilded glory round his head. Napoleon swept away these testimonials of superstition, in which he perhaps showed less policy than the Protestant king of the Netherlands, who restored them.

Antwerp, which was the birth-place of Jordaëns, Rubens, Vandyke, the Teniers, and of Quintin Masseys, who, as the story goes, was changed by love from a blacksmith into a painter, still possesses many memorials of these illustrious artists in several good collections of paintings. The geographer Abraham Ortelius was a native of Antwerp. It has also an Athenæum, a botanical garden, public library, and an academy of the fine arts.

The commerce of Antwerp is still considerable, though far below what it was in the fifteenth and sixteenth centuries, when at one period it had a population of 200,000, and 2000 vessels annually entered its port. Its population in 1831, according to Dutch authorities, was only 77,199: 995 ships entered its port in 1829; 690 in 1830; and 382 in 1831. A corresponding decrease took place in the number of vessels that cleared out of Antwerp from 1829 to 1831 inclusive. As to its inland trade, Antwerp is connected by canals with Mechlin, Louvain, Brussels, and with Ghent by the Schelde. Its chief fabrics are thread, tape, linen cloth, silks, sugar-refining, calico-printing, and diamond cutting. They use the French coinage at Antwerp. and also the French weights and measures. There is a bank, which is a branch of the Brussels bank. Antwerp exports flax and bark to Great Britain; and madder, refined suga , and Belgian manufactured articles to other places.

The language which is most in use among the higher classes of Antwerp is the French, but the Flemish is the true language of the country and of the majority of the people.

We are not able to assign the period when Antwerp became a town; the Ambivareti of Cæsar, which is probably a corrupted name, did not live on the Schelde, as Malte Brun, without the smallest reason, supposes. Antwerp, in the eleventh century, was a small republic. The industry of its inhabitants, joined to its favourable situation, raised it to the rank of the first commercial city of Europe, during the reign of Charles V. But during the reign of his unworthy successor it suffered among the horrors of Alba's government, and the stormy times that followed the declaration of independence at Antwerp in 1580. In 1576 it was pillaged for three entire days by the Spaniards. The siege of Antwerp, by the Prince of Parma, and its reduction in 1585 after a fourteen months' siege, form an epoch in the history of the city. By the terms of the peace of Westphalia in 1648, the navigation of the Schelde was closed, and this, added to other calamities, destroyed the prosperity of the city. The navigation of the Schelde was opened at the time of the French occupation of Antwerp, which took place in 1792. In 1793 the French evacuated it, but took it again in 1794, when it became the capital of the department of Deux Nèthes. It was surrendered to the allies after the treaty of Paris in 1814 by Carnot, who had defended it up to this time. The city suffered after the revolution of 1830 from the cannonading which the Hollanders in the citadel directed against the town.



1. Cathedral.
2. Old Custom-House.
3. Old Arsenal.
4. Botanical Garden.
5. Palace.
6. Bourse.
7. Grande Place and Hotel de Ville.
8. Dominican Church.
9. Museum.
10. Military Hospital.
11. Reformed Church.
12. Infantry Barracks.
13. New Custom-House.
14. Hall of the Hanse Towns.
15. Toledo Bastion.

The last memorable event in the history of Antwerp is the capture of the citadel by the French, under Marshal Gerard. The King of Holland having refused to evacuate the citadel of Antwerp, conformably to the terms agreed on by the high contracting powers, who arranged the separation of Holland and Belgium, the French entered Belgium on Nov. 15, 1832, with about 70,000 men, a large part of whom were merely intended to occupy the country round Antwerp. The citadel was defended by General Chassé, for the King of Holland, with 4500 men. The French broke ground on the night of the 29th of November; on the 14th of December, they made a breach in the face of the Fort St. Laurent by establishing three mines in it, and immediately took the place by assault. The French then directed their breaching battery against the Toledo bastion, on which they soon made considerable impression. On the 24th the citadel surrendered, and the garrison became prisoners of war. The defence of General Chassé was neither vigorous nor well concerted, though his artillery was well served; and the only result of the obstinacy of the King of Holland was the loss of much life, and the infliction of much human suffering. The loss of the French, according to official reports, was 108 killed, and 695 wounded. The loss of the Dutch, in killed, wounded, and missing, was between 500 and 600. (See *Journal of an Horticultural Tour*, &c., Edinburgh, 1823; *Journal of an Excursion to Antwerp*, London, 1833, &c.)

ANTWERP, one of the eight provinces of the kingdom of Belgium, is bounded on the north by N. Brabant, by Limbourg on the East, on the south by S. Brabant, and on the west by east Flanders and part of Zealand. The Schelde separates Antwerp from East Flanders. Its area is about 1105 E. square miles, and the population (1829), 343,214. The following table exhibits the progress of population in the province of Antwerp for the ten years,

From 1803 to 1812

No. of Births.	Marriages.	Divorces.	Deaths.	Increase of Population.
96,058	21,579	13	87,126	8932

and, from 1815 to 1824,

101,471	23,075	2	70,623	30,848

The following statistical facts are from the tables of Vander Maelen (*Etablissement Géographique de Bruxelles, fondé par Ph. Vander Maelen en* 1830).

He makes the whole superficies of the province about 1097 English square miles, being eight less than our estimate: the uncultivated land is rather more than one fourth of the whole surface; the surface occupied by water (which is not included under the head of uncultivated land) is nearly $\frac{1}{18}$ of the whole.

Population in 1831.

City.	Country.	Total.
122,370	225,220	347,590

Education.

Children in communal schools.		Children in private schools.		
Male.	Female.	Male.	Female.	Total.
11,617	8,557	3,488	3,244	26,906

Therefore one in every thirteen inhabitants is in the schools, nearly.

Antwerp sends to the chambers at Brussels four senators and nine representatives; the province has one archbishop.

The province of Antwerp is very level. The only river is the Schelde, which receives on the right bank the Rupel at Rupelmonde: the Rupel is formed by the union of the greater and smaller Nethe, the Dyle on which Mechlin stands, and the Senne which runs by Brussels. As this region belongs to the great delta of the Rhine, it partakes of the general character of that extensive level: the soil contains a great proportion of sand, with no stones in the flat districts. The rain water penetrates the surface of the earth and is found in the low parts at about ten feet depth, and often much less.

Part of Antwerp exhibits the general productiveness of the Low Countries, but this province contains, perhaps, a larger portion of heath and barren land than any of them except Limbourg, or we may say N. Brabant, as a great part of the morass of Peel is given to N. Brabant by the treaty of London, Nov. 1831. A part of the barren Kempenland or Campine belongs to the east part of Antwerp. Between Breda in N. Brabant and Antwerp the country is described as flat, sandy, and poor, and in part incapable of cultivation, but improving somewhat as we approach to the latter city: as we come near Antwerp, it is pretty well cultivated. Between Antwerp and Brussels it is generally rich and well-wooded: following the valley of the Senne we find the country very level as far as Vilvorden in S. Brabant. Between Antwerp and Mechlin (which is near the southern limit of the province) the country is well cultivated. The inclosures made by ditches, dykes, and trees, are kept in good order: some live hedges are found, but they are reckoned injurious. Good crops of wheat, rape, and carrots line the road. The houses are strong built of brick or stone, and generally thatched with straw: the roads are paved with broken stones. Many fields of broom may be observed along this road: the stems of the broom after three years' growth furnish fuel for the kitchen or the oven, and are also used in burning bricks; the ground also is found to be in very excellent condition after the broom is cut down, and secures the farmer a heavy crop. The Polders, which consist of the richest grass lands, extend along the Schelde as far down as Zantvliet, and to Bergen-op-Zoom in N. Brabant. These Polders, which are lower than the level of the sea and the Schelde at high water, are protected by dykes: they produce excellent crops almost without any other manure than ashes from wood.

The chief towns of the province of Antwerp are, Antwerp, Mechlin, Lier, Turnhout, Gheel, and Boom. The language of the mass of the people is Flemish, though French is spoken by the educated classes in the towns. From the peace of Baden, 1714, the county and quarter of Antwerp, as the district was termed, (see Busching's *Geography*,) belonged to the House of Austria, and formed a part of the Austrian share in the Duchy of Brabant. After the French revolution it was united to France, and formed the department of Deux-Nèthes. In 1814 it became a part of the United Kingdom of the Netherlands; and in 1830 it became a province of the new kingdom of Belgium.

ANU'BIS, an Egyptian deity, represented with the head of a fox, dog, or jackal, and a human body. In some Egyptian remains we observe him standing by a bier, on which a mummy is lying. Anubis was the son of Osiris and Nephthys, the wife of Typhon, and sister of Osiris. He appears to have been considered in one sense as the conductor and guardian of departed souls, and in this respect his functions bear some resemblance to those of Hermes of the Greeks, and Mercurius of the Romans. Other resemblances are suggested between this Egyptian deity and Hermes, (the god with the golden wand, χρυσόῤῥαπις,) by the supposition that the element *Anub*, in Anubis, has the same signification as the Coptic *noub*, (see Coptic version, Matt. ii. 11,) signifying gold. (See Jablonsky's *Pantheon*, *Anubis*. For the phonetic name of Anubis as son of Isis, see Salt's *Essay*, &c., pl. iii.)

ANVILLE, (JEAN BAPTISTE BOURGUIGNON D',) a distinguished geographer of the eighteenth century, was born at Paris in 1697. From his boyhood he showed a strong bias for geographical studies. At twelve years of age, while at college, a map which fell by chance into his hands, for maps were not then so common as they are now, determined his pursuits. He began alone and without assistance to draw maps of the countries mentioned in the Latin classics which he was then studying. For this pursuit he sometimes neglected his regular tasks, and he was once caught in his favourite employment by the professor of his class, who, however, perceiving on the rough sketch before him evident signs of the genius of his pupil, encouraged instead of punishing him. The study of antient geography continued ever after to be the object of his special predilection. After leaving college, he became acquainted with several learned men of his time, and particularly with the Abbé de Longuerue, a laborious investigator of antiquities, at whose request he set about drawing several maps of France and its various provinces, for the Abbé's work; *Description géographique et historique de la France ancienne et moderne.* At the age of twenty-two, he was appointed one of the King's geographers. Soon after, his map of the kingdom of Aragon was published by desire of the Duke of Orleans, Regent of France, and against D'Anville's judgment, who did not consider it as sufficiently accurate. He was employed by the Jesuits to make an atlas of China for the edition of Duhalde's History of that empire. This Atlas (*Nouvel Atlas de la Chine*, &c.) was also published at the Hague in 1737. But the work that established his reputation, was his map of Italy, which he published in 1743. He constructed this map chiefly upon a close investigation of the antient writers, and of the Roman itineraries; he corrected many gross errors of his predecessors, and the accuracy of his work was proved some years after, when Pope Benedict XIV. having enabled Father Boscovich to measure a degree of the meridian in the papal states, D'Anville's positions were found to correspond pretty closely with the observations of the mathematician. In 1744, D'Anville published his *Geographical Analysis of Italy*, in illustration of his map. In this elaborate work he shows the difference between his and Sanson and Delisle's maps, he having reduced the area of Italy by several thousand square leagues. He drew several maps of sacred geography, namely, *Ecclesia Africana*, and the four Patriarchates of Constantinople, Antiochia, Jerusalem, and Alexandria, for the *Oriens Christianus* of Father Le Quien. It would be too long to enumerate all D'Anville's works and maps, a full catalogue of which is given by Barbié du Bocage in his *Notice des Ouvrages de M. D'Anville précédée de son Eloge par M. Dacier*, Paris, 1802. He published one hundred and four maps on antient, and one hundred and six on modern geography. He wrote about forty works, including several memoirs, which are inserted in the *Recueil de l'Académie des Inscriptions et Belles Lettres*. The following are the most important among his works, all published at Paris, *Analyse géographique de l'Italie*, 1744, 4to., already mentioned; *Dissertation sur l'Etendue de l'ancienne Jérusalem*, 1747, 8vo.; *Mémoire sur la Carte des Côtes de la Grèce*, 1751, 4to.; *Notice de l'ancienne Gaule, tirée des Monumens Romains*, 4to., 1760; a work much and deservedly esteemed, in which the author, however, confines himself to Gaul as it was under the Roman empire. To this must be added: *Eclaircissemens géographiques sur l'ancienne Gaule*, 1743, 12mo.; *Mémoire sur l'Egypte ancienne et moderne, suivi d'une Description du Golfe Arabique*, 1766, 4to. Mr. Ripault, one of the scientific men who accompanied Bonaparte's expedition to Egypt, says that they were struck with the accuracy of D'Anville's positions. Indeed when we look at D'Anville's map of Egypt, and consider what his materials were for constructing it, we readily admit that it is a most convincing proof of his great industry and acuteness. The navigator Bougainville, also gave a similar testimony in favour of D'Anville's map of Asia, especially with regard to the Molucca islands, and the coast of New Guinea. —*Géographie ancienne abrégée*, 1768, 3 vols. 12mo., and 1769, fol., translated into English under the title of *Compendium of Ancient Geography*, London, 1791, 2 vols. 8vo.; *Traité des Mesures itinéraires anciennes et modernes*, 1769, 8vo., a most valuable work, in which he estimates and compares the itinerary measures which have been in use in various ages, among the nations of Europe and Asia, and ascertains the variations which each had undergone in the course of time; *Etats formés en Europe après la Chute de l'Empire Romain en Occident* 1771, 4to.; a useful book for the history of what are termed 'the dark ages,' from the fifth to the twelfth centuries, and forming a link between antient and modern geography; *L'Empire de Russie considéré dans son origine et ses accroissemens*, 1772, 12mo.; *L'Empire Turc considére dans son établissement et ses accroissemens*, 1772, 12mo. With regard to the geography of Turkey, D'Anville seems to have been fully sensible of the difficulties of the subject, owing to the want of observations, for he used to say that people in his time 'were better acquainted with the geography of India and China, than with that of the kingdom of Philip and Alexander,' meaning Macedonia; and, in fact, he has himself fallen into considerable errors in his map of that country, as M. Cousinery has shown in his *Voyage dans la Macédoine*. [See Amphipolis.]

A similar remark will apply to his map of Asia Minor, to the neck or isthmus of which he assigned a breadth from north to south which was less than the truth by one whole degree: this fundamental error necessarily deranged many of his positions, especially in the eastern part of that peninsula. D'Anville's map of the Tigris and Euphrates is still, in some points, the authority on which our present delineations are partly founded; in other, and some important points, he has long since been corrected; but so ignorant are we still of the true course of some of the streams that enter the head of the Persian Gulf, east of the Tigris, that we cannot yet positively say whether D'Anville is right or wrong. In order justly to estimate the merit of D'Anville's exertions, we ought to bear in mind, that in his time geographical information was much more scanty than at present; that comparatively few points of the earth had been determined by astronomical observations; that the surveys of coasts were very imperfect; and that he had, in consequence, but few guides whom he could trust. D'Anville himself had never travelled beyond a hundred miles from Paris; but he made up in a great measure for these disadvantages by his indefatigable researches in the authors of antiquity, as well as of the middle ages, who could afford any information on geographical matters, and by a rare sagacity and judgment in eliciting truth out of conflicting statements and opinions. He was greatly assisted by his wonderful memory. Geography made under him rapid strides towards accuracy; he used himself to say, for he was somewhat of an egotist, that 'he had found a geography made of bricks, and left one of gold.' (See his 'Eloge,' by Dacier, already mentioned.) The maps of D'Anville have been continually reproduced in England in various forms; and errors, which the author could not possibly avoid, often still appear in our ordinary maps.

But it was only on the subject of his favourite science that he showed any vanity; in all other matters he was simple and unassuming. He lived more in the past than in the present, more with books than with men. It is remarked by the biographer of D'Anville, (*Biog. Universelle*, D'Anville,) that his style is not good, and that owing to this and other causes there is often a want of method and clearness in his dissertations. In this opinion we entirely concur: his language sometimes is very inelegant and not very correct, and his discussion of the position of a place would sometimes hardly lead us to expect the precision which we find in his maps. We believe that D'Anville was occasionally more indebted to previous geographers than is generally supposed; in saying this, we do not mean to detract from his real merit, which will stand the test of the most rigorous examination. In 1773 the French Academy of Sciences elected him, then seventy-six years of age, into their body, and the same year he succeeded to the vacant place of first geographer to the king. In 1777 he published his *Considérations sur l'Etude et les Connoissances que demande la composition des Ouvrages Géographiqués*, a sort of legacy for those who should follow him in the same career. In 1779 Louis XVI. purchased his valuable collection of maps, which he had collected in the course of sixty years devoted to science. D'Anville's constitution, naturally delicate, became now exhausted, his sight failed, and he at last fell into a state of physical and mental imbecility, from which death relieved him in 1782, at the age of eighty-five. His wife, with whom he had passed fifty-one years of his life, died the year before, without his being sensible of her loss. He left only two daughters. There are two more works translated or compiled in English from D'Anville, besides the 'Compendium' already mentioned, namely *A Complete Body of Antient Geography*, including the *Orbis Romanus, Orbis Veteribus Notus*, of D'Anville, with additions, London, 1775, and the *Geography of the Greeks and the Romans in the time of Alexander and Augustus*, London, 1816.

ANWARI, or ENWERI, properly AWHAD-ED-DIN ANWARI, a celebrated Persian poet, who flourished in the twelfth century of our æra. He was born at Bedna, a village in the district of Abjurd, in Khorasan: the immediate neighbourhood of his place of birth bears the name of Khaweran, whence Anwari is also sometimes surnamed Khawerani. He received his education in the college of Mansur, at Tus. A visit of the Seljukide sultan Sanjar to Tus furnished him the first opportunity of making himself known by a poem in praise of the sultan, which is by oriental critics considered one of his best productions. Sanjar, who was fond of poetry, enlisted him among his suite, and bestowed honours and ample rewards upon him. Anwari followed the sultan to Merw, then the residence of the Seljukides. Here the poet devoted himself to astrology, but was not fortunate in his predictions, by one of which he made himself so ridiculous that he retired from Merw to Balkh, where he died in the year 597 of the Hegira, (A.D. 1200-1201.) Manuscript copies of the *Diwan*, or collection of poems of Anwari, are not unfrequently met with. It consists chiefly of *kasidas*, or long poems, mostly panegyric; and of *ghazels*, or shorter lyrical effusions. In the East, the kasidas of Anwari are admired in preference to his ghazels: to our own taste, the latter are more agreeable; in them the style of Anwari is simple and comparatively easy, while his kasidas abound in metaphors and conceited historical allusions, which render many of them unintelligible without the aid of a commentary. It deserves to be remarked, that the language of Anwari, though he is one of the earlier Persian poets, is as full of Arabic expressions as that of almost any subsequent writer; whereas, in the *Shahnameh* of Firdusi, who lived only little more than a hundred and fifty years before Anwari, we find the Persian in a state of unadulterated purity. It is unlikely that the spoken language should have undergone so striking a change within so short a period; and we are inclined to think that Firdusi, to preserve the national character of his poem on antient Persian history, studiously avoided all Arabic expressions which might, at his time, have crept into the Persian language.

ANWEILER, a town in the former duchy of Deux Ponts, and now in the circle of the Rhine, forming part of the kingdom of Bavaria; it is built on the Queich, six miles distant from Landau, and has 2200 inhabitants, who subsist chiefly from the profits of their paper-mills. The ruins of the castle of Trifels, where Richard, Cœur-de-Lion, was kept a prisoner in the year 1193, may be seen in the vicinity of this place.

ANXUR. [See Terracina.]

A'NYTUS. [See Socrates.]

ANZIN, a village in the immediate neighbourhood of Valenciennes (department of Nord) and the seat of the most extensive collieries in France. The coal was discovered in 1734, by the Viscount Desaudrouin. The working of these mines is thought to have been attended with greater difficulties than of any other in Europe. The pits amount to forty all together, and sixteen of these are of great depth; some are as much as 300 metres, or nearly 1000 feet; and some authorities (*Dict. Géog. de la France*) extend them to 389 metres, or nearly 1300 feet. The coal burns fiercely, and is in demand for purposes which require an intense flame; and it is perhaps to this circumstance that we may ascribe the establishment of some glass houses and manufactories at Anzin. The number of persons employed in the mines amounts to 16,000, and the annual produce is about 4,000,000 of quintals (of 108 lbs. avoirdupois). Comparing the above statements with those given in the *Dictionnaire Géographique de la France*, (1804,) it appears that the working of these mines has prodigiously increased; for at the last mentioned period only 1500 workmen were employed. The population of the village was then 3096; it is now about 4000. (Malte Brun; Balbi; *Dict. Geog. de la France.*)

ANZUAN, commonly called Johanna, but more properly Hinzuan, the name given to it by the inhabitants, is one of that cluster of islands which are situated in the channel of Mozambique, nearly at an equal distance from the continent of Africa and the island of Madagascar, and which are known by the name of the Comoro Islands. Though not the largest of these islands, being smaller than Comoro, Anzuan is the most important, from having the best anchoring-ground, on which account, before the acquisition of the Cape, it was much more frequently visited by English vessels trading to the East Indies and China, than has lately been the case.

This island is of a triangular form. The most southern point lies in 12° 25′ S. lat., and the most eastern in 44° 34′ E. long., and to the north it extends nearly to the 12th southern parallel. Its circumference is estimated at from seventy to eighty miles; as to area it may be compared to the island of Madeira, which it resembles in many other points.

The shore rises in many parts with remarkable boldness;

and is broken by a few open bays. Rocky reefs extend from its extremities far into the sea; and from the south-western to the north-western point it is bounded by a reef which is two miles from the shore in many places. The interior of the island presents a succession of mountains and valleys. The mountains are of volcanic origin and some of them rise to a considerable height, probably to 6000 feet and upwards; among the highest is that called the Peak, which is rather of an oblong form and situated near the eastern extremity of the island. With the exception of the highest summits, which present barren rocks, the mountains are covered with trees, chiefly fruit-trees and palm-trees. The valleys are rather narrow, but they contain in some places much level ground which is partly cultivated, and partly planted with trees. The continually changing variety of the landscape offers many highly picturesque views, and Sir William Jones does not hesitate to give them the preference over the finest views in Switzerland and Wales.

Though exact observations are wanting, the climate appears to be mild, the heat at least not being oppressive even in July.

Rice is raised, but not in large quantities. A kind of vetch is much more cultivated; and forms the principal food of the inhabitants. Yams, papayas, and sweet potatoes, abound in the kitchen-gardens. The fruits consist principally of cocoa-nuts, limes, oranges, wild pine-apples, and plantains. The areca-palms are numerous, as well as the shrubs that yield henna; the fruits of the former and the leaves of the latter are used here as in India.

Not a horse is to be found on the island, and persons of rank travel in rudely constructed palankins. Cattle are numerous and excellent, but rather small, weighing only from 300 to 350 lbs. each. Goats abound, and a wild species inhabits the most rugged eminences. Poultry is very common, and of the Guinea-fowls thousands may be seen in a wild state. No snakes, nor other venomous reptiles exist in this island; the only annoyance of the inhabitants is the mosquitos. Fish abounds everywhere along the shore. White whales frequently visit the channel of Mozambique, and are often killed by the inhabitants of this island. Cowries are found on the shoals in the neighbourhood, and form an article of export.

The population consists of Africans and Arabs. The latter, who compose the upper classes, have introduced their religion, laws, and a part of their knowledge, especially of navigation. But the Africans, who compose the bulk of the population, are very ignorant, and very little advanced in civilization. The government is a monarchy limited by an aristocracy. The king has no power of making war by his own authority; but if the assembly of nobles, who are from time to time convened by him, resolve on a war with any of the neighbouring islands, they defray the charges of it by voluntary contributions; in return for which they claim as their own all the booty and captives. As the succession to the title and authority of sultan is not fixed by unalterable laws, but requires the confirmation of the chiefs of the island, it gives rise to factions, and occasions frequent civil wars, which, together with the depredations of pirates from Madagascar, have lately much reduced the number of inhabitants, who formerly were estimated at about 100,000.

The town of Matsamudo, which lies at the end of an open bay, is visited by European vessels for refreshment, and is populous. But the king resides in another town, called Domoni, which is ten miles from Matsamudo, in the interior of the island. The trade of this island is very inconsiderable. It sends nothing to the markets of Europe, but has some intercourse with the island of Madagascar, the coast of Mozambique, and the other Comoro islands: it exports the merchandise received from the Europeans returning from Bombay, which it exchanges for elephants' teeth, rice, cattle, and other productions. (Sir William Jones; Capt. Williamson; and Horsburg's *Directory for Vessels sailing to and from India.*)

AO'RTA, a Greek word (ἀορτή). The aorta is the great vessel from which all the arteries of the body which carry red blood derive their origin. It arises from the upper and back part of the left ventricle of the heart. Its origin is directly opposite the lower margin of the cartilage of the third rib on the right side of the chest. From this point it ascends behind the pulmonary artery, still inclining a little to the right side of the chest. It continues to ascend as far as the top of the second vertebra of the back. All this part of the vessel is called the *aorta ascendens*. When it reaches as high as the lower margin of the first rib, it bends obliquely backwards towards the body of the third vertebra of the back. This part of the vessel is called the *curvature*, or the transverse *arch* of the aorta. From the third vertebra of the back, where its arch terminates, it proceeds in a straight course downwards through the chest, immediately in front of the spinal column, and towards the left side of it. Through an opening formed for it in the diaphragm, (see DIAPHRAGM,) it passes from the chest into the abdomen. All this part of the vessel, namely, that extending between the termination of the arch and the diaphragm is denominated the *descending* or the *straight* portion of the thoracic aorta. Having passed through the diaphragm into the abdomen, it is called the abdominal aorta; it continues to descend along the front of the spine a little obliquely, until it reaches the fourth vertebra of the loins: here it divides into two branches of equal size, and may be said to terminate, for it now loses the name of aorta; the two great branches into which it divides being denominated the *common iliac arteries*.

The first two branches which are given off by the aorta are those which supply the heart itself. The great branches which spring from the arch of the aorta are principally distributed to the chest, head, and upper extremities. The branches which arise from the descending or the straight portion of the thoracic aorta are likewise distributed to the viscera of the thorax, those which supply the lungs being called the *bronchial* arteries. The branches which are given off from the abdominal portion of the aorta supply, for the most part, the viscera of the abdomen; and the iliac arteries are distributed principally to the viscera of the pelvis and to the lower extremities.

The structure of the aorta does not differ materially from that of arteries in general (see ARTERY). At its origin, in the left ventricle of the heart, are placed three valves of a semilunar or crescent shape, termed the semilunar valves, (see HEART,) which effectually prevent a refluent current of blood from the vessel into the heart.

The aorta is subject to numerous and important diseases, as inflammation, aneurism, ossification, &c. [See CARDITIS, ANEURISM, OSSIFICATION, &c.]

AOSTA, the duchy of, one of the five divisions of Piedmont, or rather, speaking more accurately and according to the present administrative system of that country, one of 'the eight divisions of the continental states of the King of Sardinia.' It consists chiefly of one long valley of the same name, which follows the course of the Dora Baltea. This river, from its source in the Graian Alps, runs first eastwards for about thirty-five miles, and then turns abruptly southwards below Chatillon, flowing in the same direction to the village of St. Martin, where it enters the province of Ivrea, on its way to the Po. Many smaller valleys open into the main one on both sides, following the course of the mountain streams which flow from the Upper Alps into the Dora. The principal are on the north side, the Val Lesa, which begins at St. Martin on the Dora and extends up to the glacier of Lys, at the foot of Mont Rosa; Val Challent, called also Val d'Ayas, beginning at the town of Verrez, the Vitricium of the Romans, and stretching likewise northwards to the glaciers of the same range; Val Tournanche, which begins at Chatillon and runs to the foot of Mont Cervin, to the eastward of which is a pass, called the Joch, perhaps the highest in Europe, and leading to Visp in the Valais; Val Pellina, which extends north-east of the city of Aosta, along the base of Mont Velan and Mont Combin to the Col d'Oren, over which there is another pass, nearly 8000 feet high, into the Valais; the Val du Butier, so called from the torrent of that name, which leads from Aosta to the Great St. Bernard. Ascending the Dora from the city of Aosta towards the foot of Mont Blanc, the main valley branches out into several high and narrow glens: of these the Val d'Entreves contains the village and the baths of Cormayeur, from whence a pass leads northwards over the Col de Ferret into the Valais; and the Val Veni, called also Allée Blanche, skirts several vast glaciers that descend from the range of Mont Blanc, and leads to the Col de la Seigne, over which there is a pass into Savoy. Here the Dora has its source in the little lake Combal. Another stream, coming from the south-west, joins it at Pré St. Didier, a village with mineral waters. The valley that follows this stream, and leads to the pass of the Little St. Bernard, is called Val de la Tuile. This is the best and the easiest of all the passes leading from the Val d' Aosta over the Alps. A lofty summit, called the Cramont, covered with perpetual snow, divides the Val de la Tuile from the Allée Blanche. The other valleys that branch out of the main one south of the Dora are: Val Grisanche, which leads from the village of Livrogne to the great glacier of Riotour, embedded in a lofty group of Alps that projects eastward of the Graian range between the Little St. Bernard and Mont Iseran; Val Regence, called also Val di Rema, which leads in a parallel direction; Val Savera Vecchia, or Saveranche, leading from Villeneuve, on the southern bank of the Dora, to the foot of Mont Iseran; Val di Cogna, extending from Aosta to Mont Soana, an offset from the great chain of Mont. Iseran, which incloses the province of Aosta on the south; a passage for mules leads over Mount Soana to the valley of the river Orca in the province of Turin; and, lastly, Val Camporcier, which stretches along the same range, and opens to the right bank of the Dora, nearly opposite St. Martin.

Each of these valleys contains villages and hamlets; several hamlets are ranged in groups on the side of the mountain, and the principal one of the group is distinguished by the parish-church. The lower parts of the valleys are very fertile; they produce little wheat, but plenty of barley, oats, and rye, all sorts of fruit, and above all, rich pastures, which feed a great number of cattle and flocks of sheep. The Val d'Aosta supplies the neighbouring province with butchers' meat, butter, and cheese. Most of the cheese, however, is made by Swiss shepherds from the Valais, who come down by the St. Bernard and buy the milk of the farmers. The peasants of Aosta are industrious; most of them are possessed of some land, and those of the upper valleys, who are the poorest, emigrate for the winter, and earn their bread by various callings in the neighbouring countries, from which they return in summer for the labours of their scanty fields. Some have mules, and act as carriers or guides across the Alps; others are tanners. A considerable transit trade is carried on between Switzerland and Italy by the St. Bernard, which is the most direct communication between Bern and Turin. The vine thrives on the lower hills, which have a southern aspect, and some of the wines of the Val d' Aosta, especially those of Chambava, Donax, and Carema are not inferior to those of Montferrat; there is some very good muscadel among the rest. In the Val d'Aosta there are all seasons and climates within a short range. On the Alpine summits are perpetual ice and snow; next are forests of firs and larches; lower down, chestnut and walnut-trees; then vines; and, lastly, the olive, almond, fig, and mulberry-trees growing in all the luxuriance of the south. The traveller who descends the St. Bernard finds at once the climate and the sky of Italy, he hears the shrill cicala, and feels a sun as hot as that of Naples.

The river Dora and the other streams afford excellent trout. The duchy of Aosta is rich in iron, copper, and lead ore. There are iron works at St. Vincent, near Chatillon, at Monjovet, at St. Marcel, at Gressan, at Cogna, La Tuile, &c. There is manganese in the Val de Challant, as well as salt-pits, and cobalt and crystal. There is also abundance of mineral springs. Gold-mines are reported to have been worked in the time of the Romans, but all traces of them are now lost: particles of gold, however, are found in the streams, especially in the Evanson, which flows through the valley of Challant, and Saussure says that some of the peasants in his time gathered them in a considerable quantity out of the sand.

The people of these secluded valleys are an honest, quiet, and civil race, who speak a dialect different from the Piedmontese, but resembling rather the romance *patois* of Savoy and western Switzerland. Most of them, however, understand French, and speak it well enough for common purposes; Italian is like a foreign language here, although it is the language of the government, and, as such, spoken by all civil officers and magistrates. The country people retain their old costume; the men wear long frocks of blue, red, or green cloth, short breeches, and worsted stockings of the same colours, buckles to their shoes, and huge cocked-hats. The women wear black or white caps, fastened under the chin, which serve partly to conceal the *goitres*, or wens, with which most of them are more or less afflicted. This is a misfortune which the people of Aosta have, in common with their neighbours of the Lower Valais, north of the St. Bernard: many of them are idiots. This disease is ascribed by some to the water they drink, and by others to the thick, damp vapours which remain stationary in these deep and narrow valleys. (See CRETINS.) A French traveller, Raoul Rochette, states, that while the Val d' Aosta was under the French civil code, and all the children, female as well as male, shared the paternal inheritance, it was observed that Cretinism gradually diminished, the young women consulting their own taste in the choice of their husbands: but under the present Piedmontese law of succession, daughters being deprived of inheritance are induced to contract marriages with Cretins, in order to secure a subsistence, and this is said to have visibly forwarded the spread of goitres. The duchy of Aosta, although small in extent and population, is one of the most interesting provinces of North Italy to the traveller and the naturalist. It lies at the foot of the highest summits in Europe; Mont Blanc, Mont Iseran, the St. Bernard, Mont Combin, Mont Cervin, and Mont Rosa tower above it, and almost inclose it with their glaciers. It is bounded on the north and north-west by the Pennine chain; on the west and south-west, by the Graian Alps; on the south, by a projection from the latter; and on the east, by an offset from the range of Mont Rosa, which separates its easternmost valley, the Val Lesa, from the neighbouring province of Valsesia, in the division of Novara. Over this last range is the pass of Col Valdobbia, above 7000 feet high, affording a communication between the two provinces. A hospice has been lately built on the summit. It is only at the south-eastern extremity of the duchy of Aosta that the mountains leave an outlet into the lowlands of Piedmont, through which the Dora makes its way, and by the side of the river is the only road passable for carriages. The pass is often confined between the mountain on one side and the river on the other. Near Monjovet, King Charles Emmanuel III. had the rock cut out to widen the road. Lower down, between Bard and Donax, the rocks have been cut vertically to the height of thirty feet, and a road twelve feet wide has been thus made with a parapet on the river side, chiselled out of the rock itself: this work is ascribed to the Romans. A column, eight feet high and two in diameter, is sculptured in relief on the side of the mountain, bearing the number XXX. The fort of Bard, now destroyed, rose high above the village of the same name, and completely commanded the pass. The French army under Bonaparte, coming down from the St. Bernard, in May, 1800, was stopped here for several days, by an Austrian garrison of 400 men: the delay might have proved fatal to the conqueror, if the French soldiers had not found means to cut a path over the mountain above, and thus turn the fort; the artillery was hurried through the village in a dark night under a shower of balls from the castle.

The Salassi, a Celtic tribe, are the first inhabitants of these regions mentioned in history: Strabo (book iv.) gives an account of them. They fought repeatedly and bravely against the Romans; they were defeated in the year 718 U. C., by Marcus Valerius Messala, who was obliged to winter among the Alps. The poet Tibullus accompanied Messala in this expedition, to which he alludes in his panegyric of his patron. The Salassi having revolted again, Augustus sent Terentius Varro, who carried on a war of extermination, and completely subdued them; 36,000 of both sexes were sold as slaves at Eporedia (Ivrea). Augustus sent afterwards a colony of 3000 Prætorians, who built the town of Augusta Prætoria, now Aosta. Terentius Varro, having also subdued the Centrones on the other side of the Graian Alps, that country took the name of Tarantasia, which it still retains. Augustus made a carriage road over the mountain, now called the Little St. Bernard, which became the great line of communication from Milan to Vienne on the Rhone. Traces of this road are still to be seen in the Val d'Aosta. After the fall of the empire, the country passed under the dominion of the Goths, the Langobards, and the Burgundians; and lastly, of the Counts of Savoy. Amadeus III., in the thirteenth century, conquered the valley of Aosta, whose inhabitants had insulted and imprisoned his messengers. The Emperor Frederic II., on his passage by Turin, granted Amadeus the title of Duke of Aosta, which was borne in the last century by the second son of the King of Sardinia. The last who had it was Victor Emmanuel, who afterwards became king, and who abdicated in 1821. The duchy of Aosta, being one of the oldest Italian possessions of the House of Savoy, preserved its integrity, its separate administration, and its own laws, and usages. The whole division, province, or duchy,—

for, in this instance, they are all synonymous terms,—contains 73 communes, forming seven *mandamenti*, or districts, under one intendant-general. The population, by the census of 1826, was 64,640 inhabitants. The length of the province from east to west is 55 miles, and its greatest breadth is 30 miles; but the great inequalities of the ground add largely to the extent of its surface, one half of which, however, is occupied by barren mountains and glaciers. (Saussure, *Voyage dans les Alpes;* Millin, *Voyage en Savoie et en Piemont;* Della Chiesa, *Istoria del Piemonte.*)

AOSTA, (la Cité d',) the capital of the duchy of the same name, is built on the left, or northern, bank of the Dora Baltea, and at the confluence of the Butier, the water of which is made to flow through the middle of the streets. Most of the houses have gardens and orchards; the streets are wider and more straight than in the generality of old towns; and the extent of the city consequently appears large in proportion to its population, which, by the census of 1826, was only 5500. Aosta is the residence of the *intendente* of the province, and the seat of the courts of justice; it has likewise a bishop's see and a chapter, three parish-churches, besides the cathedral,—a large, old, Gothic structure, in which is the monument of Thomas, Count of Savoy, who died here in 1232. In the eastern part of the town are some arches with pillars and other remains of the antient amphitheatre, the arena of which is now covered with grass and trees. The cellar of a neighbouring convent was formerly the dens of the beasts, and communicated with the arena by subterraneous passages. At the north-west angle of the town is a round tower, which appears to have been intended for a mausoleum. In the city walls, as well as on the outside of several houses, are seen stones and slabs taken from the old Roman buildings. At the entrance of the town, on the road to Ivrea, stands a single triumphal arch of Roman architecture; it is built of a kind of pudding-stone, and the marble with which it was cased having been removed, no inscription or ornament remains, except fragments of the frieze and the lateral pillars. Aosta is pleasantly situated at an opening made by the meeting of several valleys, and in a fertile country. It is nearly 2000 feet above the level of the sea, and is 50 miles N. by W. of Turin and 65 miles S.E. of Geneva, in 45° 45′ N. lat., and 7° 16′ E. long. Anselm, Archbishop of Canterbury under William Rufus and Henry I., a man of considerable learning for his age, was a native of Aosta. Bernard, of Menthon, in Savoy, the founder of the Hospice of the St. Bernard, was Archdeacon of the cathedral of Aosta.

APANAGE, (*Apanagium*, *Apanamentum*,) the provision of lands or feudal superiorities assigned by the kings of France for the maintenance of their younger sons.

The prince to whom the portion was assigned was called the *apanagist;* and he was regarded by the antient law of that country as the true proprietor of all the seigniories dependent on the apanage, to whom the fealty (*foi*) of all subordinate feudatories within the domain was due, as to the lord of the 'dominant fief.'

Under the first two races of kings, the children of the deceased monarch usually made partition of the kingdom amongst them; but the obvious inconvenience of such a practice occasioned a different arrangement to be adopted under the dynasty of the Capets, and the crown was permitted to descend entire to the eldest son, with no other dismemberment than the severance of certain portions of the dominions for the maintenance of the younger branches of the family. Towards the close of the thirteenth century the rights of the apanagist were still further circumscribed; and at length it became an established rule, which greatly tended to consolidate the royal authority in that kingdom, that, upon the failure of lineal heirs male, the apanage should revert to the crown.

The period at which this species of provision was first introduced into the law of France, the source from which it was borrowed, and the origin and derivation of the term itself, are matters on which the historical antiquaries of France seem not to be agreed. (See Pasquier's *Recherches*, lib. ii. cap. 18. lib. viii. cap. 20; Calvini *Lex Jurid.* 'Appanagium;' Ducange, *Gloss.* 'Apanamentum;' Pothier's *Traité des Fiefs;* and Henault's *Hist. de France, Anno* 1283.)

By a law of 22d November, 1790, it was enacted, that in future no apanage *real* should be granted by the crown, but that the younger branches of the royal family of France should be educated and provided for out of the civil list until they married or attained the age of twenty-five years; and that then a certain income called *rentes apanagères* was to be granted to them, the amount of which was to be ascertained by the legislature for the time being.

'It is evident,' says Mr. Hallam, 'that this usage, as it produced a new class of powerful feudatories, was hostile to the interests and policy of the sovereign, and retarded the subjugation of the antient aristocracy. But an usage coeval with the monarchy was not to be abrogated, and the scarcity of money rendered it impossible to provide for the younger branches of the royal family by any other means.' . . . 'By means of their apanages and through the operation of the Salic law, which made their inheritance of the crown a less remote contingency, the princes of the blood-royal in France were at all times (for the remark is applicable long after Louis XI.) a distinct and formidable class of men, whose influence was always disadvantageous to the reigning monarch, and, in general, to the people.' (*Middle Ages*, vol. i. p. 121, 2d edit.)

A'PATITE, a mineral substance crystallized in the regular six-sided prism, usually terminated by a truncated six-sided pyramid. It occurs variously modified by the removal of its lateral sides and angles. Its specific gravity varies from 3·25 to 3·5. It is scratched by feldspar, but scratches fluor-spar. In colour it passes from white, through various shades of yellow to green and blue, and some specimens possess a red tint; it is usually translucent, but rarely transparent. From the analysis of Gustav. Rose, apatite appears to be a compound of phosphate of lime with fluoride of calcium, in which the fluorine is more or less replaced by its isomorphous element chlorine. Its constitution may be expressed by $3\,(3\,\dot{C}a + \overset{\cdot\,\cdot\,\cdot}{\ddot{P}}h) + (Ca + Fl,\ Cl.)$.

This mineral principally occurs in the primitive rocks, and is found in the tin veins of St. Michael's Mount, Cornwall, and also in those of Bohemia and Saxony. It has also been observed in a massive mineral called phosphorite, which appears to possess a similar chemical constitution, and has been found abundantly in beds alternating with limestone and quartz, near Logrosan, in Estramadura in Spain.

APLOME. [See GARNET.]

APE, (*Pithe'cus*,) in zoology, a genus of quadrumanous mammals, which closely approaches to the human species in anatomical structure, and is justly regarded as the connecting link between man and the lower animals. The word ape seems to be of doubtful origin: in German it is *affe*, from which the verb *aeffen* appears to have come; this is, perhaps, more probable than to suppose that *affe* comes from *aeffen*. The name exists, with very slight variation, in all the modern languages of Teutonic origin; as *ape* in English, *affe* in German, *aap* in Dutch, &c.; these, also, are the only European languages which possess original appropriate names to distinguish these animals from monkeys in general. Our own language is even more copious than others in terms for distinguishing the different characters of this class of animals: thus we say that an *ape* is a monkey without a tail, and a *baboon* a monkey with a short tail, reserving the term *monkey* more particularly for those species which have very long tails; and though our early writers use these three words indiscriminately as synonyms, and apply them indifferently to the same animal, yet the significations here given have generally prevailed since the time of Ray, and are now exclusively adopted. It must be confessed, however, that these significations are extremely vague, and certainly do not express the zoological relations which subsist between the different sections of this group of animals. Naturalists, therefore, being under the necessity either of inventing new names, or of changing the meaning of the old, have, in the present instance, preferred the latter, and though the change may at first be disagreeable, language and science will be ultimately benefited by its adoption.

According to its modern zoological definition then, the genus *Ape*, or *Pithecus*, comprises those quadrumanous mammals which have the teeth of the same number and form as in man, and which possess neither tails nor cheek pouches. This definition, whilst, on the one hand, it excludes certain tailless baboons and monkeys, comprehends, on the other, the three subgenera of orangs, chimpanzees, and gibbons, which, though considered by many good zoologists as generically distinct, yet differ from one another by characters too slight to warrant their separation. Nor are these the only characters which the apes share in common. They, of all other animals, approach most nearly to the human species in organization: indeed, as far as can be judged from the young subjects usually brought to Europe, their most essential difference in this respect consists in certain modifications of the extremities, which diminish their power of walking with ease on a level surface, but which are admirably adapted to increase their faculty of climbing and grasping. The arms are so long as almost to touch the ground when the animals stand erect on their hind legs; but the legs themselves are scarcely one third of the entire height. The legs, moreover, are not in the same line with the thighs; the knees are turned outwards, and the feet are articulated at the ankle in such a manner that their soles turn inwards so as to face or be opposed to one another. By these means the apes are enabled to embrace or grasp the trunks and branches of trees with much greater force than if their members were constructed like our own: they thus become essentially sylvan or arboreal animals, and never voluntarily abandon the forests, where they find at once the most congenial food and the most perfect security.

Their whole organization peculiarly adapts the apes to these habits. Besides the conformation of the extremities just noticed, the fingers and toes are long, flexible, and deeply separated from one another, and the thumb, or interior finger, is completely opposable to the other four, as well on the posterior as on the anterior extremities; thus, their feet and hands are equally formed for prehension. They are not quadrupeds, as Buffon has justly observed, but quadrumana; not four-footed, but essentially four-handed animals. One part of their organization renders them intermediate between the bats and ordinary mammals; another, makes them the connecting link between man and the inferior animals. The great length of the fingers and anterior extremities, compared with those behind, are precisely what we observe among winged mammals, only that the fingers are not connected by a flying membrane; and their economy and habitat equally correspond with this intermediate structure. They are neither confined to the surface of the earth like the generality of mammals, nor do they possess the power of elevating themselves into the air, like the bats: but they choose a middle habitat, the forests, where they habitually reside, and where they move about with an ease and velocity which can only be compared to actual flight. On the other hand, when compelled by circumstances to traverse any part of the earth's surface, their pace, properly speaking, is neither that of a biped nor of a quadruped: they do not walk upright like a man, nor yet do they walk upon all fours like the lower animals. The great length of their arms prevents them from adopting either of these modes of progression in its simple form, but they avail themselves of this very circumstance in another manner; their long arms serve them instead of crutches, and their pace is precisely that of a lame man who walks with the assistance of these instruments. From the oblique articulation of the posterior extremities, they rest only on the outer edge of the foot, but the wavering equilibrium thus occasioned is secured by the long fore-arms, which can easily touch the ground in all directions; and, when an advance is to be made, it is accomplished by resting the weight of the body upon the half-closed fists, and then swinging the hinder extremities forward, precisely like a man on crutches. In their native forests the extreme length of their fore-arms is turned to the greatest advantage: here it acts upon the principle of the rope dancer's balancing pole, and completely secures their equilibrium even with the most precarious footing. Thus it is that travellers have seen the apes poised at the very extremity of the slender trunks of the bamboo, waving their long arms from side to side, with the most graceful and easy motions.

Another circumstance in the structure of the apes, in which they differ from most other quadrumana, has considerable influence upon their habits; this is the entire want of a tail. Though the presence of this organ does not always indicate a corresponding function, and though its absence is not confined to this group of quadrumanous animals, yet a long tail would seriously embarrass the nearly erect motion of the real apes; whilst its use is in other respects superseded by the length of the fore-arms, which supply its place in adjusting the proper balance of the body, the only function which the tail performs in the common monkeys. But another character of still greater importance distinguishes the real apes from the rest of the quadrumana, viz., the want of cheek-pouches. These are sacks or cavities in the cheeks, which open inside the mouth between the cheek and the lower jaw, and serve to hold any extra provision which the animal may not at the moment require. The Semnopitheci alone, of all the other monkeys of the old world, resemble the apes in this respect, and hence arise some of the most striking resemblances which the characters and habits of these two genera present. In other respects they are sufficiently distinguished from one another, by the long tails of the Semnopitheci, not to mention their extremities of nearly equal length, and the peculiar structure of their stomachs and teeth. The nature of the influence which the possession of these cheek-pouches exerts upon the characters and economy of animals will be explained under the articles MONKEY, BABOON, &c.; it is here sufficient to observe that they are wanting in the apes. Another character which is common to all the other known quadrumanes of the old continents, is found in some species only of the real apes, and absent in others: this is the possession of callosities, which are naked callous parts of the buttocks, upon which these animals sit, when fatigued by the violent and rapid movements which they habitually execute. Illiger and some other zoologists have considered this circumstance of sufficient importance to warrant the separation of the apes into two distinct genera, the one characterized by the absence, the other by the presence of callosities; but it is to be observed that, even where these organs do exist in the apes, it is always in a rudimentary form; they are never developed to such an extent as to influence the habits of the animals, and are, consequently, unfit to be considered as generic characters. In other respects, except in these diminutive callosities, the gibbons do not differ from the orangs and chimpanzée: they have the same system of dentition, the same organs of sense, and the same singular modification of the locomotive organs; their manner of life also is precisely the same; both equally take up their habitation in the thickest and most solitary forests, inhabit the same countries, and live upon the same food.

The teeth of the apes, as indeed of all the other monkeys of the old world, are of the same number as in man; nor, as far as the incisors and molars are concerned, do they present any difference in form; but in the adult animals, and more especially in the old males, the canines are developed in the same relative proportion as in the carnivora; the tusks of the full-grown orang-outang are at least as large as those of the lion, and are most formidable weapons. Unfortunately we know but little of the manners of these animals in their adult state; but this circumstance gives us strong reason to suppose that the extreme gentleness and placidity observed in the young individuals usually brought into Europe do not always continue to characterize them in their native climates, but that their disposition alters in proportion to the development of their muscular force, and that in their adult state they are as formidable and mischievous as the baboons themselves. In all other respects their anatomical structure so closely resembles that of man, that it is only of late years, and from such trifling discrepancies as the existence or non-existence of a small intermaxillary bone, of a very small perforation in the vertebra of the os sacrum, &c., that anatomists have ascertained that the dissections of Galen were performed not upon the human subject, but upon the magot, or, as it is usually called, the Barbary ape; so perfectly conformable are his descriptions to the structure of the human frame.

The characters and habits of the apes present differences which will be noticed in speaking of the several species. As far, however, as their general manners have been observed, they appear to be of a grave and gentle disposition, totally free from that petulance and mischievous curiosity which so strongly characterize the monkeys, properly so called, very affectionate towards those who treat them kindly, solemn and deliberate in all their actions, extremely circumspect and intelligent, seldom moved to violent passion, but peevish and fretful when crossed or disappointed. They never walk on two legs except when they have occasion to use the fore-hands in carrying something. Nearly, or altogether deprived of callosities, they do not repose in the manner of ordinary monkeys, on their hams, but stretch themselves on their sides, like human beings, and support their heads upon their hands, or by some other means supply the use of a pillow.

A remarkable singularity in the organic structure of certain species of apes has been observed by Sir Stamford Raffles and M. Duvaucelle, to whose researches in the island of Sumatra we are indebted for the greater part of our knowledge regarding the *gibbons*, or that section of the genus which approaches the lower tribes of monkeys by the possession of rudimentary callosities. It consists in the connexion of the index and middle fingers of the hind hands, which are united as far as the last or nail joint, and are, consequently, incapable of separate or individual motion. The species in which this singularity was first observed has even been named by Sir Stamford Raffles *Simia syndactyla*, from this circumstance; but if the observations of M. Duvaucelle are to be relied on, it would appear, that the conformation is by no means peculiar to this species. It was the opinion of that naturalist, that the females of most, if not of all the gibbons, partake of the same structure, whilst it is supposed to exist in the male of the *Simia syndactyla* alone. Now it must be observed with regard to this opinion, which certainly does not appear to be well-founded, that besides the physical improbability of the males and females of the same species differing in so important a point of their organic structure, a difference of which there is no other known instance throughout the entire class of mammals, M. Duvaucelle's opinion amounts, after all, to a mere conjecture, since he infers the identity of the species to which he attributes this sexual difference, only from the circumstance of having procured his specimens at the same time and in the neighbourhood of one another. The female of the *Simia lar*, also described by the accurate Daubenton, and supposed by MM. Duvaucelle and Frederick Cuvier to be the same as the ounko of the former naturalist, was certainly devoid of this character, expressly assigned to the female ounko, and differed in many other respects, as will appear in the sequel. If, therefore, we admit on the one hand, that M. Duvaucelle's observations establish the existence of this organic singularity in other species besides the *Simia syndactyla*, it appears probable on the other hand, that this gentleman was led into error in attributing it to the females only, from having too hastily considered as sexual differences merely, distinctions which are in reality the characters of different species. This view strips the case of its most serious difficulties; for, as far as the mere union of the fingers is concerned, though it is certainly a remarkable circumstance in the organization of animals so high in the scale of existence as the apes, that modification is by no means peculiar to these animals. The greater number of the marsupial quadrupeds of New Holland, the kangaroos, pottoroos, koalas, phalangers, petaurists, perameles, and phascolomes, possess the same formation, and it is well known that the entire order of incessores or perching birds are principally distinguished by the same character. In no known instance, however, has it ever been observed to mark a sexual distinction.

1. The *Chimpanzée* (*P. troglodytes*, Linn.) is that species of ape usually placed next to man in the scale of animal existence; though Baron Cuvier has contested its right to occupy this rank in favour of the orang-outang. M. Cuvier's preference of the latter species arises simply from the greater development of the region of the brain, and the comparative height of the forehead, as exhibited in the very young individuals usually brought to this country; but it is to be observed, that these marks of superior mental powers are completely obliterated in the adult animal; and that, in other respects, both the organic structure and intellectual capacity of the chimpanzée appear to be of a higher order than those of the orang-outang. The African species, for instance, has nearly the same proportion between the anterior and posterior extremities that is exhibited in mankind; nor has it the deformed neck and high shoulders of its Indian congener. These circumstances probably produce a greater facility of walking upright, as this species is commonly reported to do, and which is greatly impeded, by the long and disproportionate arms of the orang-outang. But no adult specimens of these animals have ever been brought alive to Europe; they are very seldom met with even in their native forests; and we are not aware that the full grown chimpanzée exists in any museum. Our information is, consequently, derived either from the observation of very young specimens, or from the reports of travellers often detailed at second hand, and, therefore, to be admitted with caution.

The head of the chimpanzée, even in the young individual, is flattened above, with a retiring forehead and a prominent bony ridge or crest over the eyebrows. In this respect it is certainly inferior to the young orang-outang, which exhibits a remarkable elevation of forehead, and a rotundity of the cranium much greater than even in the human infant, but its mental capacity does not correspond with these external appearances, and the great development of the face and muzzle degrade it to a close approximation with the lower animals. The face of the chimpanzée, on the contrary, is not relatively more prolonged, in proportion to the capacity of the cranium, than that of the human subject; the proportions of its different parts also more closely assimilate it to the human face, and the mouth, even in the adult animal, appears to want the enormous canine teeth which characterize the Indian species. The mouth itself is wide, the ears remarkably large, the nose flat, and the arms and legs in about the same proportion as in man; the fore-fingers not quite touching the knees when the animal stands upright. In the orang-outang they nearly touch the ground, in similar circumstances, and the ears of the latter species are remarkable for their very small size and deformed appearance. The body of the chimpanzée is covered with long, coarse, black hair, thickest on the head, shoulders, and back, but thinly furnished on the breast and belly; the face is of a dark brown colour, and, like the ears, naked: the cheeks, however, are furnished with long black whiskers. Finally, the hair on the fore-arms is long and directed back towards the elbows, meeting that of the arms which is directed downwards in the usual manner, and forming a small ruff about the joint.

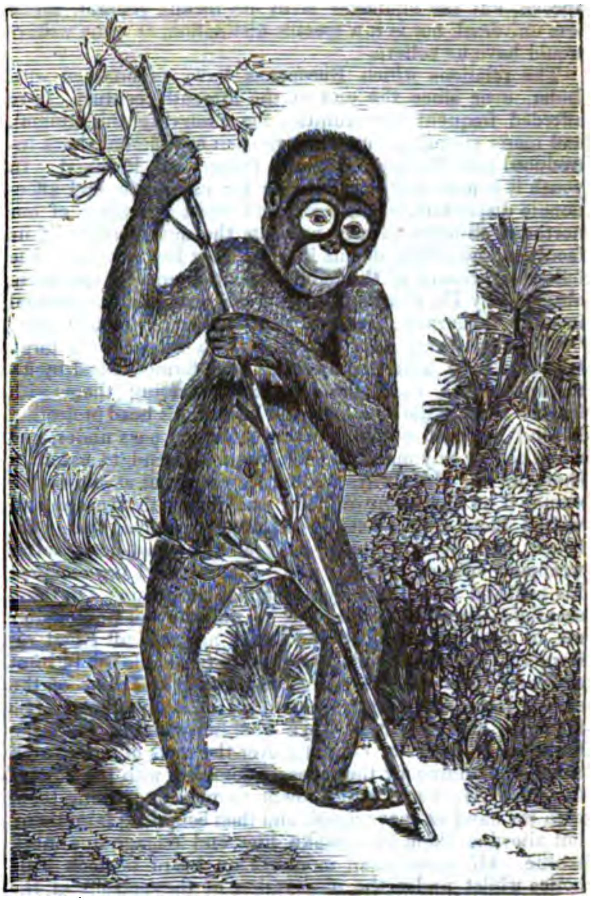
The Chimpanzée.

African travellers assure us that the adult chimpanzée attains the ordinary stature of man, and is endowed with a degree of intelligence much superior to other quadrumana. It inhabits the countries from Sierra Leone to the southern confines of Angola, perhaps even from the Gambia to Cape Negro. Chimpanzée is said to be its name about Sierra Leone, but farther south it is called smitten and pongo, according to Battel and Bosman. Buffon and his copiers have strangely confounded the habits, and even the external form and description of the mandril, a large species of baboon inhabiting the same countries, and called mandril, barris, &c., by the natives, with those of the chimpanzée. It is of importance to bear this circumstance in mind, in reading common works on natural history, as nothing is more productive of error than the confusion thus introduced into the history of individual species, by forming a purely fictitious being, out of two or more really natural animals. Linnæus upon this, as on all other subjects, judged with greater accuracy than Buffon; yet the great author of the *Systema Naturæ*, with all the profound knowledge, acuteness, and calm unbiassed spirit of inquiry by which he was so eminently distinguished, long hesitated whether to consider the chimpanzée as a second species of the genus *homo*, or the first among the apes. It was only, indeed, in his last edition that Linnæus finally adopted the latter opinion, and learned to consider this extraordinary animal as generically distinct from man himself. That the stories of the pygmies, cynocephali, and other strange and deformed people, supposed by the antients to inhabit different parts of Africa, arose from vague reports of different species of apes and monkeys, appears to be highly probable; but the term troglodytes, which some authors have supposed to refer to the animal at present under consideration, denoted in reality a race of barbarians, as is well known to those who interest themselves in antient geography. [See TROGLODYTÆ.]

All travellers agree in assuring us, that, in a state of nature, the adult chimpanzées live in society in the woods, where they construct huts to protect themselves against the sun and the tropical rains, by intertwining the leaves and branches of trees; that they walk upright, arm themselves with clubs, and unite to defend themselves against the attacks of wild beasts, compelling the elephant himself to abandon the districts in which they reside. It is dangerous for men to enter these forests, unless in companies and well armed; women, in particular, are often said to be carried away by these animals, and one negress is reported to have lived among them for the space of three years, during which time they treated her with uniform kindness, but always prevented any attempt on her part to escape. When the negroes leave a fire in the woods, it is said that the chimpanzées will gather round and warm themselves at the blaze, but they have not sufficient intelligence to keep it alive by fresh supplies of fuel.

The chimpanzées generally brought to Europe, and whose manners have been observed by naturalists, were all of immature age. A specimen exhibited some years ago at the Egyptian Hall, Piccadilly, in company with a young orang-outang of about the same age, afforded a very favourable opportunity for comparing the form and habits of these two animals. The chimpanzée, though in a declining state of health, and rendered peevish and irritable by bodily suffering, exhibited much superior marks of intelligence to his companion; he was active, quick, and observant of everything that passed around him; no new visiter entered the apartment in which he was kept, and no old one left it, without attracting his attention. The orang-outang, on the contrary, exhibited a melancholy and a disregard of passing occurrences almost amounting to apathy; and though in the enjoyment of better health, was evidently much inferior to her companion in quickness and observation. On one occasion, when these animals were dining off potatoes and boiled chicken, and surrounded as usual with a large party of visiters, the orang-outang allowed her plate to be taken away, without exhibiting the least apparent concern: not so, however, the chimpanzée; we took advantage of an opportunity, whilst his head was turned to observe a person coming in, to secrete his plate also: for a few seconds he looked round to see what had become of it, but not finding it, began to pout and fret exactly like a spoiled child, and perceiving a young lady, who happened to be standing near him laughing, or, perhaps, suspecting her to be the delinquent, he flew at her in the greatest rage, and would have probably bitten her had she not got beyond his reach. Upon having his plate restored, he took care to prevent the repetition of the joke by holding it firmly with one hand, while he fed himself with the other.

2. The *Orang-Outang* (*P. Satyrus*, Lin.), the most celebrated of all the apes, is a native of the most remote and unfrequented forests in the interior of Borneo, Java, and Sumatra; perhaps also of the southern provinces of China and the Malayan Peninsula, but the authorities upon which these latter habitats rest, are by no means unquestionable. Though exhibiting in early youth a rotundity of the cranium and a height of forehead altogether peculiar, and accompanied, at the same time, with a gentleness of disposition and gravity of manners which contrast strongly with the petulant and irascible temper of the lower orders of quadrumanous mammals, the orang-outang in its adult state is even remarkable for the flatness of its retiring forehead, the great development of the superorbital and occipital crests, the prominence of its jaws, the remarkable size of its canine teeth, and the whole form of the skull, which from the globular shape of the human head, as it appears in the young specimen, assumes all the forms and characters belonging to that of a large carnivorous animal. The extraordinary contrasts thus presented in the form of the skull, at different epochs of the same animal's life, were long considered as the characters of distinct species; nor was it till intermediate forms were obtained, exhibiting in some degree the peculiarities of both extremes, that they were finally recognised as distinguishing different periods of growth only.



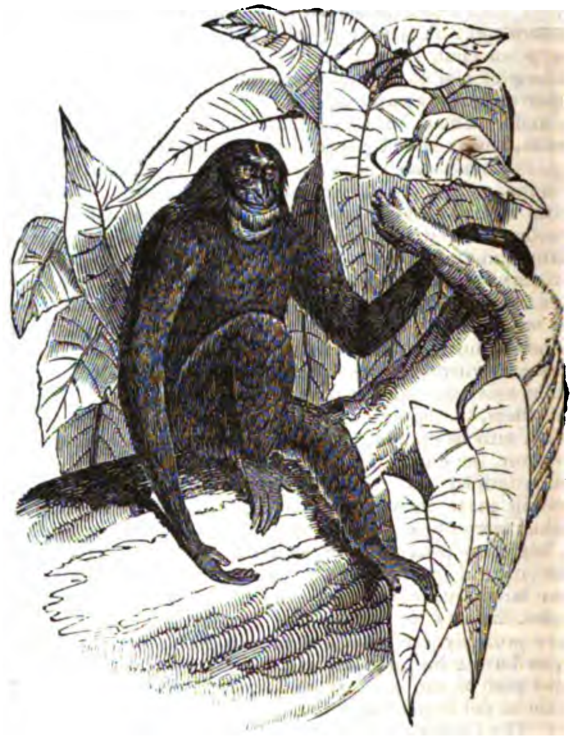
Orang-Outang.

These characters of the adult animal, as well as the disproportionate length of the arms, the short, thick neck, deformed by two large membranous sacks, which give a peculiarly shrill and hollow tone to the animal's voice, and other details of its general organization, debase the orang-outang in the scale of existence when compared with the chimpanzée. The great length of the arms is certainly the most striking peculiarity about this animal, more particularly when compared with the shortness of the body and legs: when standing perfectly upright, the fingers can almost touch the ground, and hence it arises that the biped station is by no means so convenient for this species as for the chimpanzée. It is seldom, therefore, that the orang-outang attempts to walk on the hind feet alone; but when it does, the hands are invariably employed for the purpose of steadying its tottering equilibrium, touching the ground lightly on each side as it proceeds, and by this means recovering the lost balance of the body. Like the chimpanzée, this species is destitute of callosities; the muzzle is considerably prolonged, the mouth large and ill-formed, the lips thin and protuberant, the chin almost wanting, the ears remarkably small, and the nose so flat as to be recognised only by the nostrils. The face, ears, and hands are naked, and of a reddish brick colour; the fore parts of the body also are but thinly covered with hair; but the head, shoulders, back, and extremities are very thickly clothed with long hair of a dark vinous red colour, directed forwards on the crown of the head, and upwards towards the elbows, on the fore arms. The nails of the hind thumbs are sometimes wanting in young individuals of this species, but the character is by no means general, much less universal, nor is it a specific distinction, as some writers would have us believe.

The relations which Europeans have maintained with India, ever since the end of the fifteenth century, have afforded frequent opportunities for observing this animal, and many young specimens have been at different times introduced into England, Holland, France, and Portugal. In youth it is principally remarkable for its gentle and affectionate disposition, but the cold and moist character of our northern climates always prevents the development of its faculties, and terminates its life in a very few months. The following account of the habits and manners of a specimen, observed by Dr. Clarke Abel in Java, exhibits the animal in more favourable, because more natural, circumstances. 'Whilst in Java,' says Dr. Abel, 'he lodged in a large tamarind tree near my dwelling, and formed a bed by intertwining the small branches and covering them with leaves. During the day, he would lie with his head projecting beyond his nest, watching whoever might pass under, and when he saw any one with fruit, would descend to obtain a share of it. He always retired for the night at sun-set, or sooner if he had been well fed; and rose with the sun and visited those from whom he habitually received food. On board ship he commonly slept at the mast-head, after wrapping himself up in a sail. Sometimes I pre-occupied his bed, and teased him by refusing to give it up. On these occasions, he would endeavour to pull the sail from under me, or force me to quit it, and would not rest till I had resigned it. If all the sails happened to be set, he would hunt about for some other covering, and either steal one of the sailors' jackets, or empty a hammock of its blankets. His favourite amusement in Java was in swinging from the branches of trees, or climbing over the roofs of houses; on board, in hanging by the ropes, or romping with the boys of the ship. He would entice them to play by striking them with his hand as they passed, and then bounding from them, but allowing them to overtake him and engage in a mock scuffle. Of some small monkeys on board he took little notice whilst under the observation of the persons of the ship. Once, indeed, he openly attempted to throw a small cage containing three of them overboard; but I had reason to believe that he was not so indifferent to their society when free from observation. On one occasion I observed him, lying on his back, partially covered with a sail, contemplating with great gravity the gambols of a young monkey which was bounding over him: at length, he caught him by the tail and tried to envelope him in his covering. The monkey seemed to dislike the confinement, and broke from him, but again renewed its gambols, and though frequently caught, always escaped. The intercourse, however, did not seem to be that of equals, for the orang-outang never condescended to romp with the monkeys as he did with the boys of the ship. Yet the monkeys had evidently a great predilection for his company, for whenever they broke loose, they took their way to his resting-place.

'But though so gentle when not exceedingly irritated the orang-outang could be excited to violent rage, and on one or two occasions committed an act which, in a rational being, would have been called the threatening of suicide. If repeatedly refused an orange when he attempted to take it, he would shriek violently, and swing furiously about the ropes, then return and endeavour to obtain it; if again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams, and then, suddenly starting up, rush furiously over the side of the ship and disappear. On first witnessing this act, we thought that he had thrown himself into the sea; but, on searching, found him concealed under the chains.'

It is very seldom that the adult orang-outang has come under the observation of Europeans. An interesting paper, relative to the capture of an individual seven feet high, likewise from the pen of Dr. Clarke Abel, is contained in the fifteenth volume of the *Asiatic Researches*. This animal was discovered by the company of a merchant ship, at a place called Ramboon, on the north-west coast of Sumatra, on a spot where there were but few trees or much cultivated ground. It was evident that he had come from a distance, for his legs were covered with mud up to the knees, and the natives were unacquainted with him. On the approach of the boat's crew, he came down from the tree in which he was discovered, and made for a clump at some distance, exhibiting, as he moved, the appearance of a tall man-like figure, covered with shining brown hair, walking erect with a waddling gait, but sometimes accelerating his motion with his hands, and occasionally impelling himself forward by the bough of a tree. His motion on the ground was evidently not his natural mode of progression, for even when assisted by his hands or a stick it was slow and vacillating; it was necessary to see him amongst the trees to estimate his strength and agility. 'On being driven to a small clump,' says Dr. Abel, 'he gained by one spring a very lofty branch, and bounded from one branch to another with the swiftness of a common monkey, his progress being as rapid as that of a swift horse. After receiving five balls, his exertions relaxed, and reclining exhausted against a branch, he vomited a quantity of blood. The ammunition of the hunters being by this time exhausted, they were obliged to fell the tree in order to obtain him, but what was their surprise, to see him, as the tree was falling, effect his retreat to another, with seemingly undiminished vigour! In fact, they were compelled to cut down all the trees before they could force him to combat his enemies on the ground, and when finally overpowered by numbers, and nearly in a dying state, he seized a spear made of a supple wood, which would have withstood the strength of the stoutest man, and broke it like a reed. It was stated by those who aided in his death, that the human-like expression of his countenance, and his piteous manner of placing his hands over his wounds, distressed their feelings so as almost to make them question the nature of the act they were committing. He was seven feet high, with a broad expanded chest, and narrow waist. His chin was fringed with a beard that curled neatly on each side, and formed an ornamental rather than a frightful appendage to his visage. His arms were long even in proportion to his height, but his legs were much shorter. Upon the whole,' adds his biographer, 'he was a wonderful beast to behold, and there was more about him to excite amazement than fear. His hair was smooth and glossy, and his whole appearance showed him to be in the full vigour of youth and strength.'



[The Siamang.]

3. The *Siamang* (*P. syndactylus*, Raffles) is an interesting species of ape discovered in Sumatra by the combined researches of the late Sir Stamford Raffles, and the French naturalists, Diard and Duvaucelle. It is the largest of the subdivision of gibbons, or apes distinguished by the possession of small rudimentary callosities, and in this respect, as well as in its intellectual acquirements, is considerably inferior in the scale of natural beings to the chimpanzée and orang-outang. Its skull is small and depressed; its

face naked and black, a few red hairs only marking the forehead and chin; the eyes deeply sunk under large projecting brows; the nose broad and flat, with wide open nostrils; the mouth opens almost to the articulation of the jaws; the cheeks are sunk under high cheek-bones, and the chin almost rudimentary. The hair over the whole body is extremely thick, long, and of a glossy black colour, much closer on the shoulders, back, and limbs, than on the belly, which, particularly in the females, is nearly naked. The scrotum of the males, also, is furnished with a tuft of very long straight hair, which descends to the knee, and readily distinguishes this sex from the females, which, on the other hand, are easily recognised by their naked breasts and bellies, and prominent mammæ terminated by large nipples. The ears are entirely concealed by the hair of the head; they are naked, and, like all the other naked parts, of a deep black colour. Beneath the chin there is a large bare sack, of a lax and oily appearance, which is distended with air when the animal cries, and in that state resembles an enormous goitre. It is in all respects similar to that already described in the orang-outang, and undoubtedly assists in swelling the volume of the voice, and producing those astounding cries, which, according to M. Duvaucelle's account, may be heard at the distance of several miles.

Nor is this the only point in which these two species resemble one another. The siamang, like the orang-outang, has the hair of the head directed forwards so as to shade the forehead, as in the human species, and that of the fore-arm directed upwards towards the elbow; where, encountering the hair of the humerus, which grows in the contrary direction, it forms a prominent ruff. But the most extraordinary part of the organization of this species, consists in the union of the index and middle fingers of the posterior extremities, from which it derives its specific appellation of *syndactylus*, and which, being connected together as far as the nail-joint, are altogether destitute of separate or individual motion.

The habits and character of the siamang are so vividly painted by M. Duvaucelle, from observations made upon this animal in his native forests of Sumatra, that we cannot do better than translate his account as communicated in a letter to M. F. Cuvier. 'This species,' says M. Duvaucelle, 'is very common in our forests (those, namely, in the neighbourhood of Bencoolen, in Sumatra), and I have had frequent opportunities of observing it as well in its wild state, as in bondage. The siamangs generally assemble in numerous troops, conducted, it is said, by a chief, whom the Malays believe to be invulnerable, probably because he is more agile, powerful, and difficult to attain than the rest. Thus united, they salute the rising and the setting sun with the most terrific cries, which may be heard at the distance of many miles, and which, when near, stun, when they do not frighten: this is the morning call of the mountain Malays, but to the inhabitants of the town, who are unaccustomed to it, it is a most insupportable annoyance. By way of compensation, they keep a profound silence during the day, unless when interrupted in their repose or their sleep. These animals are slow and heavy in their gait; they want confidence when they climb, and agility when they leap, so that they may be easily caught, when they can be surprised. But nature, in depriving them of the means of readily escaping danger, has endowed them with a vigilance which rarely fails them; and if they hear a noise which is unknown to them, even at the distance of a mile, fright seizes them, and they immediately take flight. When surprised on the ground, however, they may be captured without resistance, either overwhelmed with fear, or conscious of their weakness and the impossibility of escaping. At first, indeed, they endeavour to avoid their pursuers by flight, and it is then that their mal-address in this exercise becomes most apparent. Their body, too tall and heavy for their short slender thighs, inclines forward, and availing themselves of their long arms as crutches, they thus advance by jerks, which resemble the hobbling of a lame man, whom fear compels to make an extraordinary effort.

'However numerous the troop may be, if one is wounded it is immediately abandoned by the rest, unless indeed it happen to be a young one; then the mother, who either carries it, or follows close behind, stops, falls with it, and uttering the most frightful cries, precipitates herself upon the common enemy with open mouth and arms extended. But it is manifest that these animals are not made for combat; they neither know how to deal nor to shun a blow. Nor is their maternal affection displayed only in moments of danger: the care which the females bestow upon their offspring is so tender, and even refined, that one would be almost tempted to attribute the sentiment to a rational rather than an instinctive process. It is a curious and interesting spectacle, which a little precaution has sometimes enabled me to witness, to see these females carry their young to the river, wash their faces in spite of their outcries, wipe and dry them, and altogether bestow upon their cleanliness, a time and attention that, in many cases, the children of our own species might well envy. The Malays related a fact to me, which I doubted at first, but which I believe to be in a great measure confirmed by my own subsequent observations: it is, that the young siamangs, whilst yet too weak to go alone, are always carried by individuals of their own sex, by their fathers if they are males, and by their mothers if females. I have also been assured that these animals frequently become the prey of the tiger, from the same species of fascination which serpents are related to exercise over birds, squirrels, and other small animals.

'Servitude, however long, seems to have no effect in modifying the characteristic defects of this ape, his stupidity, his sluggishness, and his awkwardness. It is true, that a few days suffice to make him as gentle and contented, as he was before wild and distrustful; but, constitutionally timid, he never acquires the familiarity of other apes, and even his submission appears to be rather the result of extreme apathy, than of any degree of confidence or affection. He is almost equally insensible to good or bad treatment; gratitude and revenge are sentiments equally strange to him. All his senses are dull and imperfect; if he regards an object, it is manifestly without any intention—if he touches it, it is involuntarily. In a wood, the siamang exhibits an absence of all intellectual faculty; and if animals were to be classed according to their mental capacities, he would certainly occupy a very inferior station. Most commonly squatted on his hams, with his long arms twined round him, and his head concealed between his legs, a position which he also occupies whilst sleeping, he is seldom roused from his lethargy, nor does he break silence, unless at intervals to utter a disagreeable cry, which in sound approaches to that of a turkey-cock, but which appears to be expressive of no sentiment, nor to declare any want, and which in reality expresses nothing: hunger itself is insufficient to excite, or divest him of his natural lethargy; he takes his food with indifference, carries it to his mouth without avidity, and sees himself deprived of it without testifying either surprise or resentment.'

4. The *Wouwou (P. agilis*, F. Cuv.) has a bluish-black face, slightly tinged with brown in the female: the eyes are approximated, and deeply sunk in the head, owing to the prominent brows which surmount them; there is scarcely any forehead; the nose is not altogether so flat as in the siamang, and the nostrils open by large lateral slits; the chin is provided with a few hairs by way of beard, and the ears are almost concealed by long white whiskers, which, uniting into a narrow band, cross the forehead immediately over the eyebrows. It is difficult to give a precise idea of the colours of this animal, particularly as they are liable to considerable variation on account of age and sex. The fur itself is of a softer and more woolly quality than in the other species: it is of a very dark brown colour on the head, breast, belly, and inner surface of the arms and thighs, becomes insensibly lighter on the neck and shoulders, and finally assumes a blond hue almost white, on the loins and hips. The posterior face of the thighs is a mixture of brown, white, and red; and the backs of the hands and feet are very dark brown, like the belly. The female is not so hairy in front as the male, her eyebrows are less prominent, and her whiskers smaller. The young are of a uniform straw colour. It is likewise to M. Duvaucelle that we are indebted for the knowledge of this species, and for the only account which we possess of its habits and economy. It inhabits the same countries and localities as the siamang, but is less frequently seen, as its surprising agility enables it easily to elude observation or escape pursuit.

'These apes,' says M. Duvaucelle, 'which live more frequently isolated in couples than in families, are the most rare of the genus found in the neighbourhood of Bencoolen. Very different from the siamang in its surprising agility, the wouwou escapes like a bird, and like it can only be shot flying: scarcely has it perceived the appearance of danger when it is already far distant. Climbing rapidly to the tops of the trees, it then seizes the most flexible branches, and balancing itself two or three times to secure its equipoise, it thus springs successively, without effort as without fatigue, to the distance of forty feet and upwards. As a domestic animal, the wouwou exhibits no extraordinary faculty. It is less clumsy than the siamang, its movements are more prompt and graceful, but its manners are less lively than those of the monkey tribes in general: looking merely upon the exterior of its long slender arms and short bandy legs, one would be far from supposing that its muscles were so vigorous and its address so surprising. Nature, however, has not bestowed upon it a large portion of intelligence; in this particular it is in no way superior to the siamang: both species are equally deprived of that high and expanded forehead, which indicates superior intellectual powers, and this is one of the principal points of coincidence between them. What I have myself seen, however, convinces me that the wouwou is susceptible of a certain education, it has not the imperturbable apathy of the siamang; it may be frightened or pleased; it flies from danger, and is sensible of good treatment; it is gluttonous, curious, familiar, and sometimes even gay. Though deprived of the guttural sack so remarkable in the siamang, its cry is very nearly the same; so that it would appear that this organ does not produce the effect of increasing the sound usually attributed to it, or else, that it must be replaced in the wouwou by some analogous formation.'

The height of the adult wouwou, measured from the sole of the foot to the crown of the head, is two feet seven or eight inches; when standing in an upright posture, its fore-arms nearly touch the ground; the thumbs of the hands are very short, but those of the feet are long in proportion, and capable of being completely opposed to the other toes: it has small naked callosities, is entirely destitute of tail and cheek pouches, and in other respects perfectly resembles the common apes of the gibbon family. The female is rather smaller than the male: it is known by different names in Sumatra; that of wouwou is the most common and is meant to imitate the voice of the animal.

5. The *Ounko* (*P. Rafflesii*, Geoff.) is another species discovered, like the siamang and wouwou, during the expedition of Sir Stamford Raffles and MM. Diard and Duvaucelle into the unexplored forests of the interior of Sumatra, and named by M. Geoffroy St. Hilaire, after the first of these distinguished zoologists. This animal, which is called ounko by the Malays of Padang, appears to be of very rare occurrence; since, during fifteen months' residence on the island, the French naturalists above named never had reason to suspect its existence, though they had penetrated the woods in all directions for the express purpose of investigating its zoology. It was only a short time previous to their departure that they made the discovery; and as they enjoyed no opportunity of studying its manners, we are, consequently, deprived of those interesting details which have been furnished regarding the habits and economy of the species last described.

The size of the ounko is a little less than that of the wouwou, to which it bears so close a resemblance in form and proportions, that these two species are only to be distinguished by the difference of their colours. That of the ounko is in general black, less deep and brilliant indeed than that of the siamang, and in some degree resembling the fur of the wouwou in its length and thickness, and in the brown shade which it assumes in certain lights, particularly on the loins, which are a uniform dark brown. It further resembles the latter animal by its large white whiskers, uniting to form a scanty white beard under the chin, and by a narrow band of the same colour across the forehead. The throat is not naked and dilatable as in the siamang, but only more sparingly furnished with short hair than the breast and belly, and the scrotum is provided with a long pendent tuft of hair, tipped with red, and hanging down nearly to the knee. The female, according to M. Duvaucelle, has the index and middle fingers of the posterior extremities united as in the siamang; and upon dissection it was found that this animal had fourteen pairs of ribs, being one more than in the other species. 'Thus,' says M. Duvaucelle, 'the ounko bears a close resemblance to the siamang in the nature and colour of its fur, and to the wouwou in its white eyebrows and whiskers, its physiognomy and general proportions, in the absence of the guttural sack, and in the union of the index and middle-finger on the hind hands of the female only.' This sex further differs from the male by its smaller stature and the absence of the white whiskers, of which no further trace remains than two light brown marks over the eyes. With this exception the head is uniformly black; the breast and belly have very little hair, but that of the back and shoulders is extremely long and thick, and forms a kind of mane, of which some traces likewise exist, though in a smaller degree, in the siamang and wouwou. The hair of the fore-arm in both sexes, to judge at least from the lithographic plates of M. F. Cuvier, is reversed, as in the siamang and orang-outang; whilst in the wouwou, it is directed towards the wrist as in ordinary mammals.

6. The *gibbon* (*P. lar*, Lin.), originally described by Buffon and Daubenton, and confounded by Sir Stamford Raffles (in his Catalogue of Sumatran Animals, inserted in the 13th volume of the *Transactions of the Linnæan Society*) with the ounko, is, however, a very distinct species, and differs not only in its external characters, but likewise in its internal conformation. It is indeed true that these two species resemble one another in the quality and general colour of their hair, and in the white circle which more or less surrounds the face of both, but the hands and feet of the ounko are black, like the rest of the body, whilst in the gibbon they are light-grey, and form a striking contrast with the colour of the other parts; the hair of the fore-arm, likewise, is reversed in the former species, and directed in the usual manner towards the wrist in the latter; at least such is the direction given to it in the engraving of Buffon, and there is nothing said to the contrary either in his description, or in that of the accurate Daubenton, whose notice it could not possibly fail to have attracted, had it existed in his specimen; the index and middle hind toes are separate in the female gibbon, whilst in the ounko they are united (always presuming that M. Duvaucelle's specimens were really the male and female of the same species, of which there is good reason to doubt); and, finally, there are but twelve pairs of ribs in the gibbon, and fourteen in the ounko, as demonstrated by the dissections of Daubenton and Duvaucelle respectively.

The gibbon observed by Buffon was, like the generality of its congeners, of a gentle, affectionate disposition, and quiet and deliberate in all its movements; it was fearful of cold and damp weather, and received the bread, fruit, and other eatables which its visiters presented to it, with a gentleness very different from the abrupt and eager manners of the monkeys and baboons. It was brought from the Indian Archipelago.

7. The *Pithecus leuciscus* of Geoffroy, also called wouwou by the Malays, is a species of which we have at present but an imperfect knowledge. It closely resembles the *P. agilis*, but is of a uniform ashy-grey colour, with a black, naked face; arms still longer than in that species, and much larger callosities. Its hair is of a softer and more furry quality than in the other apes, and its face is surrounded by a circle of light grey, the ears, hands, feet, and top of the head being very dark brown. Professor Camper, who describes this animal, obtained his specimen from the Molucca Islands, where the species is often seen swinging itself among the long slender branches of the bamboos. It is said often to walk upright; its habits are active, and its disposition irritable and passionate.

APPELLEANS. [See HERETICS.]

APELLES, one of the most celebrated Greek painters, is generally considered to have been a native of the little island of Cos in the Ægean sea. Nearly all that we know about him, with the exception of some few scattered notices, is contained in the 10th chap. and the 35th book of Pliny's *Natural History*. The time of his birth is not fixed, but we are told that he was at the height of his reputation in Ol. cxii., or about B.C. 332; and as he painted a great many portraits of Philip, the father of Alexander, he could not be a very young man in B.C. 336, the time of Philip's death. He also survived Alexander, who died B.C. 323.

His chief master was Pamphilus, a Macedonian, and a distinguished artist, whose fee was very high. Apelles received instruction from him at Sicyon, a city which for some time before and after this date had a high reputation as a school both of sculpture and painting. Of his earliest essays we know nothing; but we are told that his diligence was unwearied, and that he never passed a day without doing something; 'ut non *lineam* ducendo exerceret artem:' Winkelmann interprets these words to mean, 'that he never passed a day without trying to improve himself as a draughtsman,' a sense which the words will very well bear. The story of his first acquaintance with

Protogenes the Rhodian painter, as told by Pliny, is creditable to the character of both artists: indeed Apelles is much praised for the frankness and plain-dealing of his character. Another story is told of Apelles as having given rise to the well-known saying, that a shoemaker should not go beyond his last. Apelles placed a picture which he had finished in a public place, and concealed himself behind it in order to hear the criticisms of the passers-by. A shoemaker observed a defect in the shoe, and the painter forthwith corrected it. The cobbler came again the next day, and being somewhat encouraged by the success of his first remark, began to extend his censure to the leg of the figure, when the angry painter thrust out his head from behind the picture and told the shoemaker to keep to his trade.

Apelles excelled in grace and beauty. The painter, who laboured incessantly, as we have seen, to improve his skill in drawing, probably trusted as much to that branch of his art as to his colouring: he only used four colours, as we are told (Pliny). His favourite subject was the representation of Venus, the goddess of love, the female blooming in eternal beauty; and the religious system of the age favoured the taste of the painter. His great picture of Venus, which he had undertaken for the island of Cos, was left unfinished at his death. Another, the Venus Anadyomene, representing the goddess rising from the waves of the sea, was taken to Rome, and placed by the Emperor Augustus in the temple dedicated to Julius Cæsar the Dictator. The lower part was injured, and nobody could be found to restore it; but the Emperor Nero, who had a taste for art, finding that the whole picture was going to decay, had it copied by Dorotheus.

Apelles painted many portraits of Alexander the Great, who, we are told, often visited his painting room, and would not sit to any body else. But it is not very easy to reconcile Alexander's rambling life with this account, unless we suppose that Apelles followed him into Asia; a supposition not altogether improbable, if we read the account of the revelries at Susa after Alexander's return from India, and of the number of all kinds of professional artists then assembled to add to the splendour of the festival. (See Athenæus, xii. p. 538; where Chares seems to refer these festivities to the wrong period: and ALEXANDER.) The Macedonian king is even said to have made Apelles a present of Campaspe, a beautiful female, whose graces the painter transferred to his Venus Anadyomene. According to Athenæus (xiii. p. 590. Casaub.), the painter made the beautiful Phryne his model, as she was bathing in the sea at Eleusis.

Apelles painted a portrait of King Antigonus (see his medal), which he placed in profile to hide the defect of the want of one eye. We may form some idea of the state of art in that day by the medal of Antigonus which we have, and by the fame of Apelles which has survived his works; it is not an unlikely hypothesis, that the figure of Antigonus on his coins would be in harmony with his portrait by Apelles.

The great picture of Alexander by Apelles was in the temple of Diana at Ephesus; other pictures by Apelles were in Samos and Rhodes, and Rome contained several in the time of Pliny. A Hercules in the temple of Antonia [see ANTONIA] was attributed to him. Apelles published a work on painting, which unfortunately is lost. He was accustomed to use a varnish for his pictures, which brought out the colours, and preserved them at the same time. The date of his death is unknown.

A story told by Lucian, in his little piece Περὶ τοῦ μὴ ῥᾳδίως πιστεύειν διαβολῇ, belongs to another Apelles, of Ephesus. (See Pliny; Winkelmann, vol. ii., &c.)

APEL'LICON, a personage principally memorable for his connexion with the preservation of the works of Aristotle. According to Strabo (book xiii., p. 608, &c. Casaub.), he was a native of Teos, but went to Athens, and was admitted a citizen of that state. He was very rich, and his vanity seems to have led him to seek distinction by the assumption of the literary character. He spared no expense in amassing books; but Strabo says that he was rather φιλόβιβλος (a lover of books) than φιλόσοφος (a lover of wisdom). Among other libraries which he purchased was that which had been collected by Aristotle more than two hundred years before; and which, enriched as it was by the manuscripts of that philosopher himself, and of his pupil Theophrastus, had, according to the improbable story, been long altogether concealed from the world. It had been left, Strabo says, by Aristotle to Theophrastus, and by the latter to his disciple Neleus, who carried it to his native town Scepsis, in the Troad. On his death it fell into the hands of his heirs; who, not being of a literary turn, and yet aware, probably from the instructions of Neleus, of the great value of the deposit, acted in a manner natural enough in such circumstances. To prevent the books from getting into the hands of the King of Pergamus, in whose dominion they resided, and who possibly might have removed them to the famous library of that capital without much regard to the rights of the owners, they concealed them in a cellar under ground. Here they remained until they were purchased by Apellicon from the descendants of the persons by whom they had been thus secured, about a century and a half afterwards. They had, however, suffered much from their long entombment, and the copyists whom Apellicon employed to transcribe them were not very well qualified to restore the passages which had been rendered illegible. When thus for the first time published, they consequently appeared in a very faulty state. When Sylla conquered Athens (86 B.C.) he carried to Rome, among other literary treasures, the library of Apellicon, who had just died; and this particular collection, Plutarch says, he retained as his own property. Tyrannion, the grammarian, who was a great admirer of Aristotle, contrived to ingratiate himself with Sylla's librarian, and obtained the privilege of using the manuscripts. Several publishers also of that day (βιβλιοπῶλαι) employed bad copyists to make transcripts, and did not take care to have the copies collated with the originals: this, indeed, says Strabo, is a common occurrence in books which are copied for sale, both here (in Rome) and at Alexandria. It was not until Andronicus of Rhodes [see ANDRONICUS], who was an acquaintance of Tyrannion, undertook the task of correcting the writings and putting them in order, that they were given to the world in anything like a correct form. Athenæus (v., p. 214, Casaub.) informs us that Apellicon's passion for rare manuscripts made him very unscrupulous about the means of obtaining them, and that at length he was discovered to have got into his possession the originals of many of the antient public decrees from the city archives, which so enraged the Athenians against him, that he was obliged to run away to save his life. The influence of his friends and his own wealth, however, soon obtained his return; and, having attached himself to the faction of the Peripatetic philosopher Athenion, whom the chances of civil confusion placed for a short time at the head of affairs, he was invested with the command of the island of Delos. In this situation he conducted himself with great incapacity; and the resul was, that the Romans effected a descent upon the island, and, falling upon the garrison while they were asleep, put nearly all of them to the sword. Apellicon was fortunate enough to make his escape; and, having returned to Athens, he died there a short time before the capture of the city by Sylla. Athenæus says that Apellicon embraced the opinions of the Peripatetics; and a work of his, in defence of Aristotle, is quoted in a passage of another antient writer preserved by Eusebius. (See *Bayle*, in articles Andronicus and Tyrannion, and the article ARISTOTLE.)

APENNINES, the general name for the great mountain-system of Italy. The origin and meaning of the name are lost, says Mannert, in the darkness of the early ages. But it is probable that the word contains the element *Pen*, signifying a head or high mountain; this word appears in the same sense in many parts of Europe that were once, or now are, inhabited by tribes of the Celtic family. The Greek historian Polybius speaks of ὁ Ἀπέννινος, and also uses the name in the plural number; Livy and other Latin authors use *Mons Apenninus*, in the singular; the geographer Strabo uses both the singular τὸ Ἀπέννινον ὄρος, and the plural, τὰ Ἀπέννινα ὄρη, from which probably comes the modern plural appellation: but the term *Mons Apenninus*, and ὁ Ἀπέννινος, or τὸ Ἀπέννινον ὄρος, were applied, equally with the modern 'Apennines,' to the whole system of mountains from the Alps to the extremity of Calabria. (See Strabo, pp. 201. 259; Polyb. book ii.)

The great mountain boundary of Italy on the north and north-west terminates on the shores of the Mediterranean with that subdivision of the chain called the Maritime Alps. From Monte Viso, situated near the southern limit of the Cottian Alps, and the most conspicuous feature in that group, rising in a beautiful conical form to the height of 12,586 feet above the level of the sea, the Maritime Alps have a gradual fall to the coast. They also stretch westward nearly to Toulon, where they may be said to have a natural termination by gradually sinking to a plain; but towards the east they have only an arbitrary line of demarcation, in the neighbourhood of Savona, where the Apennines commence, which may be considered as a prolongation of the great chain of the Alps. The north-western extremity of the Apennines is thus situated near the sources of the river Bormida, north of Finale, a small town on the coast between the Col de San Giacomo, the last of the conspicuous heights of the Maritime Alps, and the Col di Cadibona, the first mountain of the Apennines. From this point (about 44° 16′ N. lat., 8° 18′ E. long.) they stretch in a north-easterly direction until they reach the pass of the Bocchetta, due north of Genoa; thence they continue to run eastward, and a little to the south, to the neighbourhood of Pontremoli, from which point they extend in a general south-east direction, but not without some deviations, through the peninsula, at a nearly equal distance from the coasts of the Adriatic and Mediterranean, to Capo di Leuca, on the eastern side of the Gulf of Taranto. From the centre of Calabria a branch extends nearly due south to Cape Spartivento, (37° 56′ N. lat., 16° 5′ E. long.) the farthest extremity of Italy: they consequently run through 6° 20′ of latitude. The length of the chain is about 650 English miles in a direct line; but, including its windings, it is little short of 800 miles.

The general outline of the Apennines presents neither the vertical needles of the Alps, the sharp peaks of the Pyrenees, nor the long rocky cliffs or escarpments of the Jura mountains; their forms are smooth, rounded, and wavy, bare rocks scarcely ever appearing, except in the highest parts. The most elevated point is nearly in the centre of the chain, a little eastward of Aquila, where Monte Corno rises to the height of 9521 feet, an elevation, however, which is below the limit of perpetual snow in that climate. The great chain is usually divided into four principal groups, called the Ligurian, Etruscan, Roman, and Neapolitan Apennines.

1. The *Ligurian Apennines* encircle the Gulf of Genoa from the Maritime Alps to Monte Gisa, north of Pontremoli, at the source of the little river Magra, and from thence they stretch in a south-easterly direction as far as the borders of Tuscany. The length of this group is about 120 miles; the crest of the mountain chain is from seven to thirty miles distant from the Mediterranean, and from thirty to fifty miles from the Po. From their north-western extremity the elevation rather diminishes until they reach the pass of the Bocchetta, but from this point there is a gradual rise, and in Monte Pellegrino, near the south-eastern extremity, they attain an elevation of 5161 feet: the breadth of the group increases with the height, but does not anywhere exceed twenty-five miles. The slope of the mountains toward the sea is abrupt, and is broken by numerous deep gullies, the beds of torrents, which rush down with prodigious violence when swollen by rains. On the Mediterranean side there are only two rivers with a moderate length of course, the Vara and the Magra, which, after uniting their waters, fall into the sea at the entrance of the Gulf of Spezia; but from the northern and eastern slope there are many considerable streams, all tributaries of the Po,—the Bormida, Scrivia, Trebbia, Nura, Taro, Grostollo, and Secchia. The beds of all these rivers are sometimes filled with great torrents, at other times nearly dry, on account of the small quantity of snow which lies upon the mountains from which they are fed. The scenery of the Ligurian Apennines, particularly on the Mediterranean side, is of the most varied and beautiful description; and in the celebrated pass of the Bocchetta, nothing can be more magnificent than the prospect on issuing from the wild mountain ravine, especially to those who there, for the first time, look upon the dark blue waters of the Mediterranean. The mountain barrier between the basin of the Po and the coasts of the Gulf of Genoa is traversed in several directions by great roads, constructed at a vast expense and with much skill. The most considerable of these are, 1. the road from Alessandria up the valley of the Bormida, by Acqui and Spigno, over the pass of Montenotte at an elevation of 4450 feet, to Savona. 2. That from Alessandria over the plain of Marengo, by Novi, Gavi, Voltaggio, and the Bocchetta to Genoa. 3. From Parma by Fornovo, up the valley of the Taro, and over the pass de' Cento Croci to Pontremoli, and thence by the valley of the Magra to Aulla, Sarzana, and the Gulf of Spezia. The communication between the south of France and Italy is by the celebrated road begun under Napoleon, called the Corniche, which runs along the sea coast from Nice by Oneglia, Savona, Genoa, Chiavari, and Massa, to Leghorn.

2. The *Etruscan Apennines* extend from Monte Pellegrino to Monte Cornaro, in 12° 3′ E. long., and in a direct line between Florence and Fano, a distance of about 75 miles. In this group the mountain chain approaches nearest to the Adriatic, Monte Cornaro being about twenty-four miles from Rimini, on the Adriatic, and nearly a hundred from Orbitello on the west coast. The slope is rapid towards the Adriatic in the southern part of the group, but in the northern part there is a gradual fall to the marshes of the lower Po and the sandy plains which stretch from thence southward along the coast. On the western side, the mountains throw out numerous branches and fall gradually towards the Mediterranean, sinking southward into the low marshy country of the Maremma. The highest points of the group are, Monte Cimone, 6975 feet, and Monte Amiata, west of Radicofani, 5794 feet above the level of the sea. From the summit of the former, which is a little to the west of a direct line between Modena and Pistoja, there is a most extensive prospect; on one side the vast plain of Lombardy, including the territories of Parma, Reggio, Modena, and part of Romagna, with the Adriatic in the distance; on the other side, a great part of Tuscany, showing the whole course of the Arno to its embouchure in the Mediterranean, which terminates the view. On the eastern side of this group there are numerous streams, but none of great importance; on the western side are the sources of the Tiber, and the Arno which, though much less than the Tiber, becomes a considerable stream by the waters which it receives from these mountains. The communication between Lombardy and Florence is by two great roads over the Apennines, the one from Modena by Pavallo, Pieve-Pelago, on the west side of Monte Cimone, through the pass of Fimalbo, by Pistoja; the other from Bologna by Lojano, through the pass of Pietra Mala, at an elevation of 3284 feet.

3. The *Roman Apennines* run nearly through the centre of the peninsula, from Monte Cornaro to Monte Velino, which is almost due east of Rome, a distance of about 145 miles. In this group are the two most lofty points of the whole chain of the Apennines; they are situated not far from each other, in Abruzzo Ulteriore; the one, called Il Gran Sasso d'Italia, of which the summit, Monte Corno, is 9521 feet above the sea; the other, Monte Velino, is 8183 feet high. Besides these, there are three other mountains of great height; namely, Monte Vetora, 8135 feet, Monte Sibilla, near Ascoli, antiently Mons Tetricus, 7212 feet, and Il Terminillo Grande, north of Rieti, 7034. These are all covered with snow the greater part of the year, for snow falls sometimes in May and September. Between Monte Sibilla and Monte Velino, several branches are thrown off towards the Adriatic on one side, and towards the Mediterranean on the other, the latter having a south-west direction, and one of them accompanying the lower course of the Tiber, as far as the plains near Rome.

4. The *Neapolitan Apennines* include all that part of the mountain system of Italy which extends from Monte Velino to the two extremities of the Terra di Otranto and Calabria, Cape Leuca, and Cape Spartivento, and which no longer forms one great range, but rather a diverging group of subordinate chains. The highest point, towards their northern extremity, is Monte Miletto, in the eastern part of the Terra di Lavoro, the antient Samnium, east of Venafrum, and north of Capua. It is 6744 feet high, and in the valleys of Matese, near its summit, snow is found nearly the whole year. From Monte Chilone, west of Troja, a great branch is thrown off from the central chain, in a north-easterly direction, through the Capitanata, which, turning eastward, runs out to the promontory of Garganum, *Mons Garganus* in Apulia. It rises in several places into considerable elevations, the most conspicuous of which are Monte Calvo, 5295 feet high, and Monte Gargano, which is nearly as much. Another great branch is thrown off not far from Venosa, *Venusia*, and stretches south-east, through the districts of Bari and Otranto, and with a gradually diminishing fall terminates in the low hills between the towns of Gallipoli and Otranto. From the neighbourhood of Venosa the mountains also take a western direction, bending a little to the south, and terminating in Cape Campanella opposite the rocky island of Capri; thus

from Cape Campanella to Cape Leuca the mountains form a continuous curvilinear boundary between the northern parts and the southern portion of this great peninsula. The main chain of the Apennines stretches from the neighbourhood of Venosa to the extremity of Calabria, and rises in many places into mountains of great height. The most lofty of these, Il Pollino, is on the southern limit of the province of Basilicata, (about 40° N. lat.) and is 7076 feet high; patches of snow may be seen upon it even in July. The other lofty mountains of Calabria are, Monte Sivino in Basilicata, 6000 feet; La Sila, east of Cosenza, 4935 feet; and Monte Alto, the highest point of Monte Aspro, east of the straits of Messina, 4380 feet.

Geological Structure.—A kind of conventional boundary has been laid down between the Alps and the Apennines, but it is impossible to draw any line of separation from difference of geological constitution; there is too great a blending and interlacing of formations of different ages, to enable us to say where one system of mountains ends, and the other begins. According to Signor Pareto of Genoa, who has examined the Northern Apennines with more care than any other geologist, there are three great deposits to which the various stratified rocks of Liguria, that are older than the tertiary, may be referred. The lowest is an assemblage of gneiss, mica-slate, clay-slate, talc-slate, and a semi-granular limestone; the next, an assemblage of argillaceous slates, marly sandstones, and slates, sandstones, and limestones; and the uppermost consist of a series of marly limestones, and a sandstone called *macigno*, with impressions of marine plants. These strata, together with some partial deposits of puddingstone, are all more or less inclined, sometimes nearly vertical, and frequently much contorted, particularly the uppermost strata. Upon these are found deposits of tertiary formation, usually in horizontal stratification; but they occur only in detached spots of limited extent, on the Mediterranean side of the chain, while in Piedmont and Lombardy, they form a continuous zone, skirting the northern slope of the Apennines, from Ceva on the west, to Fornovo on the east. The prevailing stratified rock of the Ligurian Apennines, according to Brocchi, is that known in the country by the name of *macigno;* but that term is applied to sandstones of very different ages, and, therefore, some uncertainty attends all descriptions in which it is used. It contains subordinate beds of limestone; but no veins or other deposits of metals have hitherto been found in it. Besides the calcareous beds that are subordinate to the *macigno*, there are extensive tracts of what Brocchi considered, but in some cases at least improperly, a transition limestone in the Ligurian Apennines, and the same rock appears in several places southward, along the shores of the Mediterranean. The mountains of San Juliano near Pisa are composed of it; the broccatello marble of Sienna is a variety of it, and it is found in insulated hills at Piombino, Cività Vecchia, and Cape Circello, the antient Circean promontory. Not a trace of this so called transition limestone is to be seen, according to Brocchi, on the eastern side of the Apennines. The southern limit of the *macigno* is not exactly known, but it is supposed not to extend beyond the neighbourhood of Cortona.

Among the unstratified rocks of Liguria, serpentine is by far the most important. According to Pareto, it is not found in the Maritime Alps, but commences near Savona, and occupies a considerable extent of country between that town and Genoa, and as far inland as Voltaggio. It is also met with in many parts of the Ligurian Apennines, forming detached groups of hills many miles distant from each other, and Brocchi describes it as occurring as far as Orbitello, which seems to be its southern limit. It is not confined to the Mediterranean side, but rises up near Bobbio, Fornovo, and between Sassuolo and Modena, in the basin of Lombardy. A variety of serpentine, containing a mixture of felspar and diallage, called in the country *granitone*, and by geologists *gabbro* and diallage-rock, is found in several places; and occasionally of a quality that makes it applicable for works of ornament. Serpentine, under all its forms, is now classed by most geologists among the rocks of igneous origin, and, from the observations of Pareto, Hoffman, De la Beche, and others, it is probable that the great dislocations and contortions which are observed in the stratified rocks of Liguria have been produced by the forcible injection of this rock among them, in a melted state, from the interior of the earth. That the serpentine was in a highly heated condition is inferred from the altered structure of the slate and limestone, in many places where they are seen in contact with each other. Pareto is of opinion that this eruption of the serpentine took place prior to the deposit of the tertiary beds, but Elie de Beaumont considers that eruptions have repeatedly taken place and even after the formation of the most recent strata, as the tertiary deposits, though usually horizontal, are sometimes highly inclined.

Near the southern extremity of the Ligurian Apennines there is a distinct group, called the Alpi Appuani, separated from the main range by a considerable depression. In this group are situated the celebrated marble quarries of Carrara, which have been worked since the time of Augustus, and continue to supply many kinds for architectural purposes and the finest qualities for sculpture: there is an immense export of the marbles to all parts of the world. This limestone was long considered a primary formation, and was usually referred to as the type of primitive limestone; but it was afterwards thought by many to be of a more modern date, and the German geologist, F. Hoffmann, who has lately visited that part of Italy, has discovered that it contains organic remains, and he assigns it to the same geological age as the oolite or Jura limestones. The highly crystalline state of the rock, and the disappearance of the greater number of the organic remains, he considers to be the effect of heat, when the eruption of the serpentine took place. He traced the limestone uninterruptedly to where it contains numerous fossils; from that point the beds increase in inclination, and gradually change their internal structure, and at last form a mass nearly thirty miles long, scarcely ever at a less elevation than 4000 feet above the sea, and rising often much higher, as in the Panie della Croce, at the southern extremity, 6102 feet, the Pizzo d'Uccello, at the north-west end, 6147 feet, and Monte Sacro, above Carrara, 5540 feet, on the slope of which the numerous quarries are worked. The limestone in the valley of the Frigido lies upon clay-slate, which rests upon mica-slate, and this last upon gneiss, and Mr. Hoffmann is of opinion, after very careful examination, that the two latter rocks are the clay-slate altered and rendered crystalline by the action of heat.

After leaving Liguria, the rock of which the greater part of the Apennines is composed is a limestone which presents itself under different aspects. It contains very few fossils, and affords very little interest to the geologist; its uniformity is absolutely wearisome. Once entered within its domain, we may travel for days without meeting anything to relieve the tedium of its eternal sameness. It is the sole constituent of the Apennines of Tuscany, Romagna, Fabriano, Foligno, and the Abruzzi, and stretches uninterruptedly through the provinces of Basilicata and Bari to the extreme point of Otranto. The Apennines come close to the left bank of the Tiber until that river takes a sudden turn to the south-west, in the immediate neighbourhood of Monte Sant' Oreste, the antient Soracte, which is an outlier of the Apennines, as geologists term such detached hills, when they are composed of the same materials as the main ridge: it rises to the height of 2140 feet. In the Campagna di Roma, a range of mountains, composed of the same limestone, is separated from the central chain by the valley of the Tolero. This detached group, the territory and stronghold of the antient Volsci, extends in a direction nearly north and south, from Monte Fortino, a part of the antient Montes Lepini, to the sea at Terracina, and rises in some places to considerable heights: according to the measurements of Prony, Monte Schiera d'Asino is 4878 and Monte Capreo 4816 feet above the level of the sea. Another subordinate range extends, as has been already stated, between Salerno and Nocera to Cape Campanella, on the south side of the gulf of Naples, of which the island of Capri is a prolongation. In this group, Monte St. Angelo di Castellamare rises to the height of 4688 feet, and Monte Solaro, in the island of Capri, to 3195 feet, according to Tenore in his *Géographie Physique du Royaume de Naples.*

On the western side of the Apennines the limestone is mostly covered by tertiary and volcanic products, so that it seldom appears far from the central chain, unless when the subordinate branches rise to considerable heights. On the eastern side the tertiary deposits do not extend so far south at least they do not cover a great extent of country, and in some places, as in Puglia Pietrosa, a part of antient Apulia, the limestone rises to the surface of the ground, in inclined beds, from the central range to the sea shore; and in the culture of the olive and vine in that country, they break the masses of limestone to come at a layer of ochreous earth in which to set the plants. From the great scarcity of organic remains, we yet know little with certainty about the geological age of the Apennine limestones, and, indeed, we cannot say if they belong to one or to different periods; it is generally supposed that they belong to some part of our secondary series between the lias and the chalk, and most probably in greater part are equivalents, in point of age, to our oolite deposits. Like most other limestone formations, they abound in great caverns.

Calabria has hitherto been little explored by geologists. The Apennine limestone extends into it; but there are also large tracts of the country occupied by primary strata, and a granitic ridge passes through it, which rises to the height of several thousand feet. There are besides tertiary deposits, to which we shall afterwards allude.

Low hills of rounded undulating forms skirt the northern slopes of the Ligurian Apennines, and cover the greater part of the country on both sides of the Tuscan and Roman Apennines between the mountains and the sea. They have been called by geologists the *Subapennines*, as they never rise above a moderate degree of elevation. They are composed of marls, covered by yellow sand, both abounding in organic remains, and have been considered by Brocchi, who first described them in detail, and by other geologists, as belonging to one period of formation. But Mr. Lyell is of opinion that, while there is a considerable correspondence in the arrangement and mineral composition, there is not that close resemblance in all parts of the Subapennines which should lead us to assume an exact identity of age, and that the fossils they contain indisputably prove that they were deposited during three distinct periods. He considers that the tertiary strata of the hill of the Superga, near Turin, as well as the greater part of those in the valley of the Bormida, belong to the Miocene period; that the greater part of the Subapennine formations of Northern Italy and Tuscany, and perhaps those around Rome also, belong to the older Pliocene period; and that the tufaceous formations of Naples, the calcareous strata of Otranto, and probably the greater part of the tertiary beds of Calabria, were deposited during the newer Pliocene period. (See Lyell's *Principles of Geology*, vol. iii. ch. xii.)

The marls are composed of clay, with much calcareous matter, are of a greyish-brown or blue colour, often without lines of stratification, but sometimes thinly laminated. They are frequently of great thickness, as in the neighbourhood of Parma, where the marl is 2000 feet thick. They contain beds of lignite and of gypsum, and detached crystals of gypsum; sometimes they pass into compact limestone, and occasionally there are interstratified beds of sandstone. They constitute very frequently the surface of the country, but more usually are covered with sand. The great arenaceous deposit lies generally upon the marl, but sometimes it is seen reposing on the Apennine limestone. It sometimes passes into a calcareous sandstone, and between Florence and Poggibonzi there is a range of conglomerate belonging to the same deposit, extending eleven miles, the pebbles of which are chiefly limestone. (Lyell, *ibid.* vol. iii.) Both the marls and the yellow sand abound in organic remains, but not universally, for there are often large tracts of both without any fossils. The shells are usually in a high state of preservation, even to their colours and the ligament which unites the valves; they are referable to species and families of which the habits are extremely diversified, some living in deep, others in shallow water, some in rivers, others at their mouth. Many are identical with species now inhabiting the adjoining seas, others with species now living in tropical seas. The remains of corals and fishes are not unfrequent, as well as detached bones, and even entire skeletons of whales and other cetacea. The skeleton of a whale twenty-one feet long was found by Cortesi near Castel Arquato, between Parma and Piacenza, in the marl, and oyster-shells were adhering to a part of the head, showing that it must have lain as a skeleton at the bottom of the sea. Bones of land animals are frequently met with, and that they were transported to the bed of the sea is evident from their being associated with marine shells, and from the thigh-bone of an elephant having been disinterred, with oyster-shells attached to it, as in the instance of the whale's skeleton mentioned above.

Besides these marine tertiary deposits, there are others which are lacustrine, that is to say, the materials must have been deposited in fresh-water lakes. A formation of this sort occurs in the Upper Val d'Arno: this great valley, which is surrounded by precipitous rocks, consists of three distinct basins, connected together; the uppermost is that of Arezzo, the next that of Figline, and the lowest that of l'Incisa. The basin of Arezzo contains a deposit of rolled pebbles, heaped together without any order, with fossil bones in the lower part of the mass, and covering a blue micaceous clay, with bones and beds of lignite. In the basin of Figline, the same clay is covered by rolled pebbles, fine sand, and coarse quartzose sand, and bones have been found in all the beds. In the basin of l'Incisa there are the same deposits of clay and sand, but the pebbles are wanting: these last are larger in size and more numerous in proportion as they are nearer the secondary rocks of Vallombrosa, in the upper part of the valley, from which they have been derived. These deposits rise considerably above the present bed of the Arno; the blue clay, which is always undermost, from 50 to 60 feet; the gravel as much as 200. They contain no fossil marine productions whatsoever, their shells belonging exclusively to fresh water. The most extraordinary circumstance connected with this lacustrine deposit, in the very centre of the Apennines, is the enormous quantity of the bones of great quadrupeds belonging to warm climates, some of them the inhabitants of swamps, and all of extinct species. They are the mastodon, elephant, rhinoceros, and hippopotamus; the skeletons of the latter are exceedingly abundant, no less than forty individuals having been found prior to 1829. Brocchi relates that such is the quantity of elephants' bones, that the valley is like a vast cemetery of these gigantic animals, and that before the peasants learned to keep these relics for sale to the curious, they used to inclose their gardens with legs and thigh-bones of elephants. Besides these greater animals, bones have been found of bears, hyænas, an animal like the panther, wolves, boars, tapirs, horses, buffaloes, oxen, and stags. 'In winter,' says Mr. Lyell, 'the superficial degradation of the soil is so rapid, that bones, which the year before were buried, are seen to project from the surface of the soil, and are described by the peasants as growing. In this manner the tips of the horns of stags, or of the tusks of hippopotamuses, often appear on the surface, and thus lead to the discovery of an entire head or skeleton.'

Besides this great lacustrine deposit of the Upper Val d'Arno, there are others of a like nature, such as at Cadibona near Savona, where strata of gravel, sand, and clay are associated with several seams of lignite or brown coal, from two to six feet in thickness, the whole deposit exceeding eight hundred feet in depth. In the midst of the coal beds have been found entire jaws and other bones of an extinct quadruped of the pachydermatous or thick-skinned tribe, called by Cuvier Anthracotherium, the bone itself being changed into a kind of coal.

We have still to notice a very important feature connected with the structure of the Apennines, namely, the region which has been devastated by internal fires. This region is nearly confined to the middle part of Italy, and to the western side of it. The volcanic district, properly so called, is bounded on the south by Cape Campanella on the south side of the Bay of Naples, and on the north by the river Ombrone, which enters the sea a little to the south of the island of Elba; the distance between those limits is about 230 miles. Its greatest breadth, which is about forty miles, is at Radicofani in the high road between Sienna and Rome, a volcanic mountain 3060 feet high. Monte Amiata, which is also volcanic, and 5794 feet high, lies immediately west of Radicofani. Volcanic action has long ceased in every part of this district, except at its southern extremity; and there are no historical records of that action, except with respect to Vesuvius and the country immediately contiguous. The volcanic matter which covers the country is mostly in the state of ashes and cinders, either loose or agglutinated together, forming what the Italians call *tufa*; but there have been also eruptions of solid lava in many places, which are now seen in the form of beds and cliffs of hard rock. Of these last one of the most remarkable is the group of hills south of Rome, of which Monte Cavo, the antient Alban Mount, is the most conspicuous part, rising to the height of 3110 feet. The waters of the Alban Lake fill the crater of an extinct volcano from which streams of lava once flowed over; one of these may be traced by the side of the Appian Way to within two miles of the gates of

Rome. In the quarries there, which have supplied the paving stones of the city both in antient and modern times, the lava is observed to be sixty feet thick, and to rest upon previously ejected cinders. The Lago Bracciano, north of Rome, was once the crater of a volcano, and is now surrounded by hills of solid lava, which send forth numerous branches, antient streams of melted stone, into the surrounding country: and between the lake and Cività Vecchia there is a chain of limestone hills, at the eastern end of which lava has burst through, and now forms great vertical masses. Another range of hills, composed of compact lava, which branches out on every side, is in the neighbourhood of Viterbo; the highest point, Monte Soriano, the antient Mons Ciminus, is 4183 feet above the sea. The whole surface of the district we are now describing is not covered by volcanic products, for both the Apennine limestone and tertiary formations rise up in many places from beneath them, and in other places they are covered by fresh-water deposits which have been formed since the eruptions ceased. The country round Rome is overspread with volcanic matter, and the seven hills themselves are composed of the same materials lying above marine tertiary formations. These last are laid bare at the foot of the Capitoline Hill; and Monte Mario, on the right bank of the Tiber, 446 feet high, is wholly composed of the Subapennine deposits, large oyster-shells having been found in abundance at the very summit. The volcanic products are found high up among the sinuosities of the Apennine valleys: ascending the bed of the Teverone, stony tufa forms lofty rocks near Vicovaro, above Tivoli, and still farther, at a short distance from Subiaco: in the valley of the Tiber it surrounds the insulated Soracte, and it is also found in the valleys of that branch of the Apennines which terminates in the sea at Terracina. It is an important circumstance in the geological history of Italy that the volcanic products alternate in many situations with the tertiary marine deposits, and that elephants' bones have been found at considerable depths imbedded in the tufa. Marine shells are contained in the tufa or volcanic ashes on the summit of Monte Cavo, at an elevation of more than 3000 feet above the sea. We pass over, at present, Mount Vesuvius and the great volcanic district which surrounds it, because these will be treated of with more detail upon a future occasion. There are several instances of volcanic action more in the centre of the Apennines, and far detached from the great region of volcanos we have been speaking of, as at Telese, between Capua and Benevento, and Mount Vultur in Apulia.

We have alluded to deposits still newer than the volcanic ejections; these are of fresh-water formation, and are an important feature in the physical structure of the country. They are composed of sands, clays, and marls, and of the solid stone called travertino, a corruption of the antient name for it, viz. *Tiburtinum*, because it was found in great abundance near the town of Tibur. All these deposits contain lacustrine shells, particularly such as frequent stagnant waters. The travertino is a deposit from water holding carbonate of lime in solution, by means of the carbonic acid which is common in spring waters; by exposure to air the carbonic acid escapes, and the carbonate of lime is deposited: such springs abound in many parts of central Italy within the volcanic region. In some parts of Tuscany the slanting sides of hills are covered with travertino. Several instances are mentioned by Mr. Lyell (*Principles of Geology*, vol. i. ch. xii.), and many by Brocchi, in his work on the geology of the neighbourhood of Rome. At Vignone, near Radicofani, a spring has deposited a series of strata to the depth of 200 feet, and the stone is so compact as to form an excellent material for architectural purposes. At San Filippo, the water is so highly charged with calcareous matter, that a hard stratum of stone, a foot in thickness, is obtained in four months, and there is a deposit of it a mile and a quarter in length, a third of a mile in breadth, and 250 feet thick in some places. There are vast formations of travertino at Tivoli, and quarries of it at Ponte Leucano in the neighbourhood, which have supplied the materials for some of the most splendid edifices of antient and modern Rome. These fresh-water deposits appear in so many places, that there is every reason to believe they extend over the whole country around Rome. Travertino, containing fresh-water and land shells, some of which are identical with the snails now common in the gardens of Rome, forms thick solid beds on the Aventine Hill above half a mile in length; and fresh-water deposits are found at the height of 150 feet above the Tiber on the Esquiline Hill. In many places they contain the bones of elephants, and other land animals, as in the celebrated *Mons Sacer* near Rome, where elephants' bones, incrusted with calcareous spar, were dug out of a gravel pit, at a depth of thirty feet below the surface.

Before concluding this rapid sketch of the geological structure of the Apennines, it will be useful to draw the attention of the reader to those great revolutions in the physical constitution of Italy, which the records preserved in her mountains and her soil so clearly point out. Many and great changes must have taken place in that portion of the crust of the globe long before the Apennines were formed. upon the consideration of these we shall not enter, but shall confine ourselves to events of a more recent geological date. It is an established principle in geology, that all stratified rocks containing marine remains must have been originally deposited at the bottom of the sea in a horizontal, or nearly horizontal position, and the inclined strata of the Apennines must therefore have been upheaved from the bed of the ocean; it is probable that they were at the same time raised some thousand feet above the surface of the water, forming a long tongue of land, or a chain of islands. The rocks of which they are composed must have been afterwards in part broken and abraded, to supply the materials of the conglomerates and other tertiary formations now found at their foot, for in all these the parent rock is recognizable, in rounded pebbles. These materials must have been washed down into the adjoining seas, together with remains of plants and of the animals which inhabited the land, where they formed stratified deposits, inclosing, during the process of consolidation, shells and other marine bodies. By a renewal of the internal elevating force these deposits were in their turn upheaved to form the Subapennine hills, and at the same time the central mountain chain must have been raised to a greater height, greater extension must have been given to the land, the islands disappearing as the lower parts of the mountains, of which they formed the summits, rose more and more above the surface of the water; and thus must Italy have assumed nearly its present form. But during the time that those tertiary formations were in progress, there must have been submarine volcanos at work, which, from time to time, spread their ejections over the bed of the sea, and thus they became interstratified with the materials pouring down from the land. There must then have ensued a renewal of the upheaving force, and the effect of that, whether by sudden or by continued gradual elevations during a long period, amounted to a raising of the land at least 3000 feet, for marine shells are imbedded in the volcanic tufa of the Alban Mount at that height above the present level of the Mediterranean. This elevating process must have taken place subsequently to the ejection from the submarine volcanos of the ashes and tufa which cover the country more or less on the western side of the Apennines from Tuscany to the borders of Calabria; for they are, for the most part, arranged in regular stratified beds and contain marine shells. That they were not deposited in fresh water is also evident from this, that they are found in the islands of Ischia and Procida where no great lakes could have existed; and in the former, marine shells imbedded in tufa were observed by Mr. Lyell at an elevation of 2600 feet. The new land thus laid bare must, in process of time, have become covered with vegetation, flourishing in a climate suited to the rhinoceros, elephant, and hippopotamus, which, with numerous other animals belonging to species now extinct, and of kinds now unknown in Italy, must have roamed there in vast numbers. In this state of things, parts of the country must have been covered by vast lakes of fresh water, for lacustrine deposits are met with at intervals nearly over the whole peninsula. Subsequently to this epoch, other great revolutions must have taken place when the barriers of these lakes were broken down, and when the erosions of torrents and denudations of floods fashioned the surface of the country into those forms which it now presents. Such are the conclusions to which an examination of the geological phenomena of Italy seems to lead.

The Flora of the Apennines is so very nearly the same as that of the Alps, that it would be superfluous to add anything respecting their botany, beyond referring to the latter article.

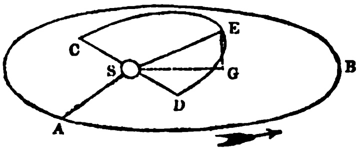
APENRADE, a Danish sea-port, situated at the bottom of a gulf, called the 'Apenrader Föhrde,' in the Little Belt, about twenty-seven miles N.N.W. of Schleswig, in the duchy of which name it is comprised. It has sea-baths, a townsmen's and charity school, cotton-print works, and three poor-houses, and is defended by a castle, in which the bailiff of the place resides. The trade and navigation of the town support a population of about 3000. The harbour is shallow, and the shipping, therefore, are moored about a hundred yards below the bridge. Its open roadstead is unsafe in winter time. Long. 9° 38′ E., lat. 55° 8′ N.

APEREA, a species of wild guinea-pig. [See CAVY.]

APERIENTS, in medicine. [See CATHARTICS.]

APE'TALOUS plants constitute one of the divisions in Jussieu's *Natural System*. They comprehend all genera which are dicotyledonous or exogenous, and which have a calyx without corolla; by some they are called monochlamydeous. The character by which these plants are defined is as constant as any of those which botanists employ for subordinate divisions, but it must not be considered absolute: for not only are many of the genera which, in consequence of their natural affinities, are included among apetalous plants provided with rudimentary petals, but it occasionally happens that in orders otherwise constantly furnished with a corolla, particular genera occur in which no petals are produced; a very remarkable instance of which is to be met with in the pretty little shore-plant found on most of the sandy beaches of this country, and called *Glaux maritima*. This species is very nearly related to the primrose, and certainly belongs to the same natural order as that plant, but it has no corolla; in place of which the border of the calyx becomes coloured, and it therefore apparently belongs to the apetalous division, although, in reality, it forms an exception to the character of monopetalous plants. It is circumstances of this kind that chiefly constitute the difficulty of studying plants according to the *Natural System;* but it is a very great mistake to suppose that such cases are numerous enough to prove a serious obstacle to the student.

APHE'LION, from the Greek ἀπὸ, *from*, and ἥλιος, *the sun*, means that point of a planet's orbit which is farthest from the sun. Its opposite point is the PERIHELION, from περὶ, *near to*, and ἥλιος, *the sun*, which is the nearest point to the sun.



Let S represent the sun, S A B the earth's orbit, or plane of the ecliptic, and S A a parallel to the line in which the earth's equator cuts the ecliptic, from which line all heliocentric longitudes (that is, measured round the sun) are measured in the direction of the earth's motion, represented by the arrow. Let C D E be a part of the orbit of a planet, S E the longest line which can be drawn through S, then E is the aphelion of the planet. If a plane S E G be drawn perpendicular to the ecliptic, the angle A S G is the heliocentric longitude of the aphelion E. The term is not usually applied to satellites, though they too have their aphelia.

The supposition of the planets moving in elliptic orbits round the sun is not true, unless the ellipses themselves be supposed slowly to change their positions and figures. In all the planets, except Venus, a very little more than a complete revolution must be made between two aphelia; in Venus, on the contrary, a little less. This inequality is represented by saying, that the aphelia of all the planets, except Venus, slowly increase in longitude, while that of Venus decreases. The apparent motion of the aphelia is greater than the real, since the line S A moves slowly backwards. [See PRECESSION.] The apparent annual motion of the aphelia is the annual precession of the equinoxes, together with the real annual motion, except in the case of Venus, in which the apparent motion is the precession of the equinoxes *diminished* by the real motion. The apparent motion of the aphelion of Venus is like that of all the others, in the direction of the earth's motion, for though the aphelion of Venus moves backwards, the line S A does the same at a greater rate. The following table gives the heliocentric longitudes of the aphelia of the bodies of the solar system at the dates specified, together with the *apparent* annual increase of longitude, made up of real increase and precession, as above described. Those of the new planets and comets cannot yet be considered as ascertained with the same degree of accuracy as those of the old planets. All but the comets are taken from *Baily's Astronomical Tables and Formulæ.*

Old Planets, January 1, 1801—

Planet.	Helioc. Long. of Aphelion.			Yearly apparent Increase of Do.
Mercury	254°	21′	47″	55″·9
Venus	308	43	53	47 ·4
Earth	279	30	5	61 ·8
Mars	152	23	57	65 ·9
Jupiter	191	8	35	57 ·1
Saturn	269	9	30	69 ·1
Herschel	347	31	16	52 ·5

New Planets, January 1, 1820—

Vesta	69°	33′	24″	94″·2
Juno	233	33	46	undetermined.
Ceres	327	7	32	121·3
Pallas	301	7	4	undetermined.

Comets—

Date.	Name of Discoverer.	Long. of Aphelion.
1835	Halley	123°
1832	Encke	337
1832	Biela	288

The longitude of the aphelion of Halley's comet is that predicted for its approaching appearance.

APHIS, the plant-louse, or puceron, an extensive genus of insects, interesting to naturalists on account of their very peculiar economy, and no less so to gardeners and farmers on whose crops many species commit most destructive depredations. As instances of the latter we may refer to the hop-fly (*A. humuli*) and the bean-dolphin (*A. fabæ*); flowers, such as the rose, the China aster, and the various chrysanthemums, suffer from other species. During the summer of 1833, the cabbage and turnip crops in Kent were much injured and often destroyed by countless swarms of *A. brassicæ*.

These insects are characterized by a soft oval body, a small head, entire and semi-globular eyes, antennæ of seven joints longer than the body, often setaceous, sometimes thickened towards the top, the two joints at the base very short, the next very long and cylindrical. The beak (*haustellum*) arises from the under part of the head between the fore-legs, and descends almost perpendicularly. The wings, when developed, are four in number, but some naturalists represent the upper wings rather as wing cases (*elytra*), from their difference of texture. The legs are very long and slender, in consequence of which they walk awkwardly. In sketching the history of these singular insects, it will be most convenient to begin it at the close of autumn, when many of the species, such as *A. quercus*, *A. rosæ*, &c., are numerous, some winged and some without wings, of both sexes, so that while the first may fly to a distance, the second are confined to their native plant or its vicinity.

After pairing, the mother aphis deposits what have been, by some naturalists, termed eggs, in a place suitable for their passing the winter; but different places are chosen by different species; some choose the oak, and place the eggs on an exposed twig high on the tree, others in the sheltered crevices of bark, or even under ground. Bonnet seems to be of opinion that the aphides are always viviparous and never lay eggs, what are commonly called eggs produced in autumn being a sort of cocoon, consisting of the young aphis inclosed in an envelope. From our own observations on those of the oak, we are convinced that this is the fact; but we cannot affirm, upon negative evidence, that none of the species lay real eggs.

The cocoons or eggs, whichever they may be, remain torpid during the winter (the parents having died after producing them,) and are called into life with the return of genial weather in the spring. The number of insects produced must of course correspond to the number of cocoons or eggs laid the preceding autumn, but being all ushered into active life at the same time, their simultaneous appearance has led to the popular, but erroneous notion, that they are generated by the air. *Blighting* weather, as it is termed, is also accused of spreading the destructive swarms over hop-grounds or bean-fields, but their rapid increase is wholly caused by their wonderful powers of multiplying.

All the aphides, it has been well ascertained, which appear in spring are exclusively females, no males being found till the autumn; and these females are endowed with a fecundity almost incredible. M. Latreille says, one female during the summer months will produce about twenty-five a-day, and M. Réaumur calculated that one aphis may be the progenitor, during its life, of the enormous number of 5,904,900,000 descendants. It is not necessary for the young female aphides produced during summer to pair with a male, which indeed would be impossible, as no males are then to be found; yet these females go on producing each their twenty-five a-day of living young ones, all of which become in a short time as fertile as their parent.

This is a circumstance so different from anything known amongst other animals, and altogether so extraordinary, that it could not be credited had it not been proved beyond all contradiction by the careful experiments, suggested by Réaumur, of the French academicians, which may be seen at length in *Insect Miscellanies*, chap. x. The result was, that nine generations were obtained without pairing in the course of three months.

At the extremity of the abdomen most species are furnished with a pair of projecting tubes, through which they eject a sweet viscid fluid, well known under the name of *honey-dew*, erroneously supposed to be an exudation from the leaves on which it is found. It is also said that the aphides feed on this, which is impossible from the structure of their mouths. Ants, however, and bees, are very fond of it.

A'PHORISM (ἀφορισμὸς), literally 'a limitation,' or 'a fixing of limits,' and hence used by the Greek writers to express a short sentence, containing a moral precept, or a rule of practice, briefly and forcibly expressed. The term has been adopted in medicine; for instance, both Hippocrates and Boerhaave have written books entitled *Aphorisms*, containing medical maxims, not treated argumentatively, but laid down as certain truths. For example, 'Neither repletion nor hunger, nor anything which exceeds natural limits, is good.' The word is similarly used in the civil law. We give the following as specimens of moral aphorisms.

'It is always safe to learn from our enemies; seldom safe to instruct, even our friends.'—*Lacon*. 'He will easily discern how little of truth there is in the multitude; and though they are sometimes flattered with that *aphorism*, will hardly believe the voice of the people to be the voice of God.'—Brown's *Vulgar Errors*, book i. 3.

Sayings of this description are well adapted to make an impression on the memory; but they tend to substitute authority instead of judgment, as the motive of action, and may therefore be as well applied to maintain prejudices as to assert truths; to impose conventional and needless restraints, as to furnish safe rules of conduct to the inexperienced. It is with reference to this that Milton uses the word. 'There is no art that hath been more cankered in her principles, more soiled and slubbered with *aphorisming* pedantry, than the art of policy.'

APHRODI'TE, the goddess of love and beauty. According to Homer, she was the daughter of Zeus and Dione, one of the Nereides, or ocean nymphs: a later legend, told by Hesiod (*Theog*. 188), relates that she sprung from the foam of the sea, produced when Kronos threw into it the amputated members of his father Uranos. There was a celebrated picture of her rising from the sea (ἀναδυομένη), esteemed the master-piece of Apelles. (See APELLES.) She first came to land at the island of Cythera, and thence proceeded to Cyprus. These islands were her favourite places of resort, and many of her epithets are derived from them (Cytherea, Cypris, Paphia, &c.). She was assigned in marriage to Hephæstus (Vulcan) the god of metallurgy, and there is a well-known tale of her detection in an amour with Ares (Mars) (See *Odyss*. viii. 266). Hermes and Poseidon (Mercury and Neptune) were also among her favoured suitors. Her amours, however, were not confined to the gods. For her adventures with Adonis, see that article: she also bore Æneas to Anchises, a youth of the blood royal of Troy, as is largely related in the Hymn to Aphrodite, ascribed to Homer. In the Trojan war she was ranged with Apollo and Ares on the side of the Trojans, and in attempting to protect her son Æneas, was wounded by Diomed. According to the fictions of the *Æneid*, she continued to extend her maternal care over Æneas, and brought about his establishment in Italy, and through him the Julian family derived their descent from her. To the Italians she is known by the name of Venus; a goddess, probably, of indigenous origin, but so confounded in the fictions of poets and mythologers with the Greek Aphrodite, that her original attributes have nearly disappeared.

The goddess is usually represented naked, or with very scanty drapery: her peculiar attribute is the *cestus* (κεστὸς ἱμάς, *Il*. xiv. 214), or embroidered girdle, which had the power of inspiring love for the person who wore it. Her favourite animals were the swan, the sparrow, and the dove; her favourite plants, the rose and myrtle. The bird called iunx, much used in amatory magic, was also sacred to her. It is a general opinion that her worship was introduced from Phœnicia, and that she is identical with Astarte, the Phœnician goddess of the moon. In the antient temples of Cyprus she was adored under the form of a conical stone, which was probably an aërolite. The Grecian artists represented her as the perfection of female beauty. One picture of Apelles we have mentioned; another, which he left imperfect, was esteemed so much that no artist dared to complete it. Many representations of the goddess in sculpture, on coins, &c., are extant: among these, the celebrated statue, called the Venus de' Medici, is that with which we are most familiarized.

APHTHO'NIUS, a Greek rhetorician of Antioch, whose epoch seems rather difficult to fix; some place him about the end of the second century A.D.; others, as Fabricius, in the third, and other critics still later. We know with certainty that he lived after Hermogenes, because he quotes this rhetorician, and, in fact, worked up the *Progymnasmata* of Hermogenes into a new shape, also entitled *Progymnasmata*. There is a curious passage in *Aphthonius* about Alexandria. (See De Sacy's *Abd-Allatif*, p. 182.) Aphthonius has also left forty Greek fables.

The work of Aphthonius is an elementary treatise on rhetoric; and in the sixteenth and seventeenth centuries it was much in use, and there were numerous editions of it. Since the end of the seventeenth century, Aphthonius has had no editor, and we believe very few readers.

Aphthonius was first printed by the elder Aldus with the other rhetoricians: *Rhetores Græci*. Venice, 1508, fol. The latest edition is by J. Scheffer, Upsal, 1670 and 1680, 8vo., with the *Progymnasmata of Theon*.

APIAN, or APPIAN (PETER), an astronomer, and, we may add, astrologer, born at Leipzig, died at Ingoldstadt, where he was professor of mathematics, in 1552, aged fifty seven. His real name was Bienewitz, sometimes misspelt Binewilt. *Biene* in German signifies a *bee*, whence the Latin Apianus. He was in favour with Charles V., who gave him an order of knighthood and the title of Count, as well as more substantial rewards. He is principally remarkable for his observations of comets, and is said to have been the first who observed that their tails are generally turned from the sun. He also attempted the solution of astronomical problems by mechanism, as described in his *Opus Cæsareum*, and is said moreover to have pointed out the use which might be made of lunar observations in navigation. For a list of his works (which are now uninteresting), see Vossius *de Scientiis Mathematicis*; Montucla, *Histoire des Mathém*., vol. i. p. 623; and Hutton's *Mathematical Dictionary*, article 'Apian;' but more particularly Kästner, *Geschichte der Mathematik*, vol. ii. p. 548, where more detail is given; or Teissier, *Eloges des Hommes Savans*, Leyden, 1715. His son Philip succeeded him at Ingoldstadt, which place he was obliged to quit in 1658, on account of his embracing the Protestant religion. He enjoyed some celebrity as an astronomer and mathematician, and died professor at Tübingen, in 1589. It is not correct, as stated in several accounts of which Montucla is apparently the source, that the only work of his which has been preserved is a letter to the Landgrave of Hesse Cassel. (See *Biographie Universelle*, and the work of Teissier above cited.)

APIARY, a place for keeping bee-hives, derived from the Latin *apis*, a bee, and formed like the word 'aviary.' The proper situation of an apiary engaged the attention of antient bee-keepers as much as it does in modern times, and, leaving out a few fanciful particulars, the directions given by Columella and Virgil are as good now as when they were written.

As to the aspect of the apiary, Virgil says—

> 'A station must be found
> To gusts of wind impervious.'—*Georgic* iv.

Milton alleges that 'it is not material in what aspect the stock stands, provided the sun shines on the hive once in the course of the day, for that well-peopled hives, kept dry, will thrive in most situations.' Wildman, again, tells us, that the apiary should face between the south and west, in a place neither too hot nor too much exposed to the cold. 'I have ever found it best,' he says, 'to place the mouth of the hives to the west in spring, care being taken that they enjoy the afternoon sun; the morning sun is extremely dangerous during the colder months, when its glare often tempts these industrious insects out to their ruin; whereas the mouth of the hive being then in the shade, the bees remain at home, and as clouds generally obscure the afternoon's sun at that season, the bees escape the temptation of going out. When food is to be obtained, the warmth of the air round the hive continues in the afternoon, which strengthens the bees, and enables them to pursue their labours.' Dr. Evans, in his pretty poem, gives very similar directions—

> 'Screen'd from the east, where no delusive dawn
> Chills, while it tempts them o'er the dew-damp lawn;
> But as on loaded wing the labourers roam,
> Sol's last bright glories light them to their home.'—*The Bees.*

Bonner stands alone in recommending an easterly aspect, which we frequently observed to be chosen in the numerous apiaries in Germany; we found those in Switzerland and Savoy more commonly placed towards the west.

Wildman prefers a situation in which bees 'returning home from their labours may descend,' and Keys says, 'a valley is preferable to high grounds to favour their increase;' but this is of less importance, perhaps, than having free egress and ingress in right lines from and to the apiary.

As to the adjuncts of the apiary, the old recommendations of Virgil are as excellent as any in modern works. He says—

> 'Let fresh springs and ponds,
> Verdant with moss, be near; and shallow brooks,
> That with swift current through the meadows run:
> The neighb'ring banks may tempt them to avoid
> The heat; and trees with hospitable boughs
> Obvious detain them. Whether dull in ponds
> The water stand, or flow in living rills;
> Into the midst throw willow-boughs across,
> And planky stones; where, as on bridges rais'd,
> They may alight; and to the summer-sun
> Expand their wings; if chance the eastern blast,
> Boist'rous, has sprinkled them returning late;
> Or plung'd them, blown askance, into the waves.'—*Trapp.*

Dr. Bevan thinks an apiary would not be well situated near a great river, nor in the neighbourhood of the sea, as windy weather might whirl the bees into the water and destroy them; yet we have seen very thriving apiaries all along the Rhine, and on the borders of the Swiss lakes. Others have recommended the neighbourhood of the sea-coast as very eligible, from a notion that the bees are fond of sea water, which, however, Keys denies from personal observation, his own bees having been kept near the sea.

Heaths, or places abounding in wild flowers, are the best sites for an apiary, and, in default of this, pasturage must be provided, such as gardens where flowers are cultivated, and fields in which are sown buck-wheat, clover, or sainfoin. The expedient of transporting apiaries to distant places, so as to take advantage of the seasons when different flowers are in blow, has been resorted to in various countries, particularly in Egypt, and along the great rivers of Europe.

M. Maillet, who was French consul in Egypt in 1692, informs us that, about the end of October, all such inhabitants of Lower Egypt as possess hives, embark them on the Nile, and convey them upon that river to Upper Egypt; calculating to arrive there at the time when the inundation is subsiding, and the lands having been sown, the flowers begin to bud. The hives being come to this part of Egypt, are there placed pyramidically in boats prepared for that purpose, after being marked and numbered by the several owners. Here the bees feed in the fields during some days, and when it is supposed that they have got in all the honey and wax that can be met with within two or three leagues round, their conductors convey them in the same boats two or three leagues lower, and remain there as long as is necessary to enable them to collect all the riches of the new station. Thus the earth forwards its productions, and the plants come into bloom in proportion as they come nearer to their place of abode. In fine, about the beginning of February, after having travelled through the whole length of Egypt, they arrive at the spots whence they had set out, and return to their respective habitations: for care is taken to set down exactly, in a roll or register, every district whence the hives set out in the beginning of the season, their number, and the names of the particular persons who sent them, as likewise the mark or number of the boats, in which they were placed according to their several habitations. Niebuhr saw upon the Nile, between Cairo and Damietta, a convoy of 4000 hives in their transit from Upper Egypt to the Delta.

Goldsmith describes, from his own observation, a kind of floating apiary in some parts of France and Piedmont. 'They have on board of one barge,' he says, 'three-score or a hundred bee-hives, well defended from the inclemency of an accidental storm; and with these the owners float gently down the stream; one bee-hive yields the proprietor a considerable income. Why,' he adds, 'a method similar to this has never been adopted in England, where we have more gentle rivers, and more flowery banks, than in any other part of the world, I know not; certainly it might be turned to advantage, and yield the possessor a secure, though perhaps a moderate income.'

Dr. Bevan strongly recommends the apiary to be roofed in by erecting a bee-house, or converting to that use some building already constructed, as much preferable to an apiary out of doors, both for convenience and security, as well as ultimate profit. He thus describes his own:—'The whole building, besides answering the purpose of an apiary, may be made subservient to other uses: my own serves for storing potatoes. The potatoe-cellar is sunk two thirds of its depth in the earth, and the bee-house is raised upon it, having a couple of steps up to the door. The dimensions of both are seven feet six inches by six feet clear within, which affords room for five colonies.

'The piles or stories of bee-boxes are placed in the bee-house at somewhat less than two feet apart, so as to make the external entrances to the several piles about a yard asunder.—(See the plate which forms the frontispiece of Dr. Bevan's work.)

'On the inside of the bee-house, the boxes in the upper row stand about table height, those in the lower about six inches above the floor. On the outside, the entrances to the upper row are about five feet, to the lower about three feet from the ground. The entrances through the wall may be cut in stone, bricks, or wood, and should be chamfered away on the outside, leaving the wall at those parts as thin as practicable, and letting the opening correspond in size with the outlets that are sunk in the floor-boards hereafter described. The potatoe-cellar is built with bricks, the bee-house of timber, lathed and plastered within, and thatched on the outside.

'Where the bees enter the boxes, two wooden shelves or resting-boards are fixed, two or three inches thick, to prevent warping; they extend the whole length of the building, are about a foot wide, and rest on cross pieces nailed fast to the uprights with which the bee-house is built; these cross pieces extend, also, about fifteen inches into the bee-house, where they serve as supporters for the shelves on which the bee-boxes are placed. The resting-boards on the outside are divided, by bricks on the edge, into several compartments, as shown in the frontispiece; the bricks extend the full width of the resting-board, and all the compartments are slated over. Thus the entrances are sheltered, and accommodation is afforded for the bees when they are at any time driven home by stress of weather in greater numbers than can readily pass through the entrances into the boxes.

'The building is not only thatched on the top, but down the sides and ends, as low as the potatoe-cellar. On that side where the bees enter the boxes, the thatch, of course, terminates at the top of the compartments, over which it is spread out so as to conceal the slate coverings. The floor of the bee-house is boarded, and the potatoe-cellar is ceiled, the space between the ceiling and the floor above being filled up with dry saw-dust.'

It is but right to say, however, that Keys is altogether against placing hives on benches, and he thinks it a great deal worse to have them under cots or sheds with shelves therein one above another, on the principle recommended by Dr. Bevan, inasmuch as these afford harbour for enemies, and are inconvenient to manage. Keys himself recommends for each hive separate stands made by driving four strong stakes into the ground three or four feet apart, in the form of a square. Eight or ten of these in one place, he thinks, are enough, and when more swarms are to be disposed of, he thinks it better to have them in separate gardens to prevent quarrels, which often happen when the swarms are numerous.

The various forms of hives will be noticed under the article Hive.

APICIUS. There were three Romans of this name, all of them celebrated for their love of good eating. The first was contemporary with Sylla; the second with Augustus and Tiberius; the third with Trajan. Of these the second is the most famous, being celebrated by Seneca, Pliny, Juvenal, Martial, &c. Athenæus (p. 7, Casaub.) places him under Tiberius; besides his general reputation for profuse and delicate attention to the gratification of his own palate, he obtains credit with that author for original genius in the composition of certain cakes, honourably distinguished by the epithet *Apician*. Seneca says that he was alive in his time, and infected the age by establishing a regular school of professors and pupils in the science of good eating in Rome, from which, in the days of simplicity and severity, even philosophers had been expelled as the corruptors of youth. The inordinate expense of his culinary establishment reduced his fortune and involved him in debt; he therefore found himself obliged to look into his affairs, and regulate his expenditure. He found that when his incumbrances were cleared off, he should have left a pittance utterly inadequate to keep such a body and soul together; wherefore, he took poison in preference to pining after unattainable luxuries. Pliny calls him the greatest gormandizer that ever appeared in the world, and mentions various ragouts invented by him; in short, he was the *Cook's Oracle* of imperial Rome. The third Apicius is to be honoured as the inventor of the art of pickling oysters (Athen. 7.); several jars of which he sent to the Emperor Trajan when in Parthia. Distant as was their destination, they reached it in high preservation and tempting savour.

The name of Apicius, long after the time even of the last of these three philosophers, was familiar as a household and culinary word. Their fame was perpetuated by the spirit of party: and the cooks of ages after were divided into Apicians and anti-Apicians. A treatise '*De re Culinaria*' is extant under the name of Cælius Apicius. It is considered by critics as antient, although not written by any of the three whom we have mentioned. Martin Lister republished it in London in 1705, with the title *De Obsoniis et Condimentis, sive de Arte Coquinaria*. The humorous Dr. King ridiculed it in a poem, entitled *The Art of Cookery*. (See *Biog. Universelle*.)

A'PION, son of Poseidonius, was born in Oasis, a town in Libya, seven days' journey from Thebes, probably the modern Oasis, called El Wah. Apion was educated at Alexandria, and wished to pass for a Greek native of that city, although he was of Egyptian extraction. Some have thought that the name of Apion is derived from Apis. Apion was a disciple of Apollonius, the son of Archibius, and of Didymus, from whom he imbibed his fondness for the poetry of Homer. Under the emperor Claudius, who reigned A. D. 41—54, he succeeded the Grammarian Theon at Rome. When the Greek inhabitants of Alexandria endeavoured to deprive the Jews who resided there of the privileges conferred upon them by Alexander the Great at the foundation of the city, and confirmed by the Ptolemies and the Cæsars, Apion was appointed to advocate their cause against the Jews. On this occasion he endeavoured to kindle the wrath of the emperor Caius Caligula, by pointing out, that the Jews would neither erect statues to the emperor, nor swear by his name, whilst they preferred to worship the head of an ass made of solid gold, which was of immense value, and was stated to have been first discovered when Antiochus Epiphanes entered the temple at Jerusalem. Antiochus Epiphanes was reported to have taken this idol away, and to have set a Greek captive at liberty, whom he found confined within the sanctuary in order to be sacrificed after having been fattened by the most delicious animal food. It was stated that the Jews were in the habit of preparing every year such a human sacrifice, in the intestines of which they discovered the events of futurity, and that all Jews tasted annually these human entrails, in order to pledge themselves afresh to hate the Greeks.

Apion, with these monstrous fables, did not fully succeed against Philo, who was sent to Rome by the Jews of Alexandria, to plead their cause. Philo, who was at the head of the embassy of the Alexandrian Jews, commenced his reply to Apion's accusation, but the Emperor Caius insultingly commanded him to leave the imperial presence. All expected the worst consequences from the emperor's wrath, but Philo said to the bystanding Jews: Be of good cheer, for Caius attacks us with words, but really he has begun to fight against God. The Emperor sent Petronius, the successor of Vitellius, as legate to Syria, with orders to place a statue of his imperial, or rather divine majesty, in the temple at Jerusalem. Petronius marched an army into Judæa, but was so much touched with the intreaties of the Jews not to profane their sanctuary, and with their readiness rather to die, than to admit the emperor's statue, that he delayed the commencement of the war, and requested the emperor to revoke his orders: Caius granted this revocation to his favourite Herodes Agrippa, but commanded Petronius to commit suicide for his disobedience. The news of Caligula's death arrived in Syria before the letter in which Petronius was ordered to kill himself, if he would avoid the tortures prepared for him. Thus, Apion's plan to hurt the Jews was providentially foiled. (See Joseph. *Archæologia*, l. xviii. cap. 8.)

Philo's work, entitled περὶ ἀρετῶν καὶ περὶ πρεσβείας πρὸς Γάϊον, *Embassy to the Emperor Caius*, is still in part extant. Apion was esteemed for his learning, but already, before his contest with Philo, he was known at Rome as a man of ostentatious character. Tiberius named him *Cymbalum mundi*, *Cymbal of the universe*, on account of his vain boastings; but Pliny, Apion's disciple, calls him rather *publicæ famæ tympanum*, or the *kettle-drum of fame*. The following writings of Apion we find quoted: *Ægyptiaca*, in five books: this work contained a description of the curiosities of Egypt: *A History according to Nations*; *On the Merits of Alexander the Great*; *Against the Jews*; *On the Luxury of Apicius*; *On the Language of Rome*; *De Disciplina Metallica*; Λέξεις Ὁμηρικαί. But of all these writings, there have only been preserved the story of *Androclus and the Lion* (Gellius, v. 14); and the *Dolphin at Dicæarchia* (Gellius, vii. 8); with fragments from the work against the Jews, preserved by Josephus in his reply.

Flavius Josephus wrote two books on the antiquity of the Jews against Apion after his death. In the first book Josephus refutes the gross mistakes and misrepresentations of Manetho, Berosus, and many other Gentiles who had written without accurate information on the affairs of the Jews. Most of the works against which Josephus wrote are now lost, and only known from his quotations. In the beginning of the second book, Josephus refutes especially the misrepresentations of Apion and his authorities. The dedication of these two books to Epaphroditus, bears some resemblance to the dedications prefixed to the Gospel according to St. Luke, and the Acts, to Theophilus. (See יוסיפון בן גוריון pages 535 and 536, ed. Breithaupt. Seneca, ep. 88. Plin. *Præf. Hist. Nat.* and lib. xxxvi. c. 12, Ersch and Gruber; Suidas, ed. Küster, i. p. 267.)

APIS. [See Bee.]

APIS, a sacred bull, whose station and temple were at Memphis in Egypt. He must be distinguished from Mneuis, the sacred bull of Heliopolis. The real or true Apis was known from among all other bulls by certain marks, which are mentioned by Herodotus and Pliny (iii. 28; viii. 46). His birth is commonly described as miraculous; though produced from a cow, his conception was caused by the descent of lightning, or the influence of the moon's beams. When the bull Apis died, or had been put to death after living the prescribed number of years (according to some authorities), a successor was diligently sought for, and, when found, was installed in his temple of Memphis with all due solemnity. The cow was not eaten in Egypt, but the bull was used as food; yet no bull could be slaughtered till it had been first ascertained that it had none of the marks which characterized a sacred bull. When this was ascertained satisfactorily, the priests put a seal or mark on the animal, to signify that it might be slaughtered: no unstamped bull could be slaughtered, under pain of death. The object of the regulation was probably the raising an income by a tax on slaughtered animals. There might possibly be other reasons also. (Herod. ii. 38.)

The worship of Apis existed at least as late as the reign of Septimius Severus. We hear of Greeks and Romans of rank paying their respects to the bull of Memphis, in which curiosity and superstition appear to have been blended. Alexander the Great, when he visited Memphis, sacrificed to all the Gods, and Apis among the rest, in which he showed more political wisdom than the Persian madman Cambyses, who, 200 years before, had insulted the Egyptians by stabbing their deity. Germanicus Cæsar, when he visited Egypt in the reign of Tiberius, went to see Apis at Memphis. It was a favourable sign when the animal would take food from the hand of his visitor, and the reverse was looked upon as presaging misfortune. The bull refused what the hand of Germanicus offered, and the Roman general died shortly after at Antioch. Strabo describes the Apis and his temple in the following terms, at the time of his visit to Egypt (xvii. p. 807):—'Memphis contains a temple of Apis, who is the same as Osiris. The bull Apis is kept in an apartment (σηκὸς), and is regarded as a god: he is quite white on the forehead and some other parts of the body, but in every other part black. By these marks they always decide which bull is to be the successor of Apis when he dies. In front of the apartment is an inclosure, in which there is another apartment for the bull's mother. They allow the sacred bull to come into this court or inclosure at certain times, and chiefly for the purpose of being shown to strangers.' The bull Apis, it is presumed (Herod. iii. 29.), was embalmed when he died. Lucas says (vol. i. p. 345, *Voyage fait en* 1714) that he observed bulls' heads in several niches of the catacombs of Abousir: he also found a bull embalmed, and in a great chest, on which the head of the animal was represented; the case, he says, was gilded and painted. (See also *Abd-Allatif*, De Sacy, p. 201.)

The deity Apis was probably a symbol of the Nile (see Jablonsky, *Pantheon*, Apis), or of the earth and fertility, as the cow also was in the Egyptian, and still is in the Hindoo mythology. The god Sivas, in the Indian mythology, has his sacred bulls, which are characterized by certain marks, and a colossal bull of stone is often an ornament of his temples. The bull (but not the cow) is an object of worship still in India. (See Colonel Briggs' *Letters on India*, p. 72.) The sacred bulls of Benares still walk about the streets of the holy city, or stop up the road, and cannot be disturbed without all due respect.

The tendency of the Israelites to fall into the idolatrous worship of the bull or cow is seen from the history in Exodus, xxxii.; and at a later period, Jeroboam, who had spent some time in Egypt, set up two calves, one at Dan and the other at Bethel, and established temples and priests, probably in honour of Apis and Mneuis respectively. (See 1 Kings xii.; compare Hosea, chap. x.; Bohlen's *Altes Indien*, i. 252, &c.; Jablonsky's *Pantheon*.)

A'PIUM is the botanical name of a genus of umbelliferous plants, among which the only species of any importance is the common celery, Apium graveolens. This valuable vegetable is found naturally in the ditches of almost every part of Europe; it is even met with in the Falkland Islands, where, if it has originally been carried thither, it has naturalized itself. In this country it is very common in many places, as, for instance, in the ditches near Sandwich.

It is a remarkable fact that this plant, which is so sweet and wholesome when cultivated, is altogether acrid and unfit for food when wild. It is by some supposed that the difference between the quality of the two states is owing to so large a part of the stem and leaves of the cultivated species being hidden from the action of light by the soil which is heaped up about it, and being in consequence unable to generate in much abundance the peculiar principle on which the acridity depends. Whatever may be the value of this explanation, it evidently does not apply to the variety called celeriac, in which the sweetness and wholesome character of cultivated celery are maintained, although no part of the leaves are deprived of the full influence of light.

For the culture of celery and its varieties, see CELERY.

Parsley, which was formerly considered a species of apium, will be noticed under PETROSELINUM.

APLOME. [See GARNET.]

APOCALYPSE. The word apocalypse (ἀποκάλυψις) signifies literally *uncovering*, *unveiling*, and is used in the New Testament to express especially an extraordinary revelation of the will of God. In this sense the apostle Paul speaks of his 'preaching Christ according to the *revelation* (κατὰ ἀποκάλυψιν μυστ.) of the mystery, which was kept secret since the world began, but now is made manifest, by the commandment of the everlasting God made known to all nations for the obedience of faith.'—Rom. xvi. 25, 26. Compare also 1 Cor. xiv. 6, where we find that when the Christians assembled, every one had a psalm, a doctrine, a tongue, a revelation (apocalypse), or an interpretation. In these and similar passages the gift of teaching, of interpreting, and of announcing future events is distinguished from the revelation (*apocalypse*) of the council of God to the spirit of the receiver.

But the word apocalypsis is used in a still more confined sense, to express especially the prophetical revelation of the future development of the Messiah's kingdom. Works which describe future conflicts between the power of the Messiah and the opposing powers of Satan, unbelief and superstition, form the apocalyptical literature. The revelations in these works communicate visions in symbolical language. The *apocalyptical* is a branch of the *prophetical* literature. Every *apocalyptical* book is prophetical, but every prophetical book is not apocalyptical.

Apocalyptic writings develope that future kingdom of the Messiah which constitutes an essential part of the Biblical doctrine in the Old as well as in the New Testament. Apocalyptic, as well as profane, literature, has its epochs and periods of flourishing and of decay; and it is divided into canonical and apocryphal branches.

The first epoch is the Jewish. The book of Daniel is the prototype of all subsequent apocalypses. The fundamental idea of Jewish apocalyptics is the first advent of the Messiah in order to lay the foundation of his kingdom. In the Jewish apocalyptics, everything concerning the Messiah is future.

The second, or the Christian, epoch, of apocalyptic literature begins after the development of Christ's kingdom: consequently, the Christian apocalyptics are clearer than the Jewish. The Jewish apocalyptics still continued after the first advent, as long as the ideas about the Messiah retained great vigour among the Jews; but they degenerated into apocryphal imitations of earlier apocalypses. These apocryphal apocalypses of later Jews were often interpolated by Christians. The decay of Jewish apocalyptics after the first advent was necessary; because Christianity is the only true continuation of Biblical Judaism. The stream of Jewish apocalyptics is lost in the sands of the Talmud. Some account of Jewish apocryphal apocalypses will be given under the articles HENOCH, ESRA, PATRIARCHS, ISAIAH.

In the history of the Apocalypse, we have to consider who was the author of the work who calls himself at the commencement of the first chapter:—'Johannes a servant of the Lord.' Some critics have asserted that this description which the author gives of himself is a proof that the Apocalypse was not written by the apostle St. John, but by another servant of the Lord, who would not assume any apostolic dignity; and, further, that in the usual title of the book (Ἀποκάλυψις Ἰωάννου τοῦ θεολόγου) he is not called St. John the apostle, but only John *the divine*, or the theologian. But most critics suppose that the present title to the Revelations can only refer to that apostle who wrote more explicitly about the divine *logos* (θεοῦ λόγος) than any other of the evangelists. Those who entertain any doubt on this head will find in Suicer's *Thesaurus* that the Greek words from which our terms *theology* and *theologian* are derived, mean respectively in the antient fathers, especially the doctrine of the incarnation of the logos and teachers of the logos. Whoever compares the phraseology, imagery, and doctrine of the Apocalypse with that of the gospel and the epistles of St. John, will, indeed, find a great difference. The Greek style of the Apocalypse is strongly tinctured with Hebraisms, and its imagery is bold. The style of the gospel and the epistles approaches more nearly to the classic Greek, and is almost without imagery.

Polycarp, bishop of Smyrna, a successor of one of those pastors to whom the seven apocalyptical letters in chap. ii. and iii. were addressed, was a disciple and friend of St. John the apostle; and Papias, bishop of Hierapolis near Laodicea, was, according to the statement of Irenæus (*Adv. Hær.* v. 33.), 'a hearer of John and a friend of Polycarp.' Polycarp and Papias were highly esteemed authors. Polycarp's letter to the Philippians is still extant, but of the writings of Papias some fragments only have been preserved. In Polycarp's letter to the Philippians the Apocalypse is not mentioned; but his disciple Irenæus acknowledges its authenticity, and appeals to the testimony of those who had seen the face of St. John.

We have the testimony of the two Cappadocian bishops, Andreas and Arethas of Cæsarea, who lived in the last quarter of the fifth century, that Papias recognised the inspiration and authenticity of the Apocalypse. Andreas says, at the conclusion of his introduction to his commentary on the *Apocalypse*, 'It is unnecessary to make many words about the inspiration of the Apocalypse, since those blessed men, I mean Gregory the theologian and Cyril, and besides these the more antient also, Papias, Irenæus, Methodius, and Hippolytus, testify to its credibility.' Arethas being later, repeats nearly the same statement in the preface to his own commentary. Papias died, according to the

Alexandrine Chronicle, A.D. 163; therefore he must have been very young when he heard St. John, who died about A.D. 98.

Justinus Martyr, who lived between A.D. 140-160, and was nearly contemporary with Polycarp and Papias, was born in Palestine, and acquainted with Alexandria, Rome, and Asia Minor. At Ephesus he held his famous dialogue with Trypho the Jew, which is still extant. Justinus Martyr quotes in this dialogue Jer. lxv. 17, &c.; Gen. ii. 17; Ps. lxxxix. 4, to support his doctrines about the millennium, and adds, that John the apostle, in the Apocalypse, likewise prophesied, that the believers in Christ should dwell in Jerusalem 1000 years before the general resurrection and final judgment should take place.

Melito, bishop of Sardes, to which town one of the apocalyptical letters is directed, belonged to the biblical critics of the second century, and wrote, according to Eusebius, 'on the devil and the Apocalypse of John.' Jerome says, in effect, the same.

Probably at the conclusion of the second century, Theophilus, bishop of Antioch, wrote against the heresy of Hermogenes. This work is lost, but Eusebius, who read it, testifies that Theophilus took some proofs (μαρτυρίας) from the Apocalypse. Theophilus seems also to use apocalyptical language in his work (*Ad Autolycum*, ii. 28); 'the demon (devil) is also called dragon (δράκων).' Hence we infer that the Apocalypse was known in the second century and influenced the language of the Christians.

Eusebius mentions likewise that Apollonius (who was, according to the book *Prædestinatus*, which was written in the fifth century, bishop at Ephesus in the second century) quoted the Apocalypse against the Montanists themselves, although these heretics derived their errors especially from this part of the New Testament.

But the most important testimony in favour of the Apocalypse is that of Irenæus, who died bishop of Lyons A.D. 202. Irenæus, in his work against heretics, quotes long passages from the Apocalypse of John, whom he calls expressly the 'disciple of Jesus' and 'the recipient of the revelation.' This presupposes that its canonical character was then generally recognised. Irenæus defends the apocalyptical number 666 against the spurious 616, by stating that all warranted old manuscripts contained 666, which number was also supported by the testimony of those who saw the face of John. Irenæus modestly confesses his own inability to explain this number, and says: 'If the name of Antichrist were to have been openly proclaimed in our days, it would have been declared by him, who saw the revelation, for it was seen not a very long time ago, but almost in our own age, namely, at the conclusion of Domitian's reign.' This testimony is important, because Irenæus was born in Asia Minor where the Apocalypse was published; and he grew up in friendly intercourse with Polycarp of Smyrna. Irenæus knew the friendly circle of St. John, and the accounts which were in vogue among his disciples. Irenæus had a very extensive acquaintance with the most distinguished Christians in the east and west, and took a lively interest in the religious differences and theological debates of the second century; consequently, we have reason to say, that Irenæus was a qualified witness. There can be no doubt that he believed the *Apocalypse* was written by John. Irenæus mentions that the authenticity of St. John's Gospel was attacked by some, but he mentions no opposition to the *Apocalypse*.

The letter by which the Christian congregations at Vienne and Lyons report to those in Asia and Phrygia the persecutions suffered under Marcus Aurelius, A.D. 177, proves likewise that the *Apocalypse* was then much read and generally recognised in Gaul and Asia. Irenæus was presbyter at Lyons when this letter (see Eusebii *Hist. Eccles.* v. 1-3) was written, and, perhaps, it was drawn up by him or under his direction. The numerous Greeks who migrated from Asia Minor into Gaul probably took with them the *Apocalypse*.

The third century is the most interesting in the history of the *Apocalypse*. The disputes against the Montanists raised, among other theological questions, that concerning the authenticity of the *Apocalypse*. (See MONTANISTS.) Tertullian, in his Montanistical writings, constantly appeals to the *Apocalypse*, and presupposes its genuineness. (Marc. 4, 5.)

It is very important that the spiritualizing Origen not only mentions the *Apocalypse* as being written by John, (*Comment. in Ev. Joannis* ed. Lommatzsch, tom. i. l. 6,) but says very decidedly in his Commentary that John, who reclined on the breast of Jesus, wrote the *Apocalypse*. Origen classified the books then used by Christians into *genuine*, *spurious*, and of *uncertain* authority, and numbers the *Apocalypse* among the *genuine* canonical books.

Origen was the greatest biblical critic of the third century; and it is an important fact that, in investigating the canonical limits of the *New Testament*, he did not meet, either in the schools of Alexandria, or in his numerous theological peregrinations, with any sufficient reason for doubting the apostolical authority of the *Apocalypse*. In spite of opposition from a sect called the *Alogi*, who asserted that the *Apocalypse* was an unintelligible and irrational fabrication of Cerinthus, it maintained its authority to the middle of the third century in churches far distant from each other, and it was used in theological researches and ecclesiastical transactions as a holy writing of the apostle St. John. But the Syrian national church, which was established either at the conclusion of the second or the beginning of the third century, omitted in the *Peshito* the second and third epistles of John, the second of Peter, the epistle of Jude, and the *Apocalypse*. These parts were added to the Syrian *New Testament* in or after the sixth century. But Theophilus of Antioch in the second, and Ephraem Syrus in the fourth century, quote the *Apocalypse*, and ascribe it to John. Hence we perceive that the *Apocalypse*, although wanting in the *Peshito*, was recognized among the theologians of the Syrian church. (Compare *Lengerke de Ephraemi Syri Arte Hermeneutica*, p. 5-8.)

During the fourth century the *Apocalypse* was used in the oriental church by Athanasius, Basilius Magnus, Gregorius Nyssenus, Didymus, Ephraem Syrus, and others. But Cyrillus of Jerusalem, who died A.D. 386, in his fourth Catechesis, advises his catechumens to read only those writings of both Testaments which were received by the church, and to neglect the apocryphal publications. Cyrillus gives a list of these canonical writings in which the *Apocalypse* is omitted. But his fifteenth catechesis seems to contain allusions to the apocalyptical phraseology.

The canon of the synod of Laodicea, which was held about A.D. 363, rejects the *Apocalypse* from the ecclesiastical canon; and so likewise the eighty-fifth of the apostolical canons, which belong, perhaps, to the fourth century.

Gregorius Nazianzenus says, in his verses on the genuine books of the inspired Scripture, after having mentioned all the other books of the *New Testament* except the *Apocalypse*, 'Thou hast them all. If there is another besides these, it belongs not to the genuine.' But the same Gregorius quotes, in his other writings, the *Apocalypse* as if he considered it genuine, and he is mentioned by Andreas and Arethas among those who recognized its inspiration and canonical character. Therefore, it is probable that the *Apocalypse* was reserved to the use of the clergy, who, remembering the Montanistic abuses, endeavoured to get the *Apocalypse* out of the hands of the laity without denying its genuineness. By this conjecture an apparent contradiction is solved.

The general ecclesiastical tradition as to the apostolical origin of the *Apocalypse* continued uninterrupted to the middle of the third century, except by the opposition of the *Alogi*. But Dionysius, a disciple of Origen, and bishop of Alexandria, who died A.D. 265, though he admitted the *Apocalypse* to be above his comprehension and the work of an inspired man, gave various reasons for supposing it not to be written by the apostle John. These reasons were subsequently reproduced in substance by Erasmus, as we shall presently mention; and, indeed, every later opposer has repeated the same arguments.

The synod of Toledo, A.D. 633, speaks of 'many who do not receive the authority of the *Apocalypse*, and despise it so much, that they do not preach it in the church of God;' but with these despisers the synod makes short work, saying, 'the authority of many councils, and the decrees of the Roman bishops, prescribe that it is of John the Evangelist, and appoint that it is to be received among the Divine books.' 'If, henceforth, any one does not receive it, or does not preach from it, between Easter and Pentecost, at the time of mass, he shall have the sentence of excommunication.'—(Harduin, *Act. Con.* tom. iii., 584.)

The synod indicates the then prevailing opinion which continued undisturbed during the middle ages. Isidorus of Seville, who died 636, described in his work, *De Officiis Ecclesiasticis*, the *New Testament* canon exactly as the church considered it henceforth to be established and closed.

According to Isidorus, the *Apocalypse* concludes, as being truly apostolical, the whole canon. But it is remarkable, that the *Decretum Aquisgranense* by Charlemagne, A.D. 789, cap. 20, decrees, that according to the synod of Laodicea only canonical writings should be read in the church. The canon of Laodicea is added, in which the *Apocalypse* is omitted. *Corpus Juris Germ.* ed. Walter, tom. ii. p. 1, p. 77, seq. But it appears from Augusti's *Denkwürdigkeiten aus der Christlichen Archäologie*, b. vi. p. 113, &c., that the *Apocalypse* continued publicly to be read in the Western church.

During the middle ages, the anticatholic sects, as well as orthodox divines, appealed to the canonical authority of the *Apocalypse*, although they differed widely in its interpretation, but with the Reformation began another period in the history of the *Apocalypse*.

Erasmus (*In Annotationibus in Novum Testamentum*, 1516) reminded his contemporaries of the former doubts, and repeated them more fully in the edition of 1527. He states that from the title *Johannes Theologus*, the frequent repetition of John's name, the difference of style, and the manner in which the author speaks of his own visions less modestly than Paul, (2 Cor. xii. 1, *seq.*) who relates them as if they happened to another, we might feel inclined to ascribe the Revelations not to John the Evangelist, if the general consent, and especially the authority of the church, had not already settled its genuineness. Nevertheless he relates, apparently with predilection, the opinions of Dionysius, and the uncertainty of Eusebius whether it belonged to the *Homologoumena* (the admitted), or the *Antilegomena* (the disputed).

What Erasmus had cautiously whispered into the ears of the learned, Carlstadt and Luther proclaimed boldly to the people. Carlstadt, in his book *Welche Bücher Biblisch Seint*, 1520, p. 4, divides the *New Testament* into three classes, the last of which contains the Epistle to the Hebrews, the two Epistles of Peter, the three Epistles of John, the Epistle of Jude, and the Apocalypse; and he adds, that, among all books of the third order, the *Apocalypse* is the least valuable, because, he says, it was not received in the days of Hieronymus by all Christians; secondly, the title is not *Apocalypsis of John the Apostle*, but of *John the Theologian*. Thirdly, its style and manner differ from those of John the Apostle. 'But,' says Carlstadt, 'I will this and the other books of the third order not reject, but only point out the difference.' In the Preface to the *Apocalypse* in the first edition of his *German Testament*, A.D. 1522, Luther writes: 'In this book of the Revelation I leave every one to his own opinion, and I will bind none by my view and conclusion. I say only what I feel. In this book more than one thing is wanting, so that I consider it to be neither apostolical nor prophetical. First, the Apostles deal not in visions, but prophesy in clear and dry words, as do Peter, Paul, and Christ himself in the Gospel. It befits the apostolic office to speak clearly, without imagery, about Christ and his doing. But there is no prophet in the *Old Testament*, much less in the *New*, who so entirely deals in visions and imagery; so that I deem it only equal to the fourth book of Ezra, and indeed cannot perceive that it was dictated by the Holy Ghost.

'It appears too much that the author should recommend his own in preference to other holy books, which are much more important, and that he commands and threatens God would take from him whosoever would take anything from the *Apocalypse*; and again, that they should be blessed who keep what is written therein, although nobody knows what it is, much less can he keep it, and it is just as much as if we had it not. There are also many nobler books which we have to keep. Many of the fathers have in former days rejected this; and although St. Hieronymus, with high-sounding words, asserts that it is beyond all praise, and contains as many secrets as words; he cannot prove it, and various passages of his praise are too mild (namely, towards this book). Finally, everybody may think of it what his own spirit lets him (what he pleases). My spirit cannot accommodate itself to this book, and it is sufficient cause for me not highly to esteem it, that Christ is neither taught nor known in it, which, before all things, an apostle ought to do, because he says (Acts i.), "Ye shall be my witnesses." Therefore I adhere to those books which give me Christ clearly and purely.' This preface of Luther was repeated in all editions until A.D. 1534.

The opinions of the reformer influenced the Lutheran theology during the sixteenth century so much, that it became habitual to divide the *New Testament* into canonical and apocryphal books. To the canonical books only was ascribed an absolute authority in matters of faith; and the Apocrypha, to which the Apocalypse was referred, were considered as subsidiary sources of information. (Compare Oeder, *Christlich freye Untersuchung*, p. 51, 313; Hartwig's *Apologie der Apokalypse*, th. iii. p. 35, 48; Storr's *Neue Apologie*, p. 7, *seq.*; and especially Bleek's *Einleitung in den Brief an die Hebräer*, p. 449, &c.)

In the disputation at Bern, A.D. 1528, one of the Roman Catholic interlocutors declared that the *Apocalypse* was written by St. John, and that wherever the Christian church caused the biblical books to be printed, the *Apocalypse* was among them; but Zwingli replied, it could not be proved historically that the *Apocalypse* was written by the Evangelist. Another Roman Catholic interlocutor complained that the Protestants would not admit the testimonies from the books of Tobit, Baruch, Maccabees, and of the *Apocalypse;* to whom Oecolampadius and Zwingli replied, that the Protestants did not absolutely reject the Apocrypha, but they could not admit their authority in the important matter of faith, and they had not been generally received by the old church. (See Zwingli's *Werke von Schuler und Schulthess*, 2 b. i. Abth. p. 87, 169, &c.) Thus it appears that Zwingli, Oecolampadius, and Bucer, who was present at the disputation of Bern, agreed with Luther and his followers in their estimate of the *Apocalypse*.

The reformers of Geneva, Calvin and Beza, seem to be more favourable to the *Apocalypse*. They quote it often without mentioning the Lutheran classification of canonical and apocryphal books of the *New Testament*. Calvin uses, in his *Institutio Relig. Christianæ*, the Apocalypse as canonical and apostolical, but does not interpret it in his *Commentarii*, and thus obtained the often-echoed praise of Scaliger: 'Calvin was wise not to write on the *Apocalypse*.' Beza defends, in his *Prolegomena to the New Testament*, its authenticity against Erasmus, but adds, that if it were not of St. John, he would ascribe it to St. Mark, on account of the similarity of style. On the authority of these reformers the *Apocalypse* was sanctioned as genuine in the *Confessio Helvetica Posterior*, the *Thirty-nine Articles of the Church of England*, the *Confessio Gallica*, and *Conf. Belgica*, and zealously expounded by Theodori Bibliandri (*Explicatio Apocalypseos*, Basle, 1549, p. 8,) and by Artopœus, (Francfurt, 1549,) and Heinrich Bullinger, who defends it against Erasmus and Luther (*Cent Sermons sur l'Apocalypse*, Genève, 1565). Hyperius (in his *Methodus Theologiæ*, Basle, 1574, p. 48,) did not conceal that its authenticity had been doubted by some, but he declares it to be canonical on the authority of the most antient fathers. So the theory and practice of the so-called reformed (Calvinistic) church were, in the sixteenth century, decidedly opposed to those of the Lutheran.

The Socinians leaned more towards the reformed than to the Lutheran view. Faustus Socinus (*De Auctoritate Scripturæ Sacræ*, opp. i. 268) declares the *Apocalypse* to be genuine.

Towards the middle of the eighteenth century, the doubts about the authenticity of the Apocalypse were revived first in England by a Deist, namely, the unknown translator of *The New Testament in Greek and English, containing the Original Text, &c., dedicated to the Lord Chancellor, Peter King, London*, 1729; and with more penetration by the anonymous author of the *Discourse, Historical and Critical, on the Revelation ascribed to St. John*. It is now known that this Discourse was written by Firmin Abauzit, the famous librarian at Geneva, a friend of Bayle and Newton, at the request of W. Burnet. It was originally written in French, under the title *Discours sur l'Apocalypse*. The original was printed, contrary to the wish of Abauzit, (who died in 1767,) in the edition of his *Œuvres Diverses*, London, 1770. Abauzit's essay gave a new impulse to these critical investigations; and it induced Dr. Leonhard Twells to write his defence of the Apocalypse in the third part of his *Critical Examination of the late Text and Version of the New Testament in Greek and English*, 1732; which contains the first essay of a solid defence of the Apocalypse by internal and external arguments. T. C. Wolf inserted an abridged translation of this work in his *Curæ Phil. et Crit.*, vol. v., p. 387. The excellent work of Twells, which silenced the adversaries of the Apocalypse in England, became known in Germany, where, after thirty years, the combat was renewed.

There was a time when the philologists of Germany generally did not recognize the æsthetical value of the Apocalypse, being influenced by the opinions of Oeder, Semler, and his followers. Herder and Eichhorn, equally learned, without any predilection for orthodoxy, but with more tact than Semler and his school, showed that the despisers of the Apocalypse had only manifested their own want of taste, when they denied the æsthetical value of the Apocalypse; and thus, without being orthodox, Eichhorn facilitated a decision favourable to orthodoxy. Herder observed, that every Christian poet who had a spark of real poesy enjoyed the Apocalypse; that the best hymns of the middle ages, on Jesus, Mary, the church, and the kingdom of God, are crowned with apocalyptical flowers; that Dante, Petrarch, and Milton were imitators of the Apocalypse.

There is in the Apocalypse neither the plastic beauty of the antique, nor the picturesque beauty of our western modern poesy; the oriental poetry loves immensity. The apocalyptical imagination opens heaven and hell, and, rising high above human and terrestrial forms, breaks through the limits of humanity and temporal existence. It calls down the heavenly Jerusalem, dimly shadowed forth by the things temporal. The poetry of the Apocalypse is that of infinity, of destruction, and of endless power.

Bretschneider, Bleek, De Wette, Ewald, Scholt, Lücke, are living divines who have written against the authenticity of the Apocalypse. Their works contain further developments of the old arguments of Dionysius.

Hänlein, Schmidt, Kleuker, Hug, Eichhorn, Feilmoser, Lange, Bertholdt, Guerike, Olshausen, are modern defenders of the authenticity of the Apocalypse; to whom we may add among the English, Lardner and his epitomizers, Dean Woodhouse, the Rev. Hartwell Horne, and others.

The most recent German opposers fairly grant, that the external testimonies are decidedly in favour of the authenticity, but they assert that these testimonies are overcome by the internal philological character of the work.

The Apocalypse has been attacked and defended with greater zeal than any part of the New Testament, because its contents excite a very strong interest either in favour or against this conclusion of the whole Bible. The fundamental idea of the Apocalypse, which Luther and other opposers of the Revelations did not understand, is the following: As Plato, in his books Περὶ Πολιτείας, considers the state to be an exact transcript of individual man, so St. John, taking yet a higher step, tells us in the Apocalypse that similar events, which happen in the life of individuals, shall also take place in the infinity of the whole universe.

As the redemption of Christ saves the whole man,—spirit, soul, and body,—so Jesus Christ saves also the universe from sin and consequent perdition. The Apocalypse teaches by a sublime imagery, what the other apostolical writings more obscurely indicate, namely, that there shall be a period in which the spirit of the Lord shall not only operate in secret by governing the hearts of believers, but a period in which it shall entirely conquer, prevailing against all opposition, and shall finally establish a kingdom of universal peace and justice here on earth.

The leading idea, then, of the Apocalypse consists in the complete victory of what is good, and of Paradise regained, or re-established on earth.

APO'CALYPTIC KNIGHTS (Cavalieri dell' Apocalisse) were a secret society, formed A.D. 1693, professedly for the defence of the Roman Catholic church against Antichrist. The founder of the Apocalyptic order was Agostino Gabrino, the son of a merchant at Brescia. When, on Palm Sunday, 1693, in the church of St. Peter at Rome, the antiphony of Ps. xxiv was sung: '*Quis est iste rex gloriæ?*' 'Who is that king of glory?' Agostino Gabrino stepped forward with a drawn sword among the ecclesiastics, crying out, '*Ego sum rex gloriæ*,' 'I am king of glory.' In a similar manner he disturbed public worship in the church of St. Salvator, and was, therefore, confined in a madhouse. A woodcutter belonging to the Apocalyptic knights laid information before the Inquisition against his order; by this tribunal the order was suppressed in 1694, and the knights confined in prison. About eighty knights, most of whom were tradesmen and labourers, wore constantly a sword at their side, even during menial occupations, and a star upon their breast. This star had seven corners and a tail, and was surrounded by a golden thread, which circle represented the terraqueous globe. The tail of the star represented the sword seen by St. John in the Apocalypse. This order has been accused of an intended rebellion against the papal government and the higher ranks. Agostino Gabrino, called monarch of the Holy Trinity, intended to introduce polygamy, and his knights were to marry pure virgins only. The history even of such a set of madmen is not without its uses: ignorance and fanaticism will, in all ages, produce the same fruits. (See Tenzel's *Monatliche Unterredungen* for the year 1694, pp. 672-677, and of 1697, p. 883, &c.; Ersch and Gruber's *Ency.*)

APO'CRYPHA (ἀπόκρυφοι βίβλοι) are such books as contain secrets and are kept in secret, from ἀποκρύπτειν, to conceal; consequently the term referred to those writings of the Gnostics and other sects which contained the knowledge of those mysteries which were communicated to their partizans only. These books are now known under the name of *pseudepigraphi*, (that is, 'books with false titles,) as the books of Adam, Henoch, the three patriarchs, &c. These volumes formed a kind of heretical canon in opposition to the orthodox canon, and hence arose the signification of the name Apocrypha, which now means *not canonical*, or not belonging to those writings which form the canon of the Holy Scriptures. [See CANON.]

The name *Apocrypha* is especially given to those additions which were introduced into the Septuagint translation of the Old Testament, from whence they were transferred into the Vulgate and many subsequent translations. The reformers separated the Apocrypha from the Old Testament, and Luther placed them between the Old and the New Covenants, under the title of Apocrypha, or books which are not to be esteemed equal to the Holy Scriptures, but are still profitable to the reader. In opposition to the reformers, the Apocrypha were declared to be canonical by the Council of Trent. Hence all translations which follow the Vulgate have the Apocrypha interspersed with the other writings which are admitted by all Christians to be canonical. The Bibles published by Protestants on the Continent place separately—the additions to Esdras; the book of Tobit; Judith; rest of Esther; Wisdom of Solomon; Ecclesiasticus; Baruch, with the epistle of Jeremiah; the Song of the Three Children; Susanna; Bel and the Dragon; the Prayer of Manasseh; the books of the Maccabees. These works, which are principally called the Apocrypha, will be noticed in separate articles. About the year 1821, a debate arose in the British and Foreign Bible Society about the propriety of printing the Apocrypha together with the Holy Scriptures. About 1826, it was decided that the Apocrypha should not be circulated by the British and Foreign Bible Society. Nevertheless the disputes of the two opposite parties were continued for several succeeding years, and many pamphlets were published by both parties, until the apocryphalists were finally defeated by the anti-apocryphalists. Besides the Apocrypha, which form a kind of appendix to the Old Testament and belong to the literature of the later Jews, there are a number of other apocryphal writings of the Old and New Testaments, which have been collected by Fabricius in the *Codex Pseudepigraphus Veteris Testamenti*, and the *Codex Apocryphus Novi Testamenti*, and more completely by Thilo in the *Codex Apocryphus Novi Testamenti*, Lipsiæ, 1832. Most of the apocryphal additions to the New Testament have been collected and published in an English translation by Hone.

APOCY'NEÆ, a natural order of plants, belonging to the monopetalous subdivision of the dicotyledonous class. Among these they are known by their flowers being perfectly symmetrical, the segments of the corolla all twisted one way, like a Catherine-wheel, five distinct stamens, a superior ovarium which, when ripening, divides into two parts, which diverge from each other at right angles, and by their stems yielding, when wounded, a copious milk. The latter is generally poisonous, and that character is to be taken as general in the order, which abounds in plants the action of which upon the human body is more or less violent; among these, the Tanghin poison of Madagascar (see TANGHINIA) and the Nux vomica (see STRYCHNOS) are remarkable instances. Notwithstanding this, some of the species are not unwholesome; as the hya-hya, or milk-tree of Demerara, and the cream fruit of Sierra Leone; caoutchouc is yielded in abundance by Vahea and Urceola elastica; and the bark of several species is a powerful febrifuge. Considering, however, the great prevalence of poisonous qualities in the order, drugs obtained from any of its species should be administered with very great caution, until it has been satisfactorily ascertained that they may be employed without danger. The order Apocyneæ is only distinguishable from Asclepiadeæ by the stamens being distinct from the pistillum, and by the pollen not being contained in little waxy bags.

A'PODES, in zoology, an order of fishes, including, according to the Linnæan system, all those which want the ventral fins, but restricted by Baron Cuvier to those which, besides possessing this character, are likewise malacopterygious. In the latter sense, the apodal fishes compose a small natural family, almost restricted to the great genus Muræna, and of which the common eel offers a good and familiar example.

APOGE'E, from ἀπὸ, *from*, and γῆ, *the earth*, an astronomical term applied to the apparent orbits of the sun and moon, signifying the points of those orbits which are at the greatest distance from the earth. It is opposed to PERIGEE, which means the point nearest to the earth. For general considerations connected with this term, see APHELION, substituting the earth in place of the sun.

The sun is in its apogee when the earth is in its aphelion, and the motion of the solar apogee is the same as that of the earth's aphelion. The motion of the lunar apogee is more complicated. At new or full moon, its longitude is increasing: at the quarters it is decreasing. But the increase, on the whole, is greater than the decrease: so that, on the average, the apogee increases its longitude daily by 6′ 41″, or describes a whole revolution in about nine years. In the *Nautical Almanac* will be found the time when the moon is in her apogee and perigee for every month. For example, we find that in January, 1834, the moon is in apogee at fourteen days eighteen hours (meaning eighteen hours after noon on the 14th, or six in the morning on the 15th, civil reckoning). On referring to the moon's right ascension for that time, we find it twenty-three hours forty-four minutes. For further details, see LUNAR THEORY.

APOLDA, a town in the grand duchy of Saxe-Weimar-Eisenach, about eight miles north of the University of Jena, and forty miles south-west of Leipzig, lying upon the river Ilm. It has a manufactory of woollens and kerseymeres, and a very large one of stockings, of which it produces about 30,000 dozen pairs a-year; linens, brandy, and spirits, are also made in the town. It has two foundries for bells. Population, 3300.

APOLLIN'ARIS, C. SULPI'CIUS, a grammarian who taught under the reign of the Antonines in the second century, at Rome. Helvinus Pertinax was his most famous disciple, and himself taught grammar till he commenced that career which led him to the throne of the Cæsars. (J. Capitol. *Vit. Pertinacis*, c. 1; *Script. Hist. Aug.*) Aulus Gellius, another distinguished disciple, mentions his master repeatedly, and praises his learning, his moderation in refuting, and his urbanity in teaching. (*Noct. Att.* l. iii. 6; xiii. 17, 19; xviii. 4; xx. 6.) The short metrical arguments of the *Comedies of Terence* are attributed to Apollinaris, in a codex in *Epist. Politiani*. Donatus quotes, in his *Life of Virgil*, an epigram of six lines on the Æneid, under the name of Sulpicius of Carthage, who is considered to be the same person as C. Sulpicius Apollinaris.

APOLLIN'ARIS, or APOLLINARIUS (Ἀπολλινάριος), a native of Alexandria, taught grammar at Berytus, a town on the coast of Phœnicia, and afterwards in Laodicea of the same country. Apollinaris married and became presbyter of Laodicea. His son, likewise called Apollinaris, was one of the greatest orators, poets, and philosophers of his age. Apollinaris, the younger, became professor of eloquence at Laodicea before A.D. 335, and afterwards lecturer of the Christian congregation. Both father and son continued their intercourse with learned heathens after their ordination. They were friends of Libanius, and attended the lectures of Epiphanius the sophist, who taught at Laodicea, and afterwards in Athens. On this account, and especially because they were present when Epiphanius recited a poem in praise of Bacchus, they were excommunicated by Theodotus, bishop of Laodicea; but again, on doing penance, admitted into church-fellowship. Georgios, the successor of Theodotus, A.D. 350, being an Arian, banished them, either on account of their continued intercourse with Epiphanius, or on account of their adherence to the Nicene Creed and the friendship of the younger Apollinaris for Athanasius. This friendship had commenced A.D. 349, at the time that Athanasius passed through Laodicea. When Julian forbad the Christians to interpret the Greek classics, the Apollinaris, father and son, composed imitations for the use of schools. The father wrote a grammar for Christians. Socrates (*Hist. Eccles.* iii. 16) attributes to the father some epic poems and tragedies, founded on the history of the Old Testament; but Sozomenus (*Hist. Eccles.* v. 18) ascribes these productions to the son, who transformed also the New Testament into the manner and style of Platonic dialogues. After the death of Julian, the classics were read again, and the imitations of Apollinaris forgotten.

The younger Apollinaris is mentioned (in *Athanas. Ep. ad Antiochenos*, tom. i.; *Opp. ed. Montfaucon*, vol. ii., p. 776) as orthodox bishop of Laodicea A.D. 362, whilst Pelagius was bishop of the Arians in that city. He was esteemed, and had some epistolary correspondence with Athanasius, Basilius Magnus, and other great men of that age, who continued to speak respectfully of his merits, even after he was suspected of heresy. Apollinaris distinguished himself especially by polemical and exegetical writings; for instance, by his work on Truth, against the Emperor Julian and the heathen philosophers. Apollinaris' thirty books against Porphyrius, against the Manichæans, Arians, Marcellus, and others, were highy esteemed. Hieronymus himself, during his residence at Antiochia, A.D. 373 and 374, enjoyed the exegetical instructions of Apollinaris, then bishop of the neighbouring Laodicea. The interpretations of Apollinaris, quoted in the commentaries of Hieronymus, were peculiarly valuable in those days on account of his knowledge of the Hebrew tongue. Basilius Magnus mentions a work of Apollinaris on the Holy Ghost; and from the works of Gregorius Nazianzenus we learn that his hymns and psalms were often sung in Christian congregations, and much admired. In the year 1552 was published at Paris, a *Metaphrasis Psalmorum* of Apollinaris; and re-edited by Sylburg at Heidelberg, in 1596; this, and the tragedy on the suffering of Christ, in the Works of Gregorius Nazianzenus, were ascribed to Apollinaris, but appear to some critics to be unworthy of his talents.

In the latter part of his life, Apollinaris, who had strenuously defended the Athanasian doctrine of the Trinity, himself incurred the reproach of heresy, because he taught that the divine *logos* occupied in the person of Christ the place of the human soul. According to him, Christ was (ἔνσαρκος) *incarnate*, but not (ἔμψυχος) *insouled*. His disciples, who were very numerous, were called Apollinarists. His heresy became generally known A.D. 371. The accusation of Socrates, Sozomenos, and Theodoret, against the character of Apollinaris, and the low notions which are said to have led him to embrace his peculiar views, are inconsistent both with the chronology and circumstances of his life. Apollinarism was first condemned at the synod held at Rome, A.D. 375, in which the Roman bishop Damasus presided; all mention of the name of Apollinaris was carefully avoided on this occasion. Nevertheless this condemnation induced Apollinaris to form a separate congregation, over which he ordained the presbyter Vitalis as bishop. Hence the Apollinarists are also called Vitalians. They are also called Dimœrites, because they were accused of dividing the nature of Christ into two parts.

Before the death of Apollinaris, which happened between A.D. 382—392, the Apollinarists formed in Syria and the adjacent countries several separate congregations having their own bishops. After his death, the Apollinarists were divided into two parties, one of which, under Polemo, or Polemius, and Timotheus, pretended that the divinity and the body of Christ were transformed into one substance, and, consequently, that the flesh was to be worshipped as well as the *logos*; these were called Polemians and Synousiasts, and also *sarkolatræ* (σαρκολάτραι, flesh-worshippers); in retaliation, they called the orthodox *anthropolatræ*, or men-worshippers. The other party, which adhered to the original doctrine of Apollinaris, were called Valentinians.

By imperial command, the public worship of the Apollinarists was impeded A.D. 388 and 397, and A.D. 428 in all towns entirely prohibited. The sects of the Apollinarists assimilated, in the fifth century, partly to the orthodox, and partly to the Monophysites [see MONOPHYSITES].

APOLLO, one of the principal gods of the Grecian heaven, also named Phœbus, and in Homer and Hesiod most commonly called Phœbus Apollo (Φοῖβος Ἀπόλλων). He was the presiding deity of archery, prophecy, and music, and in later times of the sun: but in the early poets abovementioned, the sun (Helius) is a different personage, and of different extraction, the son of Hyperion and Theia. (*Theog.* xviii. 371: see also the adventures of Ulysses in the island of Thrinakia, where the oxen of the sun, not of Apollo, are always spoken of.) According to Herodotus, (ii. 156,) Apollo is the same with the Egyptian Horus, the son of Dionysus and Isis. The Grecian deity was the son of Zeus and Leto (Jupiter and Latona). His mother, when the time of travail drew nigh, wandered through the earth, unable to find a place which would give her rest; for every land, and river, and mountain, feared too much the wrath of Hera, (Juno,) the jealous queen of heaven, to receive her. At last Delos, which was then a floating island driven about the Ægean sea, and called Asteria, afforded her a place of repose, and Apollo was born. He immediately proclaimed his functions to the assembled goddesses who watched his birth. 'The harp, the curved bow be mine, and I will proclaim to men the unerring counsel of Zeus.' (*Hymn to Apollo*, v. 131.) Thenceforward Delos was fixed. Leto promised, in return for the shelter afforded, that her son should honour that humble island above all other places; and it was always held especially sacred to him, and the principal seat of his worship. This story is beautifully related in the Homeric hymn above quoted, and in the Hymn to Delos by Callimachus. Apollo is a leading personage in mythological fiction, and a favourite with the poets, who have engaged him in a great variety of adventures. He was the president and protector of the muses. He is usually represented in the prime of youth, and manly beauty, with long hair, his brows bound with the sacred bay-tree, (*Daphne*,) bearing either the lyre, or his peculiar weapon, the bow. In later times he usurped the presidency of the healing art from its earlier deity, Paieon; hence Æsculapius was said to be the son of Apollo. The hawk, the raven, the swan, the grasshopper, (*cicada*,) were his favourite animals. His principal temples were at Delos, Delphi, Tenedos, Patara, Claros, &c.; and from these he derives a great variety of distinctive epithets. He has many others peculiar to himself, which principally refer to his skill in archery, or may be interpreted to contain some allusion to the sun; as far-shooting, silver-bowed, golden-haired, golden-sworded, light-producer, &c.

The word Phœbus is apparently connected with a Greek root, signifying *light;* but the origin and meaning of the word Apollo are entirely unknown. In later writers, and by the Latins, who do not appear to have had an antient sun-god of their own, Apollo and the sun are confounded. It is observable, however, that Ovid, in the stories of Phaeton, and Clytie, which have especial reference to him in his character of the sun, always uses the word Sol, not Phœbus or Apollo, except once (ii. v. 399.) at the conclusion of the former (Met. ii. 1. iv. 190). In Homer and Hesiod, as we have said, the two are clearly distinct. It is maintained, however, by some mythologists, and among them by Buttmann, that originally Apollo and Artemis were the sun and moon, and that those later writers who assigned to those deities the presidency over the two great luminaries, only revived the original belief which had fallen into disuse. Buttmann supports his opinion on the grounds that, 'leaving out Apollo and Artemis, there are two places vacant in the list of deities necessary to be found with a people in the state of culture in which the early Greeks were (for Helius and Selene he regards as deities of a later age); that the attributes of Apollo, his golden-sword, arrows, flowing locks, and the epithets given to him, all apply to the sun, as do those of Artemis to the moon; that they are brother and sister, and the children of Leto, (i. e. Night); the attributes of prophecy and archery, he says, would naturally be given to the sun-god, whose eye surveys every thing, and whose beams penetrate every where; and no more suitable patroness could be chosen by the hunter, who lay at night among the mountains, than the moon-goddess, whose mild radiance guided him through the woods and lawns.' (Keightley's *Mythology*.)

APOLLO BELVEDERE, a celebrated statue of Apollo, found at Capo d'Anzo, in the ruins of antient Antium, about twelve leagues from Rome, towards the end of the fifteenth century. It was purchased by Pope Julius II., before his elevation to the pontificate; and was placed by him in the Belvidere of the Vatican, whence it derives its present name. It has been said to be the work of Agasias the Ephesian, but no certain indications of the sculptor are to be traced. But it is now pretty well proved that it was made under the emperors, and probably by the order of Nero himself. (See Thiersch, *Ueber die Epochen der bildenden Kunst*, &c., p. 312, &c., second edition, 1829, p. 459.)

This statue, one of the finest specimens of sculpture extant, is a standing figure, more than seven feet high. It represents the god naked, except the cloak which is fastened round his neck, and hangs over the extended left arm. The left hand and the right fore-arm were lost, and were restored by Giovanni Angelo da Montorsoli, a pupil of Michael Angelo: so that the original action of the figure can only be conjectured. It was supposed, however, to represent the god at the moment of having discharged an arrow at the serpent Python, watching the effect of his weapon: and accordingly, in the restoration, part of a bow was placed in the left hand. A serpent, the emblem of the healing art, is fixed on the stump of a tree, which gives stability to the figure. We quote Lord Byron's fine description of it.

The lord of the unerring bow,
The god of life, and poesy, and light,
The sun in human limbs arrayed, and brow
All radiant from his triumph in the fight;
The shaft has just been shot—the arrow bright
With an Immortal's vengeance; in his eye
And nostril beautiful disdain, and might,
And majesty, flash their full lightnings by,
Developing in that one glance the Deity.—
Childe Harold, iv. 161.

(See also the Homeric Hymn to Apollo, v. 357, &c.; and *Pen. Mag.*, vol. i., p. 362.)

APOLLODO'RUS, a celebrated grammarian of Athens, of whom an account is given by Suidas. He was a pupil of Aristarchus. Of his voluminous writings, only three books of his *Bibliotheca*, a mythological work, have come down to us. He wrote a chronicle, or history in Iambic verse, extending from the destruction of Troy (B.C. 1184) to his own times (about B.C. 144). (See *Scymnus Chius*, v. 19-49.) Among his other writings was a treatise on the Gods, on the Mimi of Sophron, and on other subjects. Scipio Tetti, a Neapolitan, has written a treatise concerning the persons of different professions and various merit, who have borne this name. The first edition of Apollodorus was by B. Ægius of Spoleto, 1555, 8vo., Rome. The best editions are by Heyne, 1782-1783, four volumes, and 1802, two volumes octavo; and that by Clavier, Paris, 1805, two volumes octavo, with a French translation. Dr. Thomas Gale published a bad edition in 1675.

APOLLODORUS, a celebrated architect in the reigns of Trajan and Hadrian, was born at Damascus. The magnificent stone bridge built over the Danube, A.D. 104, by order of Trajan, was executed under his direction. The remains of this bridge still exist near the junction of the Aluta or Alt and the Danube. He is also said to have been the architect of the Forum Trajanum, in which the column of Trajan stands, and to have built a library, a music-hall (Odeum), baths, and aqueducts. It is said that Hadrian put him to death on some false and frivolous pretence. Apollodorus is the author of a work on besieging towns (Πολιορκητικά) printed in the collection of Thevenot.

APOLLODORUS, an eminent Athenian painter, who lived about four centuries B.C. (See Plin. *Nat. Hist.* xxxv. 9.)

APOLLO'NICON, the name given to a chamber organ of vast power, supplied with both keys and barrels, built by Messrs. Flight and Robson, of St. Martin's Lane, and first exhibited by them at their manufactory, in 1817. The word is formed from Ἀπόλλων (*Apollon*), and a Greek termination, *ικον*, *icon*, of common occurrence. The denomination does not appear to us the best that might have been suggested; but, being of Greek origin, was probably thought likely to captivate the multitude, who still entertain a lurking respect for whatever is conveyed through the medium of an antient, to them unknown, language.

The *Apollonicon* is either self-acting, by means of complicated, but very ingenious machinery, or may be played on in the usual manner, by means of keys. The music, when the organ is worked by machinery, 'is *pinned* on three cylinders or barrels, of about two feet eight inches long, each acting on a distinct division of the instrument; and these, in their revolution, not only admit air to the pipes, but actually regulate and work the stops, forming, by an instantaneous action, all the necessary combinations.' The key-boards are five in number; the central and largest comprising five octaves, and the smaller ones, of which two are placed on each side the larger, two octaves each. To the central key-board are attached a swell and some compound pedals, enabling the performer to produce all the changes and variety of effect that the music may require. There is also a key-board, comprising two octaves of other pedals, operating on the largest pipes of the instrument. 'These six key-boards are detached from the body of the organ, so that the performers sit with their backs to the instrument, and, consequently, with their faces to the audience.' There are 1900 pipes, the largest twenty-four feet in length, and one foot eleven inches in aperture, sounding the G, two octaves below the first line of the base, the highest giving the A in altissimo, two octaves above the second space in the treble. The number of stops is forty-five, and these in their combinations afford very good imitations of the various wind instruments used in an orchestra. Two drums are also inclosed in the case, and struck by a curious contrivance in the machinery. A tolerably correct estimate of the capabilities of this instrument may be made, when it is stated that it performs Mozart's Overtures to the *Zauberflöte*, *Figaro*, and *Idomeneo;* Beethoven's to *Prometheus;* Weber's to the *Freischütz* and *Oberon;* Cherubini's to *Anacreon*, &c., without omitting a single note of the score, and with all the fortes and pianos, the crescendos and diminuendos, as directed by the composers, with an accuracy that no band can possibly exceed, and very few can reasonably hope to rival. The *Apollonicon* was five years in building, and at an expense of about ten thousand pounds.

APOLLO'NIUS DY'SCOLUS, or ALEXANDRINUS MINOR, a grammarian, who was born at Alexandria in the second century of the Christian æra, and of whose private history we only know a few facts gleaned from Suidas and from a sketch of his life by an anonymous writer, prefixed to the edition published by Sylburgius of the work of Apollonius *On Syntax*. He was the son of Mnesitheus and Ariadne, and is said to have been so poor that he was unable to afford money sufficient even to purchase paper. It was probably this state of poverty which had an effect on his temper, and procured him the name of Dyscolus, or the morose. This second appellation was intended to distinguish him from Apollonius Rhodius, who is sometimes called Alexandrinus Major. He was the author of many works; he was called by Priscian 'Princeps Grammaticorum,' and afforded to that grammarian many hints for his *Latin Grammar*. Of his four remaining works the chief is a *Treatise on Syntax*, in four books, the first edition of which is by Aldus, 1495, Venice. An improved edition was made by Sylburgius, with a Latin translation of Æm. Portus, 1590; the last is by Bekker, Berlin, 1817. At the end of the *Treatise on Greek Dialects*, by Maittaire, Hague, 1718, Lips. 1807, there are some extracts of the Grammar of Apollonius, which were procured by Vossius from a manuscript of the Royal Library of Paris. There is also a work attributed to him, 'Ιστορίαι θαυμάσιαι, *Wonderful Stories*, the best edition of which is by Meursius, Lugd. Bat. 1620; but it is not without reason that many have doubted whether he could be justly considered the author. It has been published also by Teucher, Lips. 1792.

APOLLO'NIUS, (PERGÆUS,) after Archimedes, the most original and profound of all the Greek geometers, was born at Perga in Pamphylia, while Ptolemy III., commonly called Euergetes, was king of Egypt. Ptolemy began his reign B.C. 247.

Apollonius was in the zenith of his fame about the end of the reign of Ptolemy (IV.) Philopator, who died B.C. 205. Apollonius and Hannibal were nearly contemporary both as to birth and achievements in their different lines. Archimedes died B.C. 212, at which time Apollonius was living; it is not known when the latter died.

The life of Apollonius was passed at Alexandria, in the school of the successors of Euclid, under whom he studied. Of its details we know nothing, except that Pappus (who lived, however, as long after him as the fourth century) represents him as vain and envious that Heraclius, who wrote the life of Archimedes, asserts that he surreptitiously obtained the discoveries of the latter, and published them as his own: and that he had a son of the same name as himself. With respect to the charge of plagiarism, Eutocius, his commentator, (about A.D. 540,) who cites the charge, answers it sufficiently by saying, that it was well known that neither Archimedes nor Apollonius pretended to be the first investigators of the conic sections. Bayle objects to this defence, and finds a better one in the silence of Pappus on the subject, who, though disposed, as we have seen, not to think too favourably of the merits of Apollonius, does not take notice of the charge. To this we would add that Vossius (though Bayle takes it differently) understands Pappus as saying, that Apollonius wrote commentaries upon the four books of conic sections written by Euclid, and added four more to them; thus recognizing him as the author of that part of the work on which, as we shall see, his fame principally depends. We shall also, in the proper place, show grounds for doubting the assertion of Pappus with respect to the books of Euclid.

Of the most interesting part of an eminent man,—his opinions on disputed subjects,—we know but little in the case of Apollonius. Gassendi, in his life of Copernicus, mentions an opinion attributed by the latter to the Grecian geometer, and which is said to have been also that of Philolaus, that the sun and moon only moved round the earth, but all the other planets round the sun. This, so far as appearances only are concerned, is a sufficient explanation of all the phenomena; and, next to the system now received, is the soundest of hypotheses. We cannot find any other authority for attributing this opinion to Apollonius, except Weidler in his *Historia Astronomiæ*, who however cites Gassendi as his authority. But Apollonius certainly paid attention, at least, to the then received system, since known by the name of the Ptolemaic, for Ptolemy has preserved some theorems of his on the method of finding the stationary points of the planets, supposed to move in epicycles. Proclus, in his commentary on Euclid, mentions that Apollonius attempted to prove the axioms, and cites his investigation of the theorem, that things which are equal to the same are equal to one another, in which, as may be supposed, propositions are assumed not more obvious than the theorem itself. The same author gives a definition of an angle which he attributes to Apollonius, but which we confess ourselves unable to understand. Vitruvius cites Apollonius as the inventor of a species of clock which he terms *pharetra*.

The great work of Apollonius which now remains is seven books of his treatise on conic sections, of which we shall presently speak. But besides this, he is known to have written treatises, according to Pappus, *De Rationis Sectione*, *De Spatii Sectione*, *De Sectione determinatâ*, *De Tactionibus*, *De Inclinationibus*, *De planis Locis*, and according to Proclus, *De Cochleâ*, and *De perturbatis Rationibus*. Most of these names would require circumlocution to make them more intelligible in English, and we therefore cite them as they are usually referred to. Of these, the first only is known to us, having been found in Arabic, and published in Latin by Halley in 1708, with an attempt to restore the second. But Mersenne, cited by Vossius, says he read, in an Arabian author, Aben Eddin, an assertion that all the works of Apollonius, more in number than those mentioned by Pappus, were in Arabic at the beginning of the eleventh century. This point is even yet worth the attention of those who pursue oriental literature.

About the end of the sixteenth century, it was a very common exercise of mathematical ingenuity to endeavour to *restore* these and other lost treatises, that is, from the fullest notion which could be gathered, to guess at the propositions which they might have contained. Such attempts gave rise to the *Apollonius Gallus* of Vieta, the *Apollonius Batavus* of Snellius, and other works of Maurolico, Ghetaldi, Adrianus Romanus, Fermat, Schooten, Anderson, Halley, R. Simson, and others.

The conic sections of Apollonius are in seven books, the first four of which are extant in Greek, with the commentary of Eutocius of Ascalon, above-mentioned. The three next were supposed to be lost, till the middle of the seventeenth century, when James Golius, a celebrated oriental professor of Leyden, returned from the East, with the whole seven books in Arabic. Some delay took place in their translation and publication, during which, in 1658, Borelli accidentally discovered an Arabic manuscript in the Medici library at Florence, of the same seven books. It does not a little serve to illustrate the use made of public libraries, that while one author after another had for years expressed regret at the loss of the last four books, three of them should be lying in one of the most celebrated libraries in Europe, in the heart of a capital city, with an Italian title-page. Borelli, and Abraham Echellensis, an oriental professor at Rome, translated from the Arabic, and published their version in 1661. At the time of the discovery, Viviani was engaged in *restoring* the lost books, and when it was made known, he prevailed on the Grand Duke of Tuscany to mark all his papers, and to order Borelli to keep the contents of the new books secret. The work of Viviani, well known as an acute and accomplished mathematician, was found (see Montucla, i., 250) to fall short of that of Apollonius on several important points, though, as might be expected, the views of the Italian of the seventeenth century were more extensive in many cases than those of the Greek. The eighth book was still wanting, and a note to the version imported by Golius informed the reader that it had never been found, even by the Arabs, in the Greek. But when the Oxford press, at the commencement of the last century, was employed upon the magnificent versions of the Greek geometers, which are still the best in public use, Dr. Aldrich, observing that the preliminary Lemmas of Pappus to the seventh book were asserted to belong to the eighth, and also that the latter appeared, from the words of Apollonius himself in his introduction, to be a continuation of the former, proposed to Halley that he should endeavour with these lights to re-establish the missing book. Halley was then employed in completing the edition of the work, which the death of Dr. Gregory had interrupted, and he acceded to the suggestion. The whole appeared at Oxford, in 1710, with the commentary of Eutocius, the Lemmas of Pappus, and in addition, the work of Serenus on the same subject. This is the only edition of the Greek text.

The contents of the work are thus briefly described by Apollonius, of whose words we give a free translation. 'The first four books are elementary: the first contains the generation of the three sections of the cone, and of the sections which are styled opposite, and their principal distinctive properties, which have been treated by us more fully and generally than by any of our predecessors. The second book contains the properties of the diameters, and axes, as well as of the asymptotes, and other matters of general utility: you will hence see what *I have called* diameters, and what axes. The third book contains many and wonderful theorems, which are useful in the composition of solid loci, of which the majority are both new and beautiful. The fourth book shows in what manner sections of a cone, or of opposite cones, may cut one another, and the circumference of a circle, on the whole of which nothing has been delivered by those who went before us. The remaining four books treat of the higher part of the science: the fifth, on maxima and minima: the sixth, on equal and similar sections: the seventh, on *dioristic* theorems, or theorems useful in the solution of problems: and the eighth, on the problems thus solved.'

Apollonius was the first who used the words *ellipse* and *hyperbola*, of which Archimedes does not take notice, though he uses the term *parabola*. He also, as we see above, first distinguishes the *diameters* of the section from the *axes*. It was, moreover, in his time, and perhaps first by himself, that the *general* sections of the cone were considered; for previously it had been usual to treat only of those, the planes of which were at right angles to one of the sides of the cone; so that an ellipse could only come from an acute angled cone, and so on. Though Archimedes was aware that all the sections of any cone were of the same nature as those of the limited character above-mentioned (at least it is customary so to state), yet all testimony is against this having been known in the time of Euclid. If, therefore, Apollonius really took the books of Euclid, as according to Pappus he did, he must have so changed the face of them, by generalizing the method of cutting the cone, and introducing the properties of diameters, that they must have differed as much from their original in form and matter as one book can from another. To conclude the subject of the authorship, we remark, in reference to the charge of Heraclius above-mentioned, that the styles of Archimedes and Apollonius are very different: the latter has by no means the power of the former in the management of his demonstrations, and though remarkable for the originality and beauty of the results which he produces, is even tedious in the method of obtaining them. A supposition of Mydorge, which once created considerable discussion, viz., that the fifth, sixth, and seventh books were the work of some Arab under the name of Apollonius, deserves no attention. He must have been but a foolish Arab who would have been willing to relinquish the credit of having written the fifth book.

The most remarkable book in the whole work is the fifth, which treats of maxima and minima. With a little licence it might be called a complete treatise on the curvature of the three sections, for in considering the number of maxima and minima which can be drawn to the section from any point in its plane, the space inside and outside of the evolute has different properties. There is only wanting the addition of a name for the curve which separates the spaces (which we now call the evolute). This book, and the quadrature of Archimedes, are the highest points of the Grecian geometry.

The work of Apollonius was lightly spoken of by Descartes, who is supposed to have seen the first four books only; but it was held in particular estimation by Newton, and Cardan places its author *seventh* among all the men who have ever lived: in his own age he was called the *great geometer*.

We now briefly mention some of the principal editions of the conics. The celebrated Hypatia, daughter of Theon, wrote a commentary upon them. We have already mentioned Pappus and Eutocius as commentators, Borelli and Halley as editors. Among the Arabs, it was first translated by Thebit-ben-Cora, under the Calif Al Maimun in the ninth century: by Abalphat, in the tenth; and two editions, of little celebrity, appeared in Persian in the thirteenth. In Europe, it was first translated, but badly, by Memmius, a Venetian, in 1537; by Maccolyco about the same time, but we cannot learn that this edition was over published; also by Commandine in 1566, (mis-printed 1666, in Murhard,) and by the Jesuit Claude Richard in 1655. Montucla is incorrect in saying that this edition was announced and never published. See Murhard, *Bibl. Math.* ii., 322; also Bayle, art. *Apollonius*, and Vossius, *de Sci. Math.* (Index, *Claudius Richardus.*) In 1669, Ravius published a translation, of which Halley remarks, that it is more barbarous than can easily be imagined. In 1679, Barrow published the first four books.

Apollonius is supposed by some, among others by Vossius, to be the author of a commentary on Aratus: but Grotius, in his edition of that poet, takes no notice of the report, and as it is believed that Apollonius, the grammarian, also commented on Aratus, the two may have been confounded. Wallis, who held that the antients possessed a certain algebra which they disguised, seems a little inclined to found this opinion upon a title-page which he discovered in the Savilian library (the rest being cut away). It was *Liber de Arte Notoriâ, secundum Apollonium*, but he also suspects that the *Ars Notoria* may be *magic*, and the *Apollonius* may be Apollonius of Tyana. Algebra was called by many Italians *ars magna*, or *arte maggiore*. That Apollonius did improve the notation of arithmetic appears from the praise given to him by Eutocius, in his commentary upon the quadrature of Archimedes, for a work which he calls Ωκυτόβοον. The word is probably corrupt; Vossius reads Ωκυβόη, and Halley Ωκυτόκιον. In the *editio princeps* of Archimedes, Basle, 1543, the Greek is as usual, but the Latin translation gives Mocyntocium. Pappus more explicitly states that the improvement consisted in a simplification of the method proposed by Archimedes for representing very large numbers, which brought the system nearer to that of the moderns. (See Delambre, *Hist. Ast. Anc.* ii. 9.) Eutocius also says, that Apollonius extended the quadrature of the circle given by Archimedes.

APOLLO'NIUS RHO'DIUS, a Greek epic poet, respecting whose personal history only a few facts have come down to us, and even these are by no means well authenticated. Whether he was a native of Alexandria in Egypt, or of Naucratis, a small town on the Canopic branch of the Nile, is a point impossible to determine; but we know that he derived the surname of Rhodius from his long residence in the island of Rhodes. He was the son of Silleus, and spent his early years at Alexandria under the direction of the poet Callimachus. The exact periods of his birth and death are unknown; but we are able to fix some points in his history from other circumstances. Thus we know that Callimachus died about B.C. 230, so that he must have been acquainted with this poet at an early age, and Apollonius succeeded Eratosthenes as keeper of the great library of the Ptolemies at Alexandria, B.C. 194. The cause of his quarrel with Callimachus can only be guessed at: it is said to have been respecting the *Argonautica* of Apollonius, which was not sufficiently admired by Callimachus. In what way the disappointed poet took his revenge we are not told; but it must have been effective, if we may judge from the bitter retort it produced from Callimachus. His poem entitled *Ibis* was directed against Apollonius, and though no fragments of it remain, we can form some opinion of its character and leading features from the *Ibis* of Ovid, which is said to be an imitation of this poem. Apollonius left Alexandria, probably, in consequence of this quarrel, and took up his residence at Rhodes, where he lived for many years, and was at last recalled to his native country to occupy the place of the learned Eratosthenes. These few facts are gleaned from Suidas, and from a short account of his life prefixed to two of the most antient manuscripts.

Of all his works only one poem remains, entitled *Argonautica*, in four books, containing 5835 verses, and giving a detailed account of the wanderings of the Argonauts. This was a favourite subject with the antient poets; but how much Apollonius borrowed from his predecessors Herodorus and Epimenides, or whether he servilely copied Cleon in the whole design of his work, as an antient scholiast asserts, we have no means of determining. The opinion of Quintilian (x. 1, 54) seems to be just and impartial. He considers the poem as possessed of considerable merit, but greatly deficient in true poetic spirit. (See also Longinus *on the Sublime*, xxxii.) It is easy to perceive that Apollonius does not possess the qualities which constitute a great poet: he impedes the narrative with a minute and superfluous detail of circumstances till the reader's patience is fairly worn out. There is an affectation too of learning which often degenerates into pedantry. He has been most successful in his treatment of the tender passions: nothing can be more beautiful than the manner in which he paints the gradual progress of Medea's love for Jason till it became one absorbing passion. In this he is not surpassed by Virgil, who is said by Macrobius (*Saturn*. v. 17, ed. Bipont.) to have borrowed his idea of Dido's love for Æneas from this part of the poem of Apollonius.

Many learned Greeks wrote commentaries on Apollonius: and the Latin poet Valerius Flaccus closely imitated him in his work, also entitled *Argonautica*. Terentius Varro translated it into Latin: in still later times it was turned into Iambic verse by Marianus. The first edition of this work was published at Florence, 1496, and is of great value to book collectors. That of Beck, Lips. 1797, containing the text of Brunck with some corrections, a good Latin version, and an excellent table of contents, is one of the best editions. A. Wellauer published a new edition at Leipzig, 1828, 2 vols. 8vo. It has been translated into English by Green, Fawkes (1797), and Preston (1803); into Italian by Flangini (Roma, 1791); into German by Bodmer (Zürich, 1779); and into French by Caussin (1797). For explanatory works, the reader may consult Schoenemann, *Comment. de Geograph. Argon.* Götting. 1788; Gerhard, *Lectiones Apollonianæ*, Lips. 1816; Weichert, *Ueber das Leben und das Gedicht des Apollonius von Rhodus*, Meissen, 8vo. 1821.

APOLLO'NIUS, a celebrated statuary of the island of Rhodes, who, along with Tauriscus, executed a group in marble which represented Zethus and Amphion binding Dirce to the horns of a furious bull, to avenge their mother, Antiope, whom she had cruelly persecuted. This group, described by Pliny (xxxvi. 4), is supposed, with much probability, to be what is known to us under the name of the Toro Farnese, found during the reign of Paul III. in the ruins of the Baths of Caracalla. It must not, however, be supposed that we see it exactly in the state in which it was found. The lower half of the figure of Dirce, the two trunks and a leg of Zethus and Amphion, were the only remnants of the antient sculptors, but it is sufficient to prove that the art was then in its highest degree of perfection. The group has been restored in the very worst taste by a Milanese artist, Batista Bianchi. We have no means of discovering, with any degree of certainty, at what time Apollonius lived, but some have imagined that it was a few years after Alexander the Great. (See Piranesi, *Statue;* Maffei; Winkelmann, vi. i. p. 128; Müller, *Handbuch der Archäologie, &c.* p. 137.

APOLLO'NIUS, a celebrated statuary, the son of Nestor of Athens, only known to us from his name being inscribed on the fragments of a statue which was discovered in the fifteenth century, and is now called the Torso Belvedere. It has neither head, arms, nor legs, and yet it is considered one of the master-pieces of antiquity. Michael Angelo made it his grand object of study; and so enthusiastic was he in his admiration of it, that even after his sight failed him, he used to be led to it that he might enjoy the pleasure of feeling it with his hands. All agree as to its being one of the finest specimens of antient sculpture, but there is some doubt as to the period when Apollonius lived. Meyer, in his *History of Greek Sculpture*, p. 296, imagines that he discovers a great resemblance between the Torso Belvedere and the Ilissus of the Parthenon, while Thorwaldsen, acknowledging fully the merits of the statue, considers it the production of a much later age. Others think that this opinion is confirmed by the particular form of the letters in the inscription, but no dependence can be placed on this circumstance, as the name may have been inscribed centuries after the statue was executed. Visconti, Pio Clementino, t. i. plate x; Winkelmann, x. iii. s. 15; Thiersch, *Kunst-Epochen*, p. 333.

APOLLO'NIUS, the Sophist, supposed to have lived at Alexandria in the time of Augustus, is the author of a Lexicon of Homeric words, entitled Λέξεις Ὁμηρικαί. It was first published by Villoison at Paris, in 1773, in two vols. 4to., accompanied by a commentary and prolegomena. The work was reprinted at Leyden in 1788, 8vo., with notes by Tollius, but with the omission of Villoison's Latin translation and prolegomena.

APOLLO'NIUS of Tyana was born, at the commencement of the Christian æra, in Tyana, a town of Cappadocia. At the age of fourteen, his father, Apollonius, sent him to Tarsus, to study grammar and rhetoric under Euthydemus, a Phœnician. Dissatisfied with the luxury and indolence of the citizens, Apollonius obtained his father's permission to retire with his master to Ægæ (Ayas), a town near Tarsus, where he became acquainted with the doctrines of various philosophers. His master, Euxenus of Heraclea in Pontus, was little disposed to practise the austerities of the Pythagorean and neo-Platonic sects, the doctrines of which he professed. Apollonius observed the Pythagorean rules more strictly, took up his abode in the temple of Æsculapius at Ægæ, famous for miraculous cures, abstained from animal food and wine, lived upon fruits and herbs, avoided in his dress every article made of animal substance, walked barefoot, and let his hair and beard grow. The priests initiated him in their mysteries, and said that Æsculapius himself rejoiced at having Apollonius a witness of his cures. Apollonius recommended his moral and ascetic doctrines by example, and by an appeal to the heathen gods. He healed a young Assyrian afflicted by a disease which was a consequence of intemperance, by teaching him that the gods were willing to give health to all who were willing to receive this gift. Having finished his studies at Ægæ and other cities of Cilicia and Pamphylia, Apollonius travelled by land to India. At Niniveh he met with Damis, who became his interpreter and travelling companion. On a rock of Mount Caucasus he saw the chains of Prometheus. King Bardanes, his priests, and magi, honoured him at Babylon. In Taxila, a town of India, he met with the king, Phraortes, a descendant of Porus. In India he also saw a woman consecrated to Venus, who was black from the head to the chest, and white from the chest to the feet. He joined a party who hunted dragons by magic. The eyes and scales of these dragons shone like fire, and were talismans. He saw the animal *martichoras*, (mentioned four centuries before by Ctesias,) with the head of a man and the body of a lion, fountains of golden water, men who dwelt below the ground, griffins, the phœnix, the precious stone pantarbas casting rays of fire, and attracting all other gems, which adhered to it like swarms of bees. Phraortes recommended him to the president of the gymnosophists, who revealed to him all their secrets, convinced him that Pythagoras had borrowed his wisdom from them, and compelled him to recognise their superiority in the performance of miracles. Apollonius returned from India by sea, was much admired in the towns of Asia Minor, conversed at the grave of Achilles with the ghost of this hero, enchanted the demons, and uttered prophecies. He threatened the Ephesians with pestilence unless they would mend their immoral lives. They were converted, but nevertheless the plague broke out among them. The Ephesians sent messengers to Apollonius, then at Smyrna, requesting him to drive away the plague. Apollonius was in a moment at Ephesus, conversed with the people in a theatre, commanded them to stone a beggar, and ordered them to remove the stones on the following day, when, instead of the beggar, a large dog was found into which the demon of the plague had entered, the ravages of which had now ceased. The Greek priests at Athens, in the Peloponnesus, the oracles at Paphos, Pergamus, and Colophon, heaped their marks of honour upon Apollonius.

He afterwards went to Crete, and finally arrived in the reign of Nero at Rome, where he and his followers being questioned by the magistrates concerning the object of their journey, overcame their mistrust by restoring to life the dead body of a noble lady, predicting an eclipse of the sun, and that there should happen and not happen a great event, which prediction was considered to be fulfilled when, three days after, the cup which Nero held in his hand was struck by lightning. When Nero left Rome for Greece, he ordered all foreign philosophers to quit the city. Apollonius went to Spain, and stirred up a rebellion against Nero and the Romans. He then visited Africa, the south of Italy, and Sicily, where he heard of the death of Nero. Apollonius again visited Athens, and was initiated by the hierophant of Eleusis into the mysteries of that place. He next visited Egypt and Ethiopia, and sought for the sources of the Nile. In Egypt he joined Vespasian, who probably found it politic to gain a man whose sanctity and miracles had raised him to the rank of a deity; for during his lifetime, and still more after his death, Apollonius enjoyed this distinction, and was sometimes ranked with Jesus Christ. (See *Life of Alexander Severus*, by Lampridius, cap. 29.) Afterwards he revisited Asia Minor and Rome, where he was accused by Euphrates of high treason against Domitian, and cast into prison. Having blamed the emperor for suffering such informers, he removed to Puteoli, where he met his followers, Damis and Demetrius. He again visited Sicily, Greece, and Asia Minor, performed miracles, and had many adventures, until he died, eighty, or ninety, or one hundred, or one hundred and seventeen years old, either at Ephesus, or at Lindus in the temple of Pallas. Others say that he was chained, and shut up in the temple of Dictynna in Crete to be eaten by dogs. But when the temple was reopened, the voices of invisible virgins proclaimed his elevation to the skies, and his chains were found burst asunder. These statements are chiefly found in *The Life of Apollonius* by Philostratus. The two first books exist in an English translation by Charles Blount, Lond. 1680, fol. In 1693, this translation was suppressed on account of the annotations being hostile to Christianity, and Blount committed suicide. Philostratus wrote the Greek original by order, and from the information of Julia, the wife of Septimius Severus, who died 217. The empress had obtained possession of the account which Damis had formerly given to a relative.

It is almost needless to remark that the life of Apollonius is a heap of absurdities and impossibilities. Apollonius was probably a cunning impostor, and one of the pretenders to miracles, not uncommon in that age: his biographer, Philostratus, must have been rather credulous if he believed one half of what he wrote about his hero. The fact of Apollonius being mentioned by no writer earlier than Apuleius and Lucian (see his *Alexander*), tends to show that his celebrity during his lifetime was not so great as his biographer would have us believe. Philostratus himself wrote his account of Apollonius about a century after the wise man's death. Some extant letters attributed to Apollonius, are printed in the collection of Aldus and Cujacius; and a few appear in his life by Philostratus. For further remarks on the character of the *Life of Apollonius*, see PHILOSTRATUS, FLAVIUS. A remarkable passage in the *Life of Aurelian* (chap. 24) by Vopiscus, shows that the fame of Apollonius was even then firmly established, and that temples and statues still existed in honour of this 'true friend of the gods,' as the credulous historian calls him.

It appears from Suidas and Eudocia, that a person called Soterichus Oasites also wrote a life of Apollonius.

APOLOGETICS (*theologia apologetica*, apologetik) is the designation given in Germany to that branch of divinity which is most intimately connected with logic, metaphysics, and general history, and has for its object a systematic arrangement of those internal and external evidences by which Christians are enabled scientifically to justify the peculiarities of their faith. The name is derived from a Greek adjective *apologêticos* (ἀπολογητικός).

Since Christianity was opposed from the beginning by men who denied its high origin and its intellectual superiority, circumstances demanded on the part of Christians a compliance with the express injunction of the apostle Peter, 'Be ready always to give an answer (πρὸς ἀπολογίαν, for an *apology*) to every man that asketh you a *reason* of that hope which is in you.' (1 Pet. iii. 15.) Separate apologies have the same relation to apologetics that separate mathematical treatises have to the science of mathematics.

The science of apologetics was not the offspring of literary vanity; it was unknown till the attacks of the adversaries of Christianity assumed a learned and scientific character. In the first centuries of our æra, whilst most opposers asserted that the Christian religion was the cause of famine, and earthquakes; and that Christian worship consisted in eating children, drinking human blood, committing incest, and adoring the head of an ass, or some such abominations, separate apologies were sufficient for the refutation of these absurd charges. The name is of still later origin than the science of apologetics. The word *apologetik* was universally adopted after Gottlieb J. Planck had used it. (See his *Einleitung in die Theologischen Wissenschaften*, 1794-8, vol. i., p. 231-362.) As the fundamental idea of mathematics is that of quantity; of jurisprudence, that of right; of æsthetics, that of the beautiful; so the fundamental idea of apologetics is that of supernatural *revelation*. The apologetics contain a further development of one part of dogmatics or doctrine, which is called bibliology. Apologetics teach how to *defend* the fundamental ideas of Christianity against unbelievers; polemics teach how to *attack* those who, admitting the Christian revelation to be true, err in particulars.

The science of apologetics treats of the

I. Possibility of revelation.

1. Logical possibility. Logical refutation of those who, like John Toland, Edelmann, and Rousseau, considered the idea of revelation to be self-contradictory.
2. Theological possibility. Metaphysical refutation of those who considered the idea of supernatural revelation to be repugnant to the attributes of God, impartial justice, general love, and immutability.
3. Anthropological possibility. Refutation of those who, like Immanuel Kant, deny the ability of man to perceive the supernatural.

II. Necessity of revelation, to be demonstrated by historical and ethnographical induction, especially by the history of philosophy.

III. Reality of revelation, demonstrated by a development of the internal evidence of the peculiar Christian doctrines, and confirmed by the historical credibility of the Gospel history.

Apologetics, though based upon the Gospel, constantly require a new adaptation to the times for which they are written. There are many good apologies, but apologetics are yet in their infancy. Although they are lectured upon in the universities of Germany, they are yet a desideratum in England.

Among the societies, foundations, donations, &c., which have an apologetic character, may be mentioned the Bampton Lectures at Oxford, Hulse's foundation of the Christian Advocate at Cambridge, the London Society for promoting Christian Knowledge, with all similar societies, the Society for the Defence of Christianity at the Hague, &c.

APOLOGIES OF THE FATHERS are writings in defence of Christianity, composed from the beginning of the second to the sixth century. The opposers of Christianity generally attacked the moral character of the Christians rather than their doctrines. The fathers of the church, with the view of refuting the doctrines of heathenism and the false accusations against the followers of Jesus, composed *Apologies*, which were partly addressed to all well-informed heathens, partly written on particular occasions, and addressed to emperors in order to convince them of the injustice and folly of persecutions.

The apologies of Quadratus and Aristides are lost. Justinus Martyr describes, in two apologies, how he sought for truth in various systems of philosophy until he found it in the Gospel. In his Dialogue with the Jew Tryphon, Justinus Martyr appeals to the prophecies of the Old Testament. The apologies of Justinus contain many materials for the history of philosophy. Athenagoras defended the Christians against the charge of atheism, incest, infanticide, and other abominations with which they were charged. Tatianus, Theophilus of Antioch, and Hermas, proved the absurdity of paganism and the contradictions of philosophers in order to show the necessity of revelation.

After these Greek apologists of the second century followed, among the Latins, Tertullian, who, in his *Apologeticus*, eloquently shows how the faith and holiness of Christians were especially manifested under persecutions; and Minucius Felix, who, in his eloquent dialogue, *Octavius* introduces the representatives of various parties, whose arguments are overcome by the truth of the Gospel. Cyprian wrote *De Idolorum Vanitate*, or, On the Absurdity of Idolatry. These apologists of the second century did not defend the systems of certain schools, but only the truth of Christianity.

In the fifth century the doctrines of the Gospel were systematized by Origen among the Greeks and Arnobius among the Latins, in order to defend them successfully against the attacks of Celsus, Porphyrius, Hierocles, and Julian, which were directed not only against the morals of the Christians, but also against their history and their doctrines. These writers compared the miracles of Jesus with those of Pythagoras and Apollonius of Tyana, and questioned the credibility of the Evangelists. They recognised the leading facts of the Gospels, but endeavoured to prove contradictions in minor points. The objections are answered in the eight books of Origen against Celsus, who wrote his attack on Christianity about one hundred years before it was replied to by Origen. But the greatest apologist among the fathers is Eusebius, whose historical and chronological works have an apologetical tendency, and whose evangelical preparation (*προπαρασκευὴ εὐαγγελικὴ*, or *Εὐαγγελικῆς ἀποδείξεως προπαρασκευὴ*) contains, in fifteen books, the introduction to his Evangelical Demonstration (*εὐαγγελικὴ ἀπόδειξις*), in twenty books. The first ten books of this work are still extant, in which he demonstrates the harmony of the Old with the New Testament, the moral dignity of Jesus, the sublimity of his plan, the rectitude of his disciples, and the absurdity of those who ascribed another plan to the disciples than that which they professedly followed. Eusebius examines, in a little publication against Hierocles, the life of Apollonius of Tyana by Philostratus, and shows the contradictions of the biographer, the knavery of this notorious individual, and how his performances differed from the miracles of Christ. The works of Athanasius and Chrysostomus contain apologetical materials. Cyrillus of Alexandria wrote ten books in reply to the emperor Julian. Theodoret wrote twelve sermons under the title *Ἑλληνικῶν ϑεραπευτικὴ παϑημάτων ἢ εὐαγγελικῆς ἀληϑείας ἐξ Ἑλληνικῆς φιλοσοφίας ἐπίγνωσις*, in which he gathers the arguments for Christian truth from the writings of the heathens, and compares the Greek philosophers with Moses, the prophets, and the apostles. The most important apologetical works among the Latins are the seven books of Arnobius (*Adversus Gentes*) against the heathen; the seven books of Lactantius, *Institutionum Divinarum;* the twenty-two books of St. Augustin, *De Civitate Dei;* the catalogue of St. Jerome, by which he refutes the objection that no distinguished individuals embraced the Gospel (*Catalogus Virorum Illustrium*); and, finally, *Orosii libri septem Historiarum adversus Paganos*, in which he refutes the assertion that plague, famine, earthquakes, and other horrible events were consequences of the Gospel. The science of apologetics has made progress in the same ratio in which the attacks upon Christianity became more systematic.

The following translations and editions will be interesting to English readers. Justin the philosopher, commonly called Justin Martyr, died about A.D. 165. His *Apologia prima pro Christianis*, published by Dr. Grabe, Oxon., 1700; *Apologia secunda*, by Hutchinson, Oxon., 1703; *Justin Martyr's Full Account of the Christian Worship, Baptism, and the Lord's Supper, with Notes of Dr. Grabe and Mr. Whiston: Dialogus cum Tryphone Judæo*, London, 1722, 8vo.; *The Apologies of Justin M., Tertullian and M. Felix, with the Commentary of Vincentius Lirinensis*, by Reeves, 1709 and 1716—an unfaithful translation; *The Dialogue with the Jew*, by Brown, London, 1755, is an excellent translation, and very scarce in the book-market. Minutius Felix, of the third century, author of *A Dialogue between Cæcilius a Heathen, and Octavius a Christian*, is well translated by Sir David Dalrymple.

APOLOGUE, synonymous with fable (*ἀπόλογος*, *fabula*, fable), 'a novel story contrived to teach some moral truth.' (Johnson.) 'It would be a high relief . . to hear an *Apologue*, or fable, well told, and with such humour, as to need no sententious moral at the end to make the application.' (Shaftesbury, *Charact.* vol. iii., *Miscell.* iv. c. 1.) It is essential to an apologue that the circumstances told in it should be fictitious. Some have gone so far as to say that they must involve an impossibility, as in Æsop's fables, where we find beasts and inanimate things made to think and speak.

APO'LOGY (*ἀπολογία*), a Greek word, originally signifying a defence made in a court of justice by or for a person accused. (See the titles of several of the extant Greek orations.) The word *ἀπολογεῖσθαι*, to 'apologize,' to 'make a defence,' was the corresponding verb. There is extant a small piece attributed to Xenophon, entitled the *Apology of Socrates;* and another, with the same title, by Plato. The word apology was adopted by the Christian fathers [see APOLOGIES]. At the present day it is only used in ordinary language in one sense, that 'of asking pardon or excuse for some offence.' But even in modern times the word has occasionally been used in the early Christian sense, as by Bishop Watson in his treatise entitled an *Apology for the Bible*, and by Barclay in his *Apology for the Quakers.*

APOPHTHEGM (*ἀπόφϑεγμα*), a Greek word signifying 'a thing spoken out,' and, in its more technical sense, a pithy saying calculated to arrest the attention. 'Certainly *apophthegms* are of excellent use. Cicero prettily called them *salinas*, salt pits, that you may extract salt out of, and sprinkle it where you will. They serve to be interlaced in continued speech. They serve if you take out the kernel of them and make them your own.' (Bacon.)

We may take the following as examples of apophthegms.—'Bigotry murders religion, to frighten fools with her ghost.'—*Lacon.* 'We ask advice, but we mean approbation.'—*Ibid.* Plutarch made a collection entitled *The Apophthegms of Kings and Generals*, and dedicated it to the Emperor Trajan. Many of these apophthegms would be classed in modern times among anecdotes. The following is an example; it is one of the apophthegmata placed under the head of Alexander:—'An Indian was taken prisoner who had a very high reputation for archery, and was said to be able to shoot an arrow through a ring. Alexander bade him exhibit a specimen of his skill, and on his refusal, the king in a passion ordered him to be executed. On his way to his death the man remarked to those who were taking him, that he had not practised for several days and was afraid of missing his mark. Alexander hearing of this, admired the man, and setting him loose, made him great presents, because he preferred death to the loss of his reputation.' (Wyttenbach's edit., vol. i., p. 718.)

The Lacedæmonians were noted for affecting the apophthegmatic mode of speech; and Plutarch has collected their sentences also under the title of *Laconica.*

APOPHYLLITE, a crystallized mineral, whose fundamental form is the square prism, fig. 1. Its most general modification is obtained by supposing the angles of fig. 1 cut off, so as to give rise to a plane triangular surface, as is seen at *a* in fig. 2; these faces *a*, from the plane cutting deeper into the original crystal till they intersect each other, frequently lose their triangular form, and of course, at the same time, the face *P* again becomes a square, and the prism will be terminated by the form seen in fig. 3. On account of these modifications, apophyllite sometimes assumes the form in fig. 4.

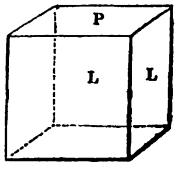
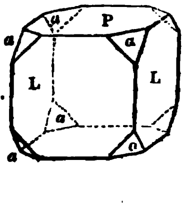


Fig. 1.

Fig. 2.



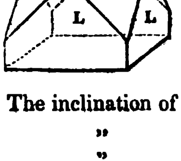
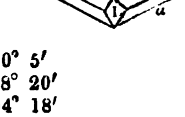


Fig. 3.

Fig. 4.



The inclination of P on a is 120° 5′
„ L on a is 128° 20′
„ a on a is 104° 18′

The structure of this mineral is lamellar, and admits of cleavage in directions parallel to the sides of the regular prism, but most readily in the perpendicular to its axis. Its colour is white or grey, sometimes tinged green or red: it possesses various degrees of transparency, and occurs even opaque. In hardness it approaches nearly to apatite; and its density varies from 2·3 to 2·5. Before the blow-pipe it forms a white glass. Its chemical constitution is stated as follows:—

$$8\,(\dot{C}a + 3\,\dot{S}) + (\dot{K} + 6\,\dot{S}) + 16Aq$$

and the mineral is therefore an hydrated silicate of potash and lime.

Apophyllite has been found in the mines of magnetic iron-ore of Sweden and Norway; in the lead-mines of the Harz mountains; also in the cavities of several basaltic rocks, at Marienberg in Bohemia; at Fossa in the Tyrol; in the isle of Skye, &c. In the basalts it is usually accompanied by analcime and stilbite.

APOPLEXY, from ἀποπληξία, a sudden blow, a deprivation of power and motion, &c. *Morbus attonitus, sideratio, percussio*, &c., are synonymous terms. In the animal body two sets of functions perfectly distinct from each other are combined, the ORGANIC and the ANIMAL; the organic include the various functions by which the structure of the body is built up and its integrity maintained, and the animal include the functions of sensation and voluntary motion. [See LIFE.] The disease termed apoplexy is an affection of the animal functions, the organic remaining comparatively unimpaired. It is the loss of sensation and voluntary motion, while respiration, circulation, secretion, and the other functions of the organic life continue to be performed, though not indeed without more or less disorder.

Of all the diseases to which the human body is subject, there is none which is commonly conceived to attack so suddenly, and to kill so rapidly. What is usually called the attack is indeed sudden; but the disease itself, so far from being sudden, is generally even slow in its progress, giving distinct and repeated indications of its presence and of its course. The signs by which the apoplectic constitution is denoted, the PREMONITORY SIGNS of the disease as they are termed, it is of the utmost importance to observe, because judicious measures adopted at this stage will almost always avert an attack, or render an attack mild which would otherwise have been mortal. There are few other diseases over which both the physician and the patient have so much control: the patient by the general management of himself, in removing the constitutional predisposition to it; and the physician by active remedies when the attack is instant, in effecting what the general management may have proved inadequate to accomplish. Prevention is often practicable; but when the attack has once come on, life is in imminent peril: the most judicious and powerful remedies, though resorted to instantly, and employed with the greatest skill, are commonly unable to avert death; and even when they do succeed, the functions of the brain and the general health have usually sustained so severe a shock that life is no longer worth possessing.

In general, the PREMONITORY symptoms are steady in their nature, uniform in their course, and so obvious that all may perceive and understand them. Considered individually, they may appear numerous and diversified; but they are really so much alike, that they all obviously belong to one class.

Among the premonitory symptoms the most remarkable are the following, which are here enumerated in the order of their importance and frequency.

1. Drowsiness. This feeling may exist in every degree from unusual dulness of mind to an uncontrollable propensity to sleep. There may be merely inability to fix the attention, or to carry on the intellectual operations with the usual vigour, or the individual may absolutely fall asleep in the midst of his ordinary occupations. The last is the more alarming event, and for that very reason the less dangerous, because it is a circumstance with which few can fail to be struck; but an unusual heaviness or torpor of mind may be overlooked or neglected: and thus, when at last the apoplectic attack comes, though warning of its approach were really given, it may be truly a surprise. Connected with drowsiness, and occasionally in the room of it, there is a sensation of weight in the head, or a feeling of fulness.

2. The next premonitory symptom is giddiness. Giddiness is more alarming than drowsiness, and would never fail to produce a conviction of danger, but that giddiness often arises from other causes; for example, from a disordered state of the stomach. Whenever giddiness is present, while the functions of the stomach are sound, its source should be carefully investigated; and even when the digestive functions are manifestly disordered, it should still be minutely investigated and vigilantly watched, because tendency to apoplexy and disordered stomach may co-exist, and the symptoms of the latter may mask those of the former. If the giddiness be combined, as it often is, with a feeling like that of approaching fainting, it may be considered that there is but a single step from the actual supervention of the paroxysm.

3. Connected with these two important symptoms are a number of subordinate sensations, which are of consequence chiefly as marking the presence of the more serious indications. The sensations in question are the ordinary companions of the first two, and are often the most prominent and obtrusive, and therefore serve to direct attention to the more important symptoms. Such concomitant and subordinate symptoms are, frequent yawning, dulness of hearing, imperfect or disordered vision, noise in the ears, motes or sparks before the eyes, repeated sneezing, occasional hiccup, and the like.

4. All this time there is generally some degree of pain in the head. The intensity of the pain may vary from the slightest uneasiness to the most intolerable headache. The slighter degrees of pain are more common than the severer, the patient usually stating that his pain is trifling. The seat of the pain is often in the forehead, and deep in the socket of the eyes, rendering them intolerant of light; but it may also be at the back part of the head, extending down the neck, between the shoulders. In the severer states of pain it is often attended with dulness and redness of the eyes, flushing of the face, and throbbing of the arteries of the neck and head. Frequently, however, there is no degree of pain whatever, and this is the occasion of a false security, alarm not being taken at the presence of the other symptoms because of the absence of pain. In general, when serious disease attacks vital organs, pain is excited, and we are thus warned of our danger; but sometimes a mortal disease invades an organ without inducing the slightest pain, and there is no disease more apt to do this than apoplexy. If, combined with the other premonitory symptoms, there be pain in the head, the inference is obvious; if there be none, the danger is the greater; for the enemy is as certainly at hand, but his approach is insidious.

5. Last in the train comes a symptom which is more important than any of the preceding, because it demonstrates their true nature, and shows that the actual attack is instant; namely, paralysis, whatever its form or degree, whether it assume the shape of inability to articulate distinctly, or to write steadily, or to walk firmly, or in reading to fix the eye on the right line, or in talking or laughing to keep the mouth in the natural position, or in deglutition to swallow without unusual difficulty, or without exciting cough. If with this loss of muscular power there be at the same time a sense of pricking over the skin, or a numbness in the limbs or fingers, or difficulty in voiding the urine, or distortion of the face or mouth, dropping of the eyelid, stammering, unsteadiness in the gait, and so on, the attack may be considered as having actually commenced.

Of these premonitory symptoms one alone may be present, or two may be combined, or several may co-exist or may follow each other in rapid succession. The period of their duration, before the attack supervenes, is different in every individual case. Sometimes there elapse only a few hours; more frequently several days; occasionally many weeks. When they are present, no man is safe from a fatal attack for a single instant.

With regard to the attack itself, the phenomena are different according to its intensity. There are, indeed, various modes or forms of the disease which are mainly matters of degree: nevertheless, these diversities are not only very striking in their own nature, but in a practical point of view are highly important, because the remedies appropriate to the one are not suited to the other, at least without such modifications as, in point of fact, to render them different remedies.

For all practical purposes it will be sufficient to comprehend the various forms of the disease under four heads, namely, first, that in which the attack is sudden and violent; secondly, that in which the attack is comparatively slight at the commencement, but progressively increases in severity; thirdly, that in which the attack commences with apoplexy and terminates in paralysis; and, fourthly, that in which the attack commences with paralysis and terminates in apoplexy.

1. The sudden and violent form constitutes the *apoplexia*

fulminans of the older authors; the *apoplexia fortissima* of more modern writers; and the *apoplexie foudroyante* of the French. In this form of the disease the patient is struck senseless and motionless instantaneously: he falls down and lies utterly deprived of all the functions of the animal life. The organic functions in the mean time go on, but in an unnatural and disordered manner. The respiration is slow, deep, and accompanied with that peculiar noise which is called stertor; the pulse is fuller, stronger, and slower than natural; the urine and fæces are passed without consciousness; the skin is covered with a cold and clammy perspiration; foam flows from the mouth; the face is flushed, tumid, and sometimes even livid. Death may take place in a few minutes, or a few seconds, or not until the end of the first, or even the second, day; but life is seldom protracted beyond the second day. Now and then the prompt and vigorous employment of the appropriate remedies saves life even in this form of the disease; but if they fail to restore consciousness in a few hours, they commonly fail altogether, and death almost always happens when the paroxysm continues undiminished during twenty-four hours.

On examining the state of the brain after death from this variety of the disease, the blood-vessels of every part of the cerebral substance and of the delicate membranes that invest it are found gorged with blood; there is also sometimes an effusion upon its surface, beneath its membranes, and within its cavities, of the thinner portion of the blood called serum, while, in many cases, pure blood itself is poured out on various parts of the brain from some ruptured vessel. Occasionally no morbid appearance can be detected sufficient to account for the attack, or for death, the consequence of it.

2. In the second form of the disease, in which the attack is less violent in the commencement, but progressively increases in severity, the loss of sensation and voluntary motion is neither sudden nor complete, or, if it be so, the abolition of these functions is only of momentary duration. Instead of stupor and coma, the patient is seized with a sudden and violent attack of headache, attended often with sickness and vomiting. The pain of the head is sometimes so severe that the patient sinks down under it, pale, faint, and exhausted, occasionally with a slight convulsion; but from this state of depression he recovers rapidly, still however remaining weak, faint, and chilly, with a quick and feeble pulse, a sunk countenance, and occasional vomiting. This state having continued from one hour to three, or more, the heat increases, the pulse acquires strength, the face becomes flushed, the sunk expression of the countenance disappears, and torpor or stupor rapidly supervenes, the patient appearing dull and heavy, answering questions slowly and with difficulty, and sinking at last into a state of profound coma. From the first invasion of the attack to the coming on of perfect coma, the period may vary from one hour to three days and more. This form of the disease is at least equally dangerous with the preceding, and, in fact, generally proves fatal.

On examining the state of the brain after death from this variety, there are found extensive effusions of blood; softening of the substance of the brain; sometimes ossification (conversion into bone) of portions of its membranes; but far more constantly ossification of the coats of its blood-vessels, which organic change in the structure of the blood-vessels diminishes their strength, renders them incapable of resisting the current of the blood and of carrying on the circulation, and thus predisposes them to rupture.

3. The third form of the disease commences with a distinct apoplectic paroxysm, which terminates in paralysis. When the apoplectic symptoms disappear, some part of the body is found to be paralyzed; it may be the muscles of the face, giving rise to various kinds of distortion; or the muscles of the limbs, occasioning inability to move the affected member; or the muscles of one side of the body, producing what is called *hemiplegia;* or the muscles of one half of the body, *paraplegia.* In the great majority of cases the speech is more or less affected, the power of articulation being either wholly lost or greatly impaired. Often the sensibility seems unimpaired, the patient endeavouring to express himself by words or signs; but, at other times, the mind itself is indistinct, confused, rambling, and incoherent. Occasionally in this form of the disease the apoplectic state disappears rapidly, while the paralysis remains for years. Sometimes the paralysis slowly diminishes until suddenly another apoplectic attack supervenes, leaving the paralysis greater than before; at other times the paralysis continues undiminished for days, months and years, until a second, or a third, or a fourth apoplectic paroxysm at length destroys the patient. In the few cases in which there is a perfect recovery from the paralysis, the mind is always slow in recovering its energy, and often never regains it.

On examining the state of the brain after death from this variety, there is commonly found an extravasation of blood into a defined cavity formed in the substance of the brain, constituting what is termed an apoplectic cell; but although this be the most ordinary form in which the blood is effused in this variety of the disease, yet there may also be a general extravasation of it, as in the other varieties, or mere effusion of serum; or softening of the cerebral substance, or ossification of the membranes, or of the blood-vessels, or several of these morbid conditions may be combined.

4. In the fourth and last form of the disease, in which the attack commences with paralysis and terminates in a complete apoplectic paroxysm, the premonitory symptoms are, in general, very distinctly marked. Drowsiness, giddiness, disordered vision, impaired memory, and pain of the head especially, commonly precede the attack. While the brain is thus affected, the limbs about to become paralytic are troubled with pricking, tingling, numbness, weakness, and cramp. These local ailments progressively increasing, the limbs at length become decidedly paralytic, and the paralytic state having continued for an indefinite period, an apoplectic paroxysm supervenes, often preceded and denoted by spasms or convulsions in the unparalyzed limbs. The coma which forms a part of the apoplectic paroxysm, sometimes comes on gradually, and is manifestly progressive in intensity, the patient at first being capable of giving a coherent answer when strongly roused, but by degrees the loss of sensation becomes more and more complete, until at last the stupor passes into a state of total insensibility, from which there is no recovery. Now and then the patient recovers from the apoplectic state, and slowly regains the condition he was in previously to the apoplectic attack; more frequently, on the contrary, the paralytic affection increases, and another apoplectic seizure quickly supervenes, which proves mortal.

In some cases the morbid appearances that present themselves on inspection of the brain after death from this variety, differ in no respect from those which have been described as belonging to the preceding form; but the most frequent and characteristic morbid change is the softening of some portion of the substance of the brain. This softening of the cerebral substance is the result of inflammation, which is generally not acute in its nature, and is slow in its progress. The vessels belonging to this softened portion lose their vitality, and allow the red particles of the blood to pass through them, so that the part morbidly changed is not only soft but red, from the infiltration of blood through the diseased blood-vessels.

From this account of the phenomena of the disease, and of the morbid changes apparent in the brain in fatal cases, we are enabled to form an accurate conception of the pathological condition of the brain in apoplexy. Two of the conditions essential to the performance of the functions of the brain, are a supply of a certain quantity of blood, flowing with a certain impetus and freedom from pressure. Without a certain portion of blood flowing with due impetus, the functions of the brain fail; with more than a certain portion, or with the velocity of the current quickened or retarded beyond a certain point, they equally fail: and when the pressure induced by either of these states exceeds a certain degree, they also immediately cease. The substance of the brain is tender and delicate, and abounds beyond all other organs with blood-vessels. It is of a soft and yielding nature, but it is enclosed in a firm, unyielding case. Coupling this fact with the phenomena of the circulation, it is easy to conceive how almost its entire mass, and still more readily how particular portions of it, may become subject to undue pressure, and how, as an inevitable consequence, the functions of the brain may become deranged. Any cause which quickens or which retards the circulation through it may produce this effect: for example, a preternatural distension of the arteries with blood, or a preternatural intensity in their action, and a consequent increased impetus of the circulation; or, on the contrary, a relaxation of the veins, a preternatural turgescence of them from a too great quantity of blood poured into them, and a consequent retardation of the circulation through them. Either from a too great velocity or intensity of the circulation in the arterial vessels, or from too great distension of the veins in consequence of an impeded flow of the blood through them, the thinner portion of the blood or serum may be poured out upon the brain, which in this manner may become subject to undue pressure. In consequence of either of these diseased states, the coats, whether of the arteries or veins, may suddenly give way and break, and the blood poured out upon the brain from the ruptured vessels may exert such a pressure upon it as instantly to destroy its functions. Again, tumors occasionally form in the brain, which progressively increase in magnitude, and at length exert such a degree of pressure upon the cerebral substance, as is no longer compatible with the performance of its functions.

The brain, like all other organs, is nourished by organic processes, over which the organic nerves exert a most important influence. The blood-vessels of the brain, like those of all other organs, depend for their vital energy on organic or ganglial nerves [see Nerve], which are distributed to them in great abundance. We may conceive that the organic nerves which preside over the nutriment of the brain may fail in their functions to such a degree, that the brain may be deprived of its vital power, and hence its functions necessarily cease. And this without doubt is the case in those fatal attacks of apoplexy in which no morbid appearance can be detected in the brain sufficient to account for death. We may conceive that the organic nerves which impart vital energy to the blood-vessels of the brain may fail in their functions to such a degree, that the blood-vessels may not only be incapable of performing their natural actions, but may become diseased in structure, their membranous, firm, and elastic coats becoming indurated, brittle, and bony. On the other hand, these organic nerves may become preternaturally irritable, and consequently produce an inordinate action in the blood-vessels. And those are the ordinary changes which precede and which predispose to apoplexy; and, in a practical point of view, these facts are of paramount importance, for they show that apoplexy is not a sudden disease, that it is even slow in its progress, and that it is as much in our power to retard or stop that progress, by the judicious employment of remedies tending to restore the brain to a sound condition, as it is by the use of such remedies to check morbid changes of structure in any other organ of the body.

Prognosis.—When once an attack has come on, even though it be slight, it places the individual in imminent danger, both because it greatly increases the predisposition to a recurrence of the paroxysm, and because, when it does not destroy life, it gives a shock to the constitution which is seldom entirely repaired, and never without much time and most judicious management. In the paroxysm the immediate danger is proportioned to the profoundness of the coma, the degree of stertor, the slowness and laboriousness of the respiration, and the frequency and intermission of the pulse. Other unfavourable signs are, delirium, convulsions, paralysis, involuntary and unconscious discharge of the urine and fæces, and above all, the continuance of the paroxysm without material diminution of its severity after the judicious employment of powerful remedies. When the respiration is exceedingly slow and laborious—when the pulse sinks to such a degree that it can be scarcely felt, and when the head, chest, and limbs are covered with a cold, clammy sweat, dissolution is near. On the other hand, the favourable signs are, mildness of the paroxysm, diminution of the symptoms after the exhibition of the appropriate remedies, and more especially restoration to consciousness, return of the power of voluntary motion, with a calm and soft pulse, a gentle, warm, and general perspiration, and a spontaneous flow of blood from the nose, the rectum, and so on.

Causes.—The causes of the disease are either predisposing or exciting. The *predisposing* causes are, 1. Sex. It is decidedly more common in the male than in the female, because the male is more exposed to the exciting causes, and nothing so surely generates a predisposition to the disease, as the long-continued operation of an exciting cause. 2. Age. It may occur in childhood and youth: it is indeed rare in the former, but it is not uncommon in the latter; still, however, the great majority of cases without doubt occur at the more advanced stages of life. The period commonly conceived to be that in which it most frequently occurs, is the interval between forty and seventy. Out of sixty-three cases, two were between twenty and thirty years of age; eight from thirty to forty; seven from forty to fifty; ten from fifty to sixty; twenty-three from sixty to seventy; twelve from seventy to eighty; and one from eighty to ninety years. 3. Conformation of the body. The large head, short neck, full chest, sanguine and plethoric temperament, have from time immemorial been considered as forming the apoplectic constitution, and though the disease may and often does occur in the very opposite states of the system, yet there cannot be a question that the conformation of the body just described is peculiarly favourable to the formation of that pathological condition of the brain on which, as we have seen, the malady depends. 4. Mode of life. Luxurious living, especially combined with sedentary habits, is a most powerful predisposing cause. 5. Suppression of accustomed evacuations, namely the suppression of the piles, or of discharges from the skin, whether from the sudden disappearance of eruptions, the result of natural disease, or the drying up of a seton or issue. 6. Mental states. Violent emotion: cases continually occur in which persons drop down suddenly in a fit in a paroxysm of anger. Long-continued anxiety is almost as powerful an exciting cause as luxurious living. It is the common opinion that the studious are more prone to this disease than other classes; but this notion is ill-founded, for the evidence is complete that moderate intellectual labour is not only in a high degree conservative of the general health, but that it is more especially preventive of that peculiar condition of the brain on which apoplexy depends. The condition of all others most conducive to apoplexy is that in which at a somewhat advanced age the food habitually taken is large in quantity and rich and stimulating in quality, at the same time that the intellectual faculties are little excited; while the history of lawyers, judges, and philosophers, would indicate a remarkable exemption from this disease in all its forms.

The predisposing causes, of whatever nature, act either by favouring an habitual determination of blood to the brain, or by impeding its return from this organ, or by impairing its vital energy, while they favour a plethoric state of its vessels. Such a condition of the brain having been formed, the slightest exciting cause is often sufficient to produce an attack.

Among the most powerful *exciting* causes are intemperance in eating and drinking, violent emotions of mind, whatever determines the blood with undue impetus to the brain or impedes its return from it, such as great muscular exertion, dependant posture of the head, tight ligature around the neck, the use of the warm bath, and the like.

Both sets of causes, the predisposing and the exciting, bring about a paroxysm either by diminishing the vital energy of the brain, or by producing undue pressure on its substance.

Treatment.—The treatment of this disease must obviously vary with the pathological condition of the brain on which it depends. The skill of the physician consists in detecting what that pathological condition is, and in exactly adapting his remedies to it, which must differ widely according as he is called to treat a threatening or an actual paroxysm, or to prescribe for a patient subsequent to an attack. To enter into a discussion of the different remedies suited to the manifold states of the brain, and of the system, in the various forms and stages of this malady, would require a larger space than can be allotted to it in this work. There are not many parts of his science in which the physician is required to make such nice and difficult distinctions, and in which life so completely depends on the accuracy of his discrimination. At one time the vital energy of the brain is so far exhausted as of itself to threaten the total abolition of its functions; at another time the arterial action or the venous congestion is so great as to threaten an immediate effusion of serum or a large extravasation of blood. For states so opposite, opposite remedies must of course be required; but the difficulty at all times is to interpret the outward signs aright. If, together with the premonitory symptoms which have been enumerated, namely, drowsiness, giddiness, headache, and so on, there be a flushed countenance, a dull or suffused eye, a hot skin, a strong or full pulse, the abstraction of blood may be indispensable to the preservation of life; but if, on the other hand, the countenance be pallid and sunk, the pulse full, and the skin cool, the smallest blood-letting may utterly exhaust the vital energies of a brain already greatly depressed, and the only chance of averting death may be the judicious employment of stimulating remedies. It is in clearly pointing out distinctions like these, and in guiding to the selection of the remedy appropriate to each, that science is the salvation of life. But such too are precisely the cases in which no skill on the part of the physician can succeed without the steady co-operation of the patient. The physician duly weighing the premonitory signs may foresee the impending danger, and give warning of it, and prescribe precisely the medicine and REGIMEN fitted to avert it; but if these are either altogether neglected or only partially followed, the disease will hold on its course and life be lost. And this loss of life is deplorably frequent from the neglect on the part of the patient of the appropriate remedies in the primary stage of the disease, when such remedies may be employed with almost certain success; and the same is true from the neglect of such remedies in the stage subsequent to an apoplectic paroxysm, although in this stage the best-concerted measures have a much less chance of securing their object.

For the same reason that it would be vain to attempt here to enter into the modifications of treatment required in the premonitory and the consecutive stages of the disease, it would be out of place to discuss the measures proper to be adopted in the paroxysm itself. The state both of the brain and of the system varies in every individual case, and safe, not to say successful treatment, must in every case be modified accordingly. It is only necessary to add here, that whenever a person is seized with a fit of apoplexy, he should be carried into a large room, the freest possible circulation of fresh air should be promoted around the body, which should be placed in the horizontal posture, with the head, however, considerably raised, all bandages should be taken from about the head and neck, and especially from about the neck; and a medical man should be sent for instantly. Every observer of such a case should bear in mind that the loss of life may be the consequence of the loss of a minute.

APO'PHYGE, a term applied by architects, generally, to a concave surface lying between or connecting two flat surfaces not in the same plane, and particularly to a slight concavity which is almost invariably found to terminate the shaft of an Ionic or Corinthian column both above and below;—immediately above the uppermost fillet of the congeries of mouldings called the base, and under the moulding or mouldings of the hypotrachelium or necking. In the latter case the apophyge is distinguished in the two positions as the lower and the upper. The more familiar English term for the same thing is, the *escape;* and in French, the apophyge is termed the *congé*. Apophyge is from a compound Greek word signifying a *flying off*.

A POSTERIO'RI. [See A PRIORI.]

APOSTLES (ἀπόστολοι, messengers, ambassadors, missionaries) were, according to Luke vi. 13, those twelve disciples whom Jesus chose from the number of his followers to be his companions, and whom he commissioned to preach his doctrines, first among the Jews only (Matt. x. 5; Luke ix. 2), and after his resurrection to the Gentiles also (Matt. xxviii. 19; Mark xvi. 15). Jesus said concerning apostles, 'As my Father hath sent me, even so send I you. He breathed on them and said, Receive the Holy Ghost. Whose soever sins ye remit, they are remitted unto them, and whosesoever sins ye retain, they are retained' (John xx. 21-23). The list of the apostles occurs Matt. x. 2; Mark iii. 16, &c.; Luke vi. 14, &c. The names of the apostles are, 'Simon, who is called Peter, and Andrew, his brother; James, the son of Zebedee, and John, his brother; Philip and Bartholomew; Thomas, and Matthew, the publican; James, the son of Alpheus; and Lebbeus, whose surname was Thaddeus; Simon, the Canaanite; and Judas Iscariot, who also betrayed him.' After the death of Judas Iscariot, 120 disciples being assembled, Peter recommended the choice of another apostle. 'Of these men which have companied with us all the time that the Lord Jesus went in and out among us, beginning from the baptism of John, unto that same day that he was taken up from us, must one be ordained to be a witness with us of his resurrection. And they appointed two, Joseph, called Barsabas, who was surnamed Justus, and Matthias. And they prayed, Thou, Lord, which knowest the hearts of all men, show whether of these two thou hast chosen, that he may take part of this ministry and apostleship, from which Judas by transgression fell, that he might go to his own place. And they gave forth their lots; and the lot fell upon Matthias, and he was numbered with the eleven apostles' (Acts i. 15-26). To these twelve apostles was afterwards added Saul, whose name among the Greeks was Paul, called to be an apostle of the Gentiles through the will of God (Gal. i. 1; Col. i. 1; Rom. xi. 13; Acts ix). By the instrumentality of St. Paul the Gospel was most effectually propagated. Barnabas (Acts xiv. 14) being an apostolic missionary is mentioned in the following manner: 'And when the *apostles* Barnabas and Paul heard,' &c. From this passage we infer that the title *apostle* was not exclusively given to the immediate disciples of Jesus. Comp. Acts xiv. 4; Rom. xvi. 7.

APOSTLES, ACTS OF THE. The authenticity of this book has not been doubted: it constitutes the second part of the Gospel according to St. Luke, which he dedicated to Theophilus (Luke i. 1; Acts i. 1). The Acts belong to the *Homologoumena*, or those canonical books which were, by all parties, recognized as genuine (Euseb. *Hist. Ecclesiastica*, iii. 25). The Severians (Eusebii, *Hist. Eccles.* iv. 29) and the Manichæans (Augustin. *Epist.* 23) acknowledged the authenticity of the Acts, although they rejected, for doctrinal reasons, their authority. Although the authenticity of the Acts was well established, they were less read among the lower classes, and accordingly Chrysostomus, at the end of the fourth century, wrote at the commencement of his *Commentary to the Acts*—'Many do not know even the existence of this little book, nor him who wrote and composed it.'

The time at which St. Luke wrote the Acts may be gathered from the following circumstances. The arrival of St. Paul in Rome took place in the spring of about the year A.D. 63. Since this arrival is mentioned in the Acts, they must have been written after the year 63; and since the death of St. Paul, about the year 68 or 69 is not mentioned by St. Luke, the Acts were probably composed and circulated before this date. Theophilus, to whom the Acts were dedicated, may be considered as the representative of the inquiring heathen; consequently, it was proper that the Acts should be written, as they are, in the Greek language.

The interpretations of the Acts by Clemens Alexandrinus in the *Hypotyposes*, and the commentaries of Origen, Diodorus of Tarsus, Theodorus of Mopsuestia, have been lost. The *Fifty-five Homilies* of St. Chrysostomus on the Acts are still extant. There exist commentaries by Œcumenius and Theophylactus. In the works of Grotius, Wolf, and others, on the *New Testament*, the Acts also have been explained. Limborch published his great work on the Acts at Rotterdam, 1711; and Walch his *Dissertationes in Acta Apostolorum* at Jena, 1756-1761, 3 vols. Besides these the following commentators may be mentioned: *Morus*, ed. Dindorf, Lips. 1794, 2 vols.; Thiess, *Uebersetzung mit Anmerkungen*, Lips. 1800; Heinrich's *Acta Apostolorum, Annotatione perpetua illustrata*, Göttingae, 1809; *Kuinoel*, Lips. 1818. Stier has written a work on the speeches contained in the Acts, (*Ueber die Reden in der Apostelgeschichte*, 2 vols. Lips. 1829, 1830.) The author endeavours to show the logical arrangement in these speeches. *Die Apostelgeschichte von Lucas erläutert von Michaël Wirth*. 2 vols. 8vo. Ulm, 1831-32. 8vo. That Matthew Henry, Wesley, Dodd, Coke, Scott, Benson, Adam Clarke, and other English commentators of the whole Bible, or of the New Testament, have not omitted the Acts, is generally known.

According to Sanclemente and Ideler, the dates in the Acts are as follows:—Stephen was stoned A.D. 35. Paul converted between 35 and 38. St. Paul's first journey to Jerusalem (Act ix. and Gal. i. 18) between 38 and 41. The second journey (Acts xi. 12) in the year 44. The third journey (Acts xv.) in the year 52. The fourth journey (Acts xviii. 22) in the year 56. The fifth journey to Jerusalem and captivity of St. Paul in the year 60. Voyage to Rome, 62. Arrival in Rome in the spring of A.D. 63.

APOSTOLIC FATHERS, are those teachers of the Christian church who distinguished themselves during the first two centuries, and derived their Christian knowledge from personal acquaintance with the apostles. [See CLEMENS ROMANUS, IGNATIUS of Antiochia, POLYCARPUS, HERMAS, BARNABAS.]

APOSTO'LICI, were imitators of the apostolic life mentioned by Epiphanius. (Hæres, 67.) In the middle ages they were called Cathari. Some of them indulged Manichæan speculations, and others distinguished themselves only by their obedience to the moral doctrine of the *New Testament*. The latter, called Apostolic Brothers, were very numerous on the banks of the Lower Rhine, about the middle of the twelfth century. We learn from a letter written A.D. 1146, in which Everwin, ecclesiastical provost of Steinfelden, exhorts St. Bernhard, of Clairvaux, to confute these heretics, that they rejected oaths, infant baptism, fasts, ceremonies, worship of saints, purgatory, masses, second marriages, the power of the pope, &c. Some of them were brought before the ecclesiastical court of the archbishop of Cologne, and defended themselves by biblical quotations. After a disputation of three days, being still unconverted, the people dragged them to the flames, in which they died manfully.

Another apostolic brotherhood was founded by Gerhard Segarelli of Parma about A.D. 1260. This brotherhood Pope Nicolas IV. endeavoured to suppress by various decrees of 1286 and 1290. Nevertheless Segarelli and his adherents spread through Italy, Germany, France, and Spain. They went about accompanied by women singing, and preaching especially against the corruptions of the clergy. In 1294, two brothers and two sisters were burnt alive at Parma. Segarelli abjured his heresy, but was burnt in 1300 for having relapsed. From this time Dolcino of Milan became the head of this party, who predicted the sudden downfall of the Romish church. Dolcino divided the development of Christianity into four dispensations, the last of which began with his apostolic order. Dolcino escaped from the inquisitors into Dalmatia, but returned to Italy in 1304. He fortified, with 1400 followers, a mountain in the diocese of Novara, near the village Balmara, and plundered, for his support, the adjacent country. In 1306 he fortified the mountain Zebello in the diocese of Vercelli, and fought against the troops of the bishop, until he was compelled by famine to surrender in 1307. Dolcino and his companion Margaretha of Trent were burnt with many of their followers. These Apostolici rejected the authority of the Pope, oaths, capital punishments, &c. Some Apostolic Brothers are mentioned A.D. 1311, near Spoleto; and A.D. 1320, in the south of France. The synod of Lavaur, 1368, mentions them for the last time.

APO'STROPHE (ἀποστροφή). A turning away, a sudden change in our discourse, when, without giving previous notice, we address ourselves to a person or thing different from that to which we were addressing ourselves before.' (Beattie, *Elements of Moral Science*.) The term is also used, less properly, for an address to some absent or inanimate object, as in *Julius Cæsar*, Act iii. Sc. I.

O pardon me, thou bleeding piece of earth,
That I am meek and gentle with these butchers.

It is also used to express the contraction or division of part of a word, as *boro'* for *borough*, *learn'd* for *learned*. This practice of division, intolerable in a language already overburdened with consonants, was much more frequent in the writers of a century, or a century and a half ago, than now; and seems to have been affected to give an air of negligence and familiarity to their style. It ought seldom to be used except in verse, and very sparingly there. The comma, by which the final *s* of the genitive case is separated from the word, is also called an apostrophe, as in 'Israel's monarch.'

APOTACTITES. [See HERETICS.]

APOTHECARIES (COMPANY OF), one of the incorporations of the city of London. In England, in former times, an apothecary appears to have been the common name for a general practitioner of medicine, a chief part of whose business it was, probably in all cases, to keep a shop for the sale of medicines. In 1345, a person of the name of Coursus de Gangeland, on whom Edward III. then settled a pension of sixpence a day for life, for his attendance on his Majesty some time before while he lay sick in Scotland, is called in the grant, printed in Rymer's *Fœdera*, an apothecary of London. But at this date, and for a long time after, the profession of physic was entirely unregulated. It was not till after the accession of Henry VIII. that the different branches of the profession came to be distinguished, and that each had its province and particular privileges assigned to it by the law. An act of parliament was passed in the third year of that king (1511), by which, in consideration, as it is stated, of 'the great inconvenience which did ensue by ignorant persons practising physic or surgery, to the grievous hurt, damage, and destruction of many of the king's liege people,' it was ordered that no one should practise as surgeon or physician in the city of London, or within seven miles of it, until he had been first examined, approved, and admitted by the Bishop of London, or the Dean of St. Paul's, who were to call in to assist them in the examination 'four doctors of physic, and of surgery other expert persons in that faculty.' In 1518, the physicians were for the first time incorporated, and their college founded, evidently with the view that it should exercise a general superintendence and authority over all the branches of the profession. In 1540, the surgeons were also incorporated, and united, as they continued to be till the beginning of the present century, with the barbers. The two associations thus established appear, however, to have very soon begun to overstep their jurisdiction. It was found necessary, in 1543, to pass an act for the toleration and protection of the numerous irregular practitioners, who did not belong to either body, but who probably formed the ordinary professors of the healing art throughout the kingdom. In this curious statute, the former act of 1511 is declared to have been passed, 'amongst other things, for the avoiding of sorceries, witchcraft, and other inconveniences;' and not a little censure is directed against the licensed and associated surgeons for the mercenary spirit in which they are alleged to have acted, while much praise is bestowed upon the unincorporated practitioners for their charity in giving the poor the benefit of their skill and care, and for the great public usefulness of their labours generally. The import of the enactment is expressed in its title, which is, 'An Act that persons being no common surgeons may minister outward medicines.' The persons thus tolerated in the administration of outward medicines, of course comprehended those who kept shops for the sale of drugs, to whom the name of apothecaries was now exclusively applied. The acceptation of the name, as thus confined, may be gathered from Shakspeare's delineation of the apothecary in *Romeo and Juliet* (published in 1596 or 1597), as one whose business was 'culling of simples,' who kept a 'shop,' the 'shelves' of which were filled with 'green earthen pots,' &c., and who was resorted to as a dealer in all sorts of chemical preparations. Nothing is said of his practising medicine; and it certainly was not till nearly a century later that apothecaries in England, as distinguished from physicians and surgeons, ever began to act as general practitioners.

Meanwhile, however, the apothecaries of London were incorporated by James I. on the 9th of April, 1606, and united with the Company of Grocers. They remained thus united till the 6th of December, 1617, when they received a new charter, forming them into a separate company, under the designation of the Master, Wardens, and Society of the Art and Mystery of Apothecaries of the City of London. This is the charter which still constitutes them one of the city companies, although various subsequent acts of parliament have materially changed the character of the society.

It appears to have been only a few years before the close of the seventeenth century, that the apothecaries, at least in London and its neighbourhood, began generally to prescribe, as well as to dispense, medicines. This encroachment was strongly resisted by the College of Physicians, who, by way of retaliation, established a dispensary for the sale of medicines to the poor at prime cost at their hall in Warwick Lane. A paper controversy of great animation rose out of this measure; but the numerous tracts which were issued on both sides are now all forgotten, with the exception of Garth's burlesque epic poem, entitled *The Dispensary*, first published in 1697. The apothecaries, however, may be considered as having made good the position they had taken; although for a considerable time their pretensions continued to be looked upon as of a somewhat equivocal character. Addison, in the *Spectator*, No. 195, published in 1711, speaks of the apothecaries as the common medical attendants of the sick, and as performing the functions both of physician and surgeon. After mentioning blistering, cupping, bleeding, and the inward applications employed as expedients to make luxury consistent with health, he says, 'The apothecary is perpetually employed in countermining the cook and the vintner.' On the other hand, Pope in his *Essay on Criticism*, published the same year, has the following lines in illustration of the domination which he asserts to have been usurped by the critic over the poet:—

'So modern 'pothecaries, taught the art
By doctors' bills to play the doctor's part;
Bold in the practice of mistaken rules,
Prescribe, apply, and call their masters fools.'

Nor, indeed, did the apothecaries themselves contend at this time for permission to practise as medical advisers and attendants any further than circumstances seemed to render it indispensable. In a cleverly written tract in their defence, published in 1724, and apparently the production of one of themselves, entitled '*Pharmacopolæ Justificati; or the Apothecaries Vindicated from the Imputation of Ignorance, wherein is shown that an academical education is nowise necessary to qualify a man for the practice of physic*,' we find the following opinion expressed (p. 31), 'As to apothecaries practising, the miserable state of the sick poor, till some other provision is made for their relief, seems sufficiently to warrant it, so long as it is confined to them.' We may here observe, that the custom of persons being licensed by the bishops to practise medicine within their dioceses continued to subsist at least to about the middle of the last century. It is exclaimed against as a great abuse in a tract entitled *An Address to the College of Physicians*, published in 1747.

It has been stated in various publications, that the order of dealers in medicines, known as chemists or druggists, first made their appearance about the end of the last century, or not much more than forty years ago. As they immediately, or at least very soon, began to prescribe as well as to dispense, the rivalry with which they were thus met was as eagerly opposed by the regular apothecaries, as their own encroachments had in the first instance been by the physicians. In certain resolutions passed by a meeting of members of the Apothecaries' Company on the 20th of November, 1812, among other causes which are asserted to have of late years contributed to degrade the profession, is mentioned the intrusion of pretenders of every description:—'Even druggists,' it is said, 'and their hired assistants, visit and administer to the sick; their shops are accommodated with what are denominated private surgeries; and, as an additional proof of their presumption, instances are recorded of their giving evidence on questions of forensic medicine of the highest and most serious import!' But in all this the druggists really did no more than the apothecaries themselves had begun to do a hundred years before. We doubt, too, if the first appearance of these interlopers was so recent as has been assumed. We find a tract, printed on a single folio leaf 'at the Star in Bow Lane in 1683,' entitled *A Plea for the Chemists or Non-Collegiats*, in which the author, Nat Merry, stoutly defends the right of himself and the other manufacturers of chemical preparations to administer medicines, against the objections of the members of the Apothecaries' Company, who seem to have been themselves at this time only beginning to act as general practitioners. And in 1708, we find a series of resolutions published by the Court of Apothecaries, in which they complain of the intrusion into their business of foreigners—that is, of persons not free of the company. Their charter, though it appeared to bestow upon them somewhat extensive privileges, had been found nearly inoperative from the omission of any means of executing its provisions, and of any penalties for their infringement. In 1722, therefore, an act of parliament was obtained by the company, giving them the right of visiting all shops in which medicinal preparations were sold in London, or within seven miles of it, and of destroying such drugs as they might find unfit for use. This act expired in 1729; and although an attempt was made to obtain a renewal of it, the application was not persevered in. But in 1748 another act was passed, empowering the society to appoint ten of their members to form a court of examiners, without whose license no one should be allowed to utter medicines in London, or within seven miles of it. It was stated before a Committee of the House of Commons, that there were at this time about 700 persons who kept apothecaries' shops in London, not one-half of whom were free of the company. But this act probably had the effect of putting the unlicensed dealers down; which may account for the common statement, that no such description of dealers ever made their appearance till a comparatively recent period. In an Introductory Essay prefixed to the first volume of the *Transactions of the Associated Apothecaries and Surgeon Apothecaries of England and Wales* (8vo., London, 1823), in which it is admitted that antiently 'the apothecary held the same situation which appertains, or ought to appertain, to the present druggist, who arose,' it is affirmed, 'about thirty years ago,' the following remark is added, 'For some time previous to that period, indeed, certain apothecaries existed who purely kept shop, without prescribing for diseases; but very few of these existed even in London; for in the memory of a physician lately dead, there were not more, as he stated, than about half-a-dozen persons in London who kept what could be called a druggist's shop.'

Up to within the last few years the Company of Apothecaries had never attempted to extend their jurisdiction beyond the metropolis and its immediate neighbourhood. But in 1815, an act of parliament was passed, which placed the society in altogether a new position, by giving to the Court of Examiners, then increased to twelve members, the sole right of examining and licensing apothecaries throughout England and Wales. It was enacted, that after the 1st of August in that year, no person not so licensed should practise as an apothecary, except such only as were already in practice. It was also made imperative that candidates for examination should have previously served an apprenticeship of at least five years with a member of the company.

The history of the steps taken to procure this act is very minutely detailed in the Essay prefixed to the *Transactions of the Associated Apothecaries and Surgeons*, already referred to. The application was commenced, and indeed principally carried through, by this private society; the Colleges of Physicians and Surgeons, and the Apothecaries' Company themselves, having declined joining in it. The act, however, fell in one material respect very far short of the design entertained by its projectors, inasmuch as the opposition of the chemists and druggists rendered it necessary to introduce a clause into it exempting that class of dealers altogether from its operation.

From the circumstance that in country places, with very few exceptions, no person can practise medicine without keeping a supply of drugs for the use of his patients, or in other words, acting as an apothecary, this statute has given to the Society of Apothecaries the complete control of the medical profession throughout England. Every general practitioner must not only have purchased their license, but must have served a long apprenticeship with a member of the company. The price of a license to practise in London or within ten miles of it, is ten guineas, and in any other part of the country six guineas. The penalty for practising without this license is twenty pounds. It is expressly declared in the act that the society may appropriate the moneys which they thus receive in any way they may deem expedient. It appears by a published list, that from the 1st August, 1818, when the new act came into operation, to the 31st July, 1832, about 1600 practitioners had been licensed by the Court of Examiners. We have not been able to find any account of the number of rejected applicants. From a return, printed by order of the House of Commons last session, it appears that from the 29th March, 1825, to the 19th June, 1833, the money received by the company for certificates was 22,822*l.* 16*s.* Of this, in the course of the eight years, 10,218*l.* 12*s.* had been paid to the members of the Court of Examiners, besides 980*l.* to their secretary.

It is right to state that the parties by whom the act was sought did not originally contemplate the giving of these extensive powers to the Apothecaries' Company. In one of their first reports, dated the 5th of December, 1812, the committee of management express themselves as of opinion 'that the management of the sick should be as much as possible under the superintendence of the physician;' and it was then proposed that a new and a distinct privileged body should be created to examine and license practitioners, composed of members of all the different branches of the profession. This scheme, however, was abandoned when both the Colleges of Physicians and Surgeons refused to cooperate in getting it carried into effect.

Before this act came into operation a large proportion of the medical practitioners in country places throughout England were graduates of the Universities of Edinburgh, Glasgow, and Dublin, or licentiates of the Royal Colleges of Surgeons of these cities, or of that of London, none of whom obtained their degrees or certificates without passing through a long course of study and a rigorous examination. Persons thus qualified are admitted as surgeons in the army and navy, and into the service of the East India Company; but they are no longer allowed to act as country practitioners in England. This privilege can only be obtained by a service of five years in the shop of a practitioner who is a member of the Company of Apothecaries, and by undergoing an examination in London before the Court of Examiners.

Except in regard to experience in the compounding of medicines, it is not denied that, until very lately, the course of education prescribed by the Company's Court of Examiners was of an extremely inferior description. For this we have their own avowal. In their regulations, dated August 1832 (the last issued, we believe), referring to the improved system which had been introduced only the preceding year, they say, 'The medical education of the apothecary was heretofore conducted in the most desultory manner; no systematic course of study was enjoined by authority or established by usage, some subjects were attended to superficially, and others of great importance were neglected altogether.' In fact, all the attendance upon lectures and hospital practice that was demanded, might have been and often was gone through in six or at most in eight months. The court admits that still 'the attendance upon lectures, but more especially upon the hospital practice, is often grossly eluded or neglected.'

The course prescribed in 1832 for those whose attendance on lectures had commenced on or after January in the preceding year, comprehends two courses of chemistry, two of materia medica and therapeutics, two of anatomy and physiology, two of anatomical demonstrations, two of the principles and the practice of medicine, two of midwifery and the diseases of women and children, one of botany, and one of forensic medicine; together with twelve months' attendance on clinical lectures in an hospital. Most of these courses are to comprehend at least forty-five lectures; and the whole, with the hospital attendance, are to occupy two years.

Notwithstanding this reform, a strong feeling of dissatisfaction has continued to prevail in many quarters at the exclusion from the right to practise of all persons except those who have served an apprenticeship of five years with an apothecary; and a bill was last session brought into the House of Commons to remove this disability. It was withdrawn in consequence of some difference of views as to a minor point among the parties by whom it was promoted; but it is understood that it will be again brought forward during the present session (1834). The object was not to take the right of examination and license from the Court of Examiners of the Apothecaries, but to permit the licentiates of the Scotch and Irish universities, and of the Colleges of Surgeons, to practise in England, as well as those who have the diploma of the Apothecaries' Company.

In respect to this proposed reform, we have only to observe, that the legislature cannot make any change in the present state of the law which regulates the practice of apothecaries in England without a full and impartial inquiry. Whatever may be the result of this, we believe it will be shown that the examinations of the court have been progressively improving, and that the attainments of the successful candidates are very much higher than those possessed by medical practitioners at the time of passing the act of 1815, and indeed than those required by the society soon after the act came into operation. That the examination is not a mere matter of form is shown by the number of pupils rejected: out of the 6227 who were examined from 1815 to 1831 inclusive, 680 were rejected by the court. In the year 1831-1832, nearly one-sixth, and in the year 1830-1831, nearly one-fourth, of the candidates were rejected. The rejected candidates no doubt frequently obtain their diplomas at a subsequent examination, after preparing themselves better; but the fact of so many being rejected is creditable to the Court of Examiners, as, in the present defective state of the early education of medical students, every body knows that a large number of them cannot possibly pass a satisfactory examination. No fees are paid by the rejected candidates. (See *A Reply to the Statement in Support of a Petition of the Royal College of Surgeons of Edinburgh.*)

We ought not to omit to mention that the Apothecaries' Society, in their interpretation of the clause which requires five years' apprenticeship to an apothecary, have considered that 'every candidate who has been an apprentice for the length of time directed by the act, is entitled to be examined, provided the person to whom he was an apprentice was legally qualified to practise as an apothecary according to the laws in force in that kingdom or particular district in which he resided: and in accordance with this interpretation, hundreds of candidates have been admitted to examination who have served their apprenticeships in Scotland and Ireland, as well as many from America and the British colonies.' (See *Reply*, &c. p. 3.) Of twenty-four graduates and licentiates of the Scottish colleges who presented themselves for examination before the Society of Apothecaries during the twelve months ending the 25th of April, 1833, eight candidates, or one third of the whole number, were rejected.' (*Reply*, &c.) The whole subject of medical education in these kingdoms requires a complete and impartial investigation; and that the apprentice clause in particular demands a fresh consideration, is now a pretty general opinion. The admission of graduates from Scotland and Ireland to an equal participation of practice with the English general practitioner, can only be regarded as a very partial measure of reform, if reform should be found necessary; and the interests of the public require, that, if others than those licensed by the Apothecaries' Society are admitted to general practice in England, there shall at least be good proof that they are as well qualified as those who obtain the apothecaries' diploma.

The Apothecaries rank as the fifty-eighth in the list of City companies. The members of the society are exempted by statute from serving ward and parish offices. Their arms are, azure, Apollo in his glory, holding in his left hand a bow, in his right an arrow, bestriding the serpent Python; supporters, two unicorns; crest, a rhinoceros, all *or*; motto, *Opiferque per orbem dicor.* They have a hall in Water-lane, Blackfriars, at which medicines are sold to the public; and where all the medicines are prepared that are used in the army and navy. They also possess a garden, to which every medical student in London is admitted, of above three acres in extent, at Chelsea, in which exotic plants are cultivated. The ground was originally devised to them, in 1673, for sixty-one years at a rent of five pounds, by Charles Cheyne, Esq., lord of the manor of Chelsea, and afterwards granted to them in perpetuity, in 1721, by his successor Sir Hans Sloane, on condition that they should annually present to the Royal Society, at one of their public meetings, eighty specimens or samples of different sorts of plants, well-cured and of the growth of the garden, till the number should amount to two thousand. This they have done, and the specimens are preserved by the Royal Society. They still observe an old custom of making every summer a number of *herbarizing* or *simpling* excursions to the country, which are now, we believe, so conducted as to be valuable botanical lessons to the apprentices or pupils by whom the members of the society are accompanied on these occasions. The society gives every year a gold and a silver medal to the best-informed students in botany, who have attended their garden. The apprentices of members of the society are not permitted to contend with other candidates for these prizes.

APOTHEO'SIS (ἀποθέωσις, a deification, literally, a god-making), the enrolment of a mortal among the Gods. The mythology of Greece is full of instances of this: it is sufficient to call to mind Minos, Hercules, and other heroes, who received divine honours. It was one of the doctrines of Pythagoras, that good men after death were raised into the order of gods. To exalt fellow-men to this extent, however, was foreign to the disposition of republican states; and, therefore, though the Greeks always held in high respect the heroes of antient times, we hear of no deifications from the time when a republican form of government became prevalent in Greece, until the spirit of independence was broken, and the Greeks became as obsequious to kings and princes, as they had formerly been unbending. There is, however, an example to the contrary recorded by Herodotus (v. 47):—the people of Egeste built an *heroum* to Philippus, though he fell in battle against them, and offered sacrifices to him, as Herodotus himself testifies; it was on account of his *beauty* that he was deified. Alexander, according to some rather doubtful stories, not only claimed divine parentage, but a divine nature while on earth; and the compliment of deification was commonly paid to the princes of the various dynasties who succeeded to his empire. On the coins of the Seleucidæ we often find the word 'God' (Θεός). In Rome, also, we find Romulus raised to the rank of a god; but there are no instances of Romans admitted to the rank of deity, from the expulsion of Tarquin, until the empire of the Cæsars. Julius Cæsar was worshipped as a god after his murder. Augustus, while yet alive, was declared the tutelary god of all the cities of the empire, and the succeeding emperors after death were enrolled among the numerous tenants of heaven. It is to the death and reception of Julius Cæsar into heaven, that the 5th *Eclogue* of Virgil is by some supposed to refer.

The term *Apotheosis*, however, is more especially used to signify the ceremony by which the Roman emperors were admitted, if we may use the expression, after death to divine honours. This is minutely described by Herodian (*lib.* iv. c. 3.), and the passage presents so curious a picture of the absurdities into which an idolatrous religion betrayed its votaries, that we translate it here. 'It is the custom of the Romans to deify those of their emperors who die, leaving successors; and this rite they call *apotheosis.* On this occasion, a semblance of mourning, combined with festival and religious observances, is visible throughout the city. The body of the dead they honour after human fashion, with a splendid funeral; and making a waxen image in all respects resembling him, they expose it to view in the vestibule of the palace, on a lofty ivory couch of great size, spread with cloth of gold. The figure is made pallid, like a sick man. During most of the day senators sit round the bed on the left side, clothed in black; and noble women on the right, clothed in plain white garments, like mourners, wearing no gold or necklaces. These ceremonies continue for seven days; and the physicians severally approach the couch, and looking on the sick man, say that he grows worse and worse. And when they have made believe that he is dead (*ἐπὰν δὲ δόξῃ τετελευτηκέναι*), the noblest of the equestrian and chosen youths of the senatorial orders take up the couch, and bear it along the Via Sacra, and expose it in the old forum. Platforms like steps are built on either side; on one of which stands a chorus of noble youths, and on the opposite, a chorus of women of high rank, which sing hymns and songs of praise (*ὕμνους καὶ παιᾶνας*) to the deceased, modulated in a solemn and mournful strain. Afterwards they bear the couch through the city to the Campus Martius; in the broadest part of which, a square pile is constructed entirely of logs of timber of the largest size, in the shape of a chamber, filled with faggots, and on the outside adorned with hangings interwoven with gold and ivory images and pictures. Upon this, a similar, but smaller chamber is built, with open doors and windows, and above it, a third and fourth, still diminishing to the top, so that one might compare it to the light houses, which are called *Phari.* In the second story they place a bed, and collect all sorts of aromatics and incense; and every sort of fragrant fruit or herb or juice; for all cities and nations and persons of eminence, emulate each other in contributing these last gifts in honour of the emperor. And when a vast heap of aromatics is collected, there is a procession of horsemen and of chariots around the pile, with the drivers clothed in robes of office, and wearing masks made to resemble the most distinguished Roman generals and emperors. When all this is done, the successor to the empire applies a torch to the building; and others set fire to it on every side, which easily catches hold of the faggots and aromatics. And from the highest and smallest story, as from a pinnacle, an eagle is let loose to mount into the sky as the fire ascends; which is believed by the Romans to carry the soul of the emperor from earth to heaven: and from that time he is worshipped with the other gods.' Compare with this description Dion's account (book 74.) of the funeral ceremonies of Pertinax.

In conformity with this practice, it is common to see on medals struck in honour of an apotheosis, an altar with fire on it, and an eagle taking its flight into the air. Several representations of real or supposed apotheoses have been preserved in antient gems and sculptures; of which the most celebrated is the apotheosis of Homer, formerly in the Colonna palace at Rome, but now in the Townley gallery of the British Museum. This monument has been illustrated by some of the most eminent of modern scholars. Montfaucon has published the apotheosis of Romulus in the third volume of the supplement to his *Antiquities.* See a remark on the apotheosis of Augustus, under *onyx,* in the article AGATE.

APO'TOME, in antient Greek music (from *ἀπὸ*, *from,* and *τέμνω*, *to cut*), the remainder of a whole tone when diminished by a *limma* [see LIMMA], or smaller semitone, the ratios being 2187 and 2048. The Greeks were aware that the tone-major could not be rationally divided into two equal parts; they therefore divided it into a greater and less semitone, which they called *apotome* and *limma,* the difference whereof is a *comma.* [See COMMA.] Under the heads TONE, and SCALE, MUSICAL, OF THE GREEKS, will be found further information concerning the antient manner of dividing the octave.

APPALACHE, a bay in the Gulf of Mexico, formed by the coast of West Florida, and a line joining Cape St. George, the most southern point of the Appalachicóla delta, with the outlet of the Suwanne river. It receives the Ocklockonne, St. Mark's, and a few other inconsiderable streams.

APPALACHIAN MOUNTAINS. The mountain system which runs along the eastern side of the continent of North America, is generally known, in this country, by the name of the Alleghanies: but these are, in fact, only a subordinate chain; and modern geographers in the United States have adopted the general term of the *Appalachian System* for the whole mass. They were called the *Appalaches,* or Appalachian Mountains, by the French, who first became acquainted with them at their southern extremity, from the Indian name of a river which flows into the Gulf of Mexico, in Appalache bay; but the English, who visited them principally in their more northern parts, preserved the Indian name there given of Alleghanies, which is supposed to mean the *Endless.*

The Appalachian system consists of numerous parallel chains, some of which form detached ridges, extending, in most instances, in the same direction as the entire system which they contribute to form. Taken as a whole, it has a range which does not deviate materially from N.E. to S.W., and it extends about 1200 miles in length. The northern and southern extremities of this mountain system are not well defined, but the elevations which form a part of the whole system may be traced from the state of Maine into Alabama. The most remarkable chains are, the Blue Ridge, which lies nearest to the Atlantic, and stretches from the state of Georgia to its intersection by the Delaware River, but no very exact limit to the name of this range is laid down; the Kittatinny Chain; the Alleghany Mountains, in the western part of Virginia and the central parts of Pennsylvania; the Cumberland Mountains, on the eastern boundary of Tennessee and Kentucky; the Catsbergs, or Catskill Mountains, in the state of New York; the Sacondago Chain, which is a continuation of the Catsbergs; the Green Mountains, in the state of Vermont; the Highlands, eastward of the Hudson River; and the White Hills in New Hampshire. In the whole of the Appalachian system, there are no great detached mountain peaks; the greatest elevations are in the White Hills of New Hampshire, where Mount Washington, according to the measurements of Captain Partridge, rises to the height of 6634 feet above the sea, its base being at an elevation of 1888. The summit is much below the limit of perpetual snow. Moosehillock, another of the White Hills, is 4636, and Grand Monadnoc, 3254 feet. In the Green Mountains, Killington Peak is 3924 feet above the sea; in the Catsbergs, Round Top is 3804, and the High Peak 3718 feet above the tide level of the Hudson, about 18 miles distant. The Peaks of Otter, in the Blue Ridge, Virginia, are said to be about 4000 feet above the sea level; though the general elevation of the Blue Ridge in Virginia is far below this height. Table Mountain, in South Carolina, is supposed to be not less than 4300 feet above the sea. Canawhee Mountain in Georgia, the southern extremity of the Blue Ridge, is 1500 feet.

The Appalachian Mountains do not form a high dividing line between the waters which flow into the Atlantic on one side, and into the Mississippi on the other. They cover a widely-extended area of about 100 miles in breadth, only one-third of which is occupied by the mountain chains, the rest being the intermediate valleys. The rivers which rise in the Appalachians, flow in long valleys between the chains, and are deflected sometimes to the east, and sometimes to the west, after passing nearly at right angles through depressions in the ridges, or through deep rents in the mountains, as at Harper's Ferry, in Virginia, where the united Potomac and Shenandoah cut the Blue Ridge at right angles. From the Connecticut River, the most northern of the great rivers belonging to the Appalachian system, to the Alatamaha of Georgia, we find a series of large rivers which, originating within the Appalachian system, or on the margin of its eastern barrier, flow to the Atlantic. The line of the great water-shed, between the streams that run to the Atlantic, and those that flow into the gulf of Mexico, runs from the sources of St. John's River, on the north-western limit of the state of Maine, to the Point of Florida, almost following the inflection of the coast, but the mountain system crosses that line, at an angle of about 30°. The land between the sea-coast and the foot of the most eastern of the Appalachian chains, is of very unequal breadth; at the Hudson River, the Atlantic almost washes the base of the mountains, but from that point southward, there is a gradual increase in the breadth of the Atlantic Slope, as it is called by the American geographers, as far as Cape Hatteras, in North Carolina, and from that point to the mouth of the Alatamaha in Georgia, the coast runs nearly parallel to the mountains, at a distance of about two hundred miles.

The western slope of the Appalachian system falls by a gentle but broken descent to the Mississippi; it is upwards of 1000 miles in length, and about 300 miles in width, from the river to the base of the mountains, covering an area of about 300,000 square miles, unbroken by any other than gently rising hills, but deeply furrowed by rivers over its whole surface. Nowhere can the wearing effects of rivers be more advantageously studied, for their channels do not appear to have been formed by rents and dislocations of the ground, the strata being usually horizontal, but by the erosion of a stream. The hills parallel to the Appalachian system on the western slope consist, in their lower parts, of transition slate and limestone, in highly inclined beds, which are covered near their summits by coal-measures and superior secondary formations, in unconformable and horizontal stratification. Hills, separated by valleys several miles wide, are composed of the same horizontal strata, the identity of the beds on both sides of the valley being recognizable; it seems, therefore, a legitimate conclusion, that the strata were once continuous over the valley, and it is difficult to conceive how the gap could have been produced, in such circumstances, except by the scooping out of water acting with great force, and for a considerable period. Further observation, however, should be made before any positive opinion is adopted about the formation of these river valleys.

In the northern parts of the Appalachian system, a considerable tract of country is occupied by primary strata, such as gneiss, mica-slate, clay-slate, and granular limestone, associated with granites, serpentines, and traps, under various aspects, underlying and penetrating the strata. Grauwacke sandstone and slates, and transition limestones, are, however, more abundant in this mountainous range than the primary strata. *Grauwacke slate* forms the western margin of the primary country of New York and New England, and also of the great body of the Alleghany Mountains and of the Catsbergs. It is still more widely extended in the north, occupying much of the surface in the state of Vermont, the northern parts of the state of New York, and Canada. In the Alleghany Mountains of Pennsylvania, Maryland, and Virginia, its beds are of great thickness, and form, in some instances, the prevailing rocks, being, however, almost invariably overlaid by sandstone. *Transition limestone* occurs over a great extent of country along the north-western side of the Alleghany chain, associated with the grauwacke slate, but generally inferior to it. It is found in Vermont alternating with grauwacke slate, and is separated from a secondary limestone in the valley of Lake Champlain by a red sandstone, which forms the upper part of a range of hills called the Snake Mountain. In the western part of Massachusetts, and along the eastern side on the Hudson River in New York, it lies upon primary clay-slate. North-east of the Hudson, this limestone nowhere occupies any great extent of country. Crossing the Hudson, and proceeding south-west, little of this limestone is seen in the lower part of New York, but it becomes more abundant in the western parts of New Jersey and Pennsylvania, and forms the lower part of the ridge in southern Pennsylvania and Virginia. According to Maclure, it extends nearly to the south-west termination of the mountains, between the Alabama and Tombeckbe rivers. It contains many caves, some of which are of great extent, and in these caves fossil bones of various animals have been found. *Arenaceous* and *conglomerate grauwackes* are perhaps the most frequent forms in which the transition rocks present themselves, but what proportion of these are of the age of our old red sandstone has not yet been made out. A red sandstone partially covers the lower levels of the primary strata, from twelve miles south of Connecticut River to near the Rappahannock River in Virginia, a range of nearly 400 miles; and, though often interrupted, it retains a remarkable degree of uniformity throughout the whole distance. The sandstones, in highly-inclined beds, prevail very generally throughout the middle and eastern chains in Pennsylvania and Maryland. Near the summit of the Alleghany Mountains, the grauwacke passes into a red sandstone, which is not in unconformable stratification, but gradually assumes a horizontal position.

In Pennsylvania there is a vast deposit of coal, associated with sandstones and slates, which American geologists have hitherto described as belonging to the transition or grauwacke series. The coal is usually termed anthracite by them, and seems to be of that quality which is generally called *blind coal* in Britain, and of which many beds in our regular coal-measures consist, in several situations, as in the South Wales Coal-basin. The great Pennsylvanian coal-fields are situated in the valleys of the Susquehanna, Lackawanna, and the Lehigh and Schuylkill rivers, the two last being affluents of the Delaware.

The natural beauties of these valleys seem destined at no distant period to be impaired by black smoking heaps, such as those which in our own country disfigure the valleys of the Tyne and the Wear. The coal-region along the Susquehanna River is in the valley of Wyoming, and runs up into the valley of its tributary the Lackawanna. It is between sixty and seventy miles long, by about five miles broad. The beds of coal break out in the face of the precipices, in the banks and beds of the rivers, and occur in several alternations with conglomerates, sandstones, and slates. In these sandstones and slates, as well as in the coal itself, there are numerous vegetable impressions, belonging to the fern tribe and others. From the description of these by Professor Silliman, coupled with the fact that balls of clay-ironstone accompany the strata, we are led to doubt whether these strata belong, as it has been said, to an earlier geological period than the regular coal-measures in Europe.

The coal-region of the Lehigh River is chiefly wrought at a place called by an Indian name, Mauch Chunk. The coal here also forms alternating beds with sandstones and slates, and is extracted at the summit of a mountain 1500 feet above the level of the sea, in a quarry open to the day. The beds are usually from twenty to twenty-five feet thick, but in some places they swell out to fifty-four feet, and they are known to extend over many miles. These mines, together with others on the Schuylkill River, are an immense source of wealth to the state of Pennsylvania. They are now extensively wrought, and the coal is conveyed by railroads to the banks of the navigable rivers. They will have a powerful influence on the future condition of the United States, for there is enough to supply the whole country along the Atlantic shore for many ages. Deposits of the same kind of coal are wrought in Rhode Island, and in Worcester County in the state of Massachusetts. Bituminous coal, of the same sort with the regular coal-measures of Europe, is found in several places on the Atlantic Slope. About ten or twelve miles west of Richmond, in Virginia, Mr. Maclure says that there is such a deposit, from twenty to twenty-five miles long, and about ten miles wide; it is situated in an oblong basin, having a whitish freestone and slaty clay with vegetable impressions alternating with the coal. It lies upon and is surrounded by primary rocks. Bituminous coal is abundant also in Tioga County, in the state of New York. About one mile west of the summit of the Alleghany, on the road from Philadelphia to Pittsburg, the coal-measures appear, and descending into the valleys, the transition strata again emerge.

There are, in several other situations in the Appalachian system, very extensive deposits of bituminous coal; one of the most remarkable of which is in the vicinity of Pittsburg, on the Ohio, where it is associated with ironstone, as in Staffordshire, and, from very similar local advantages, a Birmingham for the United States has grown up at Pittsburg. A mountain group, called the Laurel Ridge, lies between Pittsburg and the Alleghanies, and is separated from the latter by a wide valley. Near the summit of the mountain are strata of sandstone and bituminous shale alternating with coal, which is thick enough to be worked. These coal-measures are very little lower than the summit of the Alleghanies, and as they are horizontal, they must have been raised up from the bottom of the sea in a vertical direction to this great height; a circumstance which perhaps seems to indicate rather a gradual upheaving of the Appalachian system, than a sudden and violent action. The coal-mines near Pittsburg are opened along the sides of the hills at an elevation of 520 feet above the level of the Ohio, and the strata are quite horizontal. This coal-formation is believed to be of great extent, indications of it having been observed

100 miles above Pittsburg; but it is not very probable that it is uninterruptedly continuous over so great an extent.

Natural springs, extremely rich in salt, are found all along the western slope of the Appalachian system; and from Onondago, in New York, to Louisiana, wherever the earth has been penetrated to any considerable depth, salt water has been found; in some places, where the boring was from 300 to 400 feet, the water rushed up with so much force, as to rise like a fountain several feet above the surface of the ground. Salt works are established at intervals along the whole line of country from Onondago to within a short distance of Natchitoches in Louisiana, and the quantity annually made is immense. In the valleys of the Appalachian system there is a considerable number and variety of mineral waters, which are much resorted to during the summer months by invalids from all parts of the States. Thermal springs also occur, as in the county of Bath, in Virginia, the western boundary of which county is the Alleghany range.

No portion of the earth of equal extent possesses so many natural advantages for the advancement of civilized society, as the country between the Appalachian Mountains and the Mississippi; vast stores of coal, iron, limestone, and salt; the land intersected in every direction with navigable rivers, affording the utmost facilities for the construction of canals; and a direct communication by water with the sea. It can hardly fail, in the course of a few centuries, to be covered with flourishing towns and a dense population.

The secondary formations of Europe, between the coal-measures and the chalk, seem to be of very rare occurrence all along the Atlantic slope. In New Jersey and Delaware there is a very extensive deposit of an argillaceous marl, containing, however, but a small quantity of lime, which, from the included fossils, has been considered both by American and French geologists to be an equivalent, in point of age, to the chalk of Europe. It reaches from 38° to 40° 30′ N. lat., having the ocean on the east, and being bounded on the west by primary strata, on the south by the tertiary deposits to be presently mentioned. It covers upwards of 4000 square miles, and is for the most part remarkably level. It is found in many places farther south, but covered by the tertiary strata.

From the foot of the most easterly range of the Appalachian Mountains a tract of low country, of variable breadth, extends to the shores of the Atlantic. By low we do not mean flat, for the surface is diversified by hills of moderate elevation, interspersed amid widely-extended plains. Mr. Maclure, and the American geologists who wrote fifteen years ago, described this as a vast tract of *alluvial* land; but more recent investigations, especially those of Dr. Morton, Professor Hitchcock, and Mr. Conrad, have shown that it is composed of a series of tertiary deposits. Three distinct formations have been made out, and have been called by Mr. Conrad the Lower, Middle, and Upper Tertiary, being distinguished from each other by including distinct species of fossil shells. The Lower contains chiefly extinct species, the Middle a mixture of extinct species with others still inhabiting the coasts of the United States; the Upper contains scarcely anything besides the remains of existing species. Following the principle of subdivision of the Tertiary deposits adopted by Mr. Lyell, the Lower formation may be Eocene, and the Middle formation may be Miocene; but the Lower may also belong to the Miocene period. The question turns upon the *relative proportions* of recent and extinct species among the fossil shells contained in the beds. There seems no doubt that the Upper formation belongs to the Newer Pliocene period. These formations collectively, according to Mr. Conrad, form the Atlantic margin of the United States, from Sandy Hook in New Jersey to the peninsula of Florida, from whence they skirt the Gulf of Mexico, to the waters of the Mississippi. The lower tertiary is met with at the western boundary of the Atlantic slope; the upper tertiary extends to the shores of the ocean. This last also occupies by far the greatest extent of surface, extending from 100 to 150 miles west from the sea. Thus we arrive at the remarkable conclusion, as has been observed by Mr. Murchison in speaking of Mr. Conrad's work on Tertiary Shells, that the vast portion of the American continent covered by the upper tertiary deposit, must have been raised from the bottom of the ocean since the time when the existing species of mollusca occupied the adjoining seas. It is stated by Mr. Conrad that on fresh-water lacustrine formations have yet been discovered among the tertiary deposits of the United States. This is a remarkable fact; but as the space is vast and much covered by vegetation, and the careful and competent observers of geological phenomena have hitherto been few, we are perhaps hardly enabled as yet to say positively that they do not exist. These tertiary formations do not in all places occupy the surface; they are covered in many situations by great accumulations of gravel, sand, and other alluvium. In these have been found the remains of extinct quadrupeds, such as the mastodon in New Jersey and North Carolina, the megatherium in Georgia, and extinct species of the elephant in several places.

Among the unstratified rocks, granites, sienites, and serpentines occur abundantly in the Northern States, and in detached localities; but less frequently as far as the southern extremity of the mountain system.

Trap rocks of different kinds are found in many places, and sometimes in the form of columnar basalt, but there is not a trace of recent volcanic action throughout the whole of the Appalachian system.

There are both iron and lead mines, but the produce of neither has hitherto been very considerable. Gold has been found rather abundantly in the states of North Carolina and East Tennessee. The gold country of North Carolina, according to Professor Olmsted, lies on the southern side of the state, and is spread over a space of not less than a thousand square miles. The prevailing rock is a clay slate, which forms a zone more than twenty miles wide; it has interstratified beds of siliceous slate, and both are traversed by quartz veins. It is in these veins that the gold appears to exist, but almost all that is found is in the form of grains and detached lumps of various sizes in the alluvium which covers the rocks. It has been found, within these few years, in considerable quantities in the mountainous parts of the state of Georgia, not only in the alluvium, but also in veins in the rocks; usually in quartz veins, in talc slate, and mica slate, accompanied by iron pyrites. There have been found in Georgia the remains of works, which were carried on by some people before the arrival of Europeans, consisting of a shaft and excavations in a large quartz vein, with part of a furnace, and some tools.

In the natural state of the country, that is, when it was first discovered by Europeans, an almost unbroken forest spread over and around the Appalachian system of mountains, reaching to the Atlantic Ocean, Gulf of Mexico, far beyond the St. Laurence river, and westward beyond the Mississippi. The spots which have been cleared in this ocean of trees are very insignificant when compared with its vast extent, which has been estimated at 2,000,000 of square miles. The most valuable trees are several species of oak, pine, and hickory, and three or four species of maple, one of which, the sugar maple, is extremely valuable. The liriodendron, a kind of magnolia, flourishes in such luxuriance of growth, as to be called the pride of the western forests. The great Weymouth pine is one of the most beautiful of the North American forest trees, attaining its greatest magnitude and perfection in the more northern regions. Its trunk is often of the diameter of five or six feet, rising smooth and straight from 60 to 80 feet, and terminated by a dense conical top. It forms a striking feature in the forest scenery of Vermont, New Hampshire, New York, and some parts of Canada; rising by nearly half its elevation above the summits of the other trees, and resembling, like the palms of the tropics, a forest planted upon another forest. Descending from the Alleghanies into the valley of the Ohio, we find near the summit of Laurel Ridge a change in the aspect of the forest. The deep hue of the hemlock spruce, the Weymouth pine, and other trees of the family of coniferæ, is exchanged for the livelier verdure of the broad-leaved laurel, the rhododendron, and magnolia. (Darby's *View of the United States;* various Memoirs in *Silliman's Journal of Science;* Maclure's *Geology of the United States.*)

APPALACHICO'LA, a river of the United States, which rises in the state of Georgia, and flows into the Gulf of Mexico. The Appalachicola consists of two main branches, the Chatahooche and Flint river; and the Chatahooche itself consists of two main branches, the Chestatee and Chatahooche proper. The Chestatee rises in the northern extremity of Habersham county, in the state of Georgia (35° N. lat.), and in the high table-land of the Appalachian system, at an elevation of about 2000 feet. Its sources are near those of the Savannah, which flows into the Atlantic, the Coosa, which is an affluent of the Alabama river (see ALABAMA), and the Tennessee, one of the great affluents of the Mississippi. The Chestatee, after a course of 100 miles, for the most part S.S.W., receives, near the parallel of 34° and from the N.E., the Upper Chatahooche, whose course to the point of junction is shorter than that of the Chestatee.

At their junction, the river takes the name of Chatahooche, and pursues a general southern course for 250 miles to about 30° 40′ N. lat., where it is joined on the east by the Flint River. This river system presents several peculiarities. The general course of the Chatahooche proper, and that of the united streams for a short distance below the point of junction, is about S.W. Following the course of the Chatahooche proper downwards, at a short distance from its channel and to the east we find some of the higher affluents of the Savannah and all the head waters of the Alatamaha: these two rivers flow into the Atlantic. Thus it appears that a very narrow belt of high land divides the channel of the Chatahooche proper from the sources of the Atlantic streams just mentioned. From the junction of the Chestatee and Chatahooche to the junction of the Flint River, no stream larger than an inconsiderable creek joins the Chatahooche, which has a long and very narrow basin, estimated at about 320 miles in length, with a mean breadth of 35 miles, and an area of 11,200 square miles.

The Flint River rises in Georgia (33° 30′ N. lat.), and as its upper waters have a direction exactly similar to those of the upper waters of the Alatamaha, it appears, for about a third part of its course, doubtful whether its waters will enter the Gulf of Florida or the Atlantic. Its general direction is S., and then S.W. to its junction with the Chatahooche; its course is estimated at about 210 miles, and its basin is narrow, not exceeding 40 miles of average breadth.

The united streams of the Chatahooche and Flint take the name of Appalachicola, and run S. 70 miles, dividing into several channels and forming a delta. The outlets of this stream are in St. George's Sound, in the Gulf of Mexico, in 29° 46′ N. lat. The direction of this river is singularly straight, having a general southern course of above 400 miles; it runs through more than five and a half degrees of latitude; and as the elevation of the highest parts of the river is 2000 feet, we have, as we advance from the mouth to the source, all the variations of temperature that can arise from the combined effect of variation of latitude and elevation of surface.

The Appalachicola is navigable for vessels up to the junction of the two great branches, and the Chatahooche is navigable for boats almost to its source. The bed of the river is said to be deep and capacious: the tides ascend about two-thirds of the distance between the sea and the junction of the Flint and Chatahooche. (Darby's *Geographical View of the United States.*)

APPARA'TUS SCULPTO'RIS, or the Sculptor's Workshop, a constellation formed by LACAILLE. It is situated in that region of the heavens immediately to the eastward of the large star Fomalhaut or α Piscis Australis, and hardly rises above the horizon in our hemisphere. It is bounded by Cetus and Aquarius on the north, Fornax Chemica on the east, Piscis Australis on the west, and Phœnix on the south. Its principal stars are designated as follows:

Character.	No. in Catalogue of		Magnitude.
	Piazzi.	Astron. Society.	
κ^2	6	12	5·6
γ	36	2779	5
ι	50	24	6
	99	165	6
ϵ	168	191	5
δ	192	2344	5
α	250	100	5
κ^1	285	4	6

APPA'RENT (in astronomy). When it is necessary or convenient to reduce an observed phenomenon, either by clearing it of the effects of any optical delusion, or substituting for it the phenomenon which would have been observed at some more commodious station, that which is actually observed is called the *apparent* phenomenon, in opposition to that which results from correction or reduction, which is called the *real* or *true* phenomenon. Without discussing the propriety of these names, we shall give a few instances of their use. The apparent altitude of a star requires a correction for REFRACTION, an optical delusion which makes the star appear a little higher than it would do if there were no atmosphere. The observed (*apparent*) place of a planet is always reduced to that in which it would be seen from the *centre* of the earth, which is called its true place [see PARALLAX]. The same correction is required to reduce the *apparent* phenomena of an eclipse to the *true*. The *apparent* or *sensible* horizon is the plane in which lies the circle actually bounding the view; the *real* or *rational* horizon is a plane parallel to the preceding, drawn through the centre of the earth. These will be sufficient exemplifications of the use of the word; which, it must be observed, is arbitrary, and, in some cases, inconsistent. For example, the *apparent* diameter of a planet is the *angle* made by two lines drawn to the eye from opposite points of its disk; while the *true* diameter is a magnitude of a different kind, namely, the *line* which joins the points of the disk aforesaid. Nevertheless, the preceding *apparent* diameter of the moon, reduced to the centre of the earth, would be called the true diameter by astronomers, from which some confusion might arise, were it not that the linear diameter very seldom enters into the computation.

APPARENT MAGNITUDE. The angle under which any line appears at the eye, that is, the angle made by lines drawn from its extremities to the eye. [See MAGNITUDE.]

APPARENT MOTION. The velocity and direction in which a body appears to move, when the spectator himself is in motion, without being conscious of it. For further detail see MOTION.

APPARITION. The mind affects the body; the body affects the mind, and some insight may be obtained into the disordered states of the mind, by considering the physical conditions which are necessary to sound thought.

It is not true, as is commonly supposed, that we see with the eye, and hear with the ear, and taste with the tongue. The true seat of these sensations is the brain, and the eye, the ear, the tongue, are organs adapted to receive impressions from external objects, which impressions are transmitted from the organs by an appropriate apparatus to the brain, where they become sensations. When an object is presented to an organ of sense, it produces a change in the nerves of that organ. This change is conveyed by the nerves to the brain; a corresponding change is occasioned in the brain, and through the brain in the mind; and it is this change in the mind which is expressed by the term sensation. Ideas on the contrary are copies of sensations, renovations of prior feelings, in general differing from sensations in being less intense.

The functions of the brain, then, are sensation, and, if the analogous term be allowed, ideation, together with the action and re-action of these two states on each other, known under the name of intellectual operation. The main instrument by which intellectual operation is carried on is what is termed association. It is a property of the mind to combine and unite the sensations and ideas it receives in such a manner, that, after this combination or union has been once formed, if any one of these sensations and ideas be revived, the single sensation or idea so revived will immediately call up to view all the sensations and ideas that had previously been connected with it; and this power of association, as long as its action is sound, is observed to operate in a uniform and determinate manner. For example, when sound, association excites ideas in a certain order, generally in the order of sensation. Thus, if the sensations A B C were impressed upon the mind in the order of these letters, B will re-excite not A, but C. Association, when sound, operates by exciting ideas with a certain degree of velocity. If the rapidity of the succession of the trains of ideas pass beyond a certain point, instead of distinct, there is confused thought. Association, when sound, operates by exciting ideas with a certain degree of vivacity. Sensation is not produced, unless the external object be applied to the organ of sense with a certain degree of force; while, if propelled against it with too great an impetus, instead of specific sensation, it excites only pain. In like manner, unless the trains of ideas recalled by association possess a certain degree of vivacity, they present to the mind an indistinct assemblage of images; if, on the other hand, they are too vivid, they are equally incapable of forming the elements of sound thought.

In order that the brain may carry on these operations, that is, in order that it may receive the impressions conveyed to it by the nerves from the organs of sense, in order that it may convert these impressions into sensations, and in order that it may duly combine and revive them, it must be in a sound state. The chief agents which maintain the brain in a sound state are its organic nerves, and its circulating vessels. Like every other organ, the brain is maintained in a healthy condition by the organic process of nutrition, over which the system of nerves termed organic [see Nerve] preside. If these organic nerves become disordered disease may take place in the substance of the brain, and this disease may assume a variety of forms far too great to be enumerated here, the slightest of which may be incompatible with the production of sound thought. If, on the other hand, the flow of blood through its circulating vessels be deranged, the process of thought may be equally disordered. Stop the flow of blood to the brain altogether, insensibility will follow instantly; fainting will supervene, and this state will be quickly succeeded by death, unless the vital current be re-admitted. Quicken the circulation beyond a certain point, insensibility equally follows; and, though the preternatural velocity of the circulation should stop short of inducing insensibility, it may yet disturb the ordinary process of thought in an infinite variety of modes.

Now there is scarcely a single disease which is not capable of disturbing, in a greater or less degree, the action of the organic nerves of the brain; but the maladies which most commonly and remarkably disturb the functions of these nerves are certain diseases of the abdominal viscera, particularly of the alimentary canal, and more especially of that portion of it which forms the stomach; certain diseases of the liver, and of the mesenteric glands, and of the urinary and reproductive organs. In like manner excitation or depression of the action of the blood-vessels of the brain, beyond a certain point, uniformly disorders sensation and all the mental operations. Striking illustrations of both are afforded by the effect of many physical agents, as well as of natural diseases. Of the first, the effects of the inhalation of nitrous oxide affords an example. When nitrous oxide is received into the lungs, the pulse is increased in strength, fulness, and velocity. A corresponding change takes place in the mental impressions. Sensation becomes more vivid; the sensibility to touch increases; luminous points dazzle the eye; the hearing is more acute; recollections, generally of a pleasing nature, and of uncommon intensity, pass rapidly through the mind. One individual compares his feelings, under the influence of this gas, to those which he experiences when witnessing an heroic scene upon the stage; another likens them to the emotions he felt when, on the occasion of the commemoration held at Westminster Abbey in honour of Handel, he heard seven hundred instruments playing at one time.

'After my return from a long journey,' says Sir Humphry Davy, 'being fatigued, I respired nine quarts of nitrous oxide, having been thirty-three days without breathing any. After the first six or seven respirations I gradually began to lose the perception of external things, and a vivid and intense recollection of some former experiments passed through my mind, so that I called out "What an amazing concatenation of ideas!"' On another occasion, after having been enclosed in an air-tight breathing box, of the capacity of nine cubic feet and a half, in which he became habituated to the excitement of the gas, which was there carried on gradually, and after having been in this place of confinement an hour and a quarter, during which time no less a quantity than eighty quarts were thrown in, this experimentalist says, 'The moment after I came out of the box I began to respire twenty quarts of unmingled nitrous oxide. A thrilling, extending from the chest to the extremities, was almost immediately produced. I felt a sense of tangible extension, highly pleasurable, in every limb; my visible impressions were dazzling, and apparently magnified. I heard distinctly every sound in the room, and was perfectly aware of my situation. By degrees, as the pleasurable sensation increased, I lost all connexion with external things; trains of vivid, visible images rapidly passed through my mind, and were connected with words in such a manner as to produce sensations perfectly novel. I existed in a world of newly-connected and newly-modified ideas. When I was awakened from this semi-delirious trance by Dr. Kinglake, who took the bag from my mouth, indignation and pride were the first feelings produced by the sight of the persons about me. My emotions were enthusiastic and sublime; and for a moment I walked round the room perfectly regardless of what was said to me. As I recovered my former state of mind, I felt an inclination to communicate the discoveries I had made during the experiment. I endeavoured to recall the ideas—they were feeble and indistinct. One recollection of terrors, however, presented itself, and with the most intense belief and prophetic manner, I exclaimed to Dr. Kinglake, "Nothing exists but thoughts; the universe is composed of impressions, ideas, pleasures, and pains!"'

From this interesting experiment, it appears that in consequence of an extraordinary impression upon the brain, through the medium of the nerves and the circulating vessels, 1. sensations were increased in intensity; 2. ideas were increased in vividness; 3. in consequence of this change in the ordinary state of sensation and ideation, all connexion with external things was lost—a world of newly-connected and newly-modified ideas arose; 4. emotions were produced corresponding in intensity to the acuteness of sensation and the vividness of ideas. 'My emotions were enthusiastic and sublime. I exclaimed, "Nothing exists but thoughts; the universe is composed of impressions, ideas, pleasures, and pains!"'

The inhalation of malaria, the poison which produces fever, affords an equally striking illustration of the modification of sensation, and of all the subsequent operations of the mind, by a cause affecting the nerves and blood-vessels of the brain. Febrile miasma is a depressing, nitrous oxide a stimulating, agent; the effect of the former on the brain ought therefore to be the reverse of the latter, and, accordingly, on receiving into the lungs the febrile miasma, the pulse becomes oppressed and weak; languor and lassitude pervade the limbs; the countenance becomes pale, the surface cold; headache, giddiness, and sometimes vomiting supervene, while the mind is feeble, dull, dejected, incapable of the effort of attention, and utterly unable to control or even to connect the trains of gloomy and distressing images which terrify the imagination. 'Some circumstances had occurred,' says a physician who carefully observed the phenomena which attended the progressive derangement of his own mind under the influence of fever, 'to render me anxious and dispirited; of these I took an exaggerated and gloomy view. I had been studying during several months with unusual severity. One day in the cold weather of January, after having been occupied many hours in the practical duties of my profession, I returned home fatigued. Great as was my bodily exhaustion, the depression of my mind was still more remarkable. My head ached, and unable to study or to attend to any professional engagement, I lay on the sofa and attempted to read, chance having thrown in my way the American novel called the *Water Witch*. I became interested in the story, but the pain and confusion of my head increasing, I requested a friend to read to me, my own eye continually wandering from the page. The progress of the fever was rapid; its chief force fell upon the organ that had been recently over-excited, the brain; and delirium came on early, and somewhat suddenly. Immediately before I became decidedly delirious, I received an invitation to the soirées given by the Duke of Sussex to the members of the Royal Society. The friend I asked to return an answer expressive of my regret that I should be unable to attend on account of illness, used, as I conceived, an expression not strictly correct: this verbal inaccuracy, I thought, was construed into wilful falsehood; the matter was brought before this assemblage of learned men, who unanimously declared that it ought to exclude me from the society of honourable men, and that I should no more be admitted amongst them. This announcement was brought me from the palace, accompanied with martial music, but of a more solemn and impressive kind than I had ever heard before, in which was predominant the sound of bells, soft, and as if of silver tone. Remonstrance was vain: the decision, of which I succeeded in obtaining a reconsideration, was confirmed; this confirmation was brought me in the same manner as the first announcement, accompanied with the same kind of music, only still more solemn and impressive. I saw no person forming the band of musicians, but occasionally I heard very distinctly their measured step. I now thought myself an abandoned and lost being; and the apprehension that every one about me hated and sought occasion to destroy me, took possession of my mind. My physicians, my nurses, my dearest friends, were in league with a malignant spirit, which assumed the shape of the demon of the *Water Witch*. By an object of my tender affection, who was anxiously watching over me, but in whom I now saw only the willing agent of the demon, I was betrayed, and through this treachery the malignant spirit obtained entire possession of me. No sooner was I in the power of the demon than she began to suggest to me the commission of crimes abhorrent to my nature, and at last there fixed upon my mind the impression that I had really been guilty of the crimes, by the vivid picture of which my imagination had been disturbed. I pass over the hurricanes and storms I encountered, evidently suggested by the descriptions in the novel I had just been reading; on the sudden subsidence of these I thought I stood before an invisible tribunal. I felt a solemn consciousness that an all-seeing eye was on me; while there was visible to me only a portion of the deck of the Water Witch, and very obscurely the shadow of my malignant accuser. Not the crimes falsely laid to my charge, but the actual events of my life, even the events of childhood and youth, long forgotten, were now called up before me with extraordinary vividness; all the circumstances of place, person, dress, language, and attitude, such as had actually accompanied them, being revived. Of each of these events I was compelled to give a true account, an invisible hand recording every syllable that fell from my lips, and a secret power obliging me to utter the words which expressed the exact truth. During this ordeal I saw the countenances of dear friends, and of secret and open enemies, those that had long been dead, as well as those that were still living; the former cheering me by their attitudes and words, the latter scowling upon me and assuming menacing postures, but uttering no sound. And now again I felt myself under the power of the demon, by whose uncontrollable agency I was compelled to accuse myself of the crimes of her own suggesting; and while suffering the bitter anguish of self-reproach, and expecting some fearful punishment, I again saw my dearest friends, with their innocent and happy countenances, engaged in occupations with which associations of a highly pleasurable nature had been formed in my mind, but whom I could not make sensible of my presence, and with whom I was doomed to hold affectionate intercourse no more. After this I have no remembrance of anything that passed, until conscious of the return of some obscure and vague recollections. I had the impression that some calamity had befallen me; but I felt as if a soft and refreshing breeze were blowing gently upon me; and soon I found myself in a vast ocean, in a beautifully-constructed vessel, with a fresh and invigorating breeze, sailing rapidly along a coast presenting the most magnificent and lovely scenery; and at length the vessel entered gallantly a port unknown to me, but the strand was crowded with human beings with happy faces, and still happier voices. I had returned from a long voyage, but I could not make out where I had been. I felt hungry and fatigued; and now, for the first time, I recognized the individuals of my family, after having been violently delirious upwards of a fortnight, during the last three days of which time I lay in a state of total insensibility, my physicians and friends expecting every moment to be the last.'

Whoever will consider carefully the mental phenomena produced by the different and opposite conditions of the brain in these two instructive cases, the one produced by the operation of a physical agent, the other arising under the influence of disease, will have no difficulty in conceiving the origin of spectral illusions, either with the consciousness that they are illusions, or with a temporary or permanent persuasion that they are real existences, and whether arising from external or internal causes, or from both combined.

The case of Nicolai, the celebrated bookseller of Berlin, affords a curious illustration of the long continuance of vivid spectral illusions, without the slightest belief of the real existence of the apparitions. 'In a state of mind completely sound, and after the first terror was over, with perfect calmness,' says this remarkable man, 'I saw, for nearly two months, almost constantly and involuntarily, a vast number of human and other forms, and even heard their voices.

'My wife and another person came into my apartment in the morning, in order to console me, but I was too much agitated by a series of incidents, which had most powerfully affected my moral feeling, to be capable of attending to them. On a sudden, I perceived, at about the distance of ten steps, a form like that of a deceased person. I pointed at it, asking my wife if she did not see it? It was but natural that she should not see anything: my question therefore, alarmed her very much, and she immediately sent for a physician. The phantom continued about eight minutes. I grew at length more calm, and being extremely exhausted, fell into a restless sleep, which lasted about half an hour. The physician ascribed the apparition to a violent mental emotion, and hoped there would be no return; but the violent agitation of my mind had in some way disordered my nerves, and produced further consequences which deserve a minute description.

'At four in the afternoon, the form which I had seen in the morning, re-appeared. I was by myself when this happened, and being rather uneasy at the incident, went to my wife's apartment, but there likewise I was persecuted by the apparition, which, however, at intervals disappeared, and always presented itself in a standing posture. About six o'clock there appeared also several walking figures, which had no connexion with the first. After the first day, the form of the deceased person no more appeared, but its place was supplied with many other phantasms, sometimes representing acquaintances, but mostly strangers: those whom I knew were composed of living and deceased persons, but the number of the latter was comparatively small. I observed the persons with whom I daily conversed did not appear as phantasms, these representing chiefly persons who lived at some distance from me.

'These phantasms seemed equally clear and distinct at all times, and under all circumstances, both when I was by myself, and when I was in company, and as well in the day as at night, and in my own house as well as abroad: they were, however, less frequent when I was in the house of a friend, and rarely appeared to me in the street. When I shut my eyes, these phantasms would sometimes vanish entirely, though there were instances when I beheld them with my eyes closed; yet, when they disappeared on such occasions, they generally returned when I opened my eyes. I conversed sometimes with my physician and my wife of the phantasms which at the moment surrounded me: they appeared more frequently walking than at rest, nor were they constantly present. They frequently did not come for some time, but always re-appeared for a longer or a shorter period, either singly or in company; the latter, however, being most frequently the case. I generally saw human forms of both sexes, but they usually seemed not to take the smallest notice of each other, moving as in a market-place, where all are eager to press through the crowd; at times, however, they seemed to be transacting business with each other. I also several times saw people on horseback, dogs, and birds. All these phantasms appeared to me in their natural size, and as distinct as if alive, exhibiting different shades of carnation in the uncovered parts, as well as different colours and fashions in their dresses, though the colours seemed somewhat paler than in real nature. None of the figures appeared particularly terrible, comical, or disgusting, most of them being of an indifferent shape, and some presenting a pleasing aspect.

'The longer these phantasms continued to visit me, the more frequently did they return; while at the same time they increased in number about four weeks after they had first appeared. I also began to hear them talk; these phantasms sometimes conversed among themselves, but more frequently addressed their discourse to me; their speeches were commonly short, and never of an unpleasant turn. At different times there appeared to me both dear and sensible friends of both sexes, whose addresses tended to appease my grief, which had not yet wholly subsided; their consolatory speeches were in general addressed to me when I was alone. Sometimes, however, I was accosted by these consoling friends while I was engaged in company, and not unfrequently while real persons were speaking to me.'

Of the natural constitution of his mind, Nicolai states, 'My imagination possesses in general *a great facility in picturing*. I have, for example, sketched in my mind a number of plans for novels and plays, though I have committed very few of them to paper, because I was less solicitous to execute than to invent. I have generally arranged these outlines when in a cheerful state of mind I have taken a solitary walk, or when travelling I have sat in my carriage, and could only find employment in myself and my imagination. Constantly, and even now, do the different persons whom I imagine in the foundation of such a plot *present themselves to me in the most lively and distinct man-*

ner, their figure, their features, their manner, their dress, and their complexion, are all visible to my fancy. As long as I meditate on a fixed plan, and afterwards carry it into effect, even when I am interrupted and when I must begin it again at different times, all the acting persons *continue present in the very same form* in which my imagination at first produced them. I find myself frequently in a state between sleeping and waking, in which a number of pictures of every description, often of the strangest forms, show themselves, change, and vanish. In the year 1778, I was afflicted with a bilious fever, which at times, though seldom, became so high as to produce delirium. Every day, towards evening, the fever came on, and if I happened to shut my eyes at that time, I could perceive that the cold fit of the fever was beginning, even before the sensation of cold was observable. This I knew by the distinct appearance of coloured pictures, of less than half their natural size, which looked as in frames. They were a set of landscapes, composed of trees, rocks, and other objects. If I kept my eyes shut, every minute some alteration took place in the representation. Some figures vanished and others appeared. But if I opened my eyes, all was gone; if I shut them again, I had a different landscape. In the cold fit of the fever, I sometimes opened and shut my eyes every second, for the purpose of observation, and every time a different picture appeared, replete with various objects, which had not the least resemblance to those that appeared before. These pictures presented themselves without interruption as long as the cold fit of the fever lasted. They became fainter as soon as I began to grow warm; and when I was perfectly so, all were gone. When the cold fit of the fever was entirely past, no more pictures appeared; but if on the next day I could again see pictures when my eyes were shut, it was a certain sign that the cold fit was coming on.'

This is a remarkable instance of spectral illusion manifestly arising from a physical cause, in a person of a philosophical turn of mind, able to refer the illusions to their real source, and therefore to maintain his consciousness of their true nature. It was otherwise with John Beaumont, the author of a Treatise on Spirits and Apparitions, who was a man of hypochondriacal disposition, and who, while labouring under this bodily disease, saw hundreds of imaginary men and women about him, and in whose real existence he came to be a firm believer. Among the spirits that visited him, there were two who became his constant attendants, and who called each other by their names: several spirits would often call at his chamber, and ask whether such spirits lived there, calling them by their names, and they would answer, they did. One spirit, which came for several nights together, and rung a little bell in his ear, told him that his name was Ariel. The two spirits that constantly attended him were ladies of a brown complexion, about three feet in stature; they had both black loose net-work gowns, tied with a black sash about the middle; and within the net-work appeared a gown of a golden colour, with somewhat of a light striking through it. 'These women told me they would kill me if I told any person in the house of their being there, which put me in some consternation, and I made a servant sit up with me four nights in my chamber, before a fire, it being in the Christmas holidays; telling no person of their being there. One of these spirits, in woman's dress, lay down upon the bed by me every night; and told me, if I slept, the spirits would kill me, which kept me waking for three nights. In the mean time, a near relation of mine went (though unknown to me) to a physician, of my acquaintance, desiring him to prescribe me somewhat for sleeping, which he did, and a sleeping potion was brought me, but I set it by, being very desirous and inclined to sleep without it. The fourth night, I could hardly forbear sleeping, but the spirit, lying on the bed by me, told me again, I should be killed if I slept;' whereupon I rose, and sat by the fire-side, and in a while returned to my bed; and so I did a third time, but was still threatened as before; whereupon, I grew impatient, and asked the spirits, what they would have?—told them I had done the part of a Christian, in humbling myself to God, and feared them not; and rose from my bed, took a cane, and knocked at the ceiling of my chamber; a near relation of mine, lying then over me, who presently rose and came down to me, about two o'clock in the morning; to whom I said, you have seen me disturbed these four days past, and that I have not slept—the occasion of it was, that five spirits, which are now in the room with me, have threatened to kill me if I told any person of their being here, or if I slept; but I am not able to forbear sleeping longer, and acquaint you with it, and now stand in defiance of them: and thus I exerted myself about them; and, notwithstanding their continued threats, I slept very well the next night, and continued so to do, though they continued with me above three months, day and night.'

We have seen that some minds have a strong natural tendency to form vivid pictorial images of every thing that interests them; in others, there is a like tendency to the intense renovation of past impressions. 'I remember,' says Dr. Ferriar, 'that, about the age of fourteen, if ever I had been viewing any interesting object in the course of the day, such as a romantic ruin, a fine seat, or a review of a body of troops, as soon as evening came on, if I had occasion to go into a dark room, the whole scene was brought before my eyes with a brilliancy equal to what it had possessed in daylight, and remained visible for several minutes. I have no doubt that dismal and frightful images have been often presented to the mind in the same manner after scenes of domestic affliction or public horror.' Certain states of the body, and certain affections of the mind, powerfully predispose to the intense renovation of past impressions, however those impressions have been induced, and whatever their nature, the immediate exciting cause of the renovation being often some external object acting upon the senses or upon the imagination under circumstances favourable to the illusion. A large class of spectral illusions are referable to this head, of which the following may be taken as an example. A gentleman was benighted, while travelling alone in a remote part of the highlands of Scotland, and was compelled to ask shelter for the evening at a small lonely hut. When he was to be conducted to his bed-room, the landlady observed, with mysterious reluctance, that he would find the window very insecure. On examination, part of the wall appeared to have been broken down to enlarge the opening. After some inquiry, he was told that a pedlar, who had lodged in the room a short time before, had committed suicide, and was found hanging behind the door in the morning. According to the superstition of the country, it was deemed improper to remove the body through the door of the house; and to convey it through the window was impossible, without removing part of the wall. Some hints were dropped that the room had been subsequently haunted by the poor man's spirit. My friend laid his arms, properly prepared against intrusion of any kind, by the bed-side and retired to rest, not without some degree of apprehension. He was visited in a dream by a frightful apparition, and, awaking in agony, found himself sitting up in bed, with a pistol grasped in his right hand. On casting a fearful glance round the room, he discovered by the moonlight a corpse dressed in a shroud, reared erect against the wall close by the window. With much difficulty he summoned up resolution to approach the dismal object, the features of which, and the minutest parts of its funeral apparel, he perceived distinctly. He passed one hand over it, felt nothing, and staggered back to bed. After a long interval, and much reasoning with himself, he renewed his investigation, and at length discovered that the object of his terror was produced by the moonbeams, forming a long, bright image, through the broken window, on which his fancy, impressed by his dream, had pictured, with mischievous accuracy, the lineaments of a body prepared for interment. Powerful associations of terror, in this instance, had excited the recollected images with uncommon force and effect.

The peculiarity of constitution expressed by the term predisposition, whether corporeal or mental, is not only deeply implicated in the production of a general tendency to the formation of these phantoms, but it often determines even the specific character which each assumes. Since the predisposition varies in each individual, the same morbid cause may conjure up images the most diversified. The inhalation of nitrous oxide commonly excites vivid images of a pleasing nature, accompanied with grateful sensations but in some cases it presents to the imagination frightful pictures, and produces on the system painful effects; and, for the same reason, the morbid cause, whatever it be, which gives rise to spectral illusions, may in one excite soothing and delightful visions, and in another hideous and appalling spectres. The daughter of Sir Charles Lee 'saw, about two of the clock in the morning, the apparition of a little woman between her curtain and her pillow, who told her she was her (deceased) mother; that she was happy, and by twelve of the clock that day she should be with her.

Whereupon she knocked up her maid, called for her clothes, and when she was dressed she went into her closet, and came not out again till nine, and then brought with her a letter, sealed, to her father; brought it to her aunt, the Lady Everard, told her what had happened, and desired that as soon as she was dead it might be sent to him. She desired that the chaplain might be called to read prayers; and when prayers were ended, she took her guitar and psalm-book, and sat down upon a chair without arms, and played and sang so melodiously and admirably, that her music-master, who was then there, admired at it. And near the stroke of twelve, she rose and sat herself down in a great chair with arms, and fetching a strong breathing or two, immediately expired.' In this case, a spectral illusion occurring in a tender and susceptible frame, produced such a powerful impression upon the imagination, as absolutely to destroy life. The contrast to this is the case of the sturdy assessor to the Westminster Assembly, who received a visit from the arch-fiend himself, and whom he treated with a cool contempt, which must have astonished his Satanic majesty. 'The devil, in a light night, stood by his bedside. The assessor looked awhile, whether he would say or do anything; and then said, "If thou hast nothing to do, I have;" and so turned himself to sleep.'

There are many cases on record which directly prove that there is often the closest possible connexion between the very shape which these phantasms assume and the images which have previously occupied the mind. A writer in the fifteenth volume of Nicholson's Philosophical Journal, who was haunted with the apparition of frightful spectres, and who was at length struck with some connexion between these images and his previous thoughts, states, that he tried the experiment, whether, by fixing his meditation upon other objects, he could not make these assume the place of the phantasms which persecuted him; that with this view, while the faces were flashing before him, he reflected upon landscapes and scenes of architectural grandeur; that accordingly, after a considerable interval of time, a rural scene of hills, valleys, and fields appeared before him, which was succeeded by another and another, in ceaseless succession; that the manner and times of their respective appearance, duration, and vanishing, did not sensibly differ from those of the faces; that the scenes were calm and still, without any strong lights or glare; that, after a time, these figures changed entirely, and consisted of books, parchments, or papers, containing printed matter. The writer adds, 'I was now so well aware of the connexion of thought with these appearances, that, by fixing my mind on the consideration of manuscript instead of printed type, the papers appeared, after a time, only with manuscript writing, and afterwards, by the same process, instead of being erect, they were all inverted or appeared upside down. The intelligent and philosophical Nicolai saw nothing but men and women, in their natural form and aspect, horses, dogs, and birds: the illusions of superstitious minds consist of angels or devils, which assume all sorts of fantastic shapes. Remigius, who was a commissioner for the trial of witches in Lorrain, and who boasts that, in the course of fifteen years, he had condemned nine hundred criminals to the stake, paid particular attention to the form, features, and dress of demons; yet his statements clearly show that they did not vary from the gross sculptures and paintings of the middle ages, and that recollected images only were present to the persons labouring under the delusions for which they suffered death. They are said to be black faced, with sunk but fiery eyes; their mouths wide, and smelling of sulphur; their hands hairy, with claws; their feet horny and cloven. 'A devil would appear like an angel, seated in a fiery chariot; or riding on an infernal dragon, and carrying in his right hand a viper; or assuming a lion's head, a goose's feet, and a horse's tail; or putting on a raven's head, and mounted on a strong wolf; with innumerable other fantastic shapes of a similar description. These mysterious and frightful images were not only made familiar to the imaginations of the people, but even to their very senses. They could go neither into their dwellings nor their temples without seeing them; they were sculptured on the walls of the church, they were carved on the wainscots of the domestic hall, and the air and the earth were peopled with them; there was not a hill nor a valley, not a wood nor a grove, not a fountain nor a stream, in which they were not seen and heard, and communed with. No place was void,' says Burton, 'but all full of spirits, devils, or other inhabitants; not so much as a hair breadth was empty in heaven, earth, or water above or under the earth.' 'Our mothers' maids,' observes Reginald Scot, 'have so terrified us with an ugly devil, having horns on his head, fier in his mouth, and a tail in his breach, eies like a bacon, fangs like a dog, claws like a beare, a skin like a niger, and a voice roaring like a lion, that we start and are afraid when we hear any one cry *baugh!*'

What wonder that these hideous phantoms should make an indelible impression on weak and ignorant minds, and exert an influence even over strong and cultivated understandings, which their better reason could not at all times resist! What wonder when, from corporeal disease, sensations and ideas were rendered preternaturally intense, or the vivacity of ideas was so increased as to overpower actual impressions, that these spectres should be seen in solitude, and heard in the storm; should dance before the eye, and whisper in the ear; should assume a menacing aspect in the dreams of the guilty, and come with the cherub's smile in the visions of the innocent; should be to the maniac all that existed, and to the feverish and dying what most they hoped or feared!

In regard to ghosts, it is observable that they were remarkably abundant in this country during the interregnum after the civil war in 1649. 'The melancholic tendency of the rigid puritans of that period; their occupancy of old family seats, formerly the residence of hospitality and good cheer, which in their hands became desolate and gloomy; and the dismal stories propagated by the discarded retainers to the antient establishments, ecclesiastical and civil, contributed altogether to produce a national horror unknown in other periods of our history.' It is well known that ghosts commonly appear in the same dress they wore when living; sometimes, indeed, they are clothed all in white, but these are chiefly the 'churchyard ghosts, who have no particular business, but seem to appear *pro bono publico*, or to scare drunken rustics from tumbling over their graves. Dragging chains is not the fashion of English ghosts, chains and black vestments being chiefly the accoutrements of foreign spectres, seen in arbitrary governments,—dead or alive English spirits are free.' Ghosts are commonly pale, and often assume a misty or cloudy appearance, the spectral idea of colour not quite equalling in intensity the vividness of an immediate sensation. The phantoms seen by Nicolai were always of a paler colour than real beings; and when they began to diminish and disappear, their colour became fainter and fainter, until at last they appeared entirely white.

We cannot dismiss the subject of apparitions without observing, that the manner in which these phantoms have vanished before the light of knowledge affords a striking illustration of the blessings which descend even to the lowest of the people from the diffusion of the sound principles of philosophy. The powerful and capricious spirits which filled 'the heavens, the earth, and the waters above and under the earth,' added, in no inconsiderable measure, to the sum of human suffering. They were, in general, hideous in form, and malignant in intention; the number of the good small, that of the evil countless; and though of 'soft and uncompounded essence,' they might have come in what shape they chose, 'dilated or condensed, bright or obscure,' yet they did assume 'forms forbidden,' such as 'retire to chaos, and with night commix;' and their visitations were much more often accompanied with 'blasts from hell' than 'airs from heaven.' They produced powerful emotion, for the most part painful and of pernicious tendency. They afforded materials for the fiction of the poet, and the pencil of the painter; but the imagery of the one, and the figures of the other, were distinguished for incongruity and deformity, not for beauty and grace. Haunting the couch of sickness, in minds debilitated by disease, they often chased reason from its throne, and sometimes deprived the sufferer of life. The ignorant they terrified with false fears, and they afforded no compensation in the uniformity and efficacy with which they visited the guilty with remorse. As agents in the administration of reward and punishment they were most unjust. If they brought down vengeance on the criminal, it was not for the commission of crime, but the neglect of punctilios; and if, as guardian angels, they hovered about the pillow of the dying, they were not messengers of evil to the wicked, and ministers of grace to the good; but this 'blessed troop, with faces bright like the sun, bearing garlands, and promising eternal happiness,' was as disposed to waft to heaven the soul of the sinner as of the saint. By preoccupying the mind, they took off the attention from the observation of nature, and deprived it both of the power and of the disposition to discover the true solution of those physical, mental, and moral phenomena which could not wholly escape notice, and in this lies the real malignity of their influence. They incapacitated the mind for the perception of truth, disposed it for the reception of the grossest delusions of credulity, and prepared it for the admission of the most fallacious account of the sources of calamity and suffering. In the hands of the priest and the tyrant, they were potent to delude and enslave; and they did their work faithfully. The human mind will anticipate the future, and must reflect upon the past. In the former, there will always be sufficient to fear, and in the latter, enough to regret, without the stimulus of fictitious terror, or the imputation of imaginary guilt. As long as the human frame can suffer, and is subject to death, the mind will require whatever light philosophy can pour upon it, to preserve it from error, and whatever consolation religion can afford, to save it, at least, from misery, if not from despair. In philosophy, there is light, and in religion, consolation; and he is a friend to man who labours to secure to him these inestimable blessings, free from the admixture of ignorance and the alloy of superstition. See article Apparitions, *Westminster Review*, No. II., of which large use has here been made by the author of that article with the permission of the proprietors. See also *An Essay towards a Theory of Apparitions*, by John Ferriar, M.D., 1813; and *Sketches of the Philosophy of Apparitions, or an Attempt to trace such Illusions to their Physical Causes*, by Samuel Hibbert, M.D., 1824.

APPEAL. The removal of a cause from an inferior court or judge to a superior one, for the purpose of examining the validity of the judgment given by such inferior court or judge, is called an appeal.

An appeal from the decision of a court of common law is usually prosecuted by suing out a *writ of error*, by means of which the judgment of the court below undergoes discussion, and is either affirmed or reversed in the court of error. The proceedings in such cases will be found under the title ERROR.

The term appeal, used in the above sense, is by the law of England applied in strictness chiefly to certain proceedings in Parliament, in the Privy Council, in the Courts of Equity, in the Admiralty and Ecclesiastical courts, and in the Court of Quarter Sessions.

Thus, an appeal lies to the House of Lords from the decree of the Court of Chancery in this country, and in Ireland; from the Equity side of the Court of Exchequer; and from the decision of the supreme courts in Scotland.

An appeal lies to the king in council from the decrees and decisions of the colonial courts, and indeed from all judicatures within the dominions of the crown, except Great Britain and Ireland.

To the same jurisdiction are referred (in the last resort) all ecclesiastical and admiralty causes, and all matters of lunacy and idiotcy.

A decision of the Master of the Rolls or the Vice-Chancellor may be revised by the Lord Chancellor upon a proceeding in the nature of an appeal.

An appeal lies directly from the Vice-Admiralty courts of the colonies, and from other inferior admiralty courts, as well as from the High Court of Admiralty, to the king in council. This latter appellate jurisdiction has been recently regulated by statutes 2 and 3 Will. IV. c. 92, and 3 and 4 Will. IV. c. 41, by which the Court of Delegates, Commission of Review, and Commission of Appeal in Prize Causes, have been abolished.

In the ecclesiastical courts, a series of appeals is provided from the Archdeacon's Court to that of the bishop, and from the bishop to the archbishop. From the archbishop the appeal of right lay to the king in council before the Reformation; yet appeals to the Pope were in fact of common occurrence until the reign of Henry VIII., by whom an appeal was directed to be made to certain delegates named by himself. After that period, a Court of Delegates, appointed for each cause, was the ordinary appellate tribunal, until the abolition of their jurisdiction by the late act alluded to above, by which it is further provided, that no Commission of Review shall hereafter issue, but that the decision of the king in council shall be final and conclusive.

Such are the principal heads of appeal, to which we may add the appellate jurisdiction of the justices of the peace assembled at the Quarter Sessions, to whom various statutes have given authority to hear, upon appeal, the complaints of persons alleging themselves to be aggrieved by the orders or acts of individual magistrates.

APPEAL (*appeller*, to accuse), in the old criminal law of England, was a vindictive action at the suit of the party injured by some heinous offence, in which the appellant, instead of merely seeking pecuniary compensation as in civil actions, demanded the punishment of the criminal.

It differed from an indictment in some material points. Being a proceeding instituted by a private person in respect of a wrong done to himself, the prerogative of the crown was not permitted to suspend the prosecution or to defeat it by a pardon. It seems to have been in reference to this peculiarity that the appeal is said to have been called by the celebrated Chief Justice Holt 'a noble birthright of the subject,' inasmuch as it was the only mode by which the subject could insist upon the rigorous execution of criminal justice without the risk of royal interposition on behalf of the offending party. Even a previous acquittal on an indictment for the same identical offence was no bar to the prosecution by the appellant; nor was a previous conviction a bar, where the execution of the sentence had been intercepted by a pardon. It was in the power of the appellant alone to relinquish the prosecution, either by releasing his right of appeal, or by accepting a compromise.

Another remarkable feature of appeal was the mode of trial, which in cases of treason or capital felony was either by jury or by *battle*, at the election of the defendant.

Where the latter form of trial was adopted, the following was the order of proceeding. The appellant formally charged the *appellee* with the offence: the latter distinctly denied his guilt, threw down his glove, and declared himself ready to prove his innocence by a personal combat. The challenge was accepted by the appellant, unless he had some matter to allege, in what was termed a *counterplea*, showing that the defendant was not entitled to the privilege of battle, and both parties were then put to their oaths, in which the guilt of the accused was solemnly asserted on one side and denied on the other. A day was then appointed by the court for the combat, the defendant was taken into custody, and the accuser was made to give security to appear at the time and place prefixed. On the day of battle, the parties met in the presence of the judges, armed with certain prescribed weapons, and each took a preliminary oath, of which the effect was that he had resorted to no unfair means for securing the assistance of the devil in the approaching contest. If the defendant was vanquished, sentence was passed upon him, and he was forthwith hanged. But if he was victorious, or was able to persist in the combat till starlight, or if the appellant voluntarily yielded, and cried *craven*, then the defendant was acquitted of the charge, and the appellant was not only compelled to pay damages to the accused, but was further subjected to very heavy civil penalties and disabilities.

Some of the details of this singular mode of trial, as reported by contemporary writers, are sufficiently ludicrous. Thus we are told that the combatants were allowed to be attended within the lists by *counsel*, and a *surgeon with his ointments*. In the reign of Charles I., Lord Rea, on a similar occasion, was indulged with a seat and wine for refreshment, and was further permitted to avail himself of such valuable auxiliaries as *nails*, *hammers*, *files*, *scissors*, *bodkin*, *needle* and *thread*. (See Rushworth's *Collections*, cited in Barrington's *Observations*, p. 328.) We also learn from the *Close Rolls* recently published, that parties under confinement preparatory to the trial were allowed to go out of custody for the purpose of practising or taking lessons in fencing. (See Mr. Hardy's *Introduction*, p. 185.) The whimsical combat between Horner and Peter, in the second part of *Henry VI.*, has made the proceedings on an appeal familiar to the readers of Shakspeare; and the scene of a judicial duel upon a criminal accusation has been still more recently presented to us in the beautiful fictions of Sir Walter Scott.

It appears probable that the trial by battle was introduced into our jurisprudence from Normandy. The *Grand Coustumier* of that country, and the *Assizes of Jerusalem*, furnish evidence of its early existence.

The courts of criminal jurisdiction in which it was admitted were the King's Bench, the Court of Chivalry, and (in the earlier periods of our legal history) the High Court of Parliament.

In some cases the appellant was able to deprive the accused of his choice of trial, and to submit the enquiry to a

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jury:- Thus, if the appellant was a female; or under age; or above the age of sixty; or in holy orders; or was a peer of the realm; or was expressly privileged from the trial by battle by some charter of the king; or laboured under some material personal defect, as loss of sight or limb; in all such cases he or she was allowed to state in a counterplea the ground of exemption, and to refer the charge to the ordinary tribunal. The party accused was also disqualified from insisting on his *wager of battle*, where he had been detected in the very act of committing the offence, or under circumstances which precluded all question of his guilt. Indeed (if early authorities are to be trusted) it is far from clear that a criminal, apprehended *in flagranti delicto*, did not undergo the penalties of the law forthwith, without the formality of any trial at all. (See Palgrave's *English Commonwealth*, vol. i. p. 210.) The law on this latter point formed the subject of an interesting discussion in the Court of King's Bench in the year 1818, in the case of Ashford *v.* Thornton. Upon that occasion the defendant had been acquitted upon a prior indictment for the murder of a female, whom he was supposed to have previously violated. The acquittal of the accused upon evidence which appeared to many sufficient to establish his guilt occasioned great dissatisfaction, and the brother and next heir of the deceased was accordingly advised to bring the matter again under the consideration of a jury by the disused process of an appeal. The defendant waged his battle in the manner above described, and the appellant replied circumstances of such strong and pregnant suspicion as (it was contended) precluded the defendant from asserting his innocence by battle. It was, however, decided by the court that an appeal, being in its origin and nature a hostile challenge, gave to the appellee a right to insist upon fighting, and that the appellant could not deprive him of that right by a mere allegation of suspicious circumstances. The case would have proceeded in due course, if the legal antiquaries had not been disappointed of the rare spectacle of a judicial duel by the voluntary abandonment of the prosecution. In the following year an act (59 Geo. III. ch. 46) was passed to abolish all criminal appeals and trial by battle in all cases both civil and criminal.

The cases in which, by the antient law, appeals were permitted, were treason, capital felony, mayhem, and larceny. Indeed, the earliest records of our law contain proofs that appeals were a common mode of proceeding in many ordinary breaches of the peace, which at this day are the subject of an action of trespass. The wife could prosecute an appeal for the murder of her husband; the heir male general for the murder of his ancestor; and in any case the prosecutor might lawfully compromise the suit by accepting a pecuniary satisfaction from the accused. Hence it was that the proceeding was in fact frequently resorted to for the purpose of obtaining such compensation rather than for the ostensible object of ensuring the execution of justice on the offender. (See further, Hawkins's *Crown Law*, book ii. chaps. 23 and 45. *Ashford* v. *Thornton*, Barnwall and Alderson's *Reports*, vol. i.; Kendal's *Argument for Construing largely*, &c. Bigby *v.* Kennedy, Sir Will. Blackstone's *Reports*, vol. ii p. 714; and the ingenious speculations and remarks of Sir F. Palgrave on the origin of trial by battle, in his work on the Commonwealth of England.)

Besides the appeal by innocent or injured parties, a similar proceeding was in certain cases instituted at the suit of an accomplice. The circumstances under which this might be done will be found under the article Approver.

APPENZELL, the canton of, one of the twenty-two cantons or states which constitute the Swiss Confederation. It lies at the north-eastern extremity of Switzerland, and is enclosed on every side by the territory of the canton of St. Gall. Its shape is nearly circular, except on the north-east, where it forms a projection which extends towards the Rhine and the Boden See, or Lake of Constance, which it almost touches. The whole extent of the canton, according to Franscini's *Statistics of Switzerland*, is about 212 English square miles, and its population, which, in the sixteenth century, hardly amounted to 10,000, is now about 58,000. Appenzell is, next to Geneva, the most thickly inhabited canton of Switzerland, in proportion to its extent. Its territory is very mountainous, though it is not within the range of the higher Alpine chains: its mountains are calcareous, and mostly covered with rich pastures; the highest of them, called the Sentis, which rises on the southern border of the canton, is 7700 feet above the level of the sea.

The river Sitter, which has its source at the foot of this mountain, crosses Appenzell in a north-western direction, and afterwards joins the river Thur in the canton of Thurgau. The country of Appenzell produces but little corn and has no vineyards, except on some of the eastern hills, which slope towards the Rheinthal or valley of the Rhine. Numerous herds of cattle and flocks of sheep feed on the high lands of Appenzell; the former amount in summer to 25,000 heads. Butter and cheese are the chief produce of the *inner rhoden* or districts of this country. Honey and wax are also gathered plentifully. In the northern and western districts called *ausser rhoden*, manufactures of linen and cotton cloths, muslins, damask, &c., afford employment to a great part of the population. Herisau and Trogen are the two manufacturing towns of Appenzell. Herisau has between 7000 and 8000 inhabitants, and is a place of considerable wealth.

In its internal administration, Appenzell is divided into two distinct republics independent of each other, called interior and exterior *rhoden*, or communes. The former are Catholic, the others Protestant. The separation took place in 1597, after the wars of religion which raged in Switzerland in the sixteenth century. The two, however, count but as one canton of the Swiss confederation, and have only a single vote in the federal Diet, to which they send deputies each in its turn. Both governments are pure democracies; in each the *landsgemeinde*, or general assembly of all the male natives above eighteen years of age, meets once a year in a field, and constitutes the supreme or legislative power. Two councils constitute the executive; they propose the laws for the acceptance of the general assembly, and exercise also the high judicature of the country, for the two powers, administrative and judiciary, are often blended together in these small democracies. The landamman is the chief magistrate. The revenues of the state are extremely limited; those of the exterior rhoden do not ascend to 1500*l.* sterling annually, and those of the interior rhoden are still less, but the expenses are likewise trifling, for there are no establishments kept up, few public officers are paid, and those but scantily, and no national works are undertaken. The security of these little republics lies in their federal bond with the larger, more populous, and wealthier cantons of Switzerland.

The Protestant or exterior rhoden of Appenzell are more populous and industrious than the interior or Catholic districts, the inhabitants of the latter being chiefly addicted to pastoral life. It ought to be observed, however, that the interior rhoden are the most mountainous and wild, and that the people of these secluded districts, little visited by strangers, have retained much of the primitive Swiss simplicity of manners. The Catholic rhoden have a population of 15,000, while the Protestant rhoden reckon about 43,000. The landsgemeinde, or legislative assembly of the latter, musters about 9000 members.

The country of Appenzell was little known till the seventh or eighth century, when the Frankish kings who ruled over eastern Helvetia bestowed the royal or fiscal domains in these mountains and valleys on the Abbey of St. Gall. By degrees the abbey acquired the jurisdiction over the whole country, which was granted to it in 1292, by the Emperor Adolphus of Nassau. The abbots built a monastery dependent on that of St. Gall, which was called Abbatis Cella, and in German Abten-zell, from whence the name of Appenzell was given first to the village which grew around the monastery, and afterwards to the whole country. The inhabitants enjoyed, under the dominion of the abbey, considerable privileges and franchises; they elected their landamman and other magistrates, and the dues and fees they were to pay to the abbey were fixed. But under an elective government, like that of an abbey, much depended on the personal character of the abbot for the time being. Some of the abbots encroached, or allowed their bailiffs to encroach, on the liberties of these mountaineers; they levied fresh taxes on their butter and cheese, and committed various other acts of oppression. The Appenzellers complained, remonstrated, but to no great purpose. The example of their neighbours of the forest cantons, who had thrown off for similar reasons the rule of Austria, encouraged them in their resistance. In 1401, they rose in arms, surprised the castles which the abbot had built in their country, and drove his bailiffs away. A war ensued, in which first the imperial cities of Swabia, and afterwards Austria itself took the abbot's part, but the

Appenzellers waited for their enemies in the defiles of their mountains, and repeatedly defeated them. They were assisted by their neighbours of the forest cantons, by the men of Schwytz and Glarus. The war lasted several years, during which the mountaineers of Appenzell invaded the other territories of the abbot, drove him away from his abbey, overran Thurgau, and even advanced across the Rhine as far as Bregentz, in the Austrian states. At last peace was made, and the Appenzellers were recognized as an independent people; but it was not till the year 1513 that they were finally received into the Swiss confederation, of which they formed the thirteenth canton. They have ever since retained their simple form of government, and with the exception of the French invasion of 1798, have preserved their independence. During the late disturbances which have agitated Switzerland since 1830, the people of Appenzell have remained quiet. (*Geographisches und Historisches Lexicon der Schweitz.* Coxe's *Letters on Switzerland*, &c.)

APPENZELL, a town or rather large village in the inner rhoden. It is the capital of the Catholic part of the canton, and the residence of the council of government. It lies in a fine valley on the river Sitter, nine miles south of the town of St. Gall, from which there is a carriage road to it. Appenzell has two inns for travellers. Its population is about 3000. It has a convent of capuchins, and a monastery of nuns of the order of St. Clara. The mineral springs of Weissbad rise about two miles south of Appenzell. The air of this country is remarkably clear and pure; often when the low lands of Thurgau, and the banks of the lake of Constance, are enveloped in mist, Appenzell enjoys a bright sun and sky. The village and district of Gaiss, four miles N.E. of Appenzell, are celebrated as places of resort for invalids, who come here in summer to breathe the salubrious air of this elevated region, and to drink the whey which is brought warm every morning from the *chalets* or dairies of the Alps. Gaiss is about 3000 feet above the level of the sea.

APPIA'NUS, a native of Alexandria, in Egypt, the author of an extensive history of the Roman empire, in the Greek language. The time in which he lived may be fixed from several passages in his writings. In the preface (c. 7) he speaks of an interval of two centuries between the dictatorship of Cæsar (49 or 47 B.C.) and the time when he wrote his history, which brings us to the reign of Antoninus Pius (138-161 A.D.). The date of 'nearly nine centuries' from the foundation of Rome (c. 9) leads to the same result. Moreover, he speaks of Hadrian as no longer alive, in two separate passages (*Iberica*, 38; and *Bell. Civ.* i., 38). On the other hand, he mentions the terrible vengeance which Trajan and his generals inflicted on the Jews in the last year of his life (116, 117, A.D.), as occurring in his own time (*Bell. Civ.* ii. 90). Appian practised as an advocate at Rome under more than one emperor; and he so far won the favour of the court, that he was sent to his native country in the important office of procurator or imperial treasurer, if indeed he was not præfectus augustalis, or governor-general of the province of Egypt (see his preface, last chapter). His history, instead of embracing the Roman empire as a whole, treats of the several provinces separately, taking them up in succession as they become connected with Roman history, and then giving a continuous account of their relations with Rome. But to make his work a complete whole, he found it necessary to give a preliminary view of Rome under the kings, and to devote a book to the wars of Hannibal, which, running over so many countries, would otherwise have been ludicrously mutilated. The same motive led him to assign five books to the civil wars of Rome. The subjects of his twenty-two books are: 1. the regal period; 2. Italy (west of the Apennines); 3. Samnites; 4. Kelts; 5. Sicily and other islands, particularly Crete and Cyprus; 6. Spain; 7. Hannibal's wars; 8. Carthage and Numidia; 9. Macedonia and Illyria; 10. Greece and the Greek states of Lower Asia; 11. Syria; 12. Pontus; 13. the wars of Marius and Sylla; 14. those of Pompey and Cæsar; 15 and 16. the wars against the assassins of Cæsar; 17. those between Antony and Augustus; 18. 19. 20. and 21. Egypt; 22. the first century of the empire (including the reign of Vespasian). He appears also to have added afterwards histories of Dacia, Arabia, Judæa, chiefly in reference to Trajan. He speaks also of a history of his own life (Preface, c. 15). Of these, the sixth, seventh, eighth, the latter part of the ninth, the eleventh, twelfth, and those on the Civil Wars, still exist, besides some fragments of the others. We have purposely omitted the *History of Parthia.* The work entitled *Parthica*, which is usually published with his works as part of the eleventh book, consists merely of extracts from Plutarch's *Lives of Crassus and Antony*, to which some impostor of the middle ages has prefixed a short prefatory introduction, stolen from Appian's *Syrian History* The spurious *Parthica* appears to have existed already in the copy of Appian belonging to Photius, who died in 891. The extraordinary similarity between the supposed work of Appian and the acknowledged works of Plutarch had been long observed, and had done serious injury to the reputation of Appian. H. Stephanus, Scaliger, Casaubon, speak of him as a convicted plagiarist. On the other hand, Xylander, Freinsheim, Reimar, hold him innocent, and their opinion has been supported by some strong arguments in an essay affixed by Schweighæuser to his excellent edition. The very insertion of the Parthian history in the eleventh book with Syria is contrary to the plan of Appian's work, as the Romans had no relations with Parthia before the Mithridatic war, which is the subject of the twelfth book; and what is more decisive upon this point, he more than once in his *Civil Wars* (ii. 18, and v. 65) mentions his *intention* to treat of the Parthians in a *later* part of his work—'The Parthian history *will* show,' &c. These and other arguments may be seen in the essay of the German editor. Appian's long professional residence at Rome, as well as his Roman name, afford evidence that he had one advantage over Plutarch, as an historian, in possessing a perfect knowledge of the Latin language; but his merits in other respects are not great. His views of history are in general very superficial; and as a geographer, his ignorance is startling, when compared with the means of information which his age and circumstances offered. In speaking of the second Punic war (*Iberica*, 7), he places Saguntum (Murviedro) on the north of the Iberus, an error indeed into which Polybius may have led him. The same mistake appears again in c. 10; and in c. 12 the climax of confusion is completed by the supposition that Saguntum is the same city as Carthago Spartagena (Carthagena). In the very same book, c. 6, it is asserted that the Iberus (Ebro) empties itself into the Northern Ocean; in c. 1, that Spain extends 10,000 stadia in length, and as much in breadth (thus making the surface of the country at least four times as large as it really is); and that the passage from thence to Britain is made in half a day by the tide alone.

A wretched translation of Appian into Latin was published in 1472 by Candidus, at Venice. The first edition of part of the Greek text was given at Paris in 1551 by Carolus Stephanus, with the assistance of his brother Robert. In 1554, an improved Latin translation by Gelenius was published at Basle. But these editions were all imperfect. The *Spain* and *Hannibal* were first published by H. Stephanus at Paris, in 1557. Some fragments were added by Ursinus at Antwerp, in 1582; the *Illyria*, by Hœschelius, at Augsburg, in 1599; and some more fragments by H. Valesius at Paris, in 1634. The best edition is that of Schweighæuser, Leipzig, 1785, 3 vols., 8vo. This edition contains a Latin translation, taken chiefly from that of Gelenius, and a large body of notes. A. Mai published, in 1815, a letter of Appian to Fronto in the collection of Fronto's letters; and he has also published three small fragments of Appian in the second volume of his *Script. Vet. nova Collectio.* There is a German translation by F. W. J. Dillenius, 2 vols., 8vo., Frankfort, 1793-1800; one in French, by Claude Seyssel, fol., Lyons, 1544; another by Odet Desmarres, fol., Paris, 1659; and a translation of the five books of the *Civil Wars*, by Combes Dounous, appeared at Paris, 1808, 3 vols., 8vo. An English translation of Appian's *Auncient History*, &c., was printed by Raufe Newbery and Henrie Bynniman, in 1579, 4to.; and a translation by J. D. (Dryden or Davies) was published in folio, 1696.

A'PPIA VIA, an ancient road in Italy. It was first laid down as far as Capua by Appius Claudius, who afterwards, from the loss of his sight, was called Cæcus, in his censorship, B.C. 312. At a later period, it was continued as far as Brundisium. For the towns through which it passed, see ANTONINE'S ITINERARY, near the end. The road, parts of which still exist, was built of squared stones, closely fitted together without cement or iron, of various sizes, from one to five feet. There are two strata beneath; the first of rough stones cemented with mortar, the second of gravel, the whole being about three feet in depth. The breadth of the road is about fourteen feet, so as to admit two carriages.

A'PPIUS CLAU'DIUS. [See Claudius.]

APPLE, in Botany. [See Pyrus.]

APPLE. This fruit, which, from its hardiness and great abundance, combined with its excellent flavour, is one of the most important productions of cold climates, is, in its wild state, the austere crab-apple of the hedges. At what period it first began to acquire from cultivation the sweetness and other qualities which are peculiar to it in its domesticated state, or by what accident the tendency to amelioration was first given it, we have no means of ascertaining. All that we know is, that the apple is spoken of by Homer as being one of the fruit trees cultivated in the gardens of Alcinous and of Laertes, that it was a favourite fruit of the Romans, who had many varieties, and that it has never ceased to be an object of great interest with all northern nations.

It is a most inexplicable circumstance, that while some kinds of plants will produce a great multitude of varieties when raised from seed, and are susceptible of an almost unlimited degree of improvement, there are others of very nearly a similar nature which seem almost incapable of varying at all; and yet there are so many instances of it that the fact will not admit of doubt. Among these instances are the apple and the hawthorn: millions of millions of the latter have been raised in this country alone, and yet our gardens do not contain above half-a-dozen well-marked varieties; of the apple, on the contrary, which is, botanically, closely allied to the hawthorn, the varieties are innumerable; in the last edition of the *Catalogue of the Garden of the Horticultural Society*, 1400 are described; and it is probable that this is not more than half the number really known.

In the beginning, varieties, it may be supposed, were produced accidentally, owing to the peculiar tendency to change that this species of fruit possesses. A few varieties once obtained and placed in a garden, their blossoms would be certain to fertilize each other mutually, giving and taking the peculiar properties of one another: if the seeds of these were again sown, a greater degree of variation would arise; and this being repeated from generation to generation, the progeny would soon begin to differ so much from the original parents as scarcely to be recognizable. Until within comparatively a few years, varieties were procured in no other way than in this, and by constantly destroying inferior kinds as better were obtained; but since the discovery of the effect produced by fertilizing one variety with another, a very rapid advance has taken place towards bringing the apple to its highest state of perfection, and the cultivator has no longer to trust to mere chance for the results of his experiments.

In procuring improved varieties of the apple, no other mode which leads to certain results has been discovered, than this of cross-fertilization: but, at the same time, it is believed that the following circumstances ought to be kept in view: 1st, the seed from which the new variety is to be obtained should be fully formed, and 2d, it should be taken from as perfect a specimen as it may be practicable to procure; for it has been found by experience, that any debility or defect in the parent is, in fruit trees, very apt to be communicated to their offspring. No person has been more successful in experiments of this kind than Mr. Knight, the President of the Horticultural Society, who thus describes his method of proceeding. 'Many varieties of the apple were collected, which had been proved to afford, in mixture with each other, the finest ciders; a tree of each was then obtained by grafting upon a paradise stock, and these trees were trained to a south wall, or if grafted on a Siberian crab, to a west wall, till they afforded blossoms, and the soil in which they were planted was made of the most rich and favourable kind. Each blossom of this species of fruit contains about twenty chives, or males, and generally five pointals, or females, which spring from the centre of the cup, or cavity of the blossom. The males stand in a circle just within the bases of the petals, or flower leaves, and are formed of slender threads, each of which terminates in a small yellow ball, or anther. It is necessary, in these experiments, that both the fruit and seed should attain as large a size, and as much perfection, as possible; and, therefore, a few blossoms only were suffered to remain upon each tree from which it was intended to obtain seeds. As soon as the blossoms were nearly full grown, every male in each was carefully extracted, proper care being taken not to injure the pointals or females; and the blossoms, thus prepared, were closed again, and suffered to remain till they opened spontaneously. The blossoms of the tree which it was proposed to make the male parent of the future variety were accelerated by being brought into contact with the wall, or retarded by being detached from it, so that those were made to unfold at the required period; and a portion of their pollen or farina, when ready to fall from the mature anthers, was, during three or four successive mornings, deposited upon the pointals of the blossoms, which consequently afforded seeds. It is necessary in this experiment that one variety of apple only should bear unmutilated blossoms; for where other varieties are in flower at the same time, the pollen of these will often be conveyed by bees to the prepared blossoms; and the result of the experiment will in consequence be uncertain and unsatisfactory.

'Every seed, though many be taken from a single apple, will afford a new and distinct variety, which will generally be found to bear some resemblance to each of its parents. Examples of this are presented in the Grange apple and Downton pippin, and in the Foxley apple and Siberian Harvey.'

Of all the apples cultivated by our ancestors, a very small number only is known to the present generation. This may have been owing to their having gradually given way to better kinds; but, in the opinion of Mr. Knight, it is rather to be ascribed to an expenditure of their vital principle. This distinguished physiologist is of opinion, that no varieties of fruit trees are capable of remaining in perfection beyond a limited number of years: he thinks that after that period they suffer from the debility attendant upon old age, and that, although their existence may be protracted by means of grafting or budding them upon healthy stocks, yet that in the end they will entirely disappear. This opinion is founded upon the well-known fact, that the oldest varieties of the apple are now the most diseased, especially the celebrated golden pippin, which was formerly the common hardy cider-apple of the Herefordshire orchards, but which is now only preserved with difficulty in gardens. But it must be remembered, that however plausible this theory may be, it is open to several objections, among which more especially are the following: it is not impossible that the varieties alluded to by Mr. Knight were originally less hardy than those now cultivated, and that their constitutions were not adapted to the cold summers which generally prevail at the present epoch in England,—a supposition which is rendered the more probable by the circumstance, that the golden pippin still flourishes in all its pristine vigour in the island of Madeira. It may also be conjectured that neglect was a great cause of the disappearance of the golden pippin, and other kinds, from the cider orchards; for if, as is so often the case, the trees were once allowed to fall into a state of decay, then every scion taken from such trees for the purpose of propagation would carry its own debility along with it; and thus a disease, acquired in the first instance by neglect, would be perpetuated according to the well-known laws of vegetable physiology. (See Lindley's *Outline of the First Principles of Horticulture*, p. 24, &c.)

It is not our intention in this place to enter into any detailed account of the varieties of the apple, for which we must refer our readers to works treating exclusively on such subjects, especially to the *Guide to the Orchard and Kitchen Garden:* we shall rather confine ourselves to topics of general interest, such as the selection of varieties for small gardens or orchards, the modes of pruning and planting the trees, keeping the fruit when gathered, and propagation.

England is celebrated for the excellence of its cider; a beverage which perhaps acquires its highest degree of excellence in Herefordshire, and the neighbouring counties. In those districts, it has been found that the best varieties are the *foxwhelp*, a worn-out sort, much used for mixing with other kinds, to which it communicates strength and flavour; the *red must;* the *hagloe crab*, which, however, is only good in a dry soil, on a basis of calcareous stone, in a warm situation and season; the *grange apple;* the *orange pippin;* the *forest styre*, which is supposed to produce a stronger cider than any other, but is not a good bearer; the *yellow Elliot;* the *Bennett;* the *Siberian Harvey; Stead's kernel;* the *friar*, which is very hardy; and above all, the *golden Harvey*, or *brandy apple.* The specific gravity of the juice of these varieties has been stated by Mr. Knight to be as follows.

Foxwhelp	1076-1080	Yellow Elliot	1076
Red must	1064	Bennett	1073
Hagloe crab	1081	Siberian Harvey	1091
Grange	1079	Stead's kernel	1074
Orange pippin	1074	Friar	1073
Forest styre	1076-1081	Golden Harvey	1085

Besides these, the *coccagee* and the *Siberian bitter-sweet* are in much estimation.

For the kitchen, the apple is certainly, of all fruits, the most useful; and perhaps it is here that its utility to man is most conspicuous, because it proves, when cooked, a nutritious and wholesome food. In every district there is an abundance of local varieties, which are considered by their cultivators as of peculiar excellence. But for those who are anxious to possess the kinds which have been determined by comparison to be the best of all, we should recommend the following: for summer use, the *Keswick codlin* and the *Hawthornden;* for autumn, the *Wormsley pippin* and the *Alfriston;* for winter and spring, the *Bedfordshire foundling*, *Dumelow's seedling*, *Dr. Harvey*, *Brabant Bellefleur*, and *Gravenstein;* and for drying, the *Norfolk Beaufin*. Of all these, the Gravenstein, Alfriston, and Brabant Bellefleur are the best.

Of table apples, the varieties are endless; but by far the greater part of the local sorts, and of those commonly cultivated, is of only second-rate quality. The finest variety of all is the *Cornish gilliflower;* no other equals this in excellence, but it is unfortunately a bad bearer. Of those which combine productiveness and healthiness with the highest quality, the six following must be considered the best: *golden Harvey*, *old nonpareil*, *Hubbard's pearmain*, *Ribston pippin*, *Dutch mignonne*, *Court of Wick*. Finally, the best selection that could be made for a small garden, so as to obtain a constant succession of fruit from the earliest to the latest season, would be the following, which are enumerated in their order of ripening, the first being fit for use in June, and the last keeping till the end of April.

White Juneating.
Early red Margaret.
White Astrachan.
Sugar-loaf pippin.
Borovitsky.
Oslin.
Summer golden pippin.
Summer Thorle.
Dutchess of Oldenburgh.
Wormsley pippin.
Kerry pippin.
Yellow Ingestrie.
Gravenstein.
Autumn pearmain.
Golden reinette.
King of the pippins.
Ribston pippin.
Fearn's pippin.
Court of Wick.
Golden Harvey.
Golden pippin.
Beachamwell.
Adam's pearmain.
Pennington's seedling.
Hughes's golden pippin.
Cornish gilliflower.
Dutch mignonne.
Reinette du Canada.
Syke-house russet.
Braddick's nonpareil.
Old nonpareil.
Court-pendu plat.
Lamb-Abbey pearmain.
Newtown pippin.

In *pruning* the apple-tree, as indeed in all similar cases, three objects are chiefly kept in view; the first of which is to remove superfluous, or excessively vigorous shoots; the second is to admit light and air to all parts equally; and the third is to check exuberance, and thus to promote fruitfulness. The mode of proceeding in the two first cases is so obvious as not to require explanation; for the third, a few simple rules will suffice. As the apple is a tree of very hardy habits, if its branches are allowed to go unpruned, they will not produce any considerable number of lateral shoots, but will have a great tendency to keep lengthening from their terminal buds, which always produce barren and vigorous shoots; it is the lateral shoots only that are fertile, and they are so only when stunted, or in the state of what are technically called *spurs*. The mode of procedure is then obviously to destroy the terminal barren shoots, and to encourage the lateral fertile ones. This is effected by shortening back all the leading shoots every year, to a distance from their point of origin, which varies according to their strength: where they are very strong, the leading shoots should not be reduced more than within twelve or fifteen inches of their base, but when they are weaker, they may be cut to within nine inches. By this means the onward growth of the branch is momentarily arrested: the ascending sap is impelled into the lateral buds, which are thus developed, and form branches, some of which will be sure to grow so slowly as to become productive; for notwithstanding the check the branch may receive from the amputation, it will after a little while again lengthen by means of the bud nearest its extremity, and this latter will then grow so fast as effectually to hinder the new lateral shoots from acquiring much vigour. Of the lateral shoots then obtained, some will be required to form new branches others will be reserved for fruiting, and others will at once become fruit spurs; the first will be treated as those from which they sprang, the second are to be cut down to within an inch of the bottom, which will generally cause the surrounding eyes to form fruit spurs; the third will be left until they have borne fruit, when they are cut out so as to leave only a single bud behind. In all cases, the fruit spurs, which, like the leading branches, have a tendency to lengthen, should have that tendency stopped by being cut back to the length of about three inches.

Apple-trees are *trained* in the form either of *standards*, *dwarfs*, *espaliers*, or *balloons*.

No particular care is requisite in the management of *standards* beyond providing them with a straight stem six feet high, and a head consisting of three or four healthy shoots to commence with; and afterwards keeping the branches so pruned that they do not chafe against each other in windy weather, nor overshadow each other; all the rest is generally provided for sufficiently by nature herself. They are principally employed in planting orchards, being now seldom admitted into good gardens. As these orchards are of inestimable value to the farmer and the peasant, the best mode of planting them cannot be too generally understood: we therefore select, from many others, the following method recommended by Mr. Knight. 'Let a soil of good quality be selected for a nursery, which should be trenched eighteen inches deep, and planted with seedling crab stocks of one year old, each plant being placed at the distance of six feet from the others. These will be fit for grafting at two years old; and an acre of ground, thus planted, will contain about 1500 trees, and, consequently, enough to plant about forty acres, where each tree stands at twelve yards distance from others. A nursery thus planted, when the trees are seven or eight years old from the seed, will form a more productive orchard than can be obtained by any other means with which I am acquainted; and during the earlier periods of the growth of the trees, they will be rather benefited than injured if the ground be planted with potatoes, or other low-growing crops, with proper manure. During the growth of the trees in the nursery, they should not be pruned to single stems, without leaves, as is usually done in nurseries, but each should retain many small lateral branches, which will tend to make the young trees grow strong and taper in their stems, and will afford much fruit whilst the trees are very young. I would recommend the Downton pippin for an experiment of this kind, in preference to any other variety.

'At the end of eight or nine years from the time when the trees are first planted, they will have covered with their branches the whole surface of the ground, and will then begin to injure each other, if the whole be suffered to remain. At this period, therefore, every other row of trees, and at no distant subsequent period, every other tree in the remaining rows, must be taken away; and if this be done with proper care, and leaving the roots at least two feet long upon each side of the trunks, such trees may be removed with still less risk than such as are much smaller. But to insure success, it will be necessary to take off much the greater part of the lateral branches; and the holes in which the trees are to be planted must be made not less than six feet wide, and eighteen inches deep, placing the turf, if the field be pasture, in the bottom, and taking care that the trees be not planted deeper in the soil than they previously grew. Each tree will require, during the first year, a stake and a few bushes to protect it; after which, nothing more will be wanting than to wash its trunk annually with lime and water, and cow dung, to defend it from the teeth of sheep and cattle.'

For garden purposes, *dwarf* apple-trees are so far superior to all others, that they are now almost exclusively planted. Independently of the little space they occupy, the small degree in which they overshadow the soil, and the great facility they offer for gathering their fruit, they are generally so much beyond the influence of high winds as to have but little of their crop blown down by autumnal gales, and their fruit is also finer than on standards. No directions for their management can be given better than the following excellent observations of the author of the *Guide to the Orchard and Fruit Garden*.

'Trees for this purpose should have their branches of an equal strength: those which have been grafted one year, or what are termed by nurserymen Maiden plants, are the best; they should not be cut down when planted, but should stand a year, and then be headed down to the length of four or six inches, according to their strength; these will produce three or four shoots from each cut-down branch, which will be sufficient to form a head. At the end of the second year, two or three of the best placed of these from each branch should be selected, and shortened back to nine, twelve, or fifteen inches each, according to their strength, taking care to keep the head perfectly balanced (if the expression may be allowed), so that one side shall not be higher nor more numerous in its branches than the other; and all must be kept, as near as may be, at an equal distance from each other. If this regularity in forming the head be attended to and effected at first, there will be no difficulty in keeping it so afterwards, by observing either to prune to that bud immediately on the inside, next to the centre of the tree, or that immediately on the outside. By this means, viewing it from the centre, the branches will be produced in a perpendicular line from the eye; whereas, if pruned to a bud on the right or left side of the branch, the young shoot will be produced in the same direction; so that if the branches formed round a circle be not thus pruned to the eyes, on the right successively, or the left successively, a very material difference will be found, and the regularity of the tree will be destroyed in one single year's pruning; which may be readily illustrated thus:—fix four branches, either in a direct line or to a circular hoop, at the distance of eight inches from each other; let the branch on the left be called *a*, the second *b*, the third *c*, the fourth *d;* head down *a* to the left-hand bud; *b* to the right, *c* to the left, and *d* to the right. When these have grown a year, those between *a* and *b*, and between *c* and *d*, will be ten inches: thus the distances now are not as eight to eight, but as six to ten; which would require two years' pruning in a contrary direction to restore the head to its former regularity; and it must not be forgotten that this system of pruning will hold good in every other case.

What has just been said has reference only to the leading shoots, which are always produced from the terminal buds when pruned, and which alone form the figure and beauty of the tree. The intermediate space must of course be provided for at the same time, having a regard to the number of branches thus employed, that they do not crowd each other. On the contrary, they must be kept thin, and perfectly open, so as to admit plenty of sun and air, without which the fruit produced will be small and good for but little: the middle of the tree, indeed, must be kept quite open from the first to the last, taking care that all the surrounding branches lead outwards, and preserve a regular distance from each other.'

Espalier apple-trees were formerly much used, but they are in all respects so greatly inferior to dwarfs, and so much more expensive to keep in good order, that we omit all further notice of them.

A mode of managing apple-trees called *Balloon* training has been much recommended. It consists simply in this: you plant a common standard tree, with a stem six or seven feet high, and with five or six good equal-sized branches; to the tip of each branch is to be attached a cord which passes under a peg driven into the ground near the stem, and by means of which the branches may be gradually drawn downwards so as to become inverted, when, from the breadth of the part of the tree whence the branches diverge, and the approximation of their points, the whole assumes the appearance of a balloon. All the care that these trees require is, to have their branches kept at equal distances by means of a hoop, or some such contrivance, until they are strong enough to preserve their acquired direction, and to have all the shoots which will every year spring upwards from them carefully cut away, except such as can be brought down so as to fill up the spaces in the circumference of the balloon head. Trees thus managed produce an abundance of spurs, and when loaded with fruit are beautiful objects; like dwarfs, they occupy but little room, and their crop is not liable to be blown down; but they have this very great disadvantage, that all their buds are exposed to the sky in the spring, when they flower; consequently they are liable to suffer very much from the effect of spring frosts; so that they will scarcely ever bear, except in very favourable seasons, or in very mild and sheltered places. It is, in fact, only into gardens sloping to the south or south west, and on the sides of valleys, that balloon apple-trees should be admitted.

Many different methods of *preserving* apples have been recommended, and almost every one has some favourite plan of his own. As far as our own experience goes, the best mode is to allow the fruits, after being gathered, to lie till their superfluous moisture has evaporated, which is what is technically called *sweating;* the apples should then be wiped quite dry, wrapped in tissue paper, and stowed away in jars or chests of pure silver sand which has been previously dried in an oven. They should always be taken out of the sand a few days before they are wanted, and laid in dry fern or some such substance; they then absorb oxygen, and acquire a little sweetness, which is necessary to their perfection.'

The apple is *propagated* by either budding or grafting; the former practice is preferable for standards, the latter for dwarfs. The stocks that are employed are the wild crab, the doucin or English paradise, and the French paradise apple. The former should be used for standards only, as it imparts too much vigour to the scions to render them manageable as dwarfs; the French paradise should always be employed for the latter, as it has the property of stunting the shoots, and rendering them much more fertile. The doucin or English paradise stock, which is what the English nurserymen usually sell as *the* paradise stock, is intermediate in its effect between the crab and the French paradise, being less vigorous than the first and more so than the last. When there is no wish to confine the dwarf trees within a very narrow compass, this kind of stock, which is hardier than the French paradise, is the proper one to employ; but if the dwarfest trees that can be procured are the objects of the cultivator, then the latter only should be planted.

In conclusion, it is only necessary to add that the proper season for planting the apple is in October or November, as soon as the leaves are dead or discoloured, and beginning to drop. Vegetation at that season is not altogether torpid, but goes on just enough to enable the plants to send out a few rootlets before winter, and to prepare themselves for taking advantage of the first period of growth in the succeeding spring—a period, the commencement of which is never exactly known by external indications.

APPLE, LOVE. [See LOVE APPLE.]

APPLE, PINE. [See PINE APPLE.]

APPLEBY, a market town and borough in the county of Westmoreland, of which it is the capital; 270 miles N.N.W. from London, and 31 S.E. of Carlisle, 54° 35′ N. lat., 2° 28′ W. long. It is upon the river Eden, which falls into the Solway Frith below Carlisle; and is by no means of such extent or importance as formerly. It is supposed by some that Appleby was a Roman station, but there is at least no decisive evidence of this; and no Roman antiquities have been discovered. It was, however, a place of some importance before the conquest, and continued to be so until the time of Henry II., in the 22d year of whose reign it was surprised and utterly destroyed by William, King of Scotland. A second calamity of a similar kind in the 12th year of Richard II., A.D. 1388, completed the misfortunes of Appleby[*]. It never recovered from this blow. The greatest part still lay in ruins in the time of Philip and Mary, and on this account the rent due to the crown was reduced from twenty marks annually to two marks, or 1*l*. 6*s*. 8*d*. Burrals, a small place at the distance of nearly a mile, is supposed to be derived from Burgh walls; and the remains of buildings have been dug or ploughed up two or three miles from where the town now stands.

Appleby contains two parishes, St. Lawrence on the left, and St. Michael on the right side of the river. In St. Lawrence is the greater part of the town; in St. Michael a few houses only which can be considered part of the town, the parish of St. Michael being an agricultural one. The parishes are separate vicarages. The high road from London to Carlisle through Brough and Penrith passes through the latter: and a short street and an ancient stone bridge of two arches over the Eden lead into the main street of Appleby, which is irregularly built on the slope of a hill. The castle stands on a lofty height rising from the river at the upper end of the main street, and at the lower end is the parish-church of St. Lawrence. The keep of the castle is in good preservation. It is called Cæsar's Tower, but is not of Roman origin, though it is of great antiquity. The principal part of the present edifice was built in 1686, by the then Earl of Thanet, in whose family it still remains. The church of St. Lawrence was nearly rebuilt in 1655, by the Countess of Pembroke. Near the church is the market-house, rebuilt in 1811 in the Gothic style. The town-hall and shambles are incommodiously placed in the middle of the main street: at each end of the town is an antient stone obelisk. The shire-hall and new gaol are in the parish of St. Michael or Bondgate, in the part of Appleby which lies on the north-east or right bank of the Eden. Both the Lent and Summer assizes are held here, and the judges when on circuit have from time immemorial been entertained at the castle.

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[*] There is some difference in the dates assigned to the first of these events. Nicolson and Burn (*Hist. of Cumberland and Westmoreland*) give the 22d of Henry II.: but it was in this year that the fine for delivering up the place was levied on the governor, and the event might have occurred a year or two before.

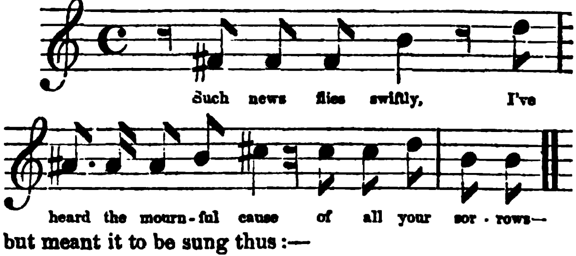
Towards the upper end of the town is an almshouse or hospital, for twelve widows and a superior, or 'mother,' founded by the above-mentioned Countess of Pembroke; and near the church is a grammar-school, established in the time of Elizabeth. The income of the school is or was 204*l.* 1*s.* 7*d.*; the number of free scholars is six. (*Digest of Reports, &c. on Public Charities*, p. 622.)

The market is on Saturday, chiefly for corn; and there are several fairs for cattle, horses, sheep, and linen-cloth; especially a cattle-fair once a fortnight from Whitsun-eve to Michaelmas. The population of the borough of Appleby was, in 1831, 851, and of the township of Bondgate and Langton 645, together 1496: but the parishes of St. Lawrence and St. Michael had 1459 and 1264 inhabitants respectively.

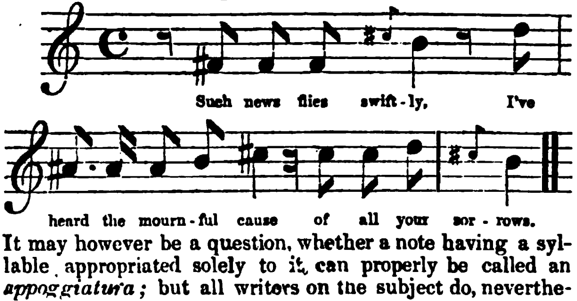
The corporation consists of a mayor, twelve aldermen, sixteen common-councilmen, and other officers. The borough returned two members up to the passing of the Reform Bill, by which it was disfranchised.

Appleby was distinguished by its adherence to Charles I. in the contest between that prince and his parliament. The Countess of Pembroke fortified the castle for the king, but it was forced to surrender.

APPOGGIATU'RA, in music (from the Italian verb *appoggiare*, to lean on), commonly called a grace note, or note of embellishment, but more correctly, a note of expression. This is invariably written in a smaller character than the essential notes of the melody. The term explains itself; the *appoggiatura* should always have more or less pressure of the breath or hand, being, where the notation is accurate, used for the purposes of emphasis, especially in recitative, where it is quite as important as the notes in a larger character. But in recitative it is a practice as common as erroneous, to write notes *not* meant to be sung, presuming that the singer will suppose notes to be intended which are not represented. Thus Handel, in his *Jepntha*, has written a recitative in the following manner:—


Such news flies swiftly, I've
heard the mourn-ful cause of all your sor-rows—

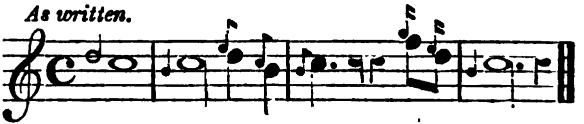
but meant it to be sung thus:—


Such news flies swift-ly, I've
heard the mourn-ful cause of all your sor-rows.

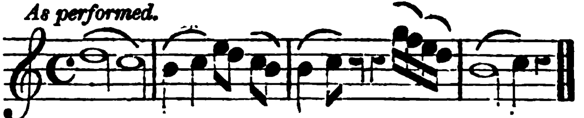
It may however be a question, whether a note having a syllable appropriated solely to it, can properly be called an *appoggiatura*; but all writers on the subject do, nevertheless, so term it.

The *appoggiatura* takes its length, or duration, from the note it precedes, whence it almost invariably abstracts one-half; except in the case of a dotted or pointed note, from which it takes two-thirds. Example:—

As written.



As performed.



Occasionally, the small note is not only written, but intended to be performed, as a very short one. For instance; a small semiquaver sometimes precedes a crotchet, or a minim, where, if it leap from a distance above to the principal note, which is rare, it is merely a note of animation. If it be the semitone, the octave, or indeed any interval below the principal note, it is then called an *acciaccatura*, or *crushing* note, (from *acciaccdre, to crush, to pound,*) and is to be forced and short. The *appoggiatura*, M. Framery observes, gives tenderness to the air; it therefore is not adapted to music of an energetic or majestic kind. In the hands of an accomplished performer it is the most expressive, the most impassioned, addition intrusted to his discretion. But modern composers, unwilling, perhaps, to repose too much confidence in those who are to execute their works, generally write all that they mean to be introduced, trusting nothing to the judgment of the performer.

APPRAISEMENT, from *apprécier*, *appriser*, or *appraiser*, 'to set a price upon an article.' When goods have been taken under a distress for rent, it is necessary, in order to enable the landlord to sell them according to the provisions of the statute 2 William and Mary, sess. i. c. 5, that they should be previously appraised or valued by two appraisers. These appraisers are sworn by the sheriff, under-sheriff, or constable, to appraise the goods truly according to the best of their understanding. After such an appraisement has been made, the landlord may proceed to sell the goods for the best price that can be procured. By the statute 48 Geo. III. c. 140, an *ad valorem* stamp duty is imposed upon appraisements.

APPRAISERS are persons employed to value property. By the statute 46 Geo. III. c. 43, it was first required that any person exercising the calling of an appraiser should annually take out a license to act as such, stating his name and place of abode, and signed by two commissioners of stamps. By the same statute a stamp duty of 6*s.* was imposed upon such licenses; and unlicensed persons were forbidden to act as appraisers under a penalty of 50*l.* The same duty has been continued by the General Stamp Act, 48 Geo. III. c. 149.

APPRENTICE, from *apprendre*, to learn, signifies a person bound by indenture to serve a master for a certain term, receiving in return for his services, instruction in his master's profession, art, or occupation. In addition to this, the master is usually bound to provide the necessary food and clothing for the apprentice, and sometimes to pay him small wages, but most commonly the master receives a premium. Formerly the word was used to denote those students of the common law in the societies of the inns of court who—not having completed their professional education by ten years' study in those societies, at which time they were qualified to leave their inns and to execute the full office of an advocate, upon being called by writ to take upon them the degree of serjeant-at-law—were yet of sufficient standing to be allowed to practise in all courts of law except the court of Common Pleas. This denomination of apprentice (in law Latin, *apprenticii ad legem nobiliores*, *apprenticii ad barras*, or simply *apprenticii ad legem*) appears to have continued until the close of the sixteenth century, after which this term fell into disuse, and we find the same class of advocates designated, from their pleading without the bar, as *outer* barristers, now shortened into the well-known term, barristers. (See Spelman's *Gloss. ad verbum;* Blackstone's *Commentaries*, vol. i. 23; vol. iii. 27.)

Apprenticeship appears to have been unknown to the antients; and although it has been stated that in Rome the distribution of the citizens into companies or colleges according to their trades took place at an early period, we can discern in the Roman history no distinct traces of such a system as apprenticeship. Its origin is to be sought in the institutions of modern Europe, and it probably sprung up in conjunction with the system of associating handicraft trades in the twelfth century, the natural result, perhaps, of those more general combinations of citizens or of burgesses, which were formed for the purposes of mutual protection against feudal oppression. The restraint of free competition, the assertion of peculiar privileges, and the limitation of the numbers of such as should participate in them, were the main results to which these institutions tended; and for these purposes a more obvious or effective instrument than apprenticeship could hardly be found. To exercise a trade, it was necessary to be free of the company or fraternity of that trade; and as the principal if not the only mode of acquiring this freedom in early times was by serving an apprenticeship to a member of the body, it became easy to limit the numbers admitted to this privilege, either indirectly by the length of apprenticeship required, or more immediately by limiting the number of apprentices to be taken by each master. So strict in some instances were these regulations, that no master was allowed to take as an apprentice any but his own son. In agriculture, apprenticeship, though in some comparatively later instances encouraged by positive laws, has never prevailed to any great extent, which is probably to be attributed to its origin as a part of the system of associated trades. The tendency to association indeed is not strong among the agricultural population, combination being, to the scattered inhabitants of the country, inconvenient and often impracticable; whereas the inhabitants of towns are, by their very position, invited to it.

Subsequently to the twelfth century, apprenticeship has prevailed in almost every part of Europe. In France, Germany, Italy, and Spain, it may be distinctly traced, and it probably existed in various other countries. It is asserted by Adam Smith, that seven years seem antiently to have been all over Europe the usual term established for the duration of apprenticeships in most trades. There seems, however, to have been no settled rule on this subject, for there is abundant evidence to show that the custom in this respect varied not only in different countries, but in different incorporated trades in the same town.

In Italy, the Latin term for the contract of apprenticeship was *acconventatio*. From an old form of an Italian instrument, given by Beier in his learned work *De Collegiis Opificum*, it appears that the contract, which in most respects closely resembled English indentures of apprenticeship, was signed by the father or other friend of the boy who was to be bound, and not by the boy himself, the latter testifying his consent to the agreement merely by being present.

In France, the trading associations prevailed to a great extent under the names of 'Corps de Marchands' and 'Communautés.' At the latter end of the seventeenth century, there were in Paris six 'Corps de Marchands,' and one hundred and twenty-nine 'Communautés,' or companies of tradesmen, each fraternity having their own rules and laws. Among these bodies the duration of apprenticeship varied from three to eight or ten years. It was an invariable rule in the 'Corps de Marchands,' which was generally followed in the 'Communautés,' that no master should have more than one apprentice at a time. There was also a regulation that no one could exercise his trade as a master until, in addition to his apprenticeship, he had served a certain number of years as a journeyman. During the latter term he was called the 'compagnon' of his master, and the term itself was called his 'compagnonage.' He had also, before being admitted to practise his trade as master, to deliver to the 'jurande,' or wardens of the company, a specimen of his proficiency in his art, called his 'chef d'œuvre.' He was then said 'aspirer à la maîtrise.' The sons of merchants living in their fathers' house till seventeen years of age, and following his trade, were reputed to have served their apprenticeship, and became entitled to the privileges incidental to it without being actually bound. These companies or associations were finally abolished at the revolution, when a perfect freedom of industry was recognized by the laws, and this, with a few exceptions, has continued to the present day. But though the contract of apprenticeship has ceased in France to be imperative upon the artisan, it has not fallen into disuse; and an act passed the 12th of April, 1803, prescribes the rights and duties both of master and apprentice. It does not, however, lay down any particular form, and leaves the time and other conditions of the contract to be determined by the parties.

In Germany, though we find the same institution, it varies not only in the name, but has some other remarkable peculiarities. The companies there called *gilden*, *zünfte*, or *innungen*, appear to have exercised in many respects a sort of judicial control over their members, and, either on account of moral or physical defects, to have refused admission to applicants for freedom at the discretion of the elders or masters. They seem to have occasionally admitted workmen who had not served a regular apprenticeship into the lower class of members of a trade; but to become masters was only allowed to those who had gone through the regular stages of instruction. The course which continues to the present day is as follows:—The apprentice, after having served the term prescribed by his indenture (*aufdings-brief*), is admitted into the company as a companion (*gesell*), which corresponds in many respects to the French *compagnon*. Having passed through the years of his apprenticeship, called *lehr-jahre*, satisfactorily, he becomes entitled to receive from the masters and companions of the guild a certificate, or general letter of recommendation (*kundschaft*), which testifies that he has duly served his apprenticeship, and has been admitted a member of the company, and commands him to the good offices of the societies of the same craft, wherever he may apply for them. With this certificate the young artisan sets out on his travels, which often occupy several years, called *wandel-jahre*, supporting himself by working as a journeyman in his particular art or trade in the various towns in which he temporarily establishes himself, and availing himself of his *kundschaft* to procure admission into the fellowship and privileges of his brother workmen of the same craft. On his return home, he is entitled, upon producing certificates of his good conduct during his *wandel-jahre*, to become a master. In Germany, the periods of servitude have varied in different states and at different periods; in general, the term is seven years; but in some instances an apprenticeship of five or three years is sufficient.

Neither in Ireland nor in Scotland have the laws relating to associated trades or apprentices been very rigorously enforced. In the former, the same system of guilds and companies certainly existed; but, as it was the policy of the English government to encourage settlers there, little attention was paid to their exclusive privileges; and in 1672 the Lord Lieutenant and Council, under authority of an Act of Parliament, issued a set of rules and regulations for all the walled towns in Ireland, by which any foreigner was allowed to become free of the guilds and fraternities of tradesmen on payment of a fine of 20*s*. A statute containing very similar enactments was passed in 19 George III. The term of apprenticeship, also, in Ireland, was of a moderate length, five years being required by 2 Anne, c. 4, for the linen manufacture, which, by 10 George I., c. 2, was reduced to four years. It is asserted by Adam Smith, that there is no country in Europe in which corporation laws are so little oppressive as in Scotland. Three years are there a common term of apprenticeship even in the nicer trades, but there is no general law on the subject, the custom being different in different communities.

It is, perhaps, impossible to ascertain precisely at what time apprenticeships first came into general use in England. But that the institution is one of very old date is certain, being probably contemporaneous with the formation of the guilds or companies of tradesmen. In the statutes of the realm, however, there is no reference to such an institution for about 200 years after the guilds are known to have existed, apprentices being first incidentally noticed in an act (12 Rich. II. c. 3) passed in 1388. But that about this time apprenticeship had become extremely common is proved by a statute passed in 1405-6 (7 Henry IV. c. 17), which contains the singular enactment, that no one shall bind his son or daughter apprentice unless he have land or rent to the value of 20*s*. by the year; the cause of which provision is stated to be the scarcity of labourers in husbandry, in consequence of the custom of binding children apprentices to trades. In the act (8 Henry VI. c. 11) which repealed this statute in favour of the city of London, the putting and taking of apprentices is stated to have been at that time a custom of London time out of mind. The same statute was repealed (by the 11th Henry VII. c. 11) in favour of the citizens of Norwich, and (by the 12th Henry VII. c. 1) in favour of the worsted-makers of Norfolk; and in the former act we find the first mention of any particular term of servitude, the custom of the worsted-sheerers of Norwich being confirmed by it, which required an apprenticeship of seven years. Except in London, it does not appear that at an early period there was in England any uniform practice in this respect, but that the duration of the apprenticeship was a matter for agreement between the parties to the contract. In Madox's *Formulare Anglicanum*, there is an indenture of apprenticeship dated in the reign of Henry IV., which is nearly in the same form as the modern instrument; and in that case the binding is to a carpenter for six years. It is, however, probable that before the statute of the 5th Eliz. c. 4, the term of apprenticeship was seldom less than seven years. In London, the period of seven years at the least was expressly prescribed by the custom as the shortest term; and Sir Thomas Smith, in his *Commonwealth of England*, written about the time of the passing of the statute of Eliz., says, in reference to the previous practice, that the apprentice 'serveth, some for seven or eight years, some nine or ten years, as the master and the friends of the young man shall think meet, or can agree together.'

The statute of the 5 and 6 Edw. VI. c. 8, which enacts that no person shall weave broad woollen cloth, unless he have served a seven years' apprenticeship, may be adduced as a further proof that this term was fast becoming the customary one, when, by the 5th Eliz. c. 4, it was made the law of the land, and one uniform practice in all trades introduced throughout England. But neither by that statute, nor by the customs of London and Norwich, which were excepted by the act, was a longer term of apprenticeship than seven years forbidden.

The London apprentices, in early times, were an important, and often a formidable body. They derived consequence from their numbers, the superior birth of many of them, and the wealth of their masters, but particularly from their union, and the spirit of freemasonry which prevailed among them. The author of a curious poem published in 1647, entitled *The Honour of London Apprentices*, observes, in his preface, that 'from all shires and counties of the kingdom of England and dominion of Wales, the sonns of knights, esquiers, gentlemen, ministers, yeomen, and tradesmen, come up from their particular places of nativity and are bound to be prentices in London.' He also mentions 'the unanimous correspondence that is amongst that innumerable company.'

It may be readily supposed that such a body, in the midst of a large metropolis, densely crowded with population, and frequented by strangers of all kinds, was not a little obnoxious to the police; and accordingly, we find in the sixteenth and seventeenth centuries a constant succession of tumults, and some instances of serious and alarming insurrections arising among the apprentices. Thus the fatal riot in London against foreign artificers, which took place on the 1st of May, 1517, and from which that day was called 'Evil May Day,' was commenced and encouraged by the apprentices.

In the year 1595, certain apprentices in London were imprisoned by the Star-Chamber for a riot; upon which, several of their fellows assembled and released them by breaking open the prisons. Many of these were taken and publicly whipped by order of the Lord Mayor. This caused a much more formidable disturbance; for 200 or 300 apprentices assembled in Tower-street, and marched with a drum in a warlike manner to take possession of the person of the Lord Mayor, and, upon the principle of retaliation, to whip him through the streets. Several of the ringleaders in this riot were tried and convicted of high treason. (See *Criminal Trials*, vol. i. p. 317.)

In the troubles of the civil wars the apprentices of London took an active part as a political body; numerous petitions were presented from them to the parliament, and they received the thanks of the House 'for their good affections.' Nor did they confine their interference merely to petitions, but, under sanction of an ordinance of parliament promising to them security against forfeiture of their indentures, they were inrolled into a sort of militia. They also took part in the restoration, and in the reign of Charles II. they were frequently engaged in tumults. The last serious riot in which they were concerned took place in 1668. On this occasion they assembled themselves tumultuously together during the holidays, and proceeded to pull down the disorderly houses in the city. For this exploit, several of them were tried and executed for high treason.

In 1681, when Charles II. was desirous of strengthening his hands in every way against the corporation of London, he thought it necessary to endeavour to secure the favour of the apprentices, and sent them a brace of bucks for their annual dinner at Sadlers' Hall, where several of his principal courtiers dined with them. The apprentices, however, were divided in opinion; for there were numerous petitions from them both for and against the measures of the court.

Subsequently to this time their union appears to have been gradually dissolved, and we do not find them again acting together in a body. After they had ceased however to form a separate class, the laws which had called them into existence, though partially repealed as to some trades, continued generally in force; nor was it until a very late period that the progress of more liberal opinions finally put an end to them. But the exclusive spirit which had dictated them was so far modified by the spirit of English liberty, that the monopolies upheld by them were never so strictly enforced, nor the evil of them so much felt in this country as on the continent. For not only were the apprentice-laws condemned by the liberal and speculative philosopher, but they found no favour in the courts of law. They were frequently reprobated by judges and legal writers; and Lord Mansfield denounced them as being 'against the natural rights of man, and contrary to the common law rights of the land.' Acting upon this view of the impolicy of the system, the decisions of the courts tended rather to confine than to extend the influence of the statute of Elizabeth, and thus the operation of it was limited to market-towns, and to those trades which were actually in existence at the time it was passed. And although, in consequence of this doctrine, many absurd anomalies and inconsistencies were introduced, yet the exclusion of some manufactures, and particularly of the principal ones of Manchester and Birmingham, from the operation of the act, had probably a favourable effect in causing it to be less strictly enforced even against those who were held to be liable to it. It was proved by a mass of extremely interesting evidence produced before a committee of the House of Commons in 1814, that the provisions of the statute of Elizabeth neither were, nor could be, carried into effect in our improved state of trade and manufactures. An alteration in the law could therefore be no longer delayed. And though the question was brought before the legislature on a petition praying that the 5th Eliz. c. 4, might be rendered more effectual, the result was the passing of an act (54 Geo. III. c. 96) by which that statute, so far as it enacts that no person shall exercise any trade without having served a seven years' apprenticeship to it, was wholly repealed. There is in the act of 54 Geo. III. c. 96, a reservation in favour of the customs and bye-laws of the city of London, and of other corporate towns, but in general the necessity of apprenticeship, as a means of access to particular trades, is abolished, and a perfect liberty, in this respect, is established.

Apprenticeship, though no longer absolutely necessary, still continues to be the usual mode of learning a trade, and as such is recognised by law; it may therefore be useful to mention, in a summary manner, some of the leading provisions of the law upon the subject. By the common law, an infant, or person under the age of twenty-one years, being unable to contract any obligation except for his own benefit, cannot bind himself apprentice so as to entitle his master to an action of covenant for departing his service, or other breaches of the indenture. The statute of 5 Eliz. c. 4, s. 42 and 43, enacts that every person bound by indenture according to the statute, although within the age of twenty-one, shall be bound as amply, to every intent, as if he were of full age. But by these words of the statute, the infant is not so bound as that a remedy lies against him upon any covenant of the indenture; and it has therefore been a common practice for a relation or friend to be joined as a contracting party in the indenture, and engaging for the faithful discharge of the agreement. But by the custom of London, an infant, unmarried and above the age of fourteen, may bind himself apprentice to a freeman of London, and it is said that, by force of the custom, the master may have such remedy against him as if he were of full age, and consequently an action of covenant. Any person under the age of twenty-one years is, by 5 Eliz. c. 4, s. 35 and 36, compellable to be bound apprentice, if so required by any householder using half a plough of land in tillage. The same act also provides that the binding must be by indenture, so that binding by deed-poll, or by an agreement to execute an indenture, or a parol binding, have been held not to constitute an apprenticeship, though, by statute 31 Geo. II. c. 11, a binding by deed not indented will enable a person to gain a settlement.

By statute of 43 Eliz. c. 2, confirmed by 8 and 9 Wm. III. c. 30, and by subsequent acts, the churchwardens and overseers of a parish, with the assent of two justices of the peace, may bind children of paupers apprentices till the age of twenty-one, and not only persons in husbandry and trade, but gentlemen of fortune and clergymen may be compelled to take them. But if such master is dissatisfied, he may appeal to the sessions. Parish apprentices may also be bound (2 and 3 Anne, c. 6) to the sea service; and masters and owners of ships are obliged to take one or more according to the tonnage of the vessel. Various regulations have been made by several acts of parliament, and in particular by 56 Geo. III. c. 139, for ensuring that parish apprentices shall be bound to proper masters, and securing them from ill-treatment. A settlement is gained by apprentices in the parish where they last resided forty days during the service. (13 and 14 Car. II. c. 12.) [See Poor Law and Settlement.]

An indenture cannot be assigned over, either by common law or equity, but by custom it may. Thus, by the custom of London and other places it may be done by a 'turn-over.' Parish apprentices may also, (32 Geo. III. c. 57, s. 7,) with the consent of two justices, be assigned over by indorsement on the indentures.

An indenture is determinable by the consent of all the parties to it; also by the death of the master, apprenticeship being a personal trust between master and servant. But it is said that the executor may bind the apprentice to another master for the remainder of his term. And if there is any covenant for maintenance, the executor is bound to discharge this as far as he has assets. In the case of a parish apprentice (32 Geo. III. c. 57, s. 1), this obligation only lasts for three months, where the apprentice-fee is not more than 5*l.*, and the indenture is then at an end, unless upon application by the widow or executor, &c. of the master to two justices, the apprentice is ordered to serve such applicant for the remainder of the term. By the custom of London, if the master of an apprentice die, the service must be continued with the widow, if she continue to carry on the trade. In other cases, it is incumbent on the executor to put the apprentice to another master of the same trade. By the Bankrupt's Act, 6 Geo. IV. c. 16. s. 49, it is enacted, that the issuing of a commission against a master shall be a complete discharge of an indenture of apprenticeship; and where an apprentice-fee has been paid to the bankrupt, the commissioners are authorized to order any sum to be paid out of the estate for the use of the apprentice which they may think reasonable.

A master may by law moderately chastise his apprentice for misbehaviour. He cannot, of his own accord, discharge him. But if he have any complaint against him, or the apprentice against his master, on application of either party to the sessions, by 5 Eliz. c. 4, or to two justices in the case of a parish apprentice, by 20 Geo. II. c. 19, and other acts, a power is given to punish or to discharge the apprentice, and in some cases to fine the master. If any apprentice, whose premium does not exceed 10*l.*, run away from his master, he may be compelled (6 Geo. III. c. 25) to serve beyond his term for the time he absented himself, or make suitable satisfaction, or be imprisoned for three months. If he enters another person's service, his master is entitled to his earnings, and he may bring an action against any one who has enticed him away.

In London, in case of misconduct by the master towards the apprentice, or by the apprentice towards the master, either party may summon the other before the chamberlain, who has power to adjudicate between them, and, upon the disobedience or refractory conduct of either party, may commit the offender to Bridewell.

The main objections to apprenticeship are, its interference with the property which every man has, or ought to have, in his own labour, and its encroachment not only on the liberty of the workman, but also of those who might be disposed to employ him, and who may safely be allowed to judge whether he is fit to be employed or not. To require in the more common mechanical trades the same length of apprenticeship as in the nicer and more difficult arts, is manifestly unnecessary and inexpedient; and it is obvious that long apprenticeships have a tendency rather to repress than encourage a love of industry, as an apprentice is excluded from the greatest incentive to voluntary labour, namely, a participation in the fruits of his exertions or skill. Most of these objections apply to apprenticeship as a necessary rather than a voluntary contract, and are of course removed by the present state of the law. At the age at which apprentices are usually bound some subjection to restraint is desirable; and, whether by being bound as an apprentice, or by working as a journeyman, a workman is most likely to gain a complete knowledge of his trade, and to acquire habits of industry, may be left to the determination of those who are practically interested in the question.

APPROACHES, the general term given to the trenches excavated by the besieger, for the purpose of forming roads, by which he may advance from his camp to the foot of the breach made in the walls of a fortress without being exposed to the view of the defenders. These approaches sometimes consist of covering masses only, formed either with earth in bags, with fascines, stuffed gabions, wool-packs, or bales of cotton.

APPROVER. By our antient law, where a person who had been arrested, imprisoned, and indicted for treason or felony, confessed the crime charged in the indictment, and was admitted by the court to reveal on oath the accomplices of his guilt, he was called an *approver*.

The judge or court might in their discretion give judgment and award execution upon the party confessing, or admit him to be an approver. In the latter case a coroner was directed to receive and record the particulars of the approver's disclosure, which was called an *appeal*, and process was thereupon issued to apprehend and try the *appellees*, viz. the persons whom the approver had impeached as the partners of his crime.

As the approver, in revealing his accomplices, rendered himself liable to the punishment due to the crime which he had confessed, and was only respited at the discretion of the court, it was conceived that an accusation, made under such circumstances, was entitled to peculiar credit, and the accomplices were therefore put upon their trial without the intervention of a grand jury.

Here, however, as in other appeals [see Appeal] the parties accused by the approver were allowed to choose the mode of trial, and the approver might be compelled to fight each of his accomplices in succession. But, unlike an appeal by an innocent person, the prosecution at the suit of an approver might be defeated and discharged by a pardon granted by the king either to the approver or to the appellee.

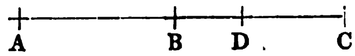
If the approver failed to make good his appeal, judgment of death was given against him. If he succeeded in convicting the appellee, then he was entitled to a small daily allowance from the time of being admitted approver, and to a pardon from the king.

The appeal by approvers had become obsolete before the abolition of it by parliament; and the present practice is to prefer a bill of indictment against all parties implicated in the charge, and to permit the criminal who confesses his guilt to give evidence against his companions before the grand jury. If upon the trial the demeanour and testimony of the accomplice is satisfactory to the court, he is recommended to the mercy of the crown. (See 2 Hawk. *Crown Law*, ch. 24.)

APPROXIMATION, from the Latin, signifies a *drawing near to*. In mathematics, results are said to be found by approximation, when the process employed gives nearly, but not exactly, the result required.

Strictly speaking, the observed phenomena in every branch of experimental philosophy are approximations, more or less near, to the truth. Thus the distance of the sun, or the diameter of a planet, are only known approximately: but general custom does not sanction the application of the term to any 'drawing near' in which the imperfection arises from error of the senses, or of instruments. It is only when the defects of mathematical analysis oblige us to be content with a formula which gives results only nearly true, that the latter are said to be approximate. To this part of the subject, then, we confine ourselves.

It may be stated as a general fact, that there are very few mathematical processes, except those of pure geometry, which give absolutely correct determinations, in which the answer obtained is neither more nor less than is necessary to satisfy the conditions of the question. But the fault is not in the processes themselves, but in the problems which it is necessary to submit to them, and in the nature of arithmetical, as distinguished from geometrical, magnitude. It is worth while, briefly, to elucidate this point. In geometry, the mind conceives one line or angle to differ from another by some magnitude of the same kind which can be *assigned*, and a magnitude is rather imagined to be given, than actually given. If we attempt to *construct* the line or angle of geometry, we must have recourse to approximation, and that of the roughest character, since the errors are as great as those of the senses. It is only by laying down the postulate that any line or angle can be assigned independently of all mechanical methods, that geometry becomes a science of absolute exactness. In arithmetic, on the contrary, the very first notion of numbers throws a theoretical difficulty in the way. We can imagine a line to grow or increase *continuously*: that is, in such a way that it shall not increase from one to two feet, without previously assuming every possible length which lies between one and two feet. This idea is forced upon us whenever we see points moving to or from each other. But is it therefore true, that every possible length which is greater than one foot and less than two, can be expressed by one foot and some determinate numerical fraction of a foot? This question reduces itself to the following. Let A D be



greater than A B (one foot), and less than A C (two feet); if B C be successively divided into two equal parts, three equal parts, four equal parts, and so on, *ad infinitum*, does it follow that some one or other of the subdivisions must of necessity fall upon the point D, previously taken at hazard? If we appealed to the evidence of the senses, we should certainly answer in the affirmative, for, though the finest compasses were used, we should soon find some point of subdivision so near to D, as not to be distinguishable from it by the severest test our senses could apply. But our mechanical points are minute solids, while the mathematical point has neither length, breadth, nor thickness. Conceive the latter, and the affirmative answer does not appear self-evident; for though the continuation of the points of subdivision is unlimited, the number of points which can be taken in the line is also unlimited. But we can demonstrably answer the question in the negative (see the *Society's Treatise on the Study of Mathematics*, p. 81): as an instance, let B D be equal to the side of that square of which B C is the diagonal, or let B C be the circumference of that circle of which B D is the diameter. In neither case can one of the subdivisions of B C ever fall on D.

Here then is a fruitful source of the necessity of having recourse to approximation, since we cannot be sure that any required relation between concrete magnitudes is absolutely expressible in numbers. In fact, we may state the following as a result of experience, though, not so far as we know, capable of demonstration:—numbers being taken at hazard, and submitted to any process which requires the solution of an equation higher than the first degree, the odds are greater than can be assigned against obtaining an absolute result without approximation. In a common table of logarithms, fixing at hazard upon any number, the odds are nearly seventeen thousand to one against choosing a number of which the logarithm can be exactly given.

This would appear to throw an air of uncertainty over almost all the conclusions of pure mathematics, and justly so, if it were not for the following truth, which, except so far as the labour of approximation is concerned, renders it practically immaterial whether a result is obtained exactly, or by approximation. Any equation whatsoever, which expresses the conditions of a possible problem, if not capable of exact solution, may yet be so far satisfied that a number or fraction can be found, which, on being tried in the given equation, shall produce an error smaller than any we may think it necessary to name at the outset. For instance, the ratio which the circumference of a circle bears to its diameter does not admit of an exact and absolute determination. If any two numbers be named, their ratio is either too great or too small. But supposing it asked to determine the circumference of a circle from its diameter so nearly, that the error shall not be so much as a foot for every hundred miles of diameter, or in that proportion. It can be shown to be more than sufficient for this purpose to multiply the diameter by 355 and divide by 113; which, if the diameter were 100 miles, would give 314 miles, 280 yards, and one foot· this, though too small, is within the conditions of the question, not being too small by one foot. Again, though it is impossible exactly to solve the equation $x^2=7$ or $x^2-7=0$, that is, to find a fraction which, multiplied by itself, shall make 7, yet naming any fraction, however small, at pleasure, for example, one millionth or ·000001, it is possible so to determine x, that x^2-7, though not absolutely *nothing*, shall be less than the proposed fraction, one-millionth.

It is not our purpose here to enter upon methods of approximation: no space which we could devote to the subject would suffice to explain any of them with sufficient detail to render them of practical use. We shall therefore content ourselves with giving a general view of one of the great methods, we might say, *the* great method, usually employed, and shall thereby, in succeeding articles, show the young mathematician that various methods, upon which he must have come in the course of his reading, contain a common principle, though disguised under the various forms of calculation which it is necessary to employ in different cases. We must now suppose the reader acquainted with the elements of the differential calculus.

When a number is given, and certain processes are also known, so that they can be performed either exactly or approximately, we are in possession of the solution of the following question—given the number, and the process, to find the result of the process. Hence immediately there results reason for inquiry into the inverse question—knowing the process, and the result of it, what was the number on which the process was employed? The way of finding this number is called the inverse process, and, if of sufficiently frequent occurrence, a name is given to it, and the rule for finding it is put into words, and arranged in its most systematic form. Thus the process of *squaring* or multiplying a number by itself, is known when multiplication is known, and the question is easily answered, what is the square of 2½ or any other number, or what *results* from the process of *squaring* employed upon the *number* 2½? From this arise such questions as the following:—The *result* of *squaring* is found to be 50; what was the *number employed?* This can only be answered approximately; that is, no number squared can give *exactly* 50, though one can be found, the square of which is as near 50 as we please. This operation occurs sufficiently often to receive the name of the extraction of the square root, and the rule for approximating to it is well known. We can now carry the generalization a step farther, for the result of the last is to put a new process into our hands which we may consider as direct, since the means of performing it in all cases, approximately at least, have been found. We may now ask, what is the result of the process denoted by

$$x^3+\sqrt{x^2-1},$$

any number being substituted instead of x: but the inverse question—namely, suppose the above process to have been performed, and the result to be 20; what number was employed?—presents itself and requires new investigations. Neither the direct nor inverse process in this case has received a name; and it is evident that, name as many as we may, each addition will give new processes, require new inverse processes, and so on *ad infinitum*.

Previous to entering upon the process of approximation, it is necessary to inquire into the effect which a small change in the number employed would produce upon the result. We say a *small* change, because changes of any magnitude require formulæ of great intricacy, compared with small changes. The consideration of the effect of such changes is, among other things, the object of the DIFFERENTIAL CALCULUS; into which we can here enter no further than to state, that in connexion with every process it discovers others, which we shall here call by the names of the *first* derived process, the *second* derived process, &c.; the two first of which are indispensable, the first for obtaining the approximation, the second for ascertaining the degree of accuracy to which the approximation has been carried. These *derived* processes (as we here call them) are the first and second differential coefficients. [See DIFFERENTIAL CALCULUS.]

Let fx represent the required process or FUNCTION. Let $f'x$ and $f''x$ represent its first and second derived functions. We suppose this notation known to the reader; but any one who has studied algebra may be prepared to follow us by reading the first thirteen pages of the Society's treatise, entitled *Elementary Illustrations of the Differential and Integral Calculus*. If the operations which fx indicates to have been performed upon x, be successively performed on a and $a + h$, giving fa and $f(a + h)$, it may be proved that

$$f(a+h) = fa + hf'a + \frac{h^2}{2}f''(a+\theta h) \quad \text{(A)},$$

where θ is a fraction less than unity, or θh is less than h. This rule only admits of exception where fx is such that either $f''x$ becomes very large, or $f'x$ very small, for some value of x lying between a and $a + h$; and since in approximations h is a very small quantity, this will rarely happen, and when it does happen, the results of an attempt to approximate will soon point it out. Let us now suppose that we wish to find x in such a way that $fx = 0$. Every case may be easily reduced to this: for example, to solve $x^2 = 7$ is to find or approximate to a value of x, which makes $x^2 - 7 = 0$. The first step is to find by trial some value of x which will very nearly satisfy the proposed condition, that is to find a, so that fa shall be small. No general rule can be given for this part of the process, which is, however, easily done in most cases. To carry an example with us, let us suppose it required to solve the equation:

$$x^3 - 2x = 5$$

or to make

$$x^3 - 2x - 5 = 0.$$

Here fx is $x^3 - 2x - 5$, and, by the rules of the differential calculus, $f'x$ is $3x^2 - 2$, and $f''x$ is $6x$. We soon find that there is a root between 2 and 2·1, for if $x = 2$, then $x^3 - 2x$ is 4, and if $x = 2{\cdot}1$, it is 5·061; the first less than 5, the latter greater, but not much. We therefore take 2·1 as the approximate value of x found by trial.

Returning now to equation (A), let us suppose a the approximate value increased by h, in such a way that $a + h$ shall be the real value of x required, or $f(a + h) = 0$. This gives

$$h = -\frac{fa}{f'a + \frac{1}{2}hf''(a+\theta h)} \quad \text{(B)},$$

in which h is not, strictly speaking, determined, because it occurs on the second as well as the first side. But h is small, because a is nearly the value required, and therefore we may approximate to the value of h from (B) by rejecting the small term

$$\tfrac{1}{2}hf''(a+\theta h)$$

from the denominator of the fraction, which gives

$$h = -\frac{fa}{f'a}$$

for an *approximate* value of h: so that the new value of x obtained from the step just made is

$$a - \frac{fa}{f'a}$$

With this new value of x we may recommence the process, and find a new correction; and so on.

Resuming the example, we find putting $a = 2{\cdot}1$,

$$fa = a^3 - 2a - 5 = {\cdot}061,$$
$$f'a = 3a^2 - 2 = 11{\cdot}23,$$
$$h = -\frac{{\cdot}061}{11{\cdot}23} = -{\cdot}0054 \text{ nearly},$$
$$x = a + h = 2{\cdot}0946 \text{ nearly}.$$

Trying this value in $x^3 - 2x - 5$, we find it ·005, nearly; less than the tenth part of its preceding value. With 2·0946 for a, the process must be now repeated.

The degree of approximation thus obtained may be estimated as follows, though we can only very briefly explain it to those who have no more practice in the differential calculus than we have hitherto supposed. Resuming the correct equation (B), we see that, if we call fa, as obtained, a small quantity of the first order, $(fa)^2$ of the second, and so on, then h will be of the same order as fa, unless $f'a$ be also of that order, which is one of the excepted cases. Hence, in rejecting θh, we reject only quantities of the first order from the term $f''(a+\theta h)$, or of the second from $\frac{1}{2}hf''(a+\theta h)$, or of the *third* order from the whole fraction, since fa is itself of the first order. This will appear from the development of the second side of (B) by common division. Thus rejecting θh, and developing

$$-\frac{fa}{f'a + \frac{1}{2}hf''a}$$

as far as terms of the second order, we have

$$h = -\frac{fa}{f'a}\left(1 - \frac{f''a}{f'a}\,\frac{h}{2} + \text{\&c.}\right),$$

in which, if on the second side we write $-\frac{fa}{f'a}$ for h, which rejects terms of the second order only, we still reject terms of the *third* order only in the value of h. Hence

$$h = -\frac{fa}{f'a}\left(1 - \frac{1}{2}\,\frac{f''a\,fa}{(f'a)^2}\right) \text{ nearly}$$

and its ratio to its preceding value $-\frac{fa}{f'a}$, is

$$1 - \frac{1}{2}\,\frac{f''a\,fa}{(f'a)^2},$$

whence $-\frac{1}{2}\frac{f''a\,fa}{(f'a)^2}$ represents roughly the greatest part of itself, by which the correction $\frac{fa}{f'a}$ may be erroneous the sign indicating whether it is too small or too great. In the preceding example, where $a = 2{\cdot}1$, and where

$$fa = a^3 - 2a - 5 = {\cdot}061,$$
$$f'a = 3a^2 - 2 \qquad = 11{\cdot}23,$$
$$f''a = 6a \qquad = 12{\cdot}6,$$

the preceding fraction is roughly $-\frac{1}{32}$, so that the correction ·0055 may possibly be one thirty-second of itself too great, or about ·0002 too great.

This method does not appear to be of much use for the second approximation; but becomes more powerful at every succeeding step. Whatever number of correct decimal places is obtained at the end of any one of the successive approximations, it is, roughly speaking, doubled by the next; since the second term of the preceding development of h, being

$$\frac{1}{2}\,\frac{f''a}{(f'a)^3}\cdot(fa)^2,$$

is of the same order as the square of h, or of the same order as

$$\left(\frac{fa}{f'a}\right)^2.$$

In treating the various articles, DIVISION, SQUARE ROOT, &c., EQUATION, we shall show that principles analogous to the preceding have been adopted in the rules for approximating.

Various methods of approximation are found in the Hindoo Algebra; but, as far as we can find, Vieta is the first who generalized the main principle so far as to connect the approximate solution of equations with the particular cases of division and the square root, which were known before. Hutton, in his *History of Algebra*, (see his Tracts,) attributes this extension to Stevinus, but on searching the works of the latter, we cannot find anything which, in our opinion, justifies the assertion. The connexion of the arithmetical rules, in which successive figures are successively found, with the preceding, will not at once be obvious; but our limits oblige us to refer to EQUATION on this point. Newton first applied the theory of derived functions directly to algebraical equations; and the method was further extended by Lagrange.

APRICOT is a well-known fruit, cultivated commonly in this and other European countries. The old English name is *a-precoke*, of which apricot is probably a corruption. Like many other domesticated plants, the native country of the apricot tree is unknown: from the name it bore among the Romans, *Armeniaca*, it would appear to have been a native of Armenia, to which country it is in fact assigned by both Pliny and Columella. It has, however, been represented by M. Regnier, a French writer, that it is rather a native of the Oases of the Desert of Egypt, an opinion that seems to have been formed upon these circumstances. firstly, that the modern Greeks call the apricot *Perikokka*. which is nearly the same as the Arabic name *Berkhach* · secondly, that vast quantities of this fruit are actually dried in the Oases and brought to Egypt, where they are called *Mish-mish;* and thirdly, that the early period of the year when its blossoms unfold, is indicative of a southern rather than of a northern climate. As to the latter observation, it seems to be completely at variance with facts, for the earliest of trees in leafing are the Tartarian honeysuckle and the sanguine hawthorn, which are both found wild in the coldest parts of Asia. It is, perhaps, impossible to demonstrate, from any published evidence, that it is really found wild in Armenia. The following note with which we have been favoured by Mr. Royle, the distinguished author of *Illustrations of the Botany of the Himalaya Mountains and of Cashmere*, may throw some light on the matter:—'The apricot is frequently found in the hills between the Ganges and the Jumna, apparently wild, as well as the walnut, peach, and pomegranate. The two latter appear to be perfectly wild, at least they are found away from villages and covering the sides of hills; but the latter having been formerly much more populous than they now are, many sites of villages and cultivation are concealed and overgrown with vegetation, so that it is difficult to recognise them. The apricot is so generally planted round villages, that there are few without them, the fruit being eaten fresh and also dried, while a very fine oil is expressed from the kernel. My collectors in visiting Cashmere said the fruit trees there formed a perfect jungle. The dried apricot is brought in considerable quantities from Cashmere into India, and called *Khoot-banee*. I am myself rather inclined to think the Caubul mountains the source of many of our fruit trees, and among others of the apricot.'

As a domestic fruit tree in the climate of England, the apricot is a plant of less importance than many others; the early season at which it blossoms causes it to be peculiarly subject to the effect of spring-frosts, so that a crop of its fruit is very precarious. It is, however, very much cultivated; and it is therefore necessary that we should say something of its varieties and of the mode of managing it.

Apricots in this country are produced either upon open standard trees, or upon walls with a westerly aspect; an eastern exposure is extremely unfavourable to them, at least on the east side of the island. The fruit produced upon walls is the finest, but that from standards is by far the best flavoured.

Of the kinds that are cultivated upon walls there are only three that are much worth having, namely, the orange for preserving, and the Moorpark and Turkey for the table; several others are to be met with in nurserymen's catalogues, but they are of little importance.

There are only two sorts that deserve notice as open standards, namely, the Breda and the Brussels; the former a small yellowish-brown unspotted kind, the latter a larger compressed variety with rich sanguine blotches on its sunned side. Both these, and particularly the latter, are annually loaded with fruit in almost any situation as far north as Ipswich, but we have not remarked them beyond that limit. For preserving, the purpose to which the apricot is best suited, the fruit thus obtained is far superior to any other, as it combines a moderate degree of acidity with a rich saccharine quality. In the south of Europe there is a sort extensively cultivated for preserving, which is hardly known in Great Britain; the French call it *Alberge*, which is probably a corruption of *Al Berkhach*, the Arabic name of the *Mish-mish* variety, from which it is probable that the alberge is not materially different: this sort is too tender for England.

The rules for training the apricot are essentially the same as those for the PEACH. The practice is to arrange the shoots upon the wall in what is called the fan fashion, which is by making them radiate at nearly equal distances from a common centre, which is the point where the scion and stock are united. In order to effect this, the shoots are annually shortened back to the length of from six to eighteen inches, according to their strength, and nailed to the wall at from five to six inches distance from each other. Besides this, the first shoots that are protruded in the spring should be examined in May, and all that are superfluous amputated; the stoutest entirely, the weakest only reduced to the length of an inch or two, when they will often become flowering spurs.

No stocks for apricots should ever be employed except the mussel plum and the common plum for clayey, or loamy, or sandy soil; and the seedling apricot itself for soils that are warm and calcareous. All others, and especially what is called the Brompton stock, are so unsuitable to the constitution of the apricot, as to be short-lived and worthless.

Besides the true apricot, there are occasionally seen in the gardens sorts called black or purple. These are distinct species, one being *Prunus dasycarpa*, and the other *Prunus Sibirica*, neither of which is at all worth the trouble of cultivating: they are small, dark purple, acid fruits, and merely objects of curiosity.

A'PRIES, an Egyptian king, the son of Psammis, (Herod. ii. 161,) otherwise called Psammuthis; he was the eighth king of the twenty-sixth dynasty, (Eusebius,) or the seventh according to Africanus. His name is also written Ouaphres by the Greeks, and he appears in the Hebrew history under the name of Pharaoh Hophra (Jeremiah xliv. 30). Apries succeeded his father B.C. 593, and reigned twenty-five years. Early in his reign (B.C. 586) Jerusalem was plundered by Nebuchadnezzar; after which a great number of the people of Judah took refuge in Egypt, under the conduct of Johanan, who carried the prophet Jeremiah with him to Tahpanhes, (Daphnæ,) then the residence of the Egyptian king. Apries, as we learn from Herodotus, made an expedition against Cyprus, and had a naval engagement with the Tyrians. Near the close of his reign he sent an army against the Greeks of Cyrene, which was defeated with great loss. This caused a revolt among the Egyptians, which ended in the dethronement and execution of Apries about B.C. 569, or 568. [See AMASIS.] He was buried in the tombs near the great temple of Athenæa at Sais, where his ancestors of the Saite dynasty were interred (Herod. ii. 169).

APRIL, the fourth month of the year, consists of thirty days, which was the number said to be assigned to it by Romulus. Numa Pompilius deprived it of one day, which Julius Cæsar restored, and which it has ever since retained. In the original Alban or Latin Calendar, April held the first station, and then consisted of thirty-six days. (See Pitisci, *Lexicon Antiq. Roman.* tom. i. p. 129; Brady's *Clavis Calendaria*, p. 67.) Its name is usually considered to have been derived from *aperire*, to open; either from the opening of the buds, or of the bosom of the earth in producing vegetation. The Anglo-Saxons called it *Ooster* or *Easter-Monath*. In this month the sun travels through parts of the signs of Aries and Taurus, that is to say, of those parts of the *ecliptic* which astronomers designate by those names. The real motion of the sun among the constellations is through parts of Pisces and Aries. [See PRECESSION, ZODIAC.]

APRIL CEREMONIES. The custom of making fools on the first of April is a practice well known in England, France, Sweden, and probably in other countries of Europe; and it is believed to be connected with an immemorial custom among the Hindoos held near the same period in India, toward the end of March, called the Huli Festival, when mirth and festivity reign among the Hindoos of every class, and people are sent upon errands and expeditions which end in disappointment, and raise a laugh at the expense of the person sent. (See *Asiat. Res.* vol. ii. p. 334.)

The origin of this April custom seems unknown everywhere, though Bellingen, in his *Etymology of French Proverbs*, considers that it may possibly have an allusion to the mockery of our Saviour, about this time, by the Jews: a conjecture which is in some degree paralleled, if not corroborated, by the custom of Lifting in the Easter holidays, undoubtedly intended to represent our Saviour's resurrection.

In England, the first of April is usually termed 'All Fools' Day,' and the person imposed upon, an April Fool. In France this person is called a 'Poisson d'Avril,' *i.e.*, a mackarel, or silly fish. In Scotland, 'an April Gowk.' Maurice, *Indian Antiq.* vol., vi. p. 71, speaks of the Huli Festival as the celebration of the period of the vernal equinox.

A' PRIO'RI and A' POSTERIO'RI; two logical terms, signifying, literally, "from a thing before," and "from a thing after." They are applied to distinguish between two different methods of reasoning, the first, *à priori*, in which the conclusion is drawn from previous arguments, which render it unnecessary to examine the particulars of the case in point; the second, *à posteriori*, in which the thing to be proved is examined, and made the source out of which the reasoning is drawn. It must be noticed, however, that these are rather terms of common conversation and writing, than of logic, properly so called; so that they are seldom noticed by writers on that science. The use of them is in general very vague, and the consequence of any attempt to define them very strictly would be either to make out *à priori* reasoning to be altogether impossible, or to throw insuperable difficulties in the way of finding where it ends and the other begins. In common language, we reason *à priori* when we infer the existence of a God from the general difficulties in the supposition of the existence of what we then call the creation, on any other hypothesis; but we reason *à posteriori* when we infer the same from marks of intelligent contrivance in this particular creation with which we are acquainted.

The term *à priori* is, however, frequently used in a sense which implies "previous to any special examination." As when a sentence begins with "*à priori* we should think, &c. &c." which in most cases will be found to mean nothing more than an expression of the leaning which the speaker found his mind inclined to, when he had only heard the proposition, and before he had investigated it.

All *à priori* reasoning is dubious, to say the least: in but very few cases, if any, are we able to say we know sufficient beforehand to render this sort of argument safe. The whole mass of school learning, the greater part of which was overturned by the inductive philosophy, was based upon *à priori* argument. But though the method is of little effect towards the establishment of truth, it is highly effective in its discovery; indeed, by the very nature of its definition, it must be the guide which points out the probable direction in which the thing sought may be found. Columbus went to look for the continent of America, in consequence of certain convictions of his own, derived from *à priori* reasoning. So far he was right: but had he contented himself with writing a quarto volume to prove the existence of the new continent, by reasons which were only strong enough to make it right to look for more, some less imaginative *à posteriori* reasoner would have been the real discoverer.

APSIDES, a Greek term, used to signify those points of a planet's orbit in which it is moving at right angles to the line drawn to the primary. These points are also those of greatest and least distance from the primary. [See APOGEE and PERIGEE for the moon and sun; APHELION and PERIHELION for the earth or a planet.]

APT, a town in France, the capital of an arrondissement in the department of Vaucluse, about nine leagues (twenty-two miles) E. of Avignon according to Reichard's *Itinerary* but considerably more (above thirty miles) by measurement on the best maps*. It is a very antient town, having existed in the days of the Romans, who planted a colony here and gave it the name of Apta Julia. There are some remains of antiquity: the present walls are said to be of Roman origin, but it does not appear to have had an amphitheatre.

Apt is on the south bank of the Caulon or Calavon, (a feeder of the Durance,) and there is a fine bridge of one arch over this stream. It possesses an old cathedral, (for it was a bishopric before the revolution,) in the subterranean chapels of which are several antient remains. The chief trade of the town is in dried fruits, especially plums. The inhabitants manufacture wax candles, which are in considerable repute, woollen stuffs, hats, and leather; they also spin cotton and silk. The neighbourhood furnishes ochre of excellent quality, and earth for pottery. The population, according to Malte Brun, is 5433. 43° 53′ N. lat., 5° 25′ E. long.

The arrondissement of Apt contains 500 square miles, and above 52,000 inhabitants.

AP′TERAL, a term used in architecture with reference more particularly to a mode of arrangement peculiar to the temples of the antient Greeks and Romans. It is formed from a Greek compound term, signifying 'not having a wing,' or 'without wings;' and in this sense it is applied to a temple having prostyles, or porticoes of columns projecting from its fronts or ends, but of which the columns do not extend laterally, and run along the flanks from one end to the other, so as to make it *peripteral*. [See PERIPTERAL, or PERIPTEROS.] The Panhellenium of Ægina, a plan of which will be found with the article ÆGINA, vol. i., p. 141, is peripteral; but if the outer columns of the fronts, with the ranges along the flanks, were removed, the temple would then be *apteral*, as it would be also amphiprostyle. The parallelogrammic temples of the Romans were for the most part simply apteral prostyles, and their arrangement has been much more followed in modern works than that of the Greek temples, which are, with few exceptions, peripteral. Our modern churches which have porticoes, though some of them are professedly on the Greek model, are, nevertheless, generally, illustrations of the apteral arrangement, and of these that of St. Pancras in London may be best referred to as an example.

APULEIUS (LUCIUS), a Platonic philosopher. He lived in the second century, and was born at Madaurus in Africa. He studied first at Carthage, then at Athens, and afterwards at Rome, where he acquired the Latin language without the help of a master. He was a man of a curious and inquisitive disposition, especially on religious subjects; and to gratify this curiosity, he travelled extensively, and sought to obtain initiation in the various *mysteries*, as they were called, by which the peculiar tenets of many religious and philosophical sects were veiled. Having spent nearly his whole fortune on these journeys, he returned to Rome, and was admitted as a priest into the service of Osiris. He practised at Rome for some time as an advocate, and then returned to seek his fortune in his native country, Africa. Here he met with distinguished success: but he set himself more at his ease by a prudent marriage, than even by his professional gains. A widow, by name Pudentilla, neither young nor handsome, had wealth, and wanted a husband. She took a fancy to him; but the marriage involved him in a vexatious lawsuit. The lady's relations set up a plea that he had attacked her heart and money with the weapons of sorcery; and they accused him of being a magician before Claudius Maximus, proconsul of Africa. Apuleius made a spirited defence; and his *Apology*, or *Oratio de Magia*, still extant, is a curious and valuable specimen of the literature of the age. The *Golden Ass*, otherwise called the *Metamorphosis*, the best-known work of Apuleius, is a running satire on the absurdities of magic, the crimes of the priesthood, the amorous intrigues of debauchees, and the systematic outrages of thieves and robbers. The dupes to the research after the philosopher's stone affected to find authority for their fantastic science laid down, and their hopes of success encouraged, in that work. The episodes are the most valuable portions of the piece; especially that of Psyche. Many persons have taken all that is related in it for true history: St. Augustin himself had his doubts on this head; and did not feel satisfied that Apuleius had designed this book only as a romance. Some of the antients have spoken contemptuously of this performance. Macrobius makes over the Golden Ass and all such romances to the perusal of nurses and gossips. But whatever may have been his defects, Apuleius was an unwearied student, and has touched many passages with a masterly hand. He wrote numerous works in verse and prose, the greater part of which are lost. They are enumerated in the Dissertation *de Vita et Scriptis Apuleii*, prefixed by Wower to his edition, and adopted into the Delphin. It is probable that Apuleius wrote some books in Greek as well as in Latin. He also translated Plato's *Phædon*, and the *Arithmetic* of Nicomachus. He wrote treatises *De Republica*, *De Numeris*, and *De Musica*. Fragments from his *Table Questions*, his *Letters to Cerellia*, his *Proverbs*, his *Hermagoras*, and his *Ludicra*, are scattered up and down in quotation. Besides his *Golden Ass* and his *Apology*, his work *De Dogmate Platonis*, containing three treatises, 1. *De Philosophia Naturali*, 2. *De Philosophia Morali*, 3. *De Philosophia Rationali*; his books, *De Deo Socratis*, *De Mundo*, which is a translation from Aristotle, and his *Florida*, have survived. He took great pleasure in declaiming, and was heard with universal applause. The effect produced by his pleading at Œea was so great, that the audience burst into a unanimous demand for the honours of citizenship to be conferred on him. The people of Carthage were so delighted with his eloquence, that they perpetuated the remembrance of it by erecting his statue. Several other cities paid him the same compliment. Some of his works have been printed separately, with notes by learned critics. The editions of his works are very numerous: that in most general use is the Delphin, in two volumes, quarto.

The *Golden Ass* has been very frequently translated. The *Biographie Universelle* enumerates six French translations and four Italian, besides translations into Spanish, German, Flemish, and English. W. Adlington's English translation, first printed in 1566, was reprinted in 1571, 1582, 1596 1639, and probably later also. The latest and best English translation is by Thos. Taylor, London, 1822, one vol. 8vo. This volume contains also the treatise on the God of Socrates, and other treatises; with a life of Apuleius prefixed.

APU′LIA, the name of one of the divisions of southern

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* Nine leagues and three-quarters of twenty-five to the degree (equal to twenty-seven English miles). (*Dict. Geog. de la France.*)

Italy in the time of the Romans. Its limits were on the east and north the Adriatic Sea, on the north-west the river Frento, or perhaps the Tifernus, which divided it from the Frentani, Samnium on the west, Lucania on the south, and Messapia on the south-east. It does not appear that the Romans ever considered the Messapian peninsula, now called Terra d'Otranto, as part of Apulia. In remoter ages, the whole of this part of Italy was known to the Greeks by the name of Iapygia (see Herod. iv. 99.), and was inhabited by the Daunii, the Peucetii or Pædiculi, the Messapians, and the Salentini, who were all said to be descendants of Greek or Pelasgic colonies. The original Apulians were probably a tribe of the Opici or Osci. (Niebuhr's *Hist. of Rome*, vol. i.)

According to Strabo (vi. p. 283), the Peucetii extended along the coast from Brundisium to Barium, a distance of about 700 stadia; north of the Peucetii were the Daunii, and then the Apuli, extending to the southern confines of the Frentani. Strabo adds, that in his time the names of Peucetii and Daunii were not in use among the natives, and that it was difficult to fix the antient limits of these people. Roman Apulia, in its extended sense, included the countries of the Apuli, the Daunii, and the Peucetii. The islands of Diomedes, now called Tremiti, belonged also to it. The principal towns of Apulia were Teanum, Luceria, Asculum, Argyrippa or Arpi, Sipontum, Salapia, Barium, Egnatia, Canusium, and Venusia, the birth-place of Horace. This country suffered greatly during the second Punic war, when some of its towns sided with Hannibal and others with Rome. The whole finally became subject to the Roman sway. After the fall of the western empire the possession of Apulia was long disputed between the Goths, the Byzantine emperors, the Longobards, and the Saracens. The Normans conquered Apulia in the eleventh century, and the Norman kings of Sicily styled themselves dukes of Apulia and princes of Capua. These two names included the whole of their continental dominions. When afterwards the monarchy was divided into two kingdoms, namely, Sicily *ultra pharum*, and Sicily *citra pharum*, the latter vulgarly called the kingdom of Naples, the name of Apulia was definitively limited to one of the four divisions of the continental kingdom, consisting of the Apulia of the Romans and the Messapian peninsula. [See Puglia.]

APURE RIVER. [See Orinoco.]

APURIMAC, a river in South America, which carries off all the waters that descend from the eastern declivity of the Cordilleras, between the 11th and 16th degrees of south lat. Its source is in the high range which extends to the north of *Arequipa*, near the 16th degree of lat., under the parallel of the northern part of the lake of *Titicaca*, to the north-west of that lake, and nearly under the meridian of 72°. At first it runs to the north, but by degrees declines to the north-east, descending in that direction in a transverse valley of the range to the meridian of 71°, where it enters into a longitudinal valley, and suddenly changes its course to the north-west, in which direction it traverses 3° of lat., from the 15th to the 12th. In this space its waters are increased by two tributaries, the *Calcamayo* and the *Villcamayo*. The former joins it from the west, having gathered, in its course of about 150 miles, the waters of many small rivers, which descend from the western range of the Cordilleras in transverse valleys. The Villcamayo runs to the east of the Apwirmai, in a longitudinal valley, nearly parallel to it, from 15° to 12°; and is separated from the Apurimac by a high range of mountains. This stream runs upwards of 220 miles. Near 12° lat., the Apurimac is joined by the *Jauja* or *Xauxa*, the largest and most important of its tributaries, which rises between the 10th and 11th degrees of south lat., on the southern declivity of that chain, from which, on the north, the Tunguragua and Huallagua descend, and flows down in a longitudinal valley from north to south, till it nearly reaches the 13th degree of lat. Here it changes its course, running to the east; but it soon returns to the 12th degree by two bends of a semicircular form, afterwards enters the plains, and joins the Apurimac under the 12th degree of south lat., after a course of about 300 miles.

After its junction with the Xauxa, the Apurimac runs through the plains in a north-eastern direction till it meets, in 10° 45′ south lat., the *Pangoa*, which brings down all the waters descending from the eastern declivity of the mountain-range skirting the valley of the Xauxa on the east; and at this junction the name of the Apurimac is changed into that of *Tambo*, under which name it unites in 10° 31′ with the Parobeni, and then takes the name of *Ucayali*. The whole course of the Apurimac may amount to nearly 500 miles.

It does not seem that either the Apurimac or any of its tributaries is adapted to the transport of commodities. Their rapid course in a stony bed between high rocks, and the shallowness of their waters, render them entirely unfit for navigation. On the contrary, they oppose considerable obstacles to travelling by land, on account of the height and steepness of their rocky banks, and in many places cannot be passed but by bridges made of cords or willow-twigs, after the fashion of wicker-work. Our authorities do not mention any fish in these rivers. The only advantage which is derived from them is the fertilizing of a few low tracts along their banks, by the spreading of their waters.

The valleys through which they flow, though of considerable length, are rather narrow. Near the sources they are mere crevices and ravines, but lower down they widen to an average breadth of two or three miles, which sometimes extends even to five. They are, however, not without cultivation. As the upper parts of the valleys lie between 6000 and 10,000 feet above the level of the sea, no tropical productions can be raised on them, but they produce the grains of Europe, especially wheat and barley, and our fruits, as also great quantity of papas. In the lower parts, especially towards the eastern plains, sugar, cacao, and cotton are raised in great quantity; the first is very abundant in the lower valley of the Xauxa and Apurimac; and here the gardens are chiefly planted with plantains and pine-apples. Indian corn and yams are cultivated for consumption. The mountains which skirt the valleys afford pasture for numerous herds of cattle.

The country drained by the Apurimac and its tributaries is the most important and most populous part of the republic of Peru; it comprehends the three departments of *Junin* or *Tarma*, *Ayacucho* or *Guamanga*, and *Cuzco*. Its superior cultivation is to be attributed not only to its being much more fertile than the countries along the Pacific, but also probably still more to the higher degree of civilization which its inhabitants had attained, under the reign of the Incas, before the discovery of America. It is still mostly inhabited and cultivated by the industrious descendants of the antient Peruvians, and contains many towns of importance, among which we may mention *Tarma*, *Guanca Velica*, and *Guamanga*, in the valley of the Xauxa, and *Cuzco*, the antient residence of the Peruvian monarchs, in the valley of the Villcamayo. (Alcedo's *Dictionary*, Humboldt's and Maw's *Travels*.)

APUS, (Constellation,) from the Greek *ἄπους*, without feet, used to signify the bird of Paradise, the *avis Indica* of Linnæus, which was formerly believed to have no feet. It is a constellation introduced by Bayer, and lies too near the south pole to be visible in our hemisphere. It is surrounded by Octans, Pavo, Triangulum Australe, and Cameleon. Its principal stars are designated as follows·

Character.	No. in Catalogue of		Magnitude.
	Lacaille.	Astron. Society.	
α	1218	1649	4·5
γ	1346	1863	5
β	1361	1886	5

AQUAFORTIS. [See Nitric Acid.]

AQUA-REGIA. [See Chlorine.]

AQUA′RIUS, (Constellation,) the Water-bearer, one of the twelve zodiacal constellations. Its Greek name is Ὑδροχόος, the Water-pourer. In the Indian zodiac it is simply a waterjug, the name of which, according to Legentil, is Coumbam, and the same in the Arabic: in the Egyptian, it is a male figure holding two urns, from which the water flows. The mythology of the Greeks refers the Water-bearer in different places to the fables of Deucalion, Ganymedes, Aristæus, and Cecrops. Its probable origin, however, whether we place the origin of the zodiac in India or Egypt, is the watery season of the year in which the sun was in this sign. Dupuis, who supports the latter opinion, thinks that Aquarius as well as Capricornus and Pisces refer to the months of the year during which the inundation of the Nile took place: Legentil, who advocates the latter, imagines that they represent the rainy season which is absolutely necessary for the growth of the rice-crops.

The *constellation* Aquarius may be found in the heavens by producing southward a line drawn through the bright stars in the head of Andromeda and the wing of Pegasus. This line passes through the two brightest stars in Aquarius, α and β, situated in the two shoulders. The middle point between these two shoulder stars is on the meridian at 12, 10, 8, and 6 P.M. in the months of August, September, October, and November respectively, at an altitude of about thirty-five degrees.

A distinction must be drawn between the *constellation* and the *sign of the Zodiac* (see PRECESSION). The latter is the part of the ecliptic which begins at the horn of the constellation Capricornus and ends in the middle of the body of that of Aquarius, comprising the arc of longitude between 300° and 330°, and forming the sun's path between January 20th and February 20th.

The following are the designations of the various stars in Aquarius. Those in the column marked Flamsteed, &c., which have no parentheses or letter, are as marked by Flamsteed: those inclosed in ( ) were added in Piazzi's catalogue: those in [ ] were added by Bradley; and the one marked Z by Baron Zach:

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi, Bradley, &c.	Astron. Society.			Flamsteed, Piazzi, Bradley, &c.	Astron. Society.			Flamsteed, Piazzi, Bradley, &c.	Astron. Society.	
	1	2433	5·6	E^2	53	2678	6·7	A^4	107	2836	6
ε	2	2450	4·5	ζ	55	2684	4	A^5	108	2850	6
k	3	2451	4	*f*	56	2686	6	*q*	(2)	2635	6·7
	4	2466	6	σ	57	2688	5		(34)	2513	7
	5	2469	6		58	2690	6		(43)	2654	7
μ	6	2470	4·5	υ	59	2696	5		(46)	2656	6
	7	2481	6	H	60	2695	6·7	T	(55)	2786	6
z^1	8	2487	6	L	61	2699	7		(66)	2522	7
z^2	9	2494	6	η	62	2698	4		(70)	2793	6
r	11	2491	6	κ	63	2701	6		(81)	2669	7
	12	2498	5·6		64	2702	6·7		(82)	2797	6
ν	13	2508	5	I	65	2712	7		(89)	2673	7
s_2	16	2525	6	g^1	66	2715	6·7		(109)	2809	7
y	17	2531	6	N	67	2714	6		(126)	2814	6·7
A	18	2538	6	g^2	68	2723	6		(130)	2816	6
y^2	19	2540	6	τ^1	69	2724	6		(133)	2818	6
	21	2542	6		70	2725	6		(142)	2694	7
β	22	2551	3	τ^2	71	2726	5·6		(145)	2697	7
ξ	23	2562	5	λ	73	2730	4		(153)	2825	6
d	25	2567	5·6	K	74	2732	·6		(154)	2549	7
	26	2572	6	δ	76	2735	3		(176)	2704	7
	28	2610	6		77	2737	6	Y	(185)	2839	6
x	29	2613	6		78	2736	6		(190)	2842	6·7
	30	2614	5·6		81	2748	6		(200)	2713	7
o	31	2615	5		82	2750	6		(200)	2847	6
	32	2618	5·6	h_1	83	2754	6		(203)	2848	6
ι	33	2622	4·5	*h*	85	2756	7		(210)	2853	6
α	34	2619	3	c^1	86	2759	5·6	M_1	(250)	2739	7
	35	2627	5·6	c^2	88	2764	4·5		(290)	2591	7
	36	2629	7	c^3	89	2766	5		(291)	2592	7
	37	2630	6	φ	90	2772	5		(305)	2762	6
e	38	2632	6	ψ^1	91	2773	5·6		(314)	2599	7
	39	2640	7	χ	92	2776	5·6	*p*	(320)	2602	6·7
	40	2643	7	ψ^2	93	2778	5		(337)	2467	7
F	41	2645	6	Z	94	2782	6		(343)	2606	6·7
	42	2653	6	ψ^3	95	2781	5	C	(345)	2607	6·7
θ	43	2655	4·5		96	2783	6		(351)	2741	6
	44	2657	6·7		97	2788	6		(378)	2616	6
D	45	2660	6	b^1	98	2789	5		(419)	2633	7
o	46	2661	6	b^2	99	2795	5		(421)	2631	7
l	47	2663	5	b^4	101	2810	5		[2773]	2529	7
γ	48	2664	4	ω^1	102	2822	5		[2888]	2621	7
	49	2668	6	A^1	103	2827	5		[2918]	2639	7
	50	2672	6	A^2	104	2828	5		[2924]	2647	7
G	51	2671	6	ω^2	105	2830	5·6		[2961]	2685	6·7
π	52	2674	5	A^3	106	2833	5		1596Z	2785	7
E^1	53	2677	6·7								

AQUATIC ANIMALS. The element in which animals habitually reside, or to which they occasionally resort for the purpose of procuring food or seeking shelter, is so intimately connected with, and bears so obvious a relation to, not only their manners and economy, but likewise their outward forms and internal structure, that it is not surprising that those who first turned their attention to the study of zoology, and sought to introduce the principles of classification into the animal kingdom, should have been so forcibly struck with its importance, as to have made it the primary basis of their system. 'Animals,' says Aristotle (*Hist.* b. i. c. 1), 'may be distributed into different classes according to their manner of living, their actions, their character, and their parts. . . . . Considered according to their manner of living, their actions, and their character, they are divided into terrestrial and aquatic. The aquatic are divided into two classes; the one, as is the case with many fishes, pass their whole life in the water, breathe that element, and find their food in it; nor do they ever leave it: the others obtain their food in the water, and even habitually reside in it, but they do not breathe it; they breathe air, and bring forth their young on dry land. Among these latter some are provided with feet and walk upon dry land, others have wings and fly, and others, like the water serpent, have no feet. . . . . Aquatic animals inhabit seas, lakes, marshes, and rivers.' These principles of classification, in which the habits of animals take precedence of those modifications in their organic conformation which produce these very habits, have long since ceased to be adopted by scientific naturalists; notwithstanding which there is perhaps no inquiry which can engage the attention of the zoologist, more fruitful in extensive views and interesting results, than the consideration of the organic structure of animals in relation to the element in which nature has ordained them to live.

Let us consider, in the first place, those animals which reside entirely in the water, and seek their food and nurture their young in that element. All their organization, even to the most minute circumstance, is rigidly adapted to these purposes. The extremities by which progressive motion is performed in the acts of walking and flying, would be a serious impediment to the movements of animals residing in an element of the same specific gravity as their own bodies: these organs accordingly are either entirely wanting, or are reduced to mere rudiments, which serve indeed to keep the body steady and preserve its equilibrium, but are entirely useless in assisting its progression. Such are the *fins* of fishes, and the *flippers*, as they are called, of cetaceous animals. The real organ of progression in both cases is the body itself, which is prolonged and attenuated towards the tail, compressed on the sides, and provided with extremely powerful muscles, with which, by alternately striking the water on either side, the animal propels itself forward with a force and velocity unexampled in any other class of animated beings. It is upon this principle that we often see a boat urged forwards by means of a single oar in the stern. The great majority of these animals not only reside habitually in the water, and seek their food there, but likewise breathe that element, and are consequently furnished with an appropriate apparatus for extracting the vivifying principle from its general mass. These tribes may reside at any depth of the ocean and for any length of time; they are not under the necessity of coming frequently to the surface for the purpose of breathing, and their organization is modified accordingly. Instead of having the tail broad horizontally, it is broad in a vertical direction, which enables them to turn with astonishing rapidity, and is no impediment, but rather an assistant to their forward movements. But the case is different in the cetaceous tribes: these animals, though residing entirely in the water, breathe air by means of lungs like ordinary quadrupeds, and are consequently obliged to come continually to the surface. For this purpose they are provided with a powerful cartilaginous tail, *flattened horizontally*, by moving which upwards or downwards as the occasion requires, they descend to or ascend from the greatest depths of the ocean with almost incredible speed. Fishes, though capable of proceeding straight forwards, or of turning with great rapidity, are comparatively slow in changing their depths; and if they breathed air, they would frequently be suffocated before they could arrive at the surface, from the vertical position of the tail not being adapted to propel them in a vertical direction. But by a simple change, merely by the direction of the tail being altered from the vertical to the horizontal position, the object of nature is accomplished, and the air-breathing cetaceous animals are adapted to all the circumstances of an aquatic life. Another beautiful adaptation is observed in the position of the mammæ, for the cetacea, like warm-blooded quadrupeds, suckle their young; these are situated upon the breast, and when the young animal requires to suck, the mother stands, as it were, upright in the water, with her head and shoulders elevated above the surface, supporting herself by means of her flippers or fore-paws. In this position she is enabled to supply her cub with the food which nature has provided, and which she could not have accomplished had the mammæ been placed in any other position.

There is another extensive tribe of aquatic animals, which are provided with perfect articulated members, sometimes, indeed, supplied with fringes which convert them into a swimming apparatus, but always adapted to enable the animals to walk or crawl along the bottom. Such is the case with all the crustaceous tribes, the crabs, lobsters, prawns, &c.; and these animals, as is well known, can walk on dry land with the same ease as at the bottom of the ocean. When they swim, it is by means of the tail, which is always constructed for that special purpose, and is large and powerful.

Nor is the modification of structure less striking, when we examine those land animals which breathe air, and resort only occasionally to the water, than when we contemplate the tribes which make it their constant residence. Progressive motion on land and in water are so different, that the organs best adapted to the one sort are exactly the most unsuited for the other. In the one case, the body being much heavier than the surrounding medium, requires to be supported, or raised above the surface of the ground; and as progression is performed by the same organs which serve for supports, it follows that the speed of the animal's course will be proportioned to the length of its extremities. in the other case, the body being already supported by the element in which it floats, the length of the extremities would be only an impediment to the progress of the animal, and consequently they are, in such cases, either entirely wanting, or reduced to a rudimentary form, at least in perfectly aquatic animals. Those which resort indifferently either to the land or water, as they are intermediate in habits, so are they likewise intermediate in structure between these two extremes; and the degree in which their organization is modified, when compared with either of the two types, is exactly proportioned to the difference of their habits and economy. All mammals and reptiles, for instance, which seek their food in *fresh-water* rivers and lakes, partake more of terrestrial than of aquatic habits; the extent of water with which they are conversant is, in this case, very small when compared to the extent of land, and their organization differs but slightly from that of ordinary land animals; their extremities are perfectly developed, and of the ordinary form, the principal difference being that their toes are united by an expanded web or membrane, which gives the paw a broad oar-like form, and thus converts it into a convenient instrument of swimming, at the same time that it scarcely interferes with the most perfect freedom of walking and running on land. Of this nature are the extremities of all the vertebrated terrestrial animals which seek their food in fresh water, the otters, beavers, &c. among mammals; the whole order of Natatores, comprising the ducks, swans, pelicans, gulls, auks, puffins, &c. among the birds; and the crocodiles, alligators, fresh-water tortoises, and frogs, among the reptiles. All these animals are, properly speaking, web-footed, and their aquatic habits are less prominent and powerful than their terrestrial; their organs of motion in fact are but little different from those of common terrestrial animals. In those which frequent the *salt water*, on the contrary, the aquatic habits greatly predominate over the terrestrial: they live less on land than in water, and the structure of their extremities approximates more to that of purely aquatic than of terrestrial animals. Their legs are short and inserted, or, as it were, buried in the common integuments of the body, as far as the elbows and knees respectively, leaving apparent only a short fin-like paw, which is unadapted to terrestrial progression, exactly in proportion to its fitness as an organ of swimming. Their progress on land is consequently slow and difficult; they creep rather than walk, dragging the body along the ground, and leaving a broad mark behind them. Few species possess even this limited power of terrestrial motion; those which do, however, have the structure of the extremities a little less approximated to the form of fins than the purely oceanic species. The seals and walruses, for instance, have the bones of the paws and feet similar to those of ordinary land quadrupeds, only much shorter and more flattened, and the hind-legs are thrown backwards in the same direction as the tail. Still they are enabled to use the extremities, in a certain degree, for walking or creeping on dry land; but the numerous tribes of cetaceous animals which can execute no kind of motion whatever out of the water, have the bones of the anterior extremities flattened and connected together like the stones of a mosaic pavement, whilst the posterior members are entirely wanting. The same is the case with the sea-tortoises, or, as they are more properly called, turtles, when compared with those which frequent fresh water ponds and rivers; the form of their extremities approximates more nearly to that of fins than of feet, and their aquatic habits consequently predominate over their terrestrial.

Thus it is that the peculiar form of the extremities not only indicates the degree in which an animal is aquatic, but even the nature of the element which it frequents. If it inhabit fresh-water ponds and rivers, its feet are simply webbed between the toes, but in other respects perfectly developed, and its terrestrial habits predominate over its aquatic: if, on the contrary, it inhabit the salt water, its feet are flattened into the form of fins, the hind legs are thrown backwards into the plane of the body, and the aquatic habits greatly predominate over the terrestrial. The first are, properly speaking, *web-footed*, the second *fin-footed*. [See AMPHIBIA.]

AQUATIC PLANTS, in horticulture, are those which are naturally found floating in deep water, and are carefully distinguished by the cultivator from mere marsh plants. The management of them when they are hardy is of the simplest kind, nothing being necessary beyond planting them in boxes with holes in the sides, and sinking them three or four feet below the surface of a pond, so that the boxes lie upon, or among the mud at the bottom.

But for those which demand the protection of the stove or green-house, some additional precautions appear requisite. If left to themselves in such situations, the uniformity of temperature is such as to deprive them in some measure of the repose that they naturally receive from the alternation of seasons; kept constantly in a growing state, their excitability is gradually destroyed, and death ensues as a matter of course. The mode of treating them most successfully may be collected from the following account of their management at Eaton Hall, given in the *Transactions of the Horticultural Society*.

'December, 1826, when the leaves were decayed, I took up the bulbs or tubers out of the stone cisterns in which they had grown for years, and put them into pots according to the size of the tubers, and plunged the pots in water to within an inch of their rims. They remained in this situation in the pine-stove till the plants began to show leaves in the April and May following. They were then planted in cisterns and in glazed earthenware pots in which were the following soils:—in the bottom, four inches of strong clay made solid; above this, six inches of light mellow loam, and at the top, an inch or two of sand to keep the water clear. The cisterns, which are made of Yorkshire flags, are of the following dimensions,—3 feet long, 1 foot 8 inches broad, and 1 foot 4 inches deep. They were placed upon the end flues of pine-pits where the fire enters and escapes, and they were elevated with bricks to within eight and twelve inches of the glass. The glazed pots were from fourteen to eighteen inches in breadth and depth, and were similarly placed, except a few that were plunged in corners of the melon-pits. They were kept constantly full of water, and it frequently was made to run over in order that the water might be kept pure. The temperature of the pits was seldom under 80°, and in sunshine often above 100° of Fahrenheit. No air was admitted at the lights immediately above the plants. As the plants increased in growth, they put out many runners, which were pinched off close to the tubers When the roots reached the clay, the leaves got very stron raising themselves on the sides of the cisterns

'The *Nymphæa cærulea* and *N. odorata*, under similar treatment, produced abundance of flowers. The first flower of *N. rubra* opened on the 13th of August; on the 15th it was fully expanded, and measured over the disk five inches and a quarter. The same plant produced another flower in September, somewhat larger, and with nineteen petals, many more buds were formed, but they opened very indifferently towards the end of September; in October the plants began to lose their leaves. When this was accomplished, the tubers were taken out of the cisterns and put into small pots as before stated. The last was done this day (December 11, 1827).

'The *Nelumbium speciosum*, in a glazed pot, with similar treatment, plunged in leaves in the same pit, has flowered well and ripened seeds.'

Various other methods have been recommended; but they all depend for their success upon keeping in view the principle of periodical rest and rapid growth under a high temperature, with but little air during the season of vegetation.

Some very good practical observations on the management of both hardy and tender aquatics have been given by Mr. Kent, in the 3d volume of the *Horticultural Transactions*, p. 24.

AQUATINTA ENGRAVING. The word *aquatinta* s a compound of two Latin words, *aqua* (water) and *tinctus* stained), by which is implied that this mode of engraving s an imitation of water-colour or India-ink drawings. The nventor, a German artist named Le Prince, was born at Metz in 1723. His method was to sift the common black resin, when tied up very loosely in a muslin bag, and being shook over the plate, the surface was partly covered with the particles: this method is, in some cases, still adhered to. It was then fixed by a moderate heat sufficient to make the dust adhere without fluxing or becoming an even varnish: he thus formed a granulated surface on the plate, usually called a *ground*, which suffered very little from the action of the diluted acid, yet allowed it to corrode very freely in the small spaces left between the grains of the resin. Mrs. Catherine Prestel, also a German, improved much upon the meagre works of Le Prince, and executed several large works with so much success, that ittle more was found wanting than a ground that would adhere better to the plate and yield a greater number of mpressions; this was effected by dissolving the black resin n the highest rectified spirits of wine (alcohol), and then pouring the mixture over the plate, the quantity of resin determining the coarseness or fineness of the grain. When the plate is large, it is necessary to have a broad and shallow tin pan (with a spout at one corner) in which the plate is laid inclining from the upper edge, so that the superfluous ground may be saved; this must be quickly returned to the bottle, and the plate laid, inclining a little, on a table, so that the ground may run to the lower edge, where it is wiped off from the extreme edge with a cloth. When the ground is quite dry, the surface will be of a bright copper colour, and in a few hours will be ready for use. A warm room is requisite for this operation in cold weather, but if hot, the early morning must be taken. Dust should be most carefully avoided. A small plate may be held on the points of the fingers and thumb of the left hand whilst the ground is laid, and be gently moved about till the ground has granulated or formed; this aids the better formation or crystallization of the grain: before a ground is laid, the plates are to be well cleansed with dry whiting and a dry linen cloth, it being absolutely necessary that the plate should have a very perfect polish, for without this the granulation cannot be well effected. Any of the resinous gums will, with spirits of wine, make a ground, but the black resin is generally preferred. As the proportions cannot be given, it is usual to have a bottle in which the ground is much too strong for use, and to make it ready in another by mixing a little of the strong ground with sufficient spirits of wine. The modern aquatinters have another advantage over their predecessors in using a composition for painting the forms of leaves of trees, or other objects, where the trouble of surrounding the forms by a varnish would be too great. This composition is made of moist sugar or treacle added to the same bulk of whiting, and ground well on a slab with a little water; a very small proportion of gum Arabic or gamboge may be added. When this composition is used, it must be thoroughly dry before the varnish is passed over it; the varnish also must be allowed time to dry, after which, cold water poured on the plate will in a few minutes bring off all the composition and the varnish which had passed over it, leaving the forms perfect and the ground in those places free to receive the acid again—the remainder of the plate being permanently *stopped out* by the varnish: this varnish is either Canada balsam or turpentine varnish mixed with a little lamp-black and spirits of turpentine; with this also the margin of the plate is to be varnished, leaving a narrow strip of the ground for trials. These trials are made, after each time that the acid has been on the plate, by taking off a small portion of the strip with spirits of turpentine, cleaning the place well, and then rubbing in with the finger a little powdered white lead; this process will give a good idea of the actual and comparative strength of tints. It is only by these trials that the aquatinter knows what he is doing, for the acid varies so greatly with the weather, that what might be considered very weak in a cool morning, becomes very strong towards the evening; for this and other obvious reasons, if the room be kept at an equal temperature, the work will advance with much greater certainty than when it varies by the changes of weather. The design intended to be engraved is then made on the ground; this is done in the following manner:—The design is first copied on very thin transparent paper, called tracing-paper; between this tracing and the prepared ground on the plate a thin sheet of paper is placed, which has been rubbed over with lamp-black, or vermilion, and sweet oil; every line of the design is then gone over with an instrument called a blunt point, with a moderate pressure, and is thus transferred to the ground so securely that the acid cannot destroy it.

Before the acid is poured on the plate, a border or wall of wax, about an inch in depth, is placed round the margin of the plate. The bordering wax is made by melting together one pound of burgundy pitch, half a pound of bees' wax, and a wine glass full of sweet oil; when melted, to be poured into cold water and worked into small cakes. When wanted, these cakes are put into lukewarm water and made into small rolls like a sausage, then flattened, and one of the edges being a little melted at the fire, is to be pressed close to the plate with a wet finger, making a spout at one corner; this should be well performed, or the acid will get beneath it and occasion much mischief. In order to make the wax adhere, the plate should be made as warm as the hand of the operator.

The plate being so far made ready, the completion of the design is resumed by stopping out the highest lights on the edges of clouds, water, &c., with a mixture of Canada balsam or turpentine varnish, and the *perfectly* impalpable oxide of bismuth (bismuth is preferred on account of its weight); these are mixed with a spatula on a slab, and used with a small sable brush, diluting the varnish occasionally with spirits of turpentine. Next pour on the acid, which has been prepared by mixing one-sixth of a pint of the strongest acid to five-sixths of a pint of water; let it remain, according to its strength, from half a minute to a minute, then pour it off, and wash the plate three or four times with clean water, and dry it with a clean linen cloth or a pair of bellows: the last is the best, if the stopping-out varnish should not be perfectly hard. If on trying the strip the tint is found not to be sufficient, repeat the acid for another half minute, and then proceed. The colour of the bismuth varnish must be changed for the second stopping-out, by adding a little chromic yellow, vermilion, or lamp-black, or any other colour that is not destroyed by the acid. The colour is to be changed after each application of the acid, that the engraver may remember in what places he has carried forward his work, what tints have been softened at their edges, &c.

It is impossible to give a scale of times for each employment of the acid, but the following may serve as a guide. If the first tint has half a minute, the second may take three-quarters, the third one minute, the fifth one minute and three-quarters, the sixth two minutes and a half, the seventh five minutes, the eighth twelve minutes. &c. The acid should be strengthened a very little after each application; and it may be so equally done that the above proportions will serve very well as a general rule, depending on the strength of the tints required. When the ground changes to a grey colour it is beginning to fail, and must be taken off by heating the plate till the bordering wax will lift off; after this, sweet oil is applied to the whole surface, and a brisk heat beneath the plate will bring off all the different varnishes with a linen cloth; then an oil rubber, made of fine woollen cloth, rolled up hard and the end cut off, applied with sweet oil, will take out the stains; tints which are too strong may be softened or even rubbed out. Perhaps it need not be added, that a single grain of sand or any other hard substance under the rubber will ruin the whole work. Gradations in skies, &c. are sometimes made in this manner, though more generally by pouring the acid on slowly, beginning at the darkest corner. It will frequently happen that some portions of the varnishes will become so hard, that the common method will not stir them; in this case a little of the oil of spike lavender applied with the finger is quite certain to produce the effect. The plate is now cleaned with spirits of turpentine and sent to the printer to prove, after which it is to be exceedingly well cleaned with turpentine, &c., and another ground laid; this should be done in such a manner as to make the grains fall exactly on the granulations of the former ground, which is called *re-biting*. It is done by making the ground much stronger than was used before. Fortunately, the liquid ground has a natural tendency to granulate upon the same places as before, and when the acid is again applied it will act in the same interstices as before, and only wants a little care to make it answer. The process for the second ground is the same as for the first; re-touching with the acid those tints which require more depth, and stopping out those parts that are sufficiently dark. Another proof must be taken, and the plate then finished with the burnisher, which some use with oil, but others prefer it dry, previously filling the whole plate with powdered white lead, by which it can be seen how much has been burnished down, according to the quantity of colour left in the plate.

It is to be regretted that aquatinta engraving has suffered much odium from the facility with which inferior plates can be produced; but it is capable of the greatest beauties, as may be seen in the justly-celebrated plates to the *Hunchback*, by W. Daniell, Esq. R. A.; Mr. Ostervald's work *On Sicily;* and many others.

AQUA TOFANA, a poisonous fluid invented about the middle of the seventeenth century by an Italian woman of the name of Tofana. This woman, who resided first at Palermo, and afterwards at Naples, was one of the most celebrated of a class of persons known under the name of Secret Poisoners [see POISONING, SECRET], who in antient times were believed to possess the power of destroying life at any stated period, from a few hours to a year; and who, during the sixteenth and seventeenth centuries, were regarded in all the nations of Europe with extraordinary terror. In the year 1659, during the pontificate of Alexander VII., it was observed at Rome that many young married women became widows, and that many husbands, suspected to be not agreeable to their wives, died suddenly. The government used great vigilance to detect the poisoners; suspicion at length fell on a society of young wives, whose president appeared to be an old woman, who pretended to foretell future events, and who had often predicted very exactly the death of many persons. By means of a crafty female their practices were detected; the whole society were arrested and put to the torture, and the old woman, whose name was Spara, together with four others, were publicly executed. It appears that Spara, who was a Sicilian, derived her art from Tofana at Palermo, the latter selling the poison, which from hence acquired the name of 'Aqua della Tofana,' in small glass phials with this inscription, 'Manna of St. Nicholas of Barri,' and ornamented with the image of the saint. Though this infamous woman lived to an advanced age, she was at length dragged from a monastery, in which she had taken refuge, and put to the torture. She confessed that she had been instrumental to the death of no less than 600 persons. The dose of her poison was from four to six drops: yet though, in this state of concentration, its nature could not be detected, it was subsequently discovered to consist of a solution of arsenic; but so little was that age acquainted with the art of chemical analysis, that they had no means of detecting a solution of arsenic so highly concentrated that from four to six drops was a mortal dose, whereas, at present, even when arsenic has been dissolved in the stomach and mixed with vegetable and animal fluids, it may be reduced to its metallic form, and made to exhibit all the physical properties of the metal to the *naked* eye, with as great distinctness as in any quantity, however large, *when only the twentieth part of a grain has been procured.* Modern chemistry, therefore, has deprived the poisoner of all chance of escape by concealing or disguising the poison he administers.

AQUEDUCT, or AQUÆDUCT (*aquæ ductus*), as it was formerly more correctly written, is composed of two Latin words, *aqua*, in the genitive case *aquæ*, and *ductus*, signifying together, a conductor or conduit of water. In this, its more extended sense, the term aqueduct may be applied to all sorts of pipes and channels for the conveyance of water, but it is commonly restricted in its application to constructions of a somewhat peculiar description, which have been formed above the surface of the ground for the purpose of conveying streams of water in a regularly, but slightly descending current across valleys and over plains, from one comparatively high point to another. The canal or conduit called the New River, by which water is brought into London from a distant source, is strictly an aqueduct, but it is not what is generally understood by the term, in any part of its length. Indeed we have not in this country an example of the sort of structure which the term designates, though it may be exemplified by some of the canal and railway ducts in the north of England and in Scotland, such as Barton Bridge, in Lancashire, which carries the Duke of Bridgewater's canal over the river Irwell; the bridge which carries the Edinburgh and Glasgow Union Canal over the valley of the water of Leith at Slateford; and the Sankey viaduct in the line of the Liverpool and Manchester railway. The former of these have been sometimes called aqueducts, but this application of the term only leads to confusion, unless *bridge* be superadded; structures for the purpose of carrying a canal are indeed more strictly viaducts than aqueducts. Nevertheless, such is the form and structure of an aqueduct,—a series of piers equidistant, or nearly so, with arches connecting their heads to form one continuous and nearly level line, on the back of which is the channel or water-course.

We do not read of any aqueducts, properly so called, till the Roman period, yet contrivances for the conveyance of water from a distant source for the supply of a city are of great antiquity. Herodotus (iii. 60) describes the mode in which Eupalinus, an architect of Megara, supplied the city of Samos with water. A hill 900 Greek feet high was pierced by a tunnel seven stadia, or 4200 feet long. The tunnel was eight feet high and eight feet wide, and in it there was cut a channel thirty feet deep (if the text is correct) and three feet wide, through which the water was conveyed in pipes (*ὀχετευόμενον διὰ σωλήνων*) from a large source to the city. In translating the word *σωλὴν* (*solen*) by the usual term 'pipe,' we do not mean either to assert or deny that pipes, properly speaking, of wood or metal were used on this occasion: the word may here signify merely channel stones.

Aqueducts were most extensively used by the Romans, and on the sites or in the vicinities of many of their more important cities in Asia and Africa, as well as in Europe,—in Greece, Gaul, and Spain, as in Italy and Sicily—parts remain, even to the present day, of extensive constructions of the kind. That of Segovia, for instance, in Old Castile, erected in the time of Trajan, is a magnificent work. The neighbourhood of the city of Rome itself is pre-eminently distinguished by a long series of these almost imperishable memorials of her antient magnificence.

The aqueducts of the Romans were built, for the most part, of brick, and consisted, as we have said, of nearly square piers running up to the same height,—the necessary fall of the course being considered—and connected by semicircular arches, over which the conduit ran. This conduit had a paved or tiled floor, and was inclosed laterally by walls of brick or stone, and covered with a transverse arch, or by a simple flat coping of stone. This species of conduit frequently involved a serious difficulty, for if the source of the water conveyed were much higher than the place at which it was to be delivered, and the distance too short to reduce the flow of water to a proper velocity, the stream had to be carried in a winding direction to expend the height in a greater length. Otherwise, the pressure of water from the head would burst or blow up the covering arch or coping of the aqueduct, render the work useless, and inundate the country over which it was attempted to carry it.

Some idea may be formed of the extent and importance of the Roman works of this kind when it is stated, that Rome was supplied with water from sources varying from thirty to sixty miles in distance, and that at one period of its history no less than twenty aqueducts brought as many different streams of water across the wide plain or Campagna in which the city stands. Great portions of the distance were of course in every case occupied by artificial channels winding along the sides of hills and mountains; and long tunnels carried the streams through these natural barriers when occasion required, but nevertheless the arcaded duct led the streams across the deep valleys, and the aqueduct was in every case required to carry it onwards from the hills over the wide plain to the doors of the eternal city. These metropolitan aqueducts were of various lengths, according to the direction in which they came, but in one of them the series of arches is calculated at nearly 7000, their height being in many places more than a hundred feet. There is nothing more interesting or more really beautiful in the existing ruins of antient Rome than the remains of these splendid works, which radiate, in almost every direction, and run across the almost level plain out of which its hills arise in long arcaded series, whose simplicity and unbroken continuity produce a degree of grandeur unmatched by the more laboured and more pretending works within the walls.

Sextus Julius Frontinus, who was inspector of the aqueducts of Rome under the Emperor Nerva, has left a treatise on this subject, which contains much curious information. [See FRONTINUS.] Some of the more remarkable aqueducts will be noticed under the names of the cities to which they belong, or the individuals whose name they bear. The modes in use, both in antient and modern times, for distributing water through a large city when brought to the great reservoirs will be noticed under the head of WATER and WATER-PIPES.

Modern Rome is abundantly supplied with water by three of the antient aqueducts, which have undergone repairs and restorations: the most important was made by that great papal reformer, Sixtus V., from whose conventual name of brother Felix (Fra Felice) one of the streams so delivered is called the Acqua Felice.

Aqueducts have been constructed in modern times, and of these the most celebrated are that of Caserta in the kingdom of Naples, of Maintenon near Versailles in France, and that of Bemfica, called *Agoas livres*, near Lisbon in Portugal.

AQUIBA, עֲקִיבָה, or Akibah ben Joseph, called by Epiphanius and Hieronymus Barakiba, lived at the end of the first and at the beginning of the second century A.D., and was president of the academy at Lydda and Tabae, as disciple and successor of rabbi Gamaliel, and one of the most famous doctors of the Mishnah. The Jews assert that things which were unknown to Moses were revealed unto Akibah. According to Jochia, the greatest part of the Mishnah originated from the verbal and written instructions of Akibah. According to Zakat, *the whole* of the Mishnah came from Akibah, who lived 120 years. When he was forty years of age he fell in love with the daughter of Kalba Shwa, in whose service he lived as herdsman. She promised to marry him if he became a rabbi. Akibah studied forty years with great zeal, and had 24,000 disciples, among whom was Rabbi Jose, the author of the Great Jewish Chronicles. He joined the pseudo-Messias, Bar Cocheba (Coziba), who raised disturbances in Judea. The Emperor Hadrian, in whose time the insurrection took place, after taking Bitter or Bethara, put many Jews to death, and ordered Akibah to be killed by iron combs, with which his skin was taken off. Akibah was buried in Tiberias, where his tomb was annually visited by his admirers between Easter and Pentecost. The book Jezirah (יְצִירָה), which some ascribe to Adam, and others attribute to Akibah, is the chief book of cabalistic doctrines. The two last editions of this famous book are by Rittangel, with a Latin translation and commentary, Amst. 1642, 4; and lately, by Friderich von Meyer at Frankfurt on the Main, with a German translation, 1832, 4to.

A'QUILA (the Eagle), a constellation situated above, so as to rest on, Capricornus and Aquarius. It may be readily found by means of the head of Draco and the bright star α Lyræ, since a line passing between β and γ Draconis, and through α Lyræ, passes through a bright star of the first magnitude, α Aquilæ, cutting also two stars of the third magnitude, β and γ, situated directly above and below α. This constellation is on the meridian at 8 o'clock P.M. in the middle of September, at about 40° of elevation. Its principal stars are here given, as in preceding constellations. The number inclosed in a parenthesis is that of Piazzi.

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed.	Astron. Society.			Flamsteed.	Astron. Society.			Flamsteed.	Astron. Society.	
m	1	2147	5·6		24	2239	6	D	51	2326	5·6
o	2	2160	5	ω^1	25	2237	5	π	52	2324	6
n	3	2161	5·6	*f*	26	2245	6	α	53	2329	1·2
	4	2165	5·6	*d*	27	2249	6	ο	54	2330	5·6
l	6	2167	5·6	A	28	2247	6	η	55	2333	4
k	9	2190	5·6	δ	30	2266	3·4	E	56	2334	6
	10	2194	6	*b*	31	2265	5		58	2337	6
i	12	2201	5·6	ν	32	2268	5·6	ξ	59	2336	5
ε	13	2198	3·4	*c*	35	2275	6	β	60	2340	3·4
g	14	2204	6	*e*	36	2278	6	φ	61	2341	6
h	15	2207	6	K	37	2288	5		62	2360	6
λ	16	2213	3	μ	38	2289	4·5	τ	63	2363	5·6
ζ	17	2214	3	κ	39	2294	4		64	2369	6
	18	2219	5·6	ι	41	2295	5	θ	65	2372	3·4
	19	2222	6	P	42	2297	6	ρ	67	2381	5
B	20	2226	5	σ	44	2301	5	G	69	2409	5
C	21	2228	6		45	2304	6	H	70	2425	5·6
	22	2233	6	χ	47	2311	6	I	71	2427	5
	23	2238	6	γ	50	2317	3		(273)	2320	6

In the Greek mythology this constellation represents the eagle of Jupiter. According to some, it is the bird which was the tormentor of Prometheus. M. Dupuis conjectures, but with very little probability, that the name was given when Aquila was near the summer solstice, and that the bird of highest flight was chosen to express the greatest elevation of the sun.

The constellation Antinous is usually considered as a part of Aquila, and is treated as such in catalogues. It is represented as a boy in the grasp of the eagle, and its principal stars are η, θ, ι, κ, and λ, in the above catalogue. It is said to have been placed in the heavens by the order of the Emperor Hadrian, in memory of a favourite of that name, who is generally supposed to have perished in the Nile, A.D. 131. Others have supposed it to refer to the fabulous history of Ganymede, who was carried to heaven by the eagle of Jupiter; but this is rendered unlikely by the silence of Ptolemy, who, though he speaks of the group of stars in question, does not call them the constellation Antinous, but simply 'unformed stars, among which is Antinous.' Had the two figures originally contained any reference to the mythology above alluded to, it is most probable that the constellation would have been regularly distinguished long before the time of Ptolemy.

A'QUILA, a considerable town in the kingdom of Naples, and the chief place of the province called Abruzzo Ultra Primo. It is situated six miles south of the ruins of Amiternum, a town of the Vestini, and the birth-place of the historian Sallustius, where remains of an amphitheatre and other buildings are still seen near the village of San Vittorino. Remains of another town, called Forconium, an episcopal see in the early Christian ages, and which was ruined by the Longobards, are found about four miles south of Aquila, near a place called Bagno. The origin of Aquila appears to have been in the twelfth century, when the inhabitants of various ruined towns in that neighbourhood thought of uniting and building a place of defence against the incursions of foreign and domestic depredators, so common in that age. Frederic II., emperor and king of Sicily, is, however, considered as the real founder of Aquila, having given it a diploma or charter, assigning to the new city a territory which comprehended the two districts of Amiternum and Forconium. The name of Aquila is said to have been first given by him in honour of the emblem of the imperial eagle. He wished to make the new town a bulwark of his kingdom on the frontier of the papal states. In 1254 the episcopal see of Forconium was transferred to Aquila. This city became populous and powerful, and acted a conspicuous part in all the wars that followed the first French invasion of the kingdom under Charles of Anjou. It generally took part with the popes and the Angevins against the Aragonese.

After Charles V. had taken possession of Naples, the French, under General Lautrec, having invaded the kingdom, took possession of Aquila; the imperial army, however, retook it soon after, and the prince of Orange, who commanded in the name of Charles, irritated by the disaffection of its inhabitants, laid enormous contributions on them, in order to pay which all the plate and the treasures of the churches were taken. Numbers of the citizens were imprisoned, and many outrages committed by the soldiers on the inhabitants. This occurred in 1529. The plague, which broke out soon after, completed the desolation of the city, which never after recovered its former prosperity. It was long considered the first city in the whole kingdom next to Naples, and it could muster 15,000 armed men at the sound of the alarm-bell. Charles V. built the castle, which is situated in the highest part of the city, and was considered very strong at the time. Aquila is on the slope of a hill, at the foot of which the river Aterno or Pescara flows. It commands the view of a fine valley about sixteen miles in length, watered by numerous springs, and productive in corn, fruit trees, flax, and especially saffron. The hills are covered with vineyards, and the lofty Apennines, which rise behind on both sides, afford pasture in summer to numerous herds of cattle and flocks of sheep. The chain to the north-east of Aquila is overtopped by Monte Corno, and that to the south-west by the mounts called Della Duchessa, which divide the valley of the Aterno from that of the Salto, a branch of the Velino. [See ABRUZZO.] Aquila has manufactures of linens, paper, leather, and woollen cloths: its comfits or sweetmeats have a great reputation. Its population, according to the Italian itineraries of 1830, is 13,000. The walls are above three miles in extent, but a great portion of the enclosed space is now occupied by gardens. It had once twelve gates, eight of which have been blocked up. Aquila has declined, while Chieti, Lanciano, Teramo, and other towns of Abruzzo, have increased.

The province of Aquila, which once occupied the largest part of Abruzzo, has been of late years divided into two *intendenze* or divisions, the chief towns of which are Aquila and Teramo. Aquila is the residence of the intendente, and also of a military commandant: the civil and criminal courts for its division are held here. It has also a lyceum. The streets, though generally narrow, are straight, and it has two squares ornamented with fountains. The palace of justice, or town house, and the episcopal palace and cathedral, are its principal buildings. It reckoned once above one hundred churches, and numerous monasteries, besides twelve nunneries; many of the churches, however, had fallen to ruin already in the last century. Others have been since suppressed.

Aquila is the residence of many families of the provincial nobility. Its inhabitants speak Italian, like their neighbours of the Roman state, and not dialect, as the rest of the kingdom. It lies in 42° 20′ N. lat., 13° 28′ E. long., 106 miles N.N.W. of Naples, and 57 N.E. of Rome. There is a post road from Aquila to Sulmona, 32 miles distant, and from thence to Naples. A mountain road leads from Aquila over the pass of Antrodoco to Rieti in Sabina, and from thence to Rome. (Bernardino Cirillo, *Annali della Città dell' Aquila.*)

A'QUILA, Ακύλας, עקילוס, was, according to Epiphanius, *De Ponderibus et Mensuris*, cap. 15, a relative of the emperor Hadrian, and converted from idolatry to Christianity, but afterwards excommunicated on account of his idolatrous astrology. He embraced Judaism, was circumcised, and translated the *Old Testament* literally into Greek (Iren. iii. 24; Euseb. *Demonst. Evang.* vii. 1; Hieronymus, *ep. ad Pammach. Opp. ed. Mart.* t. iv. p. ii. p. 255). Aquila adhered so strictly to the Hebrew text that he translated בְּרֵאשִׁית *ἐν κεφαλαίῳ*, יִצְהָר *στιλπνότης*, אֵת by *σὺν*, אִשָּׁה *ἀνδρίς*. The word עַלְמָה Jer. vii. he translated *νεᾶνις* and מָשִׁיחַ anointed, or the Messiah, Ps. ii. *ἠλειμμένος*, and consequently the Jews preferred his translation to the Septuagint. It appears also from Irenæus, iii. 24, that the Ebionites used the translation of Aquila in order to support their Judaizing tenets. The remains of this translation have been edited by Montfaucon, Martianay, and others, in the *Hexapla* of Origen. [See HEXAPLA.] *Dathe de Aquilæ Reliquiis Interpretationis Hoseæ in Opusculis Dathii ed. Rosenmüller*, Lips. 1746, 8. Schleusner, *Opuscula Critica ad versiones Græcas Vet. Test. pertinentia*, Lips. 1812, 8; Capelli, *Critica Sacra, ed. Scharfenberg*, l. v. c. 3. t. ii. p. 805. The translator עקילוס, in the Talmud of Jerusalem, is called in the Talmud of Babylon אונקלוס, Onkelos. [See ONKELOS.]

AQUILE'GIA, literally the *Watergatherer*, because the leaves collect water in their hollow, is a small genus of plants, commonly called *Columbines*, belonging to the crowfoot tribe, of which several species are cultivated in gardens. They are known from aconitum, to which they are the most nearly related, by the leaves of the calyx being all of the same form and size, and by the petals having each a long curved horn or spur at the base. All the species are handsome perennials, easily propagated by dividing the crown of their roots: the commonest, hence named *A. vulgaris*, is found in woods and thickets in this and all other parts of Europe; it has produced many varieties, differing in the colour of the flowers, and in the multiplication of the petals, for the sake of which it is commonly cultivated. The other species are found either in the north of Asia, or in North America They are all acrid plants, but so much inferior in virulence to aconite, that no attention has been paid to their qualities.

AQUILEIA, a town of the antient Veneti, whose origin is lost in the obscurity of the ante-Roman ages, was made a Roman colony in the year 181 B.C., and became the first city in the Venetia, and the bulwark of Italy on the side of Illyricum and Pannonia. It was built near the right or western bank of the river Sontius, now Isonzo, in a low and fertile plain, watered by numerous rivers. It was a place of great trade, for, although several miles distant from the coast of the Adriatic, vessels could reach it through canals which communicated with the rivers Natissa and Anfora, which flow near it. Its walls were twelve miles in extent, and the city was adorned with an amphitheatre and other splendid buildings. The Via Æmilia, a continuation of the Flaminian road from Rome, led through Ariminum and Bononia to Aquileia. Augustus, Tiberius, and other emperors occasionally resided in this city. The poet Cornelius Gallus was born here. Aquileia distinguished itself for its fidelity to Rome. When the Thracian Maximinus, after the death of Alexander Severus, was proclaimed emperor by the legions of Pannonia, and afterwards outlawed by the Roman senate, he marched against Italy to avenge himself. The citizens of Aquileia boldly opposed his passage, and sustained a siege, during which the women vied with the men in the defence of the town. The soldiers of Maximinus, disheartened by this unexpected resistance, and the delay thereby occasioned to their intended march upon Rome, revolted and killed Maximinus and his son, A.D. 241. The Roman senate, relieved of its fears, voted thanks to the Aquileians.

Aquileia, from its situation, was exposed to the first attacks of Alaric and the other barbarians who successively invaded Italy from the north-east. The famous Attila at last stormed it, after an obstinate defence, pillaged, and destroyed it by fire, after butchering the greater part of its inhabitants, in the year 452. Some of those who escaped took refuge in the neighbouring island of Grado, where they built a town of that name, and where the bishops of Aquileia resided for a time. It was about the same epoch that many fugitives from various towns destroyed by Attila escaped to the islets in the lagoons, where afterwards Venice was built. In the year 489, Theodoric and his Goths defeated in the plains of Aquileia Odoacer, king of Italy. Aquileia was afterwards restored by Narses, the general of Justinian, but it never recovered its former splendour. The see of Aquileia was one of the oldest in Italy; its first recorded bishop, Hermagoras, is said to have lived under the Emperor Nero. There is also a tradition that St. Mark the evangelist was the first bishop of Aquileia, and that he wrote there his Gospel, a MS. of which, pretended to be an autograph of the saint, was transferred to Venice in the fourteenth century, and deposited in the treasure-room of the church of St. Mark. During the first three centuries the chronology of the bishops of Aquileia exhibits several chasms, but from the beginning of the fourth the records of that see proceed without interruption. Towards the end of the same century it was made a metropolitan see, about the same time as Milan. Its jurisdiction extended first over Istria, and lastly over the whole of Venetia, and even as far as Como, and beyond the Alps, to the river Save, having twenty-seven bishops under it. Rufinus, the translator of Origenes, and who carried on a bitter controversy with St. Jerome, was a priest of the church of Aquileia. In the sixth century a schism arose between the see of Aquileia and that of Rome, which continued for two centuries, during which we find often two bishops for the same see, one orthodox at Grado, and the other schismatic at Aquileia. It was then that the metropolitans of Aquileia assumed the title of patriarchs, which was used in the Greek Church, and had been adopted by the Goths and other Arians. When the Longobards invaded Italy under their king Alboin, the patriarch of Aquileia removed to Grado with the treasures of the church. In the subsequent wars between the Longobards and the Greeks, and afterwards the Franks, many families emigrated from Aquileia to Venice. Charlemagne and his successors bestowed privileges on the see of Aquileia, which had already become reconciled with that of Rome; and Otho II. gave it the castle of Udine and other estates in the March of Frioul (Forum Julii); and Conrad II. and his successor Henry III. enlarged still more the dominions of the see, giving it almost the whole of Frioul and Istria, so as to render the patriarch a sovereign prince, and a great feudatory of the empire, with power of coining money, raising troops, &c. Rome had acknowledged his title of patriarch, which was a singularity in the western church. Pope John XIX. qualified the see of Aquileia as 'being second in rank to that of Rome, and above all other episcopal sees in Italy.' Popo, who was patriarch about that time, restored the walls of Aquileia, and built a magnificent temple, with a lofty tower, which he dedicated to the Virgin Mary, making provision for fifty priests to officiate in it. This was to Aquileia a period of revived prosperity. But the wars between Frederic II. and the popes, and the factions of the Guelphs and Ghibelins, came again to disturb the country; and these, added to the growing unhealthiness of Aquileia, occasioned by the stagnant waters around, induced the patriarchs, in the thirteenth century, to remove their residence to the castle of Udine, which town then rose on the decline of that of Aquileia. From that time Aquileia became desolate, and by degrees dwindled away to a mere unhealthy village. The patriarchs, however, continued to govern the country of Frioul as independent princes, and to exercise their spiritual jurisdiction over the numerous dioceses subject to them. They were frequently at variance with their neighbours, the Venetians, the Paduans, the dukes of Carinthia, the counts of Gorizia, and the dukes of Austria, and sometimes with their own subjects. At last, in 1420, the Venetians conquered Frioul, and Udine submitted to them. Thus ended the temporal dominion of the patriarchs. Their spiritual authority they retained to a much later period, until the year 1758, when, in consequence of disputes having arisen between the Venetian senate and the court of Austria about the right of nomination to the vacant see, the patriarchate was finally abolished, with the consent of the pope, and its diocese divided into two episcopal sees, Udine and Gorizia. The province of Frioul continued under the Venetians until the fall of that republic in 1797. Aquileia, or rather its remains, form now part of the circle of Istria, in the government of Trieste, in the Austrian monarchy, being just outside the frontiers of the Lombardo-Venetian kingdom, the Italian boundary being two or three miles to the west of Aquileia. The road from Venice to Trieste passes through Palmanova, about eight miles north of Aquileia. (Johannes Candidus, *Commentariorum Aquilejensium*, libri viii.; De Rubeis, *Monumenta Ecclesiæ Aquilejensis*.)

AQUI'NAS, THOMAS, that is, Thomas of Aquino, in Naples. This famous theologian was of very distinguished birth, being a younger son of Landulf, count of Aquino, and lord of Loretto and Belcastro, who was nephew of the Emperor Frederic I., the celebrated Barbarossa. He was born in 1227, some authorities state in the town of Aquino, others in the castle of Rocca Secca, the seat of his family, near the monastery of Monte Casino. Having been sent at five years of age to the neighbouring monastery to receive the rudiments of his education, he remained there till he was nearly thirteen, when he proceeded to the university of Naples, which had been founded in 1230 by his relation, the Emperor Frederic II., grandson of Barbarossa, and had already acquired great reputation. From his earliest years he had shown a love of study, and the circumstances of the time were, in various respects, such as naturally tended to encourage the preference which he was thus led to form for a literary, or at least a meditative, life. His native country was distracted by civil dissensions, in which if he was to mix, the trade of arms alone offered him any chance of distinction. On the other hand, a fervent excitement had been recently awakened among all classes by what were then esteemed learning and philosophy, which, puerile and misdirected as their spirit might to some extent be, at least afforded an intellectual exercise, and therefore advanced the world a most material step in civilization. About 1217, the order of preaching friars called after his name had been founded by St. Dominic; and of this body, already in the enjoyment of vast popularity, the young nobleman proposed to become a member. On his earnest entreaties the superior of their convent at Naples was prevailed upon to admit him as a novice. He was at this time in his fifteenth year, and the important step upon which he had ventured was taken without the knowledge of his parents. As soon as they heard of what he had done, his mother hastened to Naples in the hope of inducing her son to change his resolution. On finding that, to avoid her, he had taken flight for Rome, she proceeded after him to that city, but there learned that he was already on the road to Paris. He was, however, apprehended on his way by the exertions of his two elder brothers, who then held commands in the army of the emperor in Tuscany, and brought back to Rocca Secca. But no entreaties or other inducements could prevail upon him to give up his determination; and at length, after about a year had elapsed, the friars got both the emperor and the pope, Innocent IV., to interfere in the case, and by their command Aquinas was permitted to return to his convent. With the view, probably, of effectually preventing all further attempts to withdraw him from his chosen vocation, he soon after (in 1243) made profession, and then went to Cologne to attend the theological and philosophical lectures delivered by Albertus Magnus in the Dominican convent there. Here, from his silence, which, however, was not that of stupidity, but of meditation, he is said to have been named by his fellow-students the Dumb Ox. His teacher, however, detected the genius that was wrapped up under this taciturnity, and remarked, that if that ox should once begin to bellow, the world would be filled with the noise. After remaining a few years at Cologne, he accompanied Albert on a visit to Paris, from which they returned together in 1248. Aquinas was then ordained a priest. He returned to Paris in 1253. Soon after this he published the first work by which he distinguished himself as a writer, a treatise in defence of the monastic life, in answer to a doctor of the Sorbonne, who had attacked the privileges of the new mendicant orders. He afterwards defended his positions in a debate with his opponent, in the presence of Pope Alexander IV. This, and some other exploits of a similar kind, acquired him the highest reputation in what was then deemed the chief of intellectual feats—the dexterous use of the weapons of the Aristotelian metaphysics and logic. In 1255 Aquinas received from the University of Paris his degree of doctor in theology; and he afterwards spent several years in that city, lecturing publicly with immense applause. In 1272, however, he returned to Italy, and for two years taught theology at Naples. Pope Gregory X. having then requested his presence at the general council which had been summoned to meet at Lyons, with the object of effecting a union between the eastern and western churches, he prepared to set out for that city, but first paid a visit to his niece, Frances of Aquino, the wife of the Count Annibal de Ceccano. Having arrived at their residence, the castle of Magenza, he was there suddenly attacked by fever, on which he desired to be removed to the neighbouring Cistertian monastery of Fossi-Novi, in the diocese of Terracino; and here he expired on the 7th of March, 1274, in the forty-eighth year of his age.

The honours paid to Thomas Aquinas, both during his life and after his death, comprise nearly all the highest distinctions by which men have ever testified their admiration of intellectual eminence. Popes, kings, emperors, learned bodies, and great cities, contended for his presence during his life; and as soon as he had ceased to live, the order to which he belonged, the monks of the abbey in which he died, and the University of Paris, of which he had been an alumnus and a graduate, disputed the right to the possession of his body. It was not till nearly a century afterwards that this latter controversy was terminated by the removal of his remains on the 28th of January, 1369, to the Dominican convent of Toulouse, where a magnificent tomb erected over them still remains. Before this he had been canonized by Pope John XXII. by a bull dated the 18th of July, 1323. Pope Pius V. also declared him a doctor of the church in 1567.

The piety and moral virtues of St. Thomas Aquinas have received the warmest commendations from his contemporaries. His religious sincerity and fervour appear to have been accompanied by unaffected humility, and also by a mildness of temper that has not always been the grace of eminent theologians. The popularity of his writings was formerly so great that there have been at least five or six editions of the complete collection. The best edition is considered to be that printed at Rome, in 1570, in seventeen volumes, folio. Various of his treatises have also been repeatedly printed separately. Of the whole the most famous is his *Summa Theologiæ*, which is still a favourite authority in the Catholic church. His *Commentary on the Four Books of Peter Lombard* (called the Master of Sentences) is another performance that was long in high esteem. He has also left Commentaries on several of the writings of Aristotle, which, however, he perhaps only knew in Latin translations made from the Arabic. A good many of the works that have been attributed to Aquinas are now admitted to be spurious; and doubts have even been entertained as to whether the 'Summa Theologiæ' be really his. Of the theological opinions which he maintained, the most memorable is his assertion of the supreme and irresistible efficacy of divine grace. This doctrine was afterwards opposed by Duns Scotus; and it formed for ages a matter of violent controversy between the *Thomists* and the *Scotists*, as the followers of the two doctors called themselves. The writings of Aquinas are not likely to be very fairly appreciated in the present day; but though we had no other evidence than the recorded admiration which he excited in his own times, it would be impossible to doubt his extraordinary genius. His talents, too, appear to have been as various as they were powerful. He wrote in verse as well as in prose; and some of the Latin hymns still used in the service of the Romish church are of his composition. He seems also to have been celebrated for his ready and pointed repartees. One which has been preserved is, his reply to Pope Innocent IV. when that pontiff, on some money being brought in one day when they were together, remarked, 'You see that the age of the church is past when she could say, Silver or gold have I none:—'Yes, holy father,' answered Aquinas, 'and the day is also past when she could say to the paralytic, Take up thy bed and walk.' There are other stories of the absence of mind which he sometimes showed in company when absorbed in some of his profound speculations. One day, while dining with Louis IX., king of France (St. Louis), he suddenly, after a long silence, struck the table with violence, and called out, 'A decisive argument! the Manichæans could never answer it!' Reminded of where he was by the prior of the Dominicans, who was also present, he asked pardon of the king; when his majesty expressed himself only anxious to get hold of the unanswerable argument against the Manichæans, and, calling in a secretary, had it taken down immediately. Rabelais alludes to another anecdote of this kind. (See *Pantagruel*, liv. iii. chap. 2, and the note of Duchat on the passage.) The titles of Aquinas, in the list of the scholastic doctors, are, the Angelic Doctor, and the Angel of the Schools. (See a few remarks on Aquinas in the notes to the translation of Richard de Bury's *Philobiblon*. Lond. 1832.)

AQUI'NO, an antient but long since decayed town in the province of Campania or Terra di Lavoro, in the kingdom of Naples. It was a Roman colony, and a large and populous city in the time of Strabo: the Via Latina passed through it. Juvenal, the Roman satirist, was born at, or in the neighbourhood of, Aquinum. Pescennius Niger, one of the competitors for the empire after the death of Pertinax, was also a native of this place. Aquinum suffered greatly by the various invasions of the barbarians after the fall of the empire. It was at last utterly destroyed during the wars of Conrad and Manfred against the Popes, after the death of Frederic II. of Suabia. The chroniclers of the following centuries speak of it as a place in ruins, and containing but a few hundred inhabitants. It retained, however, its bishop's see and the feudal title of county. The famous St. Thomas was the son of a count of Aquino, and was born at Rocca Secca in the neighbourhood. At present Aquino contains hardly a thousand inhabitants; the ground is covered with ruins of buildings of various ages and styles, among which are the remains of a theatre and of an amphitheatre, and a lofty wall of square stones united without cement, which formed part of a magnificent Doric temple. Several columns about four feet in diameter lie prostrate around, as well as a large portion of the frieze with triglyphs and part of the cornice. From a hasty measurement taken by Sir R. C. Hoare, this temple appears to have been 190 feet in length, and above 60 in breadth. An old ruinous church, which is still called Il Vescovato, (although the see has been long since transferred to Pontecorvo, where the bishop resides;) is built on the site, and partly with the materials, of another antient temple. Adjoining it is a triumphal arch of a mixed style, Corinthian and Ionic; a copious stream now flows between the arch, and, after supplying a neighbouring mill, runs to join the Liris. A native of the place, the nephew of the Canonico Bianchi, has collected copies of all the inscriptions which are found at Aquino and in the neighbourhood. Aquino lies six miles west of the town of San Germano, the antient Casinum, in a plain between the rivers Melfa and Liris, bounded on the north-east by the mountain on which the monastery of Monte Casino is built. The air of Aquino is unwholesome; the village of Palazzuolo, three miles distant, enjoys a better air. [See MONTE CASINO.]

AQUITA'NIA, one of the great divisions of antient Gaul. The limits of Aquitania are stated by Cæsar to have been the river Garumna, the Pyrenees, and the Ocean. The Garumna divided it from Celtic Gaul. The original Aquitanians are supposed to have been of Iberian race, distinct from the Celts. Cæsar did not go into Aquitania, but his lieutenant, the younger Crassus, made an incursion into it. The country, however, was not finally subjugated until the year 28 B.C., when Augustus sent Marcus Valerius Messala to conquer it. The poet Tibullus accompanied Messala in this expedition, which he has commemorated in his poems. In the division of Gaul into Roman provinces as settled by Augustus, the limits of Aquitania were extended northwards as far as the river Ligeris (the modern Loire), and eastwards to the Mount Cebenna, which formed the limits of the Narbonensis province. By this extension, Aquitania was made to include several large districts or tribes of Celtic Gaul, such as the Santones, Pictones or Pictavi, Bituriges, Arverni, Lemovices, &c. In the following subdivisions of Gaul under the later emperors, we find the Aquitania of Augustus divided into three provinces, viz., the Novempopulana, which comprised the greater part of the original Aquitania, between the Garumna, the Pyrenees, and the Ocean; its principal towns were Climberris, afterwards Augusta, Beneharnum, Iluro, Aquæ Tarbellæ: the Aquitania prima bordering on the Ligeris, and whose capital was Avaricum, afterwards called Bituriges (now Bourges), and the Aquitania secunda, situated between the other two, and whose principal city was Burdegala (Bordeaux). Under the reign of Honorius, the Visigoths, after ravaging Italy, passed into Gaul and took possession of Aquitania; which they kept till Clovis, king of the Franks, defeated them in a great battle near Poitiers A.D. 507, and killed their king Alaric II. Aquitania then became part of the monarchy of the Franks; but under the weak successors of Clovis it was detached from it again, and given as an apanage to Charibert, a younger son of Clotarius II. We find in the beginning of the eighth century, Eudes, duke of Aquitania, and a descendant of Charibert, at war with Charles Martel. The Saracens from Spain having invaded the country and pillaged Bordeaux, Eudes was glad to make his peace with Charles and to join him against the Mohammedans, who were utterly defeated by Charles between Tours and Poitiers A.D. 732. In 768, Waifer, Eudes' successor, was attacked by Pepin, who conquered the whole of Aquitania and reunited it to the French monarchy. But Aquitania had undergone another change in its southern limits. The Vascones, a Spanish people, finding themselves hard pressed by the Visigoths, crossed the Pyrenees and settled in the southern part of Aquitania, which from them took the name of Vasconia or Gascony, which it has retained ever since, whilst the more northern parts of the same province continued to be called Aquitaine, and afterwards by corruption, Guienne. The Vascones were conquered by Pepin and Charlemagne, but revolted again, and formed an independent state, having their dukes, until the eleventh century, when they became united to the duchy of Aquitaine, which, under the successors of Charlemagne, had become one of the great fiefs of the French monarchy, and virtually independent of the crown. Eleanor, the heiress of William, last count of Poitou and duke of Aquitaine, married Louis VII., king of France, but being repudiated by him, she next married Henry, duke of Normandy, afterwards Henry II. of England, who thus became possessed of Guienne, Poitou, Gascony, Anjou, in short, of the whole Aquitania in its most extended sense. This was the origin of long wars between the two kingdoms. At last Charles VII. conquered Guienne and the other districts above-mentioned, and took Bordeaux in 1451-2, and reunited the whole to France. The name of Guienne continued after wards to be used as that of one of the provinces of the old monarchy, though restricted to a very small portion of the former Aquitania, until the revolution, when the whole country was divided into departments, and the old denominations became obliterated.

ARA (the Altar), a southern constellation, not visible in our latitude. It is situated near Lupus, above Pavo and Triangulum Australe, in such manner that the Centaur appears to be placing the Wolf upon the Altar. One mythological account explains it as the altar upon which Chiron sacrificed a wolf; another, as an altar constructed by Vulcan, upon which the gods swore fidelity to each other during the war against the Titans.

The principal stars are as follow:—

Character.	No. in Catalogue of		Magnitude.
	Lacaille.	Astron. Society.	
η	1386	1910	4
ζ	1399	1929	3·4
ε	1402	1933	4·5
γ	1422	1983	3
β	1423	1984	3
δ	1433	1992	4
α	1436	2001	3
θ	1480	2073	4

ARA. (*Macrocercus*, Viellot.) [See Macaw.]

ARABESQUE. This term is applied to an heterogeneous species of ornament, or mode of enrichment on flat surfaces employed in works of architecture principally. The name is intended to mean simply 'in the Arabian manner,' and is a French form of that expression. The mode of enrichment which it refers to, was practised in the decoration of their structures by the Moors, Saracens, or Arabians of Spain, for they were called by all those names by their Christian but less civilized neighbours, and from them particularly the species of ornament to which it belongs was so designated. As far as the Mohammedan conquerors of Spain were concerned, they appear to have borrowed the idea from the hieroglyphical enrichments of the monuments of Egypt. The dogmas of their religious code, however, forbidding the representation of animals, in order to avoid the very semblance of idolatry, they employed plants and trees in a similar manner, and with stalks, stems, tendrils, foliage, flowers, and fruit, produced an endless variety of forms and combinations, with which they painted and sculptured the surfaces of their buildings. Hence fanciful combinations of natural objects to form the continuous ornament of a flat surface came to be called Arabesque, though it differed so widely from the Arabian or Mohammedan compositions as to be filled with representations of animals of every variety, and with combinations of plants and animals, as well as combinations of animal forms almost equally discordant with nature. The name, indeed, has become so general as to be applied to the fanciful enrichments found on the walls in the ruins of Herculaneum and Pompeii, as well as to others of the same and earlier date, which were formed and forgotten long before the sons of Ishmael learned to draw. The most celebrated Arabesques of modern times are those with which Raphael ornamented the piers and pilasters of the arcaded gallery of the palace of the Vatican, which bears his name. This gallery, or these galleries rather, for it is in three lengths, are always distinguished as Raphael's galleries ('Le Logge di Raffaelle'), because of the Arabesques and of the illustrations of the Bible history in the cielings, though, indeed, but one of the three sides exhibits the designs of the great artist himself.

The term Arabesque is more applied to painted than to sculptured ornament, though it is not restricted to the former; but Arabesque ornament in sculpture, if not kept very low in relief, is apt to become grotesque, as is the case with many or most of the sculptured enrichments of our pointed architecture.

ARABIA. It is intended in the present article to offer a sketch of the prominent natural features of Arabia, and a brief survey of the history, state of cultivation, language, and literature of its inhabitants. Further information concerning particular points connected with each of these departments, will be found by turning to the separate articles, such as Mecca, Koran, Mohammed, Abulfeda, &c.

The entire surface of Arabia is calculated to be about four times that of France. It is considered as pertaining to Asia, though, from its position and physical character, it would appear rather to belong to Africa. If the Red Sea did not interpose a narrow interruption, one almost continuous tract of sandy deserts would extend from the shores of the Atlantic to the Persian Gulf.

Arabia presents the form of a vast peninsula, connected with the south-western extremity of the continent of Asia by an isthmus of sandy deserts, the breadth of which, from the northern end of the Gulf of Akaba to the mouth of the Shatt-el-Arab (the Euphrates) in the Persian Gulf, may be estimated at about 800 English miles. It is situated between 12° and 30° N. lat., 32° and 59° E. long., partly within, and partly to the north of the tropical region: the tropic of Cancer divides it into two nearly equal parts. It is bounded on the N. by Syria and the Euphrates, on the E. by the Persian Gulf; the Indian Ocean (called here the Arabian Sea and the Sea of Oman) washes the long extent of its south-eastern coast; the straits of Bab-el-Mandeb and the Red Sea form the western boundary. Cape Rasalgate or Ras-al-Had is the most eastern projection of the peninsula; cape Mussendom (cape Maketa of the antients) extends in a north-easterly direction towards the straits of Ormuz; cape Aden, near the south-west angle of the peninsula, is discovered between fifteen and twenty leagues off at sea, as a steep and lofty rock; Bab-el-Mandeb, or the Gate of Tears, the dangerous passage from the Indian into the Red Sea, is the point of the peninsula which is situated farthest to the south-west; and cape Mohammed marks the projection of the Sinai mountains between the Gulfs of Suez and Akaba, the two northern branches or gulfs of the Red Sea.

The name Arabia, by which the Greeks introduced this vast country to the knowledge of Europeans, is derived from the name which has for ages been used by the inhabitants themselves. The word *arab*, as a collective noun in the singular, is used as the common name of the Arabic nation: its plural, *a'râb*, is restricted to signify the wandering, nomadic tribes of the Arabs of the desert. Belâd-el-Arab (*i. e.* the land of the Arabs), and Jezirat-el-Arab (*i. e.* the peninsula of the Arabs), are the usual native designations of the country: besides these, we may also notice the Persian appellation of Arabistân, by which name Arabia is often called among the Persians and Turks.

The derivation of the word Arab is doubtful. Pocock has adopted the notion of several oriental writers, that the country and its inhabitants were so named from Araba, a district in Yemen, to which Ya'rab, the son of Kahtan, the father of the antient Arabs, gave his name. But the real existence of an individual referred to by the name of Ya'rab, like that of several others of the primeval forefathers mentioned in the antient genealogies of the Arabs, appears to us subject to the same historical doubts, as that of many of the reputed founders of states in antient Greece. The very form of the name Ya'rab shows a peculiarity, observable also in other names that occur in the early genealogies of the Arabian tribes, which, in our opinion, characterizes it as a verbal derivative, formed at a subsequent period, in allusion to a former event, the remembrance of which might be preserved by tradition. We are inclined to trace the word *Arab* to the same verbal root, from which this name Ya'rab is evidently derived, namely to the Hebrew verb *arab*, 'to set or go down (as the sun).' According to this etymology, the name Arab implies 'the nation or country situated towards sunset,' *i. e.* westward from the Euphrates, and from the regions which were probably the earliest seats of the Semitic tribes. In support of this derivation, it may not be irrelevant here to observe, that in the Old as well as in the New Testament, by the names Arabia and Arabs, only small territories or isolated tribes in the northern part of what we now call Arabia appear to be meant. (See, *e.g.* Jerem. xxv. 24; Ezek. xxvii. 21; Galat. i. 17.) Others have deduced the name Arab from the Hebrew substantive *ărâbah*, 'a barren place or desert,' which, in several passages of the earliest parts of the Old Testament, is used as the designation of the dreary region east of the Jordan and the Dead Sea, and as far south as the Ælanitic Gulf.

Greek and Roman Christian writers have confounded the Arabian tribes from Mecca to the Euphrates under the name of the Saracens, the import of which term, as appears from its etymology, (*shark*, in Arabic, 'the East,' *sharkî*, 'Eastern,') is 'Eastern Nations.' We do not hesitate to adopt this interpretation, notwithstanding the passage of

Ptolemy (pointed out by Gibbon), who expressly mentions the western and southern position of the Saracens.

The name of Arabia, in its proper acceptation, comprehends the peninsula as far as the isthmus, which runs from the northern extremity of the Gulf of Akaba to the mouth of the Shatt-el-Arab. In a more extensive sense it is made to comprehend also a large tract north of the isthmus, reaching as far as the river Euphrates on the east, and the south-eastern angle of the Mediterranean on the west.

Some of the antients have extended the limits of Arabia considerably to the north of the isthmus just defined. Pliny (*Nat. Hist.* v. 24) makes Arabia comprehend part of Mesopotamia, nearly as far as the frontiers of Armenia. Xenophon, in his personal narrative of the march of Cyrus the Younger [see ANABASIS], considers the sandy tract along the left bank of the Euphrates, and south of the tributary river Araxes (the Khabour), as part of Arabia; and the physical features of the country, of which he gives the following lively description, will, perhaps, justify him in assigning this tract to the division of Arabia. Having crossed the Araxes, Cyrus 'marched along through Arabia, having the Euphrates on his right for five days' journeys through the desert, a distance of thirty-five parasangs. In this region the soil was a plain, perfectly level like the sea, but full of absinthium: whatever else there was to be seen of brushwood or reed, was all fragrant like spices; yet no tree was found. There also was a variety of animals, among which wild asses were the most numerous, and not a small quantity of ostriches; there were also bustards and gazelles.'

The whole peninsula of Arabia, as far as it is at present explored, consists of an elevated table-land, declining on the north towards the Syrian desert, and encircled along the sea-coast with a belt of flat sandy ground. The flat country, beginning at Suez and extending round the whole peninsula to the mouth of the Shatt-el-Arab, is called Gaur or Tehâma, *i. e.* the 'Low-land,' from which the mountainous region in the interior is distinguished by the appellation of Jabal, 'the Hills,' or Nejd, the 'High-land.' The width of the Tehâma varies: near Mokha its breadth is about one day's journey, near Hodeida and Loheia about twice as much. On the eastern coast, in the province of Oman, from Ras-al-Had up to Cape Mussendom, it is much narrower: between the villages of Sib and Sohar, indeed, its width extends to about a day's journey; but in the remaining part of the country, the hills reach almost to the sea.

The soil of the Tehâma, from its regular inclination towards the sea, as well as from the large beds of salt and marine exuviæ with which it is interspersed, appears to have been once a part of the bed of the sea. It is observed that the sea on the western coast still continues to recede: the reefs of madrepore and coral which abound in the Arabian Gulf, and in some parts rise ten fathoms above the sea, are increasing and coming nearer the shore; and as the intermediate space is gradually filled up with sand, the Tehâma is on that side constantly extending its limits. Muza is mentioned by Arrian (*Periplus of the Erythræan Sea*, c. 5) as a sea-port of Arabia Felix; we now find it at a distance of several miles from the sea. The harbour of Jidda is described by Lord Valentia as being formed by innumerable reefs of coral, which extend to about four miles from the shore, leaving many narrow channels between, in which there is a good bottom at from six to twelve fathoms, and where the sea is perfectly smooth even when it blows the heaviest gale. In the southern part of the Arabian Gulf these banks of coral are less numerous.

The low-land of Arabia is occasionally for many years entirely destitute of rain; but sometimes it is scantily watered by the falling of slight showers during the months of March and April. The dews in the most arid tracts are said to be copious. The high-land has its regular rainy season, which begins about the middle of June, and continues till the end of September. Springs also abound in the loftier mountains, which, when fed by the copious annual rains, send streams of water through the valleys that descend towards the Tehâma: some of them are lost before they leave the mountainous region; others, which are more abundant, rush into the Tehâma, where the fertility of the soil mainly depends on irrigation. Most of the larger streams, as soon as they enter the burning plains, spread out into shallow lakes, and are lost in the sand; only a few reach the sea. These temporary currents of rain-water and the small verdant valleys, but a few feet below the general level, which intersect the arid Tehâma, constitute an important and characteristic feature in the aspect of the country: they are called *wâdis*, an expression which we frequently meet with, though variously written, as a component part of the names of rivers generally, on the maps of other countries also into which Arabian settlers have penetrated. The adopted Greek word *oasis* or *auasis* appears to be the same as *wâdi*. The Wadi Zebid and Wadi Meitam are the two principal torrents in the territory of Yemen: the former reaches the sea near the town of Zebid on the Arabian Gulf; the latter, taking a southerly course, pours its waters into the Indian Sea. In the province of Oman, the rivers Masora and Wadi Sib contain water throughout the year, and both reach the Indian Sea. Arabia is entirely destitute of navigable rivers.

In the Tehâma, the heat during summer, owing to the want of rain, and the almost direct action of a tropical sun, is intense. Niebuhr states, that during his residence in the low-land of Yemen, in the month of August, the thermometer rose to 98° Fahrenheit, and at Loheia, during the month of January to 86°; at Sana, in the high-land, it only reached 85° during the summer, and Niebuhr heard it asserted, that, in the latter district, it sometimes freezes. At Muscat, the thermometer varies, according to Frazer, from 92° to 102° of Fahrenheit during summer. Niebuhr was struck with the delightful scenery of the coffee-mountains near Beit-el-Fakih, where he found the air much fresher and cooler than in the parched plains of the Tehâma: yet he had then scarcely reached half the ascent to Kusma and to the summit of the range of hills, which here forms the boundary between the Nejd and the Tehâma. The inhabitants of Yemen, he observes, are dwelling, as it were, in different zones; and within the limits of a comparatively small territory may be found a variety of indigenous species of the animal and vegetable kingdoms, such as in other countries can only be seen when brought together by man from distant regions.

The poisonous blasts known by the names of *sam*, *samum*, or *samiel*, seldom blow in the southern parts of Arabia. They are chiefly experienced in the tract between Basra, Bagdad, Haleb, and Mecca; but even here they are only dreaded during the hottest months of the year. These winds seem to derive their noxious qualities from passing over the great sandy desert when scorched by the intense rays of the tropical sun; and accordingly, Niebuhr was informed that at Mecca the samum blows from the east, at Bagdad from the west, and at Basra from the north-west. The nature of winds generally seems to differ according to the tract which they have passed over. Ali Bey observes that, at Jidda, 'the north-wind, traversing the deserts, arrives in such a state of dryness, that the skin is parched, paper cracks as if it were in the mouth of an oven, and the air is always loaded with sand. If the wind changes to the south, everything is in the opposite extreme: the air is damp, everything that you handle feels of a clammy wetness, and the atmosphere appears to be loaded with a sort of fog.' Lord Valentia remarks, that the southern part of the Arabian Gulf, as far as the island of Jebel-Teir, opposite Loheia, is, during eight months of the year, exposed to the S.W. monsoon, which, as it blows over the arid sands of Africa, renders the climate of the adjacent coast extremely sultry. From Jebel-Teir to Jidda the winds are variable. Above Cosseir as far as Suez, the wind blows for rather more than eight months from the N.W.

Arabia has long been celebrated for the abundance of its odoriferous plants. The frankincense of Saba is alluded to by the Hebrew prophets (Isaiah lx. 6; Jeremiah vi. 20). Herodotus (iii. 107) mentions frankincense, myrrh, cassia, cinnamon, and ladanum, as productions exclusively peculiar to Arabia, though his information on the products of Arabia is neither extensive nor exact. Among the Romans also, Arabian odours seem to have been quite proverbial. (Propert. ii. 22.)

The coffee-shrub is cultivated chiefly on the western descent of the chain of hills which, in the province of Yemen, separates the level country from the high-land: that grown at Bulgosa near Beit-el-Fakih, and exported from Mokha, still maintains its superiority over the coffee produced in the European colonies in all other parts of the globe. The farinaceous deposit called manna, familiar to all readers from the use made of it by the Israelites during their wanderings in the desert, is now, according to Niebuhr, chiefly, if not exclusively, found on the leaves of a species of oak called *ballôt* or *afs*: according to others, it is a pellucid substance exuded by the leaves of different kinds of trees, chiefly the *hedysarum alhagi* of Linnæus. Grapes are cultivated in several parts of Arabia, though in the Koran wine is forbidden to the Mussulmans. In Yemen, where some pains are bestowed upon agriculture, Niebuhr saw excellent wheat, Turkey corn, or maize, durra, barley, beans, lentils, tobacco, &c.; senna and the cotton-tree are also cultivated here. Much indigo is grown about Zebid. Niebuhr says that he saw no oats in Arabia: the horses are fed on barley, and the asses on beans. The time of the harvest varies. At Muscat, wheat and barley are sown in December and reaped in March; in the high-land, near Sana, the time of the harvest for barley is about the middle of July.

Arabia is rich in indigenous trees; the *acacia vera*, from which the gum Arabic is obtained, the date-tree, and many varieties of the palm and fig-tree deserve to be particularly noticed. Forests appear to be rare. In the barren tracts of the country, the Beduins sometimes supply the deficiency of fuel by the dried dung of the camel.

Among the antients, Arabia was celebrated for its wealth in precious metals; yet, according to the accounts of modern travellers, Arabia possesses at present no mines either of gold or silver. Iron mines are noticed by Niebuhr as existing in the territory of Saade. The lead mines of Oman are, according to him, very productive, and large quantities of lead are exported from Muscat.

On the sands of Arabia and Syria, the camel, the ship of the desert as it is emphatically called by the natives, is an invaluable treasure. Like the Beduins themselves, it learns from early youth to endure hunger, thirst, and fatigue. It performs journeys of 300 to 400 hours without requiring to drink oftener than once in eight or ten days. The herbage scantily supplied by the desert is sufficient for its food. It carries a weight of a thousand pounds and upwards, without being unloaded for weeks. A hint from its leader directs its motions; a song renews its strength. Its hair is manufactured into cloth for garments and tents; its milk, like that of the cow, is nutritious and sweet; its flesh, when young, is in taste similar to veal.

Arabia is noted for its horses, of which there are two distinct breeds. The one, which is called *kadishi*, i. e. of unknown descent, is in no higher estimation than the common horses in Europe; horses of this breed are employed to carry loads, or as draught-animals. The other, called *koheili* or *kohlâni*, i. e. of antient and noble pedigree, is reserved for riding only. The best horses are bred in the desert bordering on Syria: they are here educated in the encampments of the Beduins with a careful tenderness which trains them to habits of attachment to their masters. It is for this quality, and for their amazing speed, that they are valued, more than for their size or beauty.

There is also in Arabia a spirited kind of ass, which is used for riding and for military service; the best are to be found in the province of Lahsa. The Arabian oxen and cows are distinguished by a hump over the shoulders. Herodotus (iii. 113) mentions two kinds of sheep with fat tails as being indigenous in Arabia. The rock goat, the fox, the musk-deer, and a wild species of ass inhabit the hill-country. The jackal, the wolf, the hyæna, and the panther, roam around the tents of the Beduins, or follow the track of the caravans through the solitary desert. The gazelle seeks pasture and shade in the isolated *wadis*. The woods of Yemen and Aden are inhabited by troops of monkeys. The lion, from the frequent allusions to it in antient Arabic poetry, and from the number of names which the language has for it, must at one period have been very common.

Among the birds indigenous in Arabia, we find mentioned several large birds of prey, such as the eagle, the vulture, and several kinds of hawk. The carrion-vulture frequents battle-fields and performs the services of scavenger. The ostrich and other birds valued for their plumage live in the deserts. Tame fowls, pheasants, and different sorts of pigeon, are frequent in Yemen. Along the coast of the Red Sea, pelicans and various kinds of sea-fowl are found.

The locusts of Arabia, whose devastations are so often alluded to, are dried, and roasted or boiled, and in this state eaten by the Arabs. Niebuhr states that they are strung on threads and offered for sale in the markets of all the Arabian towns from Bab-el-Mandeb to Basra.

The sea, on the eastern coast of Oman, is so abundant in fish, that not only asses, cows, and other domestic animals are fed with them, but they are also spread on the fields, to improve the soil, as manure. The pearl-fisheries of the Persian Gulf are universally celebrated. The bank of which pearl-shells are principally found extends from the Bahrein islands to very near the promontory of Julfar. The northern extremity, near the isles Karek and Bahrein, is distinguished as particularly rich in pearls. The pearl-fisheries in this part of the Persian Gulf are alluded to by Arrian.—(*Periplus Mar. Rubr*. c. 9.)

Divisions of Arabia.—Arabia has been variously divided at different times, and by different authors. Strabo (xvi. c. 4.) divides the whole country into the Happy and the Desert Arabia, the former occupying the southern, and the latter the northern part of the peninsula. The triple division into Arabia Felix, Arabia Petræa, and Arabia Deserta, was introduced by Ptolemy: *Arabia Felix* he called the peninsula, as far as the isthmus already described; *Arabia Petræa*, so named from Petra, the ancient capital of the Nabathæans, was the country between the Red and the Dead Sea, bordering upon Palestine and Egypt; and *Arabia Deserta* comprehended the whole extent of the Syrian desert, as far as the Euphrates, where we find Palmyra.

By some contemporary Christian writers on the history of the Crusades, the territory around Bostra, or the Auranitis of the antients, is called *Arabia Prima;* the country east of the Jordan had the name of *Arabia Secunda* or *Arabia Petracensis* (in allusion to its capital Krak or Karrak, also named Petra Deserti, which was erroneously supposed to stand on the spot of the antient Petra of the Nabathæans); the country around Shaubek (Shobak) or Mont-royal (Mons Regalis) was called *Arabia Tertia*, also *Syria Sohal*, or *Terra Montis Regalis*. Oriental writers generally enumerate five provinces of Arabia, viz., Yemen, Hejaz, Tehâma, Nejd, and Yemâma; some add Bahrein as a sixth, while others consider this as part of Irak Arabi. The three provinces, Tehâma, Nejd, and Yemâma, are by some considered as subdivisions of Hejaz. Arabia Petræa, including Mount Sinai, is by most of them considered as belonging partly to Egypt and partly to Syria; and the northern part of Arabia Deserta is generally called the desert of Syria.

The following outline of the present division of Arabia is founded chiefly on that adopted by Niebuhr.

I. *Yemen*, bordering upon the Red Sea, and upon the territories of Hejaz, Nejd, and Hadramaut. It is subdivided, according to Niebuhr, into fourteen independent provinces, the principal of which are the following:—

1. Yemen Proper, with the towns of Sana, in the mountainous district towards the high-land, the residence of the Imam of Yemen; Mokha, on the borders of the Red Sea, now the principal sea-port of Arabia; Zebid, Beit-el-Fakih, Hodeida, and Loheia, in the flat country along the coast of the Arabian Gulf.

2. Aden, with the celebrated antient town and harbour of the same name, situated at the foot of high mountains which surround it on almost every side, and leave only one very narrow causeway by which the town can be approached on the land side. Aden was, during the twelfth, thirteenth, and fourteenth century, an important emporium in the European trade with India, which has since been transferred to Mokha. [See ADEN, ALBUQUERQUE.]

3. The principality of Kaukeban.

4. Belad-el-Kobail, an extensive mountainous district towards the north of Yemen Proper, the princes of which have maintained themselves independent of the Imams of Sana.

5. Abu Arish, with the mercantile town of Jezan on the Red Sea.

6. Two small territories called Khaulan, the one to the south-east of Sana, the other on the road from that town to Mecca.

7. Sahan, a large district in the hills between Belad-el-Kobail and Hejaz, mostly inhabited by independent Beduins.

8. Nejran, a pleasant and fertile country, rich in water, with excellent pastures, and famous for its camels and horses: its capital, Nejran, is by some supposed to be the Nagara of Ptolemy.

9. Jauf or Jof, a territory extending to a great distance over the Arabian high-land, to the east of Belad-el-Kobail, with the antient Mareb or Mariaba, the capital of the Sabæans.

10. Yafa, situated between Jof, Hadramaut, and Yemen Proper.

11. *Hadramaut*, a country once famous for its trade,

chiefly in frankincense, is bounded on the south-east by the Indian Ocean, on the north-east by Oman, on the north by the Arabian high-land, and on the west by Yemen. The trade with Oman and Yemen is carried on by sea; Dafar and Keshin are the principal harbours. Part of the country is occupied by independent Beduin chiefs, among whom the sheikh of Shibam is the most powerful. The island of Socotora or Socatra, famous for the aloe which it produces, was, at the time of Niebuhr's visit, subject to the chief of Keshin.

III. *Oman* extends along the coast of the Persian Gulf and the Indian Sea, and borders, on the west and south, on the great elevated desert which fills the interior of Arabia. The country is in some parts fertile in wheat, barley, Turkey corn, lentils, grapes, dates, and garden fruits; it also has lead and copper-mines. Rostak is the residence of the Imam of Oman. The harbour of Muscat is important as an emporium.

IV. *Independent States on the islands and borders of the Persian Gulf.*—Almost all the sea-ports in the Persian Gulf, occasionally even some on the Persian coast, are in the possession of Arabic tribes, who for the most part depend on navigation, fishery, and diving for pearls, for their livelihood. Dates, durra-bread, and fish, are their principal articles of food. Each little town has its own sheikh. In time of war, all their fishing-boats are made battle-ships; and as with a navy of this description decisive battles cannot easily take place, the internal contests between the little states continue almost without an interruption. When a Persian army is sent against them, they leave their settlements on the coast, where they have but little to lose, and retire in their boats to some uninhabited island till the troops are withdrawn. Gombroon, or Bender-Abbas, and Abusheher, or Bushire, are the principal sea-ports on the Persian coast. The island of Kharej, or Karek, in the northern part of the gulf, nearly opposite Abusheher, is, through its situation, an important station for eastern commerce. The little island of Hormuz, or Ormuz, in the straits which form the entrance from the Indian Sea into the Persian Gulf, is celebrated from the importance which it possessed while the Portuguese trade with India was flourishing. At no very great distance from Ormuz is situated the large island called Kishme, or Loft, by the Europeans, and Tawile, or Derâz, by the Arabs and Persians. The island, or rather the group of islands called Bahrein, near the western coast of the Persian Gulf, is celebrated for its pearl-fishery. It is said to have been very populous formerly, and to have contained upwards of three hundred and fifty towns and villages. The principal island of the group is known by the name of Awâl. The antient harbour of Gerra is supposed to have been somewhere on the opposite coast of Arabia. (See Strabo, xvi. c. 4, p. 776, Casaub.)

V. The country of *Lahsa*, or *Hajar*, lies along the western shore of the Persian Gulf; the part immediately along the coast is sometimes called Bahrein. It borders on the south on Oman, on the west on the Arabian high-land, and on the north on the territory of the Beduin tribe Kaab, near the Shatt-el-Arab. The greater part of the country towards the interior is occupied by Beduins; the inhabitants along the coast subsist chiefly by the pearl-fishery, or the cultivation of date-trees. The principal towns are Lahsa, the residence of the sheikh, and Katif, a sea-port opposite the Bahrein islands, perhaps near the antient Gerra.

VI. The country of *Nejd* occupies nearly the whole extent of the high-land of Arabia, from Yemen and Hadramaut in the south to the Syrian desert on the north and from Hejaz in the west to Lahsa and Irak Arabi on the east. It is inhabited almost exclusively by wandering tribes of Beduins. The hilly tracts are fertile, chiefly in dates; but rivers, and even the temporary *wadis*, are scarce, and to obtain water deep wells must be dug. The greater part of the country consists of arid deserts. The climate is excessively hot, but the air is pure and salubrious. Besides the moveable tents of the nomadic Arabs, the traveller meets with a number of small villages, irregularly built, but populous, and agreeably situated on the declivities of hills, or in the midst of verdant valleys.

The country of Nejd is at present subject to the Wahhabites, a religious sect, which not long ago threatened by its rapid progress to overthrow the whole Mohammedan community. The founder of this fanatic sect was Abd-al-Wahhâb, a native of Nejd, who lived several years at Basra, and, after visiting Bagdad and Persia, returned to his native country. Here he began to promulgate his religious opinions, which were soon embraced by many of the independent Beduin chiefs. We are still without an authentic and detailed account of the doctrine of Abd-al-Wahhâb; its main tendency seems to be, to reduce the Mussulman faith to a pure deism, by representing Mohammed and his predecessors, Moses, Jesus, &c. not as inspired prophets, but only as enlightened and benevolent men. The capital of the Wahhabite dominion, and the principal city of the whole Arabian high-land, is Dereïye, a town of about 2500 houses, picturesquely situated along the borders of the Wâdi Hanifa. This valley, extending itself from west to east, is several hundred English miles in length, and about one and a half in breadth: during part of the year it is watered by a torrent of rain from the mountains; during summer, the want of irrigation is supplied from the copious wells of the surrounding country. Dereïye has twenty-eight mosques, (but, contrary to the Mussulman fashion, without minarets and cupolas,) and thirty schools, in which the children receive instruction twice every day, except Fridays. The gardens and fields around Dereïye are fertile in dates, pomegranate-trees, apricots, peaches, grapes, melons, &c., also in wheat, barley, and millet. [See Rousseau, in the *Mines de l'Orient*, II., p. 155, &c.]

VII. *Hejaz* borders on the east on Nejd, on the north on the Syrian desert and the Gulf of Akaba, on the west on the Red Sea, and on the south on Yemen. It is the holy land of the Mohammedans, on account of the two sacred cities Mecca and Medina, the former the native town of Mohammed, the latter the place where he is interred. As long as the Grand Seignior of Constantinople, in his character of Protector of the Holy Places, maintained his sovereignty over this important province, he used regularly to appoint a pasha, who resided in the citadel of Jidda, the sea-port of Mecca, with a Turkish guard, and divided the receipts of the custom-house with the sheriff of Mecca, who was considered as his vassal. The dominion of the Grand Seignior was, however, little more than nominal, and the sheriff might very easily have made himself independent long ago, if the existing relations with Constantinople had not been advantageous to the Hejaz, on account of the rich presents annually sent from the Turkish capital to the sanctuary of Mecca, in which all the descendants of the prophet's family throughout the Hejaz, and almost every inhabitant of that town, were allowed, as servants attached to the temple, to participate. But when the power of the Porte in the African and Asiatic provinces became weakened, and when the increasing ascendency of the Wahhabites cut off the communication between Constantinople and the sacred cities, the sheriff of Mecca became disinclined to remain tributary to the sultan. Disputes and open hostilities followed; the sheriff attacked the Turkish pasha at Jidda, destroyed his citadel, and got rid of him by poison. Soon, however, the sheriff found himself besieged by the Wahhabites; and the caravans of pilgrims, which annually proceed from all Mohammedan countries to Mecca, were frequently intercepted, and exposed to constant annoyance from the followers of the new religion. Mohammed Ali, the present viceroy of Egypt, at length succeeded in checking the power of the Wahhabites; he made himself master of the Hejaz, and assumed the protectorship of the holy towns.

'The number of pilgrims,' says Niebuhr, 'who annually assemble at Mecca is very great. One great caravan comes from Damascus, consisting chiefly of pilgrims from the Turkish empire. Another, coming from Egypt, brings along the Mogrebi or African pilgrims; both meet at a few days' distance from Mecca. Another caravan arrives from Bagdad, with which most of the Persian pilgrims travel. Two smaller caravans come from Lahsa and Oman, besides a separate company of pilgrims from Yemen, and numberless smaller crowds which arrive direct by sea from Persia, the southern and eastern parts of Arabia and the adjacent islands, from India, the Arabian colonies on the west coast of Africa, &c. Only a few pious Mohammedans perform the pilgrimage out of real devotion, and at their own expense; most of the pilgrims undertake the tour with a view to profit. Some accompany the caravan as soldiers, and are remunerated for the protection which they afford to the pilgrims against the attacks of the warlike Beduins; some are pilgrims by profession, and are paid to perform the sacred journey for others, who are prevented from discharging this religious duty personally.'

The principal towns of the Hejaz (Mecca, Medina Jidda) have already been alluded to. Besides these, we may mention Yanbo, the sea-port of Medina; Tayef, which is agreeably situated upon a lofty eminence, and supplies Jidda and Mecca with excellent fruits; Ghunfude, and Hali.

VIII. *The desert of Mount Sinai*, including the Arabia Petræa of the antients, once the seat of the Nabathæan dominion, is now nearly desolate, and contains but few towns; the open country is entirely in the hands of the independent Beduins. The group of the Sinai mountains is the last considerable elevation towards the north-west of the mountains which form the high-land in the interior of Arabia. It nearly fills a peninsula projecting into the Red Sea, having the Gulf of Akaba on the east, and that of Suez, called also the Gulf of Kolzum, on the west. At the northern extremity of the eastern gulf is situated the antient town of Aila, the Elath of Scripture (Deut. ii. 8; 1 Kings ix. 26; 2 Kings xvi. 6), now commonly called Akaba. At the northern extremity of the western gulf lies the town of Suez, one of the few safe and spacious harbours in the Red Sea where ships can be repaired: it is now of secondary importance, as the traffic by sea between Egypt and the Hejaz is chiefly carried on from Kosseir; yet the trade in coffee and Indian goods still passes by Suez to Kairo. On the eastern side of the gulf of Suez is another good harbour called Bender-Tor, where the ships trading between Jidda and Suez are in the habit of anchoring to take in fresh water, which the neighbouring mountains supply of excellent quality. In the Sinai mountains we find sandstone, and on the highest parts granite. In the midst of the hills, on the height of Jebel Musa, surrounded by higher mountain-tops, and near the summit considered as the proper Sinai of Scripture, is situated the convent of St. Catherine, founded, according to the credited tradition, by Helena, the mother of Constantine, in the fourth century. Jebel Musa is rich in springs of fresh water; the surrounding valleys produce excellent grapes, pears, dates, and other fruits, quantities of which are brought for sale to Kairo. Wadi Faran, or Feiran, with its continuation Wadi-el-Sheikh, and Wadi Girondel, both to the north of Jebel Musa, and sloping towards the gulf of Suez, are filled with water during the rainy season, which obliges the inhabitants then to retire up the hills.

Towards the north of the group of Sinai is a desolate tract, called by the Arabs El-Ti, or Tiah-Bani-Israïl, *i.e.* the desert of the children of Israel. Abulfeda (*Descript. Ægypti*, p. 14, ed. Michaelis) states its dimensions from hearsay at forty parasangs in length, and as much in breadth, the soil being partly rocky and hard, and partly sandy, with now and then a well of brackish water. This account is fully confirmed by Burckhardt, who describes it as the most dreary and barren wilderness that he ever met with.

To the north of the Gulf of Akaba, in the hilly district of Jebel Shera, at a distance of about seven hours from Shobak, or Kerek-al-Shobak, its capital, the Wadi Musa opens itself, watered by the copious spring of Aïn Musa. In this valley, below the village of Eldjy, Burckhardt discovered the magnificent ruins of a town which he, no doubt correctly, supposed to be the antient Nabathæan capital Petra. 'The metropolis of the Nabathæi,' says Strabo, (book xvi., c. 4, p. 403, ed. Tauchnitz; Casaub. p. 779,) 'is a town called Petra. It is situated in a place which itself is smooth and level, but which is all around fenced by a circle of rocks, and on the outside consists of precipitous cliffs, while towards the interior it has copious springs for the watering of fields and for horticulture.' Pliny (N. H. vi., c. 28) describes Petra as situated 'in a valley somewhat less than two thousand paces wide, inclosed by inaccessible mountains, with a stream running through it.'

IX. *Tribes of Beduins, or Wandering Arabs.*—The word *beduin* is a corruption of the Arabic *badwi*, which is derived from the substantive *badw*, 'an open country, a desert,' and signifies an inhabitant of the desert. The Arabs who live in towns, Niebuhr observes, especially those near the seacoast, have through their commerce had so much intercourse with strangers, that they have lost much of their antient manners and customs. But the true Arabs, who have always valued their freedom higher than wealth and luxury, live in detached tribes under tents, and still adhere to the primitive form of government, habits, and usages of their ancestors. Their nobles they call sheikhs. A sheikh rules over his family, and all their servants. If they are unable separately to defend their property against a hostile neighbour, several petty sheikhs unite, and choose a chief from among themselves. Several chiefs, with the assent of the petty sheikhs, submit to one still more powerful, who is called sheikh-al-kebir, or sheikh-al-shoyukh, and the entire body of united tribes is then named after the family of this supreme sheikh. The Beduins are all, as it were, born soldiers, while at the same time they attend to their cattle. The sheikhs of the great tribes have a large number of camels, partly for use in time of war, partly to transport the goods of merchants from one town to another, and partly for sale. The smaller tribes, which are less wealthy and independent, principally tend sheep. Agriculture, and other descriptions of hard work, they commit to their subjects, the common Arabs, who live in miserable huts; the sheikhs live under tents. Being accustomed to an atmosphere of great purity, the scent of these Arabs of the desert is uncommonly nice. It is said, they are able to live for five days without drinking. The government remains in the family of every greater or smaller sheikh: among the sons or nearest relations, not the eldest, but he who appears the best fitted, is chosen. They pay little or nothing in the way of taxes to their superiors. Every little sheikh is not only the protector, but also the leader of his family; he is, accordingly, looked upon by the greater sheikh rather as a confederate, than as a subject. If one of the little sheikhs is dissatisfied with his sheikh-al-kebir, and is nevertheless unable to depose him, he will remove with his cattle to another tribe, which is usually glad to strengthen its party. Every sheikh, however small he may be, must therefore endeavour to govern his tribe well, for fear of being deposed or deserted. The names of many tribes, once possessing great power, have thus fallen into oblivion; and small families, unknown before, have raised themselves to importance.

The Beduins have never been subjugated by foreign conquerors: only a few tribes who live near the large towns of Bagdad, Mosul, Orfa, Damascus, and Aleppo, are in some degree subject or tributary to the Grand Seignior. The several tribes are often at war with one another; but their conflicts are neither of long duration nor sanguinary. Whenever any tribe is attacked by a foreign enemy, all the neighbouring chiefs will unite in defence of the common cause. Every sheikh considers himself as sovereign in his territory, and therefore entitled to exact a tribute from travellers passing through it. The Turkish sultans even used to engage themselves to pay annually a fixed sum of money, besides a number of garments, to the Beduin tribes on the road to Mecca, for not destroying the wells along the way, and for conducting the pilgrims through their respective territories. Nevertheless, disputes frequently arose between the sheikhs and the haughty Turkish leaders of the caravans, in consequence of which the pilgrims were often attacked and plundered.

The sheikhs are daily mounted on horseback or on their dromedaries, to inspect their subjects, to visit friends, or to enjoy the pleasures of the chase. The horizon in the desert is nearly as open as at sea. If a Beduin sees a solitary wanderer from afar, he rides towards him, and orders him to undress. In such cases, the Beduins are real robbers; yet it would be incorrect to say that they live chiefly from robbery. They seldom kill those whom they plunder, provided no resistance is offered; the robber is sometimes even kind and hospitable to the forlorn traveller whom he has plundered, furnishing him with provisions and old clothes in exchange for his own, and conducting him part of his way, that he may not perish in the desert.

The tents of the Beduins are made of a coarse kind of dark coloured cloth, woven by their own women, which is drawn over seven or nine poles fixed upright in the ground, the middlemost being the highest. The larger tents consist of two or three compartments, so as to have separate rooms for the men and women, and for the domestic animals. The poor, who cannot afford the expense of a regular tent, spread a piece of cloth, as large as they can get, near a tree, or take shelter in the caves of rocks from heat or rain. There is but little furniture in a Beduin tent: a mat of straw is used as table, chairs, and bedstead; spare clothes are kept in bags. The kitchen apparatus is very simple and portable. The pots are made of copper lined with tin; the dishes of the same metals, or of wood. Their hearth is easily built, they merely place their cauldrons on loose stones, or over a pit dug in the ground. They have neither spoons, nor knives and forks. A round piece of leather serves them as table-cloth, in which the remains of the meal are preserved. Their butter, which the heat soon melts down, they keep in leather bottles. Water is kept in goats' skins: a copper cup, carefully tinned over, serves as a drinking-vessel. Wind mills and water-mills are unknown; all grain is ground in a small hand-mill. There are also no ovens in the desert: the dough is either kneaded into a flat cake, and baked on a round iron plate, or it is formed into large lumps, which are laid between glowing coals till they are sufficiently baked. Among the great sheikhs of the desert, who require nothing but pilau—*i.e.* boiled rice—for their meals, a large wooden dish full is served up, around which one party after another sits down, till the dish is emptied, or all are satisfied. (*Niebuhr, Beschreibung von Arabien*, p. 379, &c.; also *Reise nach Arabien*, vol. i., p. 233.)

Ancient Arabia, as known to the western nations.—The history of antiquity is not without traces of an early influence of the Arabs on the condition of neighbouring nations. The book of Genesis (x. 10) mentions Nimrod as the founder of the Babylonian empire—'And the beginning of his kingdom was Babel and Erech, and Accad and Calneh, in the land of Shinear.' We think we recognize in Nimrod, the mighty hunter, an Arabian chieftain, like the modern sheikhs of the Beduins: in the passage quoted from the Hebrew, Erech is, according to several of the antient versions, the modern Orfa (Edessa); Accad is supposed to be Nisibis, in Mesopotamia; and Calneh to correspond to the situation of Ctesiphon on the Tigris.

Egypt seems at an early period to have been infested by invasions from Arabia; for we cannot hesitate to consider the Hyksos as predatory Arabian tribes. They are said to have occupied the Delta, and even to have penetrated as far as Memphis: the king of Thebes, Thutmosis, at last succeeded in expelling them. Their dominion over Egypt is said to have lasted 284 years—it is supposed from the eighteenth till the sixteenth century before the Christian æra. Sesostris is said to have built a wall, 1500 stadia long, from Pelusium to Heliopolis, to protect Egypt from a repetition of such invasions; but this story about the wall is open to several serious objections.

Among the nomadic tribes in the northern tracts of Arabia, the Midianites seem to have early applied themselves to traffic with the neighbouring nations. It was a caravan of Midianite merchants to whom Joseph was sold (Gen. xxxvii. 28, 36). Arabia was the country of frankincense; and so essential a requisite of religious worship in all the temples of antiquity would soon give great importance to the trade of foreign countries with Arabia. Gerra, probably situated near the present El Katif or Lahsa, was, according to Strabo, a Babylonian colony, founded by Chaldæan emigrants. The exact period of its foundation is unknown; but the companions of Alexander the Great found it as an opulent town (Strabo, xvi. c. 3. p. 766, Casaub.), and it must have been long prospering as an emporium. The advantages for an extensive commerce by land and by sea, possessed by a harbour thus situated on the spacious Persian Gulf, are striking. From Gerra the productions of both Arabia and India were shipped to Babylon, and farther up the Euphrates to Thapsacus, whence they spread by land all over western Asia.

Considerable variety of opinion prevails concerning the situation of Ophir, the country whence the ships of Solomon, conjointly with those of the Phœnicians, brought gold, silver, gems, sandalwood, and other precious articles (1 Kings ix. 28; x. ii. 22). Bochart, Reland, and other critics sought it in India. Modern historians are inclined to think that it was situated in Arabia. The name is, in the book of Genesis (x. 29), enumerated among Arabian tribes descended from Joctan, and a town named El-Ofir has recently been found on the coast of Oman. (*Bohlen's Indien*, ii. p. 137.)

In the history of antient commerce generally, Arabia is of importance not only on account of the export of its own productions, but also as an intermediate station in the trade with India. Herodotus (iii. 107) calls Arabia the only country where frankincense, myrrh, cassia, and ladanum are to be found: Strabo (xiv. c. 4, tom. 3. p. 385, ed. Tauchnitz) mentions the province of Cattabania in particular as the country of frankincense, and Chatramotitis (Hadramaut) as that of myrrh. Gold and precious stones are also often alluded to by the antients as indigenous productions of Arabia Felix. Gold-mines are not at present known to exist: some precious stones, such as the onyx, the ruby, and a kind of agate called the Mokha-stone, are common in Yemen and Hadramaut. In enumerating cinnamon among the productions of Arabia, Herodotus probably confounded the real productions of the country with the other foreign articles, which, like ivory and ebony, the western nations might procure from Arabian emporia.

Antiquity abounds in proofs of the early trade of the Phœnicians with India, which must in a great measure have been carried on through Arabia. One of the earliest and most important allusions to this mercantile intercourse of the Phœnicians with several towns or countries and tribes of Arabia, occurs in the elegy of the prophet Ezekiel on the fall of Tyre. We insert a literal translation of the passage, leaving the proper names in their Hebrew forms, and subjoining to each, between parentheses, the probable modern or classical equivalent.

Ezek. xxvii. 12. 'Tarshish (Tartessus) was thy (Tyre's) customer, on account of the variety of all [thy] treasures: silver, iron, tin (*bĕdîl?*), and lead did they (the merchants from Tarshish) place on thy markets.

13. Yavan (Greece), Thubal (the Tibareni in Pontus), and Meshech (the Moschi between Armenia, Iberia, and Colchis) dealt with thee: souls of men (slaves), and copper vessels did they bring on thy markets.

14. Those from the house of Thogarma (Armenia) brought on thy markets horses for draught and horses for war, and mules.

15. The sons of Dedan (according to Bochart, a town on the Persian Gulf; according to Heeren, one of the Bahrein islands; why should it not be here, as elsewhere, the tribe in the neighbourhood of Idumea?) dealt with thee; many islands transacted business with thee: with ivory and ebony did they repay thy gifts.

16. Aram (Syria) was thy customer on account of the variety of thy manufacture: [in exchange] for gems, and red purple, and embroidery, and byssus, and corals, and crystal [which Aram brought] on thy markets.

17. Juda and the land of Israel dealt with thee: wheat of Minnith (a town in the land of the Ammonites), and sweetmeats, and honey, and oil, and balsam did they place on thy markets.

18. Damesek (Damascus) was thy customer, on account of the variety of thy manufactures, and on account of the variety of all [thy] treasures: [in exchange] for wine from Chelbon (Haleb, Aleppo) and shining wool [which Damesek brought in return].

19. Vedan and Yavan (both here Arabian towns or tribes not yet ascertained) brought weavings on thy markets: wrought iron, cassia, and calamus hadst thou for sale.

20. Dedan (a tribe in the neighbourhood of Idumæa) dealt with thee in carpets that are spread to sit upon.

21. Arab (Arabia) and all the chiefs of Kedar (the Arabes Cedreni of Pliny) were transacting business with thee: they were thy customers with their lambs and rams and he-goats.

22. The tradesmen of Sheba (Sabæa in Arabia Felix) and of Raĕma (the Rhegma of Ptolemy, on the Persian Gulf) dealt with thee: the choicest of all spices, and all [sorts of] precious stones, and gold did they bring on thy markets.

23. Haran (Carrhæ, the modern Harran in Mesopotamia) and Canneh (= Calneh, *i.e.* Ctesiphon?) and Eden (probably the Ma'adan of Syrian writers, in the province of Diarbekir), the tradesmen of Sheba (Sabæa), Ashur (Assyria), and Kilmad (not yet ascertained) dealt with thee.

24. They dealt with thee in rich garments, in crimson and variegated cloth, and in chests full of many-coloured weavings, tied with ropes, and firm, [which they brought] on thy markets.'

Professor Heeren, in his valuable work on antient commerce, (*Ideen*, &c. vol. i. part ii. p. 102, &c., fourth edit.), has adopted the interpretation of J. D. Michaelis, according to which, by the first three names in verse 23, three great Arabian harbours on the coast of the Indian Sea are to be understood. This we think improbable, since almost all the other names which can be traced with some degree of certainty belong to northern countries; besides the special evidence in favour of the identity of at least Haran with Carrhæ. To arrive at a precise conclusion as to the exact import of many of the names mentioned by the Hebrew writer, is perhaps the more hopeless, as it is clear enough, from the context, that the Phœnician merchants (in the same manner as the Nabathæans afterwards) did not resort to the places personally, but received their goods from thence by foreign caravans: thus the name and situation of the countries whence the several articles came would be less attended to than if the case had been the reverse.

Besides this caravan trade with the Phœnicians, the intercourse of the antient Arabs with the western world seems to have been but scanty, and, accordingly, the accounts of Arabia given by the classical writers are imperfect. The intrepid valour of the Arabs was proverbial among the Greeks and Romans. The body of the nation has escaped the dominion of the most powerful monarchies that have arisen and fallen in its immediate neighbourhood. Of the antient Persian empire, Herodotus (iii. 88,) expressly mentions, that all nations of (western) Asia were subject to Darius Hystaspis, except the Arabs, who were the independent confederates of the Persians: and when Cambyses had formed the design of invading Egypt, he was obliged to seek the friendship of some Arabs, who engaged to supply the Persian army with water during its march through the sands of Arabia Petræa. (Herodot. iii. 7-9.) If Phul, the conqueror of the new Assyrian empire, is said to have subdued the Arabs, or if Sanherib is called the ruler of Assyria and Arabia, this can only be understood as applying to the northern tribes of Arabia.

Alexander the Great is said to have contemplated the circumnavigation of Arabia and the subjection of its predatory hordes. The fleet of Nearchus was preparing to make the circuit of the peninsula, when the death of Alexander prevented the execution of the design.

The Nabathæi (*Nebaïoth*, Gen. xxv. 13; xxviii. 9; Isa. lx. 7) inhabited, according to Diodorus (ii. 48), the north eastern part of Arabia, which was subsequently, in allusion to the name of their capital Petra, called Arabia Petræa. Diodorus describes them as a valiant nation, safe in their deserts as in an asylum, where none but themselves knew the springs of water. Like other Beduin tribes, they subsisted in a great measure by predatory excursions: but they seem at an earlier age than their neighbours to have applied themselves to an independent traffic, and in consequence also to other occupations of peace. 'Some of them,' says Diodorus, 'make it their business to transport to the Mediterranean frankincense, myrrh, and other spices, which they obtain from those that bring them from Arabia Felix.' Their territory was repeatedly invaded by the states arising out of the Macedonian empire. Demetrius, the son of Antigonus, and afterwards Antiochus the Great (224-187 B.C.), attacked them without success. The Nabathæans maintained their independence, and their trade flourished even more than previously. After Syria had become a Roman province (64 B.C.), its governors Scaurus and Gabirius repeatedly threatened Petra with an invasion. In the reign of Augustus, Ælius Gallus is recorded to have conducted an expedition into Arabia Felix, in which Obodas, then king of Petra, assisted him with a thousand Nabathæan Arabs. The Roman army landed at Leukekōme (Yanbo), and after a fatiguing march of several months reached Marsyabæ (Strab. xvi. c. 4, p. 407, Tauchnitz), the capital of the Sabæans. But want of provisions, and the bad effects of the climate, compelled the invaders to a speedy retreat to the coast, and over the Red Sea to Egypt. It is to this expedition that Propertius (ii. 8) alludes in the lines:

> 'India quin, Auguste, tuo dat colla triumpho,
> Et domus intactæ te tremit Arabiæ.'

In the reign of Trajanus, Arabia Petræa became, through the victory of A. Cornelius Palma, a Roman province (A.D. 107), and the northern countries, towards the east of the river Jordan, formerly in the possession of the Nabathæans, continued to be subject to the Romans even after the death of Trajanus. A Roman legion was stationed at Bostra, and the Emperor Philippus, who was born here, hence received the surname of *Arabs*. Petra sunk into insignificance: its inhabitants deserted it, and sought the freedom of their deserts; even the place where it had flourished was forgotten; till, in our own time, Burckhardt discovered the ruins of Wadi Musa.

History of the Arabs.—Of the internal history of Arabia before Mohammed, our knowledge is very imperfect. Prior to the beginning of the third century of the Christian æra, all that has been transmitted to us by Arabic writers amounts only to some genealogies or lists of kings, without any fixed chronology, and interspersed with but a few facts unsatisfactorily recorded.

The Arabians are, by their own writers, (Abulfaraj, *Hist. Dynast.* p. 100) distinguished into two classes, the old and the modern tribes. As belonging to the old Arabians, which are now entirely extinct, we find enumerated the tribes of Ad, Thamud, Tasm, Jadis, the (antient) tribe of Jorham, and Amalek. The names of these tribes now only survive in vague traditions. thus Sheddad, of the tribe of Ad, is said to have founded the magnificent city and the delicious garden of Irem, which are often alluded to in eastern poetry, and fancied by some to be still extant, though now miraculously hidden from view in impassable deserts. The present or modern Arabians are, by their own historians, divided into pure or genuine, and insititious or naturalized Arabs. the former date their origin from Kahtan (the Yoktan of the Old Testament, Gen. x. 28), and the latter from Adnan, a descendant of Ismael, the son of Abraham and Hagar. These Ismaelide Arabs seem to have settled chiefly in Hejaz; while the southern part of the peninsula received its inhabitants through the Kahtanides or Yoktanides. Kahtan's son was Ya'rab, who was the father of Yash'ab; the son of Yash'ab was Abd-al-shams, (or according to some, Amer,) surnamed Saba. This Saba had a great number of sons, two of whom, Himyar (pronounced by some Homeir) and Kahlan, had a numerous progeny. The family of Himyar, it appears had, during 2020 years, the general government over all the descendants of Saba who were settled in Yemen, whence the name of the Himyarides (or Homeritæ) was sometimes taken by foreign nations as synonymous with that of Sabæans. Himyar was, according to Arabian authors, the first king of the family of Kahtan that wore a crown. He is said to have governed fifty years. The only fact which we find recorded of him is, that he expelled the tribe Thamud from Yemen into Hejaz. Various reports exist as to Himyar's successor: according to some it was his son Wathel; according to others his brother Kahlan: probably Wathel succeeded him in Yemen, and Kahlan in Hadramaut. Similar variations in the lists of kings given by different authors (Abulfeda, Hamza of Isfahan, Nuweiri, Masudi, &c.) are observable throughout the antient history of Yemen. Among the succeeding rulers, Al-Hareth-al-Rayesh is distinguished as the first conqueror among the kings of Yemen; he also first received the title of Tobba, *i. e.*, 'successor,' which became hereditary in his line. Dsu'l-manar Abraha and his son Dsu'l-adsar are reported to have made conquests in Nigritia and other parts of Africa. The next sovereign but one in succession after Dsu'l-adsar is queen Balkis, according to Arabian authors, the queen of the Sabæans who visited Solomon (1 Kings x. 1, seq.; 2 Chron. ix. 1. seq.). Many generations after Balkis, in the reign of Akran, an event occurred which forms an important epoch in the history of Arabia. Impetuous mountain-torrents used frequently to destroy the labours of agriculture in the plains of Yemen, till some antient king (according to some, Lokman, according to others, Himyar himself) opened channels which brought the waters to the sea, constructed an immense dike or mound between two hills just above the capital Mareb (or Saba), which prevented sudden inundations, and from the reservoir thus formed, supplied the gardens and fields below, through aqueducts, with the necessary irrigation. The country around Mareb had thus become fertile and happy; but its prosperity depended on the preservation of the mound, which in the lapse of time fell into decay. Its final ruin is one of the few facts in the antient history of the Arabs, the period of which can with some degree of probability be ascertained. According to De Sacy, it occurred about the beginning of the third century. This event, which is in oriental writers designated by the name of *Seil-al-Arim*, i. e., 'the Torrent of the Mound,' caused a great change in the whole peninsula. Amru ben Amer, surnamed Mosaikiya, one of the nobles of the country, perhaps the chief of the Kahlanides, had been previously warned of the imminent danger; he sold his estates, and with a number of families quitted Yemen and went into the country of Acc. After the death of Amru, the emigrant families separated, and settled in different countries. The family of Amru's son, Jofna, established itself in Syria, and founded the kingdom of the Ghassanides in the desert S.E. of Damascus, which embraced the Christian religion, and formed part of the Roman or Grecian dominions; till, in the reign of the caliph Omar, it was incorporated in the Mohammedan empire. The tribes of Aus and of Khasraj, descended from Amru by his son Thalaba, went to Yatreb (afterwards called Medina). The descendants of Azd settled partly in Oman, and partly in the country of Sherat in Syria; Malec ben Fahm, also of the family of Azd, established himself in Irak, and founded the kingdom of Hira, which was governed during 597 years by a succession of twenty-five kings, who at last became vassals to Persia; till, in the caliphat of Abu Bekr the country was subjected to the Mohammedan dominion. The tribe of Taï, which had left Yemen soon after Amru ben Amer, settled in the Nejd, between the mountains of Aja and Solma, since called the mountains of Taï. The family of Rebia, grandson of Amru, settled at Mecca, and received the name of Khozaa.

In the series of the Himyaride kings that ruled over Yemen after Akran and the Seil-al-Arim, there is almost as much confusion as in the earlier part of it. We shall not enter into an enumeration of the names, but refer the reader to the dissertation of De Sacy, *Sur divers évènemens de l'Histoire des Arabes avant Mahomet*, in the fiftieth volume of the *Mémoires de Littérature of the French Academy*, and to Johannsen's *Historia Jemanæ* (Bonn. 1828).

The fountain Zemzem and the black stone in the antient temple of Mecca, called the Caaba, had, from immemorial time, been regarded by the Arabs as national sanctuaries. The (modern) Jorhamides, descended from Jorham the son of Kahtan, had established themselves in Hejaz about the same time that Ya'rab settled in Yemen, and had for many ages been the hereditary protectors and keepers of the Caaba; when Amru ben Loheia of the tribe Khozaa, with the Yemenese emigrants from Acc, and assisted by the tribe of Bekr, availed himself of the opportunity of a dispute between the Jorhamides and the neighbouring Ismaelides, to expel the former from Mecca, and take possession of the sanctuary. Soon, however, the tribe of Bekr felt indignant at being excluded by a stranger from the governorship over the Caaba, which honour, after the services they had rendered, they considered due to themselves. They entered into a treaty with Kossaï of the Ismaelide tribe of Koreish, and by his assistance compelled the tribe of Khozaa to resign the charge which it had assumed. But the tribe of Bekr was again excluded from the guardianship of the temple, which came through Kossaï into the hands of the tribe of Koreish. It is calculated that this happened about A.D. 464.

The grandson of the Koreishide Kossaï was Hashem, who is reported to have averted a famine by giving up his treasures. His son Abd-al-Motalleb is famous for his victory over Abraha, an Æthiopian ruler of Yemen, and a Christian, who approached Mecca with an army and several elephants, intending to destroy the Caaba. A miracle is said to have preserved the sanctuary, and to have destroyed the army of Abraha. The year of this victory is in the chronicles of the East named the 'Year of the Elephant,' in allusion to the elephant on which Abraha was mounted, which suddenly refused to proceed farther when the army was approaching the sacred city: it is the year 571 of our æra. Another event rendered it still more universally memorable; for in it Hashem's grandson, Abdallah, became the father of the Arabian prophet Mohammed.

Yemen had since the Seil-al-Arim become temporarily subject to foreign power. The Jews, who since the destruction of Jerusalem had in great numbers retired into Arabia, had made proselytes of several Arabian tribes, particularly those of Kenana, Kenda, and Hareth ben Kaaba, and had already gained considerable power in some parts of the peninsula. Dsu-Nowas, who occupied the throne of the Himyarides towards the close of the fifth century, adopted their religion, and began cruelly to persecute all those who would not follow his example. Christianity had about the same time found its way into the southern parts of the peninsula, and had become the religion of the tribes of Himyar, Ghassan, Rebia, Tagleb, Bahra, Tanuh, Taï, and Kodaa, besides the inhabitants of Hira and of Nejran. The inhabitants of Nejran in particular were suffering from the atrocious cruelty of Dsu-Nowas, when the Negus of Habesh came to the assistance of his persecuted fellow Christians. The Jewish Arabs were vanquished; Dsu-Nowas, in despair, sought a voluntary death by throwing himself into the sea, and Yemen became an Æthiopian province. This Æthiopian occupation of Yemen became of a melancholy importance to the civilized world through the small-pox which the victors brought with them into Arabia, and which, by the conquests of the Mohammedans, soon spread all over the earth. In consequence of a revolt among the Æthiopian occupants, Abraha came in A.D. 549 to the command of Yemen. He endeavoured with great zeal to spread Christianity among the Arabs, and with this view built a church at Sana which he intended should, as a place of pilgrimage, vie with the ancient Caaba. The heathen Arabs, indignant at this measure, profaned the new-built church, and Abraha, to avenge the insult, resolved on an expedition against Mecca, the failure of which (A.D. 571) has already been alluded to. After a reign of twenty-three years, Abraha was followed by his sons Yeksum (572-589) and Masruk (589-601). During the reign of the latter, Seif ben Dsi-Yezen, an offspring of the antient royal Himyaride family, obtained the assistance of a Persian army under Wehraz, with the aid of which he put an end to the Æthiopian power, after it had lasted about 72 or 73 years. Yemen was now governed by Persian prefects, till it became subject to the Mohammedans, when the last of the prefects, Badsan, embraced the Mussulman faith.

The Arabs before Mohammed, like those of the present day, partly dwelt in cities, and partly as wandering tribes in moveable encampments. The inhabitants of cities subsisted by agriculture and by different trades, especially by commerce, in which the tribe of Koreish appears early to have distinguished itself. The wandering Arabs employed themselves in the breeding and tending of cattle, and occasionally in the pillage of travellers. The picture exhibited by antient poets (especially in the romance *Antar* by Asmaï) of their customs and mode of life, entirely corresponds to the representation which modern travellers make of the manners of the present Beduins. The elements forming the sphere of their life are so simple, and their habits so closely adapted to the nature of their country, that the lapse of time can work no perceivable change in their social state. Hospitality, expertness in the use of arms, horsemanship, and eloquence in his own copious and energetic language, were of old, as they still are, the accomplishments on which the Arab valued himself most.

With respect to the religion of the antient Arabs, our information is very imperfect. As they were ranging their trackless deserts beneath the concave of unclouded skies, they seem to have been early led to the worship of the heavenly luminaries. The tribe of Himyar is said to have chiefly worshipped the sun; Kenana, the moon; Taï, the fixed star Sohail (Canopus); Misam, the star Aldebaran, &c.; Saba, the ancient capital of Yemen, had a temple built in honour of the planet Venus; the temple of Mecca was, according to some, originally consecrated to Saturn; and Abd-al-Shams, *i.e.*, 'Servant of the Sun,' is a name occurring several times in the fragments of Ante-Islamitic history. The Koran alludes to three female deities: Allat, (see Herod. iii. 8,) adored by the tribe of Thakef, whose temple, at Nakhla, was destroyed by Mogaira in the ninth year of the Hejra; Al-Uzza, adored by the tribes of Koreish and Kenana, under the form of a tree; and Menat, the goddess of the tribes of Hudseil and Khozaa. Two other deities, Asaf and Naïla, were adored by the tribe of Koreish, the one under the form of a man, and the other under that of a woman. Five more are noticed, which were worshipped under various human and animal shapes, besides a number of inferior idols, belonging to particular families. Among the tribe of Temim, in the Persian Gulf, the Persian fire-worship is said to have been introduced. The idea of goblins and fairies, some of a terrific, some of a mild and placid character, was early associated with the loneliness of the deserts. Fortune-telling, necromancy, astrology, and sorcery, were early at home in Arabia.

Such was the condition of the Arabs about the beginning of the seventh century. A few small provinces in the north had, like the neighbouring countries of Syria, Palestine, and Egypt, become subject to the Grecian empire, while those bordering on the Euphrates acknowledged Persian supremacy, and an Æthiopian dynasty ruled temporarily in the south. The great mass of the country remained free, and probably even ignorant of these slight encroachments of foreign dominion. The Arabs, long celebrated for their valiant and intrepid character, had never yet been united by a common tie into one mass. Their wandering tribes, without fixed mutual relations, scattered over a vast extent of land, and often engaged in transitory feuds among each other, continued to enjoy unlimited independence. The union of these tribes into a nation, and the greatness of that nation as a link in the chain of historical events, dates from the promulgation of the Islam by Abu'l-Kasem Mohammed. The noble inspiration, the firm belief in the truth and divine origin of the new religion, and the intrepid courage which animated the prophet and his successors, the natural inclination of the Arabs towards war and perilous undertakings, the weakness of the neighbouring governments, and the precept of the Koran, which enjoined the propagation of the Islam, and war against the unbelievers as a religious duty,—spread within a century the dominion, the faith, and even the language of the Arabs, from the Atlantic Ocean to the Indus, and from the Indian Sea and the African Deserts to France, the Mediterranean, Asia Minor, and the Caspian Sea.

Mohammed was born in the tribe of Koreish, at Mecca, according to some on the 10th of November, 570, according to others on the 21st of April, 571, P.C. In his twentieth year he took part in an expedition against predatory hordes which then molested the pilgrims on their way to Mecca. Five years later he visited the fair of Damascus as the agent of Khadija, a rich widow, whom he subsequently married. In the fortieth year of his age (A.D. 610) came the *Leilat-al-Kadr*, i. e. 'the Night of the Divine Determination,' in which, the Mohammedans believe, the angel Gabriel called him to become the prophet of God. Khadija his wife, his cousin Ali ben Abi Taleb, and his father-in-law Abu-bekr, were the first who acknowledged his divine mission. Twelve years had elapsed, when a revolt at Mecca threatened the life of Mohammed. The day of his flight to Yatreb (since called Medina or Medinat-al-nabi, *i. e.* 'The Town of the Prophet'), the 16th of July, 622, has become the æra from which the Mohammedans count their years. With it commenced a war against the opposers of the new religion. When Mecca was conquered, when the tribes of Arabia joined in the profession, that 'There is no God but Allah, and Mohammed is his apostle,' the prophet commanded to spread the Islam over all countries, and to unite into one community, by conquest or by faith, all the nations of the earth. Mohammed died at Medina, the 8th of June, 632, in the sixty-third year of his age. [See MOHAMMED.]

The Byzantine empire had just then been engaged in a long conflict with Persia. The despotism of its rulers, frequent though inefficient revolutions, and constant efforts for the repression of foreign enemies, the low state of the finances, notwithstanding an oppressive taxation, and the discord of contending religious sects, had exhausted its strength. The Persian empire had sunk still lower: the superannuated doctrine of Zoroaster could no longer animate its followers in the contest against a religion defended and propagated by a new nation with all the vigour and enthusiasm of youth. This weakened state of the two principal neighbouring empires favoured the quick progress of the Arabian conquests. Whoever adopted the Mohammedan faith became embodied in the new state, and was no longer regarded as a stranger. Jews and Christians were tolerated, but required to pay a tribute: death awaited the followers of other religions. The supreme pontificate and worldly command were united in the person of Mohammed's successors, the caliphs. Many of these were individually weak; but their authority and the might of the empire were supported by a religious belief which was rooted deeply in the mind of the nation.

The history of the first century of the caliphat exhibits an almost continuous series of conquests. In the reign of Abu-Bekr, the valiant Khaled conquered the whole of Syria and Mesopotamia; in that of Omar the victories of Amru ben As added Egypt to the Arabian empire; after a siege of fourteen months, Alexandria was taken; Memphis fell, and Amru laid in the neighbourhood of its ruins the foundation of Fostat, the present Old Cairo. The conquest of Egypt was soon followed by that of Cyrenaica and the other states along the coast of the Mediterranean: congenial habits united the Berber hordes of Africa with the sons of the Arabian Desert. The victories won by Saad ben Abi-Wakkas over the Persian forces near Cadesia (635), Jalula (637), Holwan and Nehawend (642), decided the fall of the Persian throne. Under Osman, the island of Cyprus was plundered (648); Abdallah ben Amer conquered Khorasan, and penetrated as far as Balkh. The reign of Ali ben Abi-Taleb was spent in the quelling of internal commotions, which ended in the murder of the caliph by the hand of the fanatic Abdorrahman ben Moljam, and the accession of the Ommaiades to the caliphat.

Moawiya, the first of the Ommaiade caliphs, removed the residence of the empire from Kufa, near the Euphrates, to Damascus. In his reign Okba ben Nafi laid the foundation of Kairwan (675), and penetrated as far as Tanger and the Atlantic. Okba was murdered when he was preparing to pass over into Spain, in consequence of which many of the provinces conquered in these distant regions were lost again; but after a few years (688), the entire northern coast of Africa, as far as the Straits of Gibraltar, was in the possession of the Arabs. In the reign of Walid I. (705-715), the dominion of the Arabs attained its widest extent. Julianus, the governor of Ceuta, incensed, it is said, against his sovereign, king Roderic of Spain, who had disgraced his daughter, surrendered Algeziras (Jezirat-al-Khadra, 'the Green Island,') into the hands of the Arab Tarik ben Ziad, who, at the command of the African governor Musa ben Nosair, landed at the promontory which still bears his name (Gibraltar, corrupted from Jebel Tarik, the mountain of Tarik), vanquished Roderic in the battle of Xerez de la Frontera (19 July, 711), and in a short time subjected the greater part of Andalusia, Granada, and Murcia to the Mohammedan power. In the East, Koteiba ben Moslem, the governor of Khorasan, took possession of Mawaralnahr, Bokhara, Turkestan, and Khowarezm; and Mohammed ben Kasem-al-Thakefi made conquests in the northern parts of India. Under Soleiman (715-717) the greater part of Asia Minor was conquered, and Constantinople besieged; and in the reign of Omar ben Abd-al-Aziz (717-720) the countries of Jorjan and Tabaristan were added to the empire. But the want of energy of the latter caliph, as well as of his successor, Yezid II. (720 724), and the avarice of Hesham (724-743), roused a spirit of dissatisfaction in the interior, and encouraged the revolutionary attempts of other aspirants to the caliphat. It was in the reign of Hesham that the arms of the Musulmans experienced their first signal defeat; the victory of Charles Martel over Abdorrahman ben Abdallah, near Poitiers (Oct. 732), checked for ever the farther progress of the Arabs on the continent of Europe: the river Aude, in Languedoc, became the frontier of their dominion.

When, in the year 749, the family of Abbas came to the command over the Faithful, all the surviving Ommaiades were cruelly persecuted: Abdorrahman ben Moawiya only escaped into Spain, and became the founder of the Ommaiade caliphat of Cordova (756).

Under the Abbasides, who fixed their residence at Bagdad, but few additions were made to the Mohammedan empire: the islands of Crete, Corsica, Sardinia, and Sicily, became subject to the Arabs of Spain and Africa. The sovereigns of the House of Abbas generally distinguished themselves as much by their love and zeal for the arts and literature, as their predecessors had done by their warlike achievements. The names of Mansur, Harun-al-Rashid, and Mamun, are for ever entitled to an honourable place in the history of letters, and their reigns form the brilliant epoch of the Mohammedan power. But their love of mental refinement, and their fondness for a quiet and luxurious life, withdrew the attention of the Abbaside caliphs from the affairs of government; internal disturbances soon became frequent; the authority of the court of Bagdad became imperceptibly diminished, at first in the distant provinces of the empire. Abdorrahman, by establishing an independent Ommaiade dominion in Spain, had set an example which the prefects of other countries soon followed. The caliphs were obliged to assemble a life-guard of Turkish mercenaries around their throne, and surrendered the care of the government into the hands of ministers of unlimited authority, the *Emirs al Omara.* Through these arrangements, and through the encroachments of the Seljukide Turks, the caliphat had long since become a merely nominal dignity, when Hulaku took Bagdad (1528), and put an end to the dominion of the Abbasides. [See ABBASIDES.]

The history of the several Mohammedan states which arose out of the caliphat from the ninth century, does not, strictly speaking, belong to the history of the Arabs; we shall, however, here briefly enumerate the principal dynasties.

I. In Spain, the *Ommaiades* reigned till 1038. Among the small principalities which sprung up afterwards, that of Granada maintained itself till 1492.

II. In Africa, 1. in Egypt, Ahmed ben Tulun established in 868 an independent dominion, which remained in the possession of his family, the *Tulunides*, till 905, when Egypt returned to its allegiance to the caliphat. From 935-969, the *Ikshids* or *Akshids*, the family of Abu Bekr Mohammed, a descendant of the antient kings of Ferghana, ruled over Egypt. They were in 969 followed by the *Fatemides*, or *Moezzides*, who called themselves descendants of Fatima, the daughter of Mohammed: their dominion lasted for two centuries, and extended from the Euphrates to Kairwan. In 1171, the Fatemides were succeeded by the *Ayubide* dynasty, which was in 1250 followed by the dominion of the *Baharide Mamluks.* In 1517, Egypt became a Turkish province.

2. In Kairwan, Ibrahim ben Aglab declared himself independent in the reign of Harun-al-Rashid (805); the dominion of his family, the *Aglabides*, in the territory of the antient Carthaginians, continued till the beginning of the tenth century.

3. In Fez, Edris, a descendant of Fatima, founded an independent kingdom (788), which remained in the hands of his family, the *Edrisides*, till 985, when it became tributary to the Fatemides.

4. The *Zeirides*, descendants of Yussuf Belkin ben Zeiri, governed over Tunis and the surrounding country, from 978 till the middle of the twelfth century.

5. In Marocco, Abdallah founded about 1056 the religious sect and the dominion of the *Morabets*, which soon extended itself as far as the Straits of Gibraltar, and subsequently caused the fall of the Ommaiades in Spain. (See ALMORAVIDES.)

III. In Asia, 1. in Khorasan, Taher had already under Mamun, in 819, declared himself independent. His successors, the *Taherides*, were soon obliged (873) to yield the dominion over the adjoining Persian provinces to the *Soffarides*, descendants of Yacub ben Leith.

2. The *Samanides*, who pretended to be of the race of the antient kings of Persia, established a powerful dynasty in Khorasan and Mawaralnahr, which reigned from 898 till 999, when it was overthrown by the Gasnevites.

3. Nasireddin Sebuktegin founded the dynasty of the *Gasnevites* in the eastern part of Persia, which ruled at Gasna from 976 till 1182: they were obliged to yield to the *Gaurides*, and these, in 1208, to the sultans of Khowarezm.

4. The *Dilemite* dominion originated early in the ninth century, among the emigrant descendants and followers of the caliph Ali, who had taken refuge in the hilly parts of the provinces of Ghilan and Mazenderan. It continued from 927 till 1029, when the Gasnevites took possession of the country.

5. The *Buides* (properly *Bawaihides*) ruled in Persia, and had their residence at Shiraz: they were in 932 recognized by the caliphs. They kept the title and power of Emir-al-Omara till their dominion was overthrown by the Seljuks in 1056.

6. An *Ismaelide* dynasty arose at Kasbin in Persia since 1090, and lasted till the Tatar invasion in 1256. They are only a ramification of the religious sect of the Ismaelians, which, under different names (viz., Batenians, Karmates, Fatemides, Druzes, Nosairis, &c.), has often played an important part in the history of Mohammedism.

7. The *Hamadanides*, in Syria, ruled over Mosul from 929 till 978; and their successors the Merdasides over Aleppo till 1086.

8. The *Assassins* were a fanatic sect in Mount Lebanon, who gained great importance at the time of the Crusades; the present Druzes are believed to be their descendants.

9. The *Seljukide Turks*, under Togrul Beg, occupied Bagdad in 1055; their dominion over Aleppo lasted till 1154; over Kerman till 1187; over Iran till 1195; and over Iconium till 1308. Independent of them, a dynasty of Atabeks had since 1127 established itself in the country east of the Caspian Sea.

Since the time when the Ommaiade caliph Moawiya chose Damascus for his residence, and still more when the Abbasides removed the seat of the government to Bagdad, the country of Arabia relapsed into its former insignificance; it became a mere province of the Mohammedan empire, and was soon again divided into small domains. Curious details about the history of one of the most important of these divisions, that of Yemen, from the time of Mohammed till near the close of the fifteenth century, are to be found in Johannsen's *Historia Jemanæ*. Except the monotonous enumeration of the annual procession of pilgrims to the sacred city, the mutual conflicts among the Beduin chiefs, and of late the rise of the Wahhabite power in the Nejd, the recent history of Arabia generally offers little of sufficient interest to fix the attention of the general historian.

After the conquest of Syria, Persia, Mauritania, and Spain, the trade of the Arabs became of great importance. The Islam favoured the establishment of emporia, and the wide dominion of one religion and one language rendered travels and mercantile transactions easy. The luxury of the court of Bagdad, and the magnificence of the Abbaside caliphat, caused frequent travels of merchants into India. Since the ninth century of our æra, Arabs began to settle in various parts of India; several Indian princes embraced the Mohammedan faith. Soon the Arabs penetrated to the Indian islands, Ceylon, Sumatra, Java, Celebes, and even to China. Arabian caravans proceeded over land as far as Tartary and Siberia in the north; in Africa they came to the Niger, where, since the tenth century, the Mohammedan states of Ghana, Wangara, Tokrur, Kuku, and afterwards those of Sennaar, Darfur, Burnu, Tumbuctu, and Melli, were founded. On the coasts of Africa they came through the Straits of Bab-el-Mandeb to Zanguebar, established the harbours of Makdashua, Melinde, Sofala, Kelu, and Mozambique, and went over to Madagascar. It is even probable that Lusitanian Arabs were, in the eleventh century, the first discoverers of America. (See *Notices et Extraits des MSS. de la Bibl. du Roi*, vol. ii. p. 25; Kosegarten, *Dissert. de Mohammede Ebn Batuta*, Jena, 1818, 4to.; Rasmussen, *Essai sur le Commerce et les Relations des Arabes et des Persans avec la Russie et la Scandinavie dans le moyen âge*, in the *Journal Asiatique*, vols. v. and vi., Paris, 1824, 1825, 8vo.)

Arabian Language.—The Arabic forms, with the Æthiopic, the southern ramification of the great stock of languages commonly, though improperly, called the Semitic; the other two principal branches are, 1. the Aramaic branch, indigenous in Syria, Mesopotamia, and Babylonia, comprising the Syriac and Chaldee languages; and 2. the Hèbrew, once the language of Palestine and Phœnicia. These dialects have flourished at different epochs. Of the Hebrew, we possess the earliest written documents. About the time when it ceased to be a living language, the Chaldee makes its appearance. Whatever we possess in Syriac is of a still more recent date. The literature of the Arabic language does not reach far back beyond the age of Mohammed. At present most of these Semitic languages are extinct, or survive only in small districts. The Arabic alone has outlived all its sister-tongues, and has spread not only as the vernacular tongue all over Syria, Egypt, and Northern Africa, but also as the language of religion throughout Persia, the Turkish empire, and all countries into which the Mohammedan faith has been introduced.

Various dialects prevailed among the Arabian tribes previous to the age of Mohammed, among which that of the tribe of Koreish has, through the Koran, become the classical tongue. Ebn Khaldun thinks that the reason of the elegance and purity of the Koreishide dialect is to be found in the seclusion of that tribe from intercourse with foreigners. Next to Koreish, the neighbouring tribes of Thakif, Hudseil, Khozaa, Kenana, Asad, Temim, and Ghatfan, are by native writers distinguished for the correctness of their language; less so the Yemenese Arabs, and the tribes of Rebia, Lakhm, Jodham, Ghassan, Iyyad, and Kodhaa. Niebuhr observes that the Arabic is at present spoken with the greatest purity in the district of Sahan. The Arabic language is rich, not only in words (especially in such as refer to natural objects and to the life of a nomadic people), but also in grammatical inflections, particularly in the verb, where certain general modifications of the meaning are briefly and energetically expressed by slight changes in the form of the roots. The purity and copiousness of their language had among the Arabs long been an object of national pride. When, after the first conquests of the Mohammedans, its genuine correctness seemed to become endangered through the frequent and unavoidable intercourse with strangers, grammarians arose, to fix its rules and secure it from corruption. Abu'l-Aswad al-Duli is mentioned as the first author on Arabic grammar: he flourished under the caliph Ali ben Abi Taleb. Among the subsequent Arabian grammarians, Sibawaih, Ebn Malek, Zamakhshari, Ebn Hesham, Ebn Doreid, Motarrezi, Tebrizi, Beidhawi, &c., deserve to be distinguished. Khalil ben Ahmed al-Ferahidi, of Basra, who lived during the second century of the Hegira, reduced the prosody and metrics of the Arabic poets into a system. Abu Nasr Ismael ben Hammad al-Jauhari (A.D. 1000, or, according to others, 1009) compiled a dictionary of the pure Arabic language, containing about 40,000 words, and entitled *Al-Sihah*, i.e., 'the Purity (of language):' this work is still of great value in oriental philology on account of the numerous quotations from antient poems which are adduced in illustration. Al-Darir and Al-Sighani, two other lexicographers flourished, the one in the eleventh and the other in the thirteenth century. In the fourteenth, Mohammed ben Yacub al-Firuzabadi (A.H. 817, A.D. 1414) compiled an immense Arabic thesaurus, entitled *Al-Lami*, i.e., 'the

Illuminator,' of which the author himself prepared an abridgment under the title of *Al-Kamus*, or 'the Ocean;' the latter work contains about 60,000 words, and is the best original Arabic dictionary that we possess; an accurate edition of it was published at Calcutta in 1817; a Turkish translation appeared at Scutari, in three volumes, folio, 1815-1817.

The period at which the art of writing was introduced into Arabia is not known. Arabian authors speak of an alphabet used by the antient Himyarides, which they call *Al-Mosnad:* this alphabet is now lost. In the second volume of the *Mines de l'Orient* may be found a copy of a few undeciphered inscriptions discovered by Seetzen, between Doffar and Mankat, near Jerim, in Yemen, which he supposed to be in the *Mosnad* character. The northern Arabs do not appear to have had any alphabet till a short time before Mohammed: Morar ben Morrah is said to have introduced an alphabet which was founded on the Syriac Estrangelo character. In it the Koran was written, originally without diacritical points and vowels, which were, however, added before the end of the first century after the Hegira. This character, which was called the Cufic, in allusion to the copyists that lived at Cufa, remained long in use on coins and inscriptions: for common purposes a current handwriting, known under the name of *Neskhi*, was introduced by Ebn Mokla, in the tenth century. This is the character still in use: the Persian *Taalik* and the African *Mogrebi* character are modifications of it.

To European students who wish to acquire a knowledge of the Arabic language the following works deserve to be recommended:—Silvestre de Sacy's *Grammaire Arabe*, 2d edit., Paris, 1832, 2 vols., 8vo.; Ewald's *Grammatica Critica Linguæ Arabicæ*, Leipzig, 1831-1833, 2 vols., 8vo.; Rosenmüller's *Institutiones ad Fundamenta Linguæ Arabicæ*, Leipzig, 1818, 4to.; S. de Sacy's *Chrestomathie Arabe*, 2d edit., Paris, 1826-1830, 4 vols., 8vo.; Kosegarten's *Chrestomathia Arabica*, Leipzig, 1828, 8vo.; Golius' *Lexicon Arabico-Latinum*, Lugduni Batav., 1656, folio; Wilmet's *Lexicon Linguæ Arabicæ in Coranum, &c.*, Rotterdam, 1784, 4to.; Freytag's *Lexicon Arabico-Latinum*, Halle, 1830, seqq., 4to. (not yet completed.)

The modern vernacular Arabic does not materially differ from the classical language of the Koran, which has become the model and standard of correctness for all Arabic writers; but in the grammatical forms time seems to have produced a change similar to that which we perceive in other languages, the history of which we can trace with accuracy. Many terminations in the inflections of the verb and noun have disappeared, and their want is supplied by auxiliary words. The pronunciation is said to vary considerably in different countries: that of Yemen is esteemed the purest. Among the grammars which have appeared of the modern Arabic, that of Caussin de Perceval (Paris, 1823, 4to.) is considered the best.

Arabic Literature.—It is now generally agreed by those who study oriental literature, that the Arabs do not possess any authentic literary relics anterior to the sixth century of our æra, and that the poems called *Moallakat* all belong to that or the beginning of the next century. It cannot, however, be disputed that, at the time when they were composed, the language and the poetry of the Arabs had already attained a high degree of cultivation; the language appears in them with perfect grammatical regularity, and subject to all the rules of a fixed system of prosody.

The life of a nation secluded by the nature of its country from the introduction of foreign refinement, and compelled by its occupations of hunters and herdsmen to live in small clans spread over a wide extent of country, amidst the awful solitude of deserts, the terrors of which, while tempting the spirit of the hazardous to dangerous enterprise, seem to endear the security of a sociable home, and to tie closer the bonds of fellowship, appears of itself rich in poetic elements; and indeed, as far as we are able to trace back the character of the Arabs, we find the love of poetry one of its essential features. The appearance of a poet in a family was hailed with congratulations by the neighbouring tribes, and we hear of assemblies annually held at Okadh, in Yemen, where poets from all parts of Arabia contended for a prize by reciting their compositions: the poems of the successful competitors were, it is said, written in letters of gold and hung up on the Caaba, whence they were named *moallakat*, i.e., 'the suspended.' Seven of these poems, those of Amru ben Kolthum, Amrulkeis, Antara, Tarafa, Lebid, Hareth, and Zohair, have been preserved to us; and the careful manner in which they have been commented upon by native grammarians (Zuzeni, Nahas, &c.) attests the importance that was attached to them by the Arabs in subsequent ages. The poem of Shanfara, that of Asha, and that of Nabega Dhobyani, are in some manuscripts appended to the Moallakat. More comprehensive collections of antient poems are the Diwan of the Hudseilides, the *Hamasa* of Abu Temmam (about A.D. 830) explained by the scholiasts Tebrizi and Merzuki, and the small *Hamasa* of Bokhtori (A.D. 896). A Diwan of Hatim Taï and of Taabbata-Sharran, besides a single poem of Caab ben Zohair, are handed down separately.

Mohammed recommended learning and poetry, and the admired and often truly sublime diction of the Koran attests that he himself was no stranger to the powers of poetic language. Yet during the first century after his death, in the reign of the warlike Ommaiades, the voice of poetry was silenced or not heard in the noise and tumult of war. 'But,' says Abulfaraj (*Hist. Dyn.*, p. 246), 'when Allah called the family of Hashem (*i. e.* the Abbasides) to the government, and surrendered to them the command, the hearts returned from their indolence, the minds awoke from their torpor.' Among the writers who flourished under the earlier Abbaside caliphs, Asmai deserves to be distinguished: to him is ascribed a romance of great celebrity in the east, called Antar, after the name of its hero; it exhibits an interesting picture of the condition of Arabia shortly previous to the appearance of Mohammed, especially of the life of its wandering tribes, of which it gives as lively a representation as the well-known *Arabian Nights* do of the state of society in the Arabian towns. The exact period to which the composition of this latter work must be assigned is still subject to discussion. That some of the most fanciful and enchanting tales in the collection are derived from an Indian source appears to us undeniable, although notions and images suited to the sphere of ideas of a Mohammedan and an inhabitant of western Asia have been carefully substituted for every allusion to polytheism and Hindoo institutions that might have puzzled the imagination or shocked the good sense of a Mussulman reader.

Among the poets who flourished during the caliphat, we must be satisfied here to mention the names of Abu'l-Atahia, Dsu'l-Rumma, Ferezdak, Abu Temmam, Bokhtori, Hamadani, Hariri, Motenabbi, Abu'l-Ola, Omar ben Faredh, &c. Specimens of the works of some of them will be found in the *Anthologie Arabe*, by Grangeret de Lagrange (Paris, 1828); in the collection published at Calcutta, under the title of *Hadikat-al-Afrah;* and in Carlyle's *Specimens of Arabian Poetry* (Cambridge, 1796).

Al-Mansur, the second of the Abbaside caliphs, was the first who distinguished himself through his zeal for literature, especially for the study of the law, of astronomy, mathematics, and philosophy. The celebrated Christian physician, George Bakhtishu, with his disciple Isa ben Shahlata, and the Persian astronomer Nubakht, lived at Al-Mansur's court: Bakhtishu seems to have first drawn the attention of the Arabs to Greek and Syriac literature. Harun al-Rashid, by the advice of his accomplished minister and friend Yahya ben Khaled, the Barmecide, called Gabriel the son of Bakhtishu to his court, who then lived at Nishabur; he caused many Greek and Syriac works to be translated into Arabic, and established colleges in the principal towns of the empire. In the reign of Mamun the literature of the Arabs saw its golden age. Among the foreign scholars who lived at his court, we distinguish the Indian physician Saleh ben Nahala, and the Syrian Yahya ben Mesawaih (commonly called Joannes Mesue). The works of Aristotle, of Hippocrates, Galen, Dioscorides, and Theophrastus, of Euclid, Archimedes, and Ptolemy, were translated partly from the Greek originals, partly through intermediate Syriac versions. Among the translators we find mentioned the Sabian astronomer Thabet ben Korra; the Christian physician Honain, with his son Is'hak, and his grandson Hobaish ben al-Asam; Yahya ben Batrik, Yahya ben Adda, Ibrahim ben Takwin, and others. At the command of Mamun, Mohammed ben Musa, of Khowarezm, wrote the first elementary treatise on Algebra, evidently drawn in a great proportion from Indian sources. Mamun founded academies at Bagdad, Basra, Kufa, and Bokhara, and furnished scholars with the necessary means to visit foreign countries for literary purposes. In his reign Yahya ben Abi'l-Mansur built and superintended observatories at Bagdad and Damascus. Soon after the accession of Theophilus to the throne of the Grecian empire (A.D. 829) a war had broken out between him and Mamun, in which Theophilus was unsuccessful. He was, like his antagonist, a friend to science, and, in order to negotiate a peace, sent the celebrated scholar Joannes Grammaticus as ambassador to the court of the caliph. The assistance and advice of this envoy were of great value in the scientific undertakings then encouraged by Mamun; and Joannes was so much in favour at Bagdad, that he would doubtless have effected a reconciliation between the two courts, had not the caliph died in the midst of the negotiation.

In the subsequent times of the caliphat, the Emirs al Omara and the Bawaihide (Buide) sultans encouraged literature; in almost all the dynasties which sprung out of the caliphat, there were some sovereigns, at least, who loved the sciences and patronized scholars. The dynasty of the Fatemides in Egypt is in this respect distinguished. Ibrahim ben Aglab, the founder of the Aglabide dynasty, made Kairwan a seat of learning; and Zeiri encouraged literature in the town of Afshir, which he had founded in the territory of the present Algiers.

In Spain, the Ommaiade caliphs followed the example of Al-Mansur and his successors. An exchange of learned ambassadors took place between Abdorrahman III. (912-961) and the German Emperor Otto I. His son Hakem founded the university of Cordova, and many colleges and libraries in Spain; his own library is said to have contained not less than 600,000 volumes. Gerbert of Aurillac, who afterwards ascended the papal throne as Sylvester II., studied at Cordova, and introduced into Europe the Arabic decimal system of numerical notation, for which the Arabs themselves were indebted to the Hindoos. Several English scholars, Adelard or Adhelard of Bath, in the eleventh, and Robert and Daniel Morley in the twelfth century, also visited the Arabic universities of Spain. It was through Spain, and through the Arabic versions, that the attention of the schoolmen was first drawn to the writings of Aristotle.

Among the Arabic philosophers, Pococke (in a note prefixed to his edition of Ebn Tofail) selects the following as the most distinguished: Abu Nasr Mohammed al-Farabi (died A.D. 942), Abu Ali al-Hossein ben Abdallah ben Sina, commonly called Avicenna (born A.D. 980), Abu Hamed Mohammed al-Gazali (d. A.D. 1111), Abu Bekr Mohammed ben Yahya ben Baja, commonly called Avenpace (d. A.D. 1129 or 1139), Abu'l-Walid Mohammed ben Ahmed ben Mohammed ben Roshd, commonly called Averroes (d. A.D. 1198), and Abu'l-Kasem al-Jonaid (d. A.D. 910).

Some of the most celebrated Arabic writers on mathematics and astronomy are the Sabian Thabet ben Korra, the Christian Is'hak ben Honain, Mohammed ben Musa, Jaber ben Afla, Behaeddin of Amol, Mohammed ben Jaber al-Battani, Al-Fergani, Ibn Yunis, Abu'l-Hassan Kushyar, Ulugh-Beg, &c.

The literature of the Arabs is particularly important on account of its numerous and valuable historical works: of most of the following authors in this department, the reader will find some account by turning to their respective articles. The earliest historical writer of the Arabs, of whom we have any knowledge, was Hesham ben Mohammed ben Shoaib al-Khelebi (d. A.D. 826). In the same century lived Ibn Koteiba, Abu Obeida, Mohammed ben Omar al-Wakedi, Abu'l-Abbas Ahmed al-Beladsori, and Asraki. Since the beginning of the tenth century, history became a favourite study of the learned Arabians. Masudi, Tabari, Hamza of Isfahan, and the Christian patriarch of Alexandria Eutychius, also called Said ben Batrik, were among the earliest authors of works on universal history. They were followed by Abulfaraj, George Elmakin, Ibn al-Amid, Ibn al-Athir, Mohammed Hemavi, Abulfeda, Nuweiri, Jelaleddin Soyuti, Ibn Shohna, Abu'l-Abbas Ahmed al-Dimeshki, &c. Abu'l-Kasem Khalef ben Abdalmalek ben Baskwal of Cordova (d. 1139), Temimi, Ibn Khatib, Ibn Alabar, Ahmed ben Yahya al-Dhobi, and Shehabeddin Ahmed al-Mokri (or al-Makari) wrote chronicles of the Arabian dominion in Spain; Kotbeddin in the sixteenth, and Abu'l-Hassan Bekri in the eighteenth century, composed histories of Mecca; Omar ben Ahmed Kemaleddin (d. 1261) wrote a chronicle of Aleppo; Ibn Khallican, Ibn Abi Oseibia, Dsahebi, and others, compiled biographical dictionaries; Makrizi, Abdallatif, Shehabeddin ben Abi Hijla, Marai ben Yussuf al-Hanbali, Jemaleddin Yussuf ben Tagri Bardi, and Mohammed ben al-Moti, wrote special works on the history of Egypt; Behaeddin and Emadeddin wrote biographies of the Sultan Saladin; Ibn Arabshah described the life of Timur; Ibn Khaldun, besides various other works of high interest, wrote a history of the Berbers; Haji Khalfa composed a bibliographic work on the history of literature among the Arabs, Persians, and Turks.

Damiri, Ibn Beitar, and Kazwini, left books on natural history; the latter is also the author of a work on geography. Peculiar to the Arabic geographers is the division of the earth (the northern hemisphere) into seven climates, or as many zones, which are counted from the equator towards the north pole, and are measured by the increase of the duration of daylight at the summer-solstice. Among the Arabic writers on geography we must notice Ibn Khordadbeh, Istakhri, Abu Is'hak al-Faresi and Ibn Haukal, who flourished in the tenth century; the Sherif Edrisi (often called *Geographus Nubiensis*), who lived in the twelfth century in Sicily under Roger I.; Omar Ibn-al-Wardi; Yakuti (d. 1249), and Al-Osyuti. More information than from the professedly geographical works of some of these writers, may perhaps still be obtained from the accounts given by Arabic travellers of the countries which they had visited. Al-Hassan ben Mohammed al-Wassan al-Fasi, of Grenada, commonly known under the name of Leo Africanus, travelled through Asia and Africa; Ibn Waheb and Abu Zeid al-Hassan visited India and China in the ninth century; Selam al-Tarjoman visited central Asia during the reign of the caliph Wathek; Abd-al-Rizzak travelled in the fifteenth century as ambassador from Persia to India; Mohammed Ibn Batuta wandered in the fourteenth century through the interior of Africa, India, Java, China, Russia, Greece, Spain, &c.

A history of Arabic literature is still wanted. A good account of the works printed in Arabic till the year 1811 may be found in Schnurrer's *Bibliotheca Arabica.* Those who want further information on the subject of Arabic literature must consult the *Notices et Extraits des MSS. de la Bibliothèque du Roi*, the *Bibliotheca Arabica Escurialensis* of Casiri, the *Bibliotheca Orientalis* of Assemani, the *Chrestomathie Arabe* and other works published by De Sacy, Mœller's *Catalogue of the Arabic MSS. at Gotha*, Uri's and Nicoll's catalogues of the MSS. in the Bodleian library, the *Mines de l'Orient*, the *Bibliothèque Orientale* of D'Herbelot, &c.

ARABIAN GULF. [See RED SEA.]

ARABIAN NIGHTS. [See ARABIA, p. 219.]

ARA'BII were, according to St. Augustin (Hæres. c. 83), a sect of Christians in Arabia, who believed the human soul to be mortal, and that it is dissolved by death together with the body, but will be restored to life at the resurrection. Mosheim (in *Commentariis de Rebus Christianorum ante Constantinum Magnum*, ed. 1753, p. 718, seq.) thinks, that the materialism of Epicurus had some influence on the origin of this sect: but it is more likely that the prevailing opinion in those days of the materiality of the human soul occasioned their heretical inferences. The Arabii were confuted and converted by Origen in a synod held in Arabia, A.D. 246 (Mansi, *Collectio Conciliorum*, t. i. p. 789).

ARABLE LAND, so called from the Latin word *arare* 'to plough,' is that part of the land which is chiefly cultivated by means of the plough.

Land in general is divided into arable, grass land, wood land, common pasture, and waste. The first of these is by far the most important in agriculture. In this article we shall briefly explain the principles on which are founded the most improved methods of cultivating arable land, by which the natural produce of the soil is greatly increased, and many productions are obtained in perfection which are foreign to the soil and climate.

We shall, first, consider the nature and properties of various soils.

2. The best modes of preparing and improving the natural soil, so as to increase its produce.

3. The most advantageous succession of crops, so as to obtain the greatest returns, with the least diminution of fertility.

Of Soils.—When the surface of the earth is penetrated we generally find that the appearance, texture, and colour vary at different depths. There is a layer of earth nearest the surface, of greater or less thickness, which covers the more solid and uniform materials which lie below it. This may be particularly observed wherever there are natural or artificial excavations or pits. A distinct line, nearly parallel to the surface, generally marks the depth of the upper soil and separates it from the sub-soil. The soil is more or less composed of minute parts of various kinds of earth, mixe with animal and vegetable substances, in different states of decomposition; and to these, in a great measure, it owes its colour, which is generally darker than that of the sub-soil. Except where iron, peat, coal, or slate abound in the soil, a dark colour is an indication of corresponding fertility. The rich soil of gardens, long cultivated and highly manured, is nearly black. As the soil is the bed in which all vegetable productions are to be reared, and in which they are to find their proper nourishment, its texture and composition become objects of great importance to the cultivator; and, without a competent knowledge of these, no practical rules can be laid down or depended upon.

All soils are composed of earths,* metallic oxides, saline substances, vegetable and animal matter, and water. The earths are chiefly clay or alumina, flint or silica, and lime.

Magnesia, barytes, and other earths are occasionally met with, but in so few instances that they may be omitted in the list.

Of the metals, the most abundant is iron in the state of peroxide. The other metals are rarely found near the surface.

Saline substances form a small part of a soil, but an important one.

Potassa exists in almost every vegetable, soda in a few and ammonia is produced by the decomposition of animal matter, but from its volatile nature it is not long retained in the soil, except when it forms a fixed compound with other substances.

The vegetable acids, as a general rule, are perhaps limited to small portions of acetic acid in combination with some base, as lime or potash.

The mineral acids are found united with earths and alkalies, in the state of neutral compounds.

These saline substances have a powerful effect on vegetation, and a knowledge of their proportions in the soil and of their various qualities, is indispensable in order to modify or correct their action by other substances for which they have an affinity.

Water, in a state of combination, or of mere mechanical diffusion, is essential to the growth of all plants: without it, and atmospheric air, there is no life either animal or vegetable.

Of the Earths.—Clay or alumina, so called because it is obtained in its purest state from alum, in which it is combined with the sulphuric acid,† is the basis of all strong and heavy soils. When it is minutely divided, it is easily suspended in water; when dried slowly, and stirred while drying, it becomes a fine powder soft to the feel, and when kneaded with water, a tough ductile mass easily moulded into hollow vessels, which retain liquids. This property, of being impervious to water, gives the specific character to clay as an ingredient of the soil. In a pure and unmixed state it is absolutely barren. When clay is heated to a great degree, it parts with the water combined with it; it is then said to be baked, as we see in bricks. It is no longer diffusible in water, and differs little from silica or sand in its effects on the soil.

Silica, or the earth of flints, suffers no change in water. It consists of crystals, or fragments, of very hard stone, forming *gravel* or *sand* according to their size; and the finest siliceous sand, when examined with a magnifying glass, has the appearance of irregular fragments of stone without any cohesion between them.

Siliceous sand holds water in its interstices by simple cohesive attraction in proportion to its fineness. It heats and cools rapidly, letting the water pass through it readily, either by filtration or evaporation. Its use in the soil is to keep it open, to let the air and water, as well as those other substances on which the growth of plants depends, circulate through it. Unmixed, it dries so rapidly that no vegetation can continue in it, unless a constant supply of moisture be given by irrigation. A small portion of clay will much improve light sands; it takes a large quantity of sand to correct the tenacity of clay.

Lime in its pure state is familiar to every one as the basis of the mortar used in building. It is produced by burning marble, chalk, limestone, or shells, in a great heat. In the stones which are formed principally of lime, it is combined with some acid, most generally the carbonic acid, which separates from it by the operation of burning, in the form of an air or gas, hence called *fixed air*, from its being thus *fixed* in a stone. These stones, of various degrees of hardness, are now all classed under the name of carbonates of lime.

Lime unites readily with water, which it also absorbs from the atmosphere. It then becomes *slaked*. By uniting with carbonic acid, it returns to its former state of carbonate; with this difference, that, unless much water be present, it remains a fine impalpable powder. Pure lime is soluble in water, though sparingly; a pint of water cannot dissolve more than about twenty grains: the carbonate is not soluble in water. Carbonate of lime has a powerful effect on the fertility of a soil, and no soil is very productive without it. It is consequently used extensively as an improver of the soil, otherwise called a *manure;* but its use in this respect, and the mode in which it acts, will be given in the articles MANURE and LIME.

Carbonate of lime, as an earth, is neither so tenacious as clay, nor so loose as sand. In proportion to the fineness of its particles it approaches to the one or the other, and when the parts are large and hard it takes the name of limestone gravel.

Its distinguishing feature is its solubility in acids, which it neutralizes, depriving them of their noxious qualities in the soil. A proper mixture of these three earths, in a due state of mechanical division, forms a soil well fitted to the growth of every species of plants, especially those which are cultivated for food; and nothing more is required than a proper climate as to heat, a proper degree of moisture, and sufficient nourishment, to make all the plants generally cultivated thrive most luxuriantly in such a mixture, which is usually called a loam.

But there are some soils, which, besides a proper mechanical texture and mixture of earths, contain a large proportion of a natural manure which renders them extremely fertile. This is a substance produced by the slow decay of animal and vegetable matter. It can be separated from the other parts of the soil, and has been accurately analyzed and described by many of the most experienced chemists, particularly by Fourcroy, Davy, Chaptal, and Theodore de Saussure. (See *Recherches Chimiques sur la Vegetation*, Paris, 1804, 8vo.) This substance has been called *vegetable mould;* but, as this is not a very distinct term, we shall, after Thaer and other eminent writers on agriculture, adopt the name of *humus* when speaking of it. Humus is a dark, unctuous, friable substance, nearly uniform in its appearance. It is a compound of oxygen, hydrogen, carbon, and nitrogen, which, with the exception of nitrogen, which is found only in some substances, are the elements of all animal and vegetable substances. It is the result of the slow decomposition of organic matter in the earth, and is found in the greatest abundance in rich garden mould, or old neglected dunghills. It varies somewhat in its qualities and composition, according to the substances from which it has been formed, and the circumstances attending their decay. It is the product of organic power, such as cannot be compounded *chemically*.

Besides the four essential elements in its composition, it also contains other substances in smaller quantities, viz., phosphoric and sulphuric acids combined with some base, and also earths and salts. Humus is the product of living matter and the source of it. It affords food to organization. Without it nothing material can have life. The greater the number of living creatures, the more humus is formed; and the more humus, the greater the supply of nourishment and life. Every organic being in life adds to itself the raw materials of nature, and forms humus, which increases as men, animals, and plants increase in any portion of the earth. It is diminished by the process of vegetation, and wasted by being carried into the ocean by the waters, or it is carried into the atmosphere by the agency of the oxygen of the air, which converts it into gaseous matter See Thaer, *Grundsätze der Rationellen Landwirthsha* Berlin. 1810, four vols. 4to.)

Humus, in the state in which it is usually found in the earth, is not soluble in water, and we might have so difficulty in comprehending how it enters into the minu vessels of the roots of plants; but here the admirable pr vision of nature may be observed. Humus is insoluble an antiseptic; it resists further decomposition in itself, and other substances in contact with it. It remains for a lon time in the earth unimpaired; but no sooner is it broug into contact with the atmosphere, by the process of cultivation, than an action begins. Part of its carbon uniting with the oxygen of the atmosphere, produces carbonic acid, which the green parts of plants readily absorb: while its hydrogen with the same forms water, without which plants cannot live; and in very warm climates, where this process goes on more rapidly, the moisture thus produced keeps up vegetable life, when rains and dews fail. The residue becomes a *soluble extract*, and in that state is taken up readily by the fibres of the roots. But the changes still go on; the extract absorbs more oxygen, and becomes once more insoluble, in the form of a film, which Fourcroy calls *vegetable albumen*, and which contains a small portion of nitrogen, readily accounted for. By bringing fresh portions of humus to the surface and permitting the access of air to it, more carbonic acid, water, extract, and albumen are formed, and give a regular supply to the plants, which, by their living powers, produce the various substances found in the vegetable kingdom of nature. Hence we see the great importance of frequently stirring the surface of the earth between cabbages and other vegetables.

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* We retain the old division, although the earths have been ascertained to be oxides of peculiar metals, but as they are never found in the soil in their metallic state, the results and reasonings are not affected by this circumstance.

† Sulphuric acid, commonly called oil of vitriol, is composed of sulphur and oxygen, which is the pure or *vital* part of the atmosphere. [See AIR.]

It is to the patience and perseverance of the chemists above-named that we owe this insight into the wonderful process of vegetable growth. What we here state is on their authority.

We can now readily understand the great importance of humus, and of those rich manures which are readily converted into it, when not immediately absorbed by plants. But it has still another property, highly important to fertility: it renders stiff clays porous, and consolidates loose sands. It does so more than lime, or any other earth. Hence a soil with a considerable proportion of humus is much more fertile than the quantity of alumina, or of sand, in its composition would lead one to expect, as we shall see when we come to the analysis of soils of known fertility; and we see the great advantage of animal and vegetable manures, not only as nourishment to vegetables, but as mechanical improvers of the texture of soils.

The greatest enemy of humus is stagnant water; it renders it acid and astringent, as we see in peat; and soils abounding with vegetable matters, from which water is not properly drained, become *sour*, as is very justly said, and produce only rushes and other useless and unpalatable plants. The remedy is simple and obvious; drain well, and neutralize the acid with lime; by these means abundant fertility will be restored.

In very light soils humus is seldom found in any quantity, being too much exposed to the air, and rapidly decomposed; the extract is washed through them by the waters, and as they waste manure rapidly, they are called *hungry*. Such soils are very unprofitable, until they are improved and consolidated by clay or marl, which makes them retain the moisture.

With calcareous earths humus acts well, provided they are pulverized and of sufficient depth. Some chalky soils are rendered very fertile by judicious culture and manuring.

In order to ascertain the probable fertility of a soil, it is very useful to analyze it and find out the proportion of its component parts. To do this with great accuracy requires the knowledge of an experienced chemist; but, to a certain degree, it may be easily done by any person possessed of an accurate balance and weights, and a little *spirits of salts*, or muriatic acid. For this purpose, some of the soil, taken at different depths, not too near the surface (from four to eight inches, if the soil is uniform in appearance), is dried in the sun till it pulverizes in the hand, and feels quite dry: the small stones and roots are taken out, but not minute fibres. A convenient portion of this is accurately weighed: it is then heated in a porcelain-cup, over a lamp, or clear fire, and stirred, till a chip or straw put in it turns brown. It is then set to cool, and weighed; the loss of weight is the water, which it is of importance to notice. Some soils, to appearance quite dry, contain a large proportion of water, others scarcely any. It is then pulverized and sifted, which separates the fibres and coarser parts. The remainder, again weighed, is stirred in four or five times its weight of pure water; after standing a few minutes to settle, the water is poured off, and it contains most of the humus and soluble substances. The humus is obtained by filtration, well-dried over the lamp, and weighed. The soluble substances are obtained by evaporating the water; but, unless there is a decidedly saline taste, this may be neglected. The humus may be further examined by heating it red hot in a crucible, and stirring it with a piece of the stem of a tobacco-pipe, when the vegetable part will be consumed, and the earths remain behind; thus the exact quantity of pure vegetable humus is found. Some muriatic acid, diluted with five times its weight of water, is added to the deposit left after pouring off the water containing the humus and soluble matter; the whole is agitated, and more acid added gradually, as long as effervescence takes place, and until the mixture remains decidedly acid, which indicates that all the calcareous earth is dissolved. Should there be a great proportion of this, the whole may be boiled, adding muriatic acid gradually, till all effervescence ceases; what remains after washing it well, is siliceous and argillaceous earth. These are separated by agitation, allowing the siliceous part to settle, which it does in a few seconds. The alumina is poured off with the water, filtrated, heated over the lamp, and weighed,—the same with the siliceous sand. The loss of weight is calcareous earth. In this manner, but with greater care and more accurate tests, various soils of known fertility have been analyzed, of which we will give a few examples.

A very rich soil near Drayton, Middlesex, examined by Davy, consisted of ⅓ of siliceous sand and ⅔ of impalpable powder, which, analyzed, was found to be composed of

	Parts.
Carbonate of lime	28
Siliceous earth	32
Alumina	29
Animal and vegetable matter .	11
	100

This is a rich sandy loam, probably long and highly manured, fit for any kind of produce, and, if deep, admirably fitted for fruit trees.

Another good turnip soil, by the same, consisted of [illegible] parts of coarse siliceous sand, and 1 of fine earth, which being analyzed, consisted of

	Parts.
Carbonate of lime	63
Silica	15
Alumina	11
Oxide of iron	3
Vegetable and saline matter .	5
Water	3
	100

This is a very light sandy soil, and owes its fertility to the fine division of the carbonate of lime and the vegetable and saline matter. It may probably have been limed or marled at some time or other.

The best loam in France, according to Mr. Tillet, consists of

	Parts.
Fine siliceous sand . . .	21
Coarse ditto	25
Carbonate of lime	37·5
Alumina	16·5
	100

A loam at Chamart, highly prized by gardeners about Paris, as the basis of their artificial soils, consists of

	Parts.
Argillaceous sand	57
Finely divided clay	33
Siliceous sand	7·4
Carbonate of lime, coarse . .	1
Ditto, fine	·6
Woody fibre	·5
Humus and soluble matter .	·5
	100

The argillaceous sand is composed of fragments of sandstone, which retain moisture, and do not bind hard; the small proportion of humus is of no consequence when manure is to be had in any quantity.

A very rich heath or bog earth found at Meudon, and in great request for flowers and in composts, consists of

	Parts.
Gritty siliceous sand . . .	62
Vegetable fibres partly decomposed	20
Humus	16
Carbonate of lime	·8
Soluble matter .	1·2
	100

This soil, like our bog earth, would be very unfit for the growth of corn; but, from the quantity of humus and vegetable matter, is highly useful in composts and artificial soils; mixed with lime, it would make an excellent top-dressing for moist clay soils.

Mr. Thaer has given a classification of soils of known qualities, which, we think, worthy of notice. It is as follows:—

No		Clay, p. cent.	Sand, p. cent.	Carb. of Lime, p. cent.	Humus, p. cent.	Value.
1	First class of strong wheat soils . .	74	10	4½	11½	100
2		81	6	4	8½	98
3		79	10	4	6½	96
4		40	22	36	4	90
5	Rich light sand in natural grass . .	14	49	10	27	?
6	Rich barley land .	20	67	3	10	78
7	Good wheat land .	58	36	2	4	77
8	Wheat land . .	56	30	12	2	75
9	Ditto	60	38	Very insignificant quantities.	2	70
0	Ditto	48	50		2	65
1	Ditto	68	30		2	60
12	Good barley land .	38	60		2	60
3	Ditto second quality	33	65		2	50
14	Ditto	28	70		2	40
15	Oat land . . .	23½	75		1½	30
16	Ditto	18½	80		1½	20

Below this are very poor rye-lands.

In all these soils the depth is supposed the same, and the quality uniform to the depth of at least six inches; the subsoil sound, and neither too wet nor too dry.

Nos. 1, 2, and 3, are alluvial soils, and from the division and the intimate union of the humus, are not so heavy and stiff as the quantity of clay would indicate.

No. 4 is a rich clay loam, such as is found in many parts of England, neither too heavy nor too loose,—a soil easily kept in heart by judicious cultivation.

No. 5 is very light and rich, and best adapted for gardens and orchards, but not for corn; hence its comparative value can scarcely be given.

Nos. 6, 7, 8, are good soils; the quantity of carbonate of lime in No. 8 compensates for the smaller portion of humus. This land requires manure, as well as the others below. In those from No. 9, downwards, lime or marl would be the greatest improvement. Nos. 15 and 16 are poor light soils, requiring clay and much manure. But even these lands will repay the cost of judicious cultivation, and rise in value.

The last column, of comparative value, is the result of several years' careful valuation of the returns, after labour and seed had been deducted.

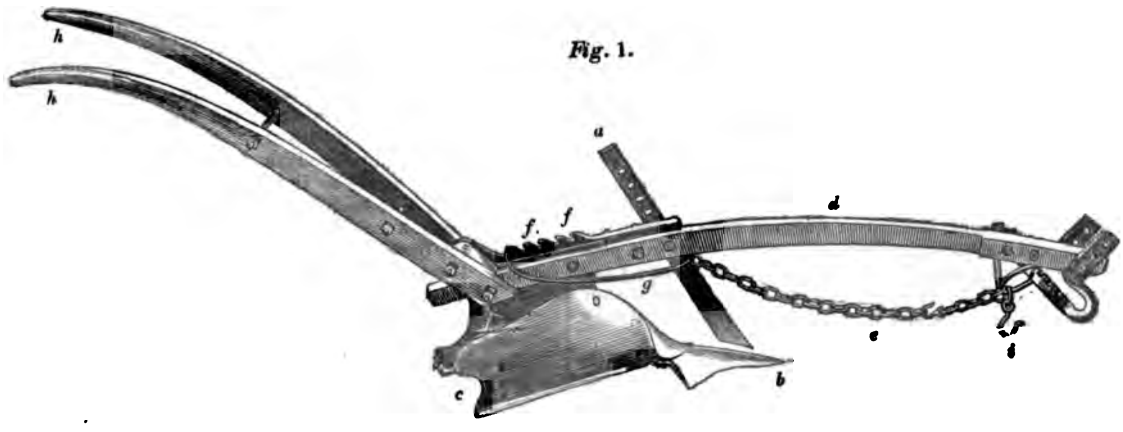
Few soils in England contain more than 4 or 5 per cent. of humus, even when in very good heart; and 2 per cent., with a good loamy texture, will render a soil fit for corn with judicious cultivation. The texture is of most importance, as may be seen by comparing Nos. 7 and 8 with No. 6. If this is of good quality, dung will soon give the proper supply of humus.

The depth of the soil and the nature of the subsoil greatly affect its value. However rich it may be, if there is only a thin layer of good soil over a sharp gravel or a wet clay, it can never be very productive: in the first case, it will be parched in dry weather; and in the latter, converted into mud by every continued rain. If the subsoil be loam or chalk, six inches of good soil will be sufficient. With a foot of good soil, the subsoil is of little consequence, provided it be dry, and the water can find a ready outlet. The best alluvial soils are generally deep, the chalky shallow.

The exposure, with respect to the sun, and the declivity of the ground, are very important circumstances, and equivalent to an actual difference in the climate. A gentle declivity towards the south, and a shelter against cold winds, may make as great a difference as several degrees of latitude; and in comparing the value of similar lands in different climates, the average heat and moisture in each must be accurately known. A soil very fertile in the south of Europe may be very unproductive in England; and a light soil of some value in the west of Scotland might be absolutely barren in Italy or Spain.

Of the Cultivation of the Soil.—The better the soil, the less cultivation it requires to produce tolerable crops; hence, where the land is very rich, we find in general a slovenly culture; where the ground is less productive, more labour and skill are applied to compensate for the want of natural fertility. The simplest cultivation is that of the spade, the hoe, and the rake,—and on a small scale it is the best; but spade husbandry cannot be carried to a great extent without employing more hands than can be spared from other occupations. The plough, drawn by oxen or horses, is the chief instrument of tillage, and has been so in all ages and nations of which we have any records. Its general form is familiar to every one, and requires no minute description. The various kinds of ploughs in use at different times, and the improvements which have been made, and are attempted daily, will be noticed in a separate article [see PLOUGH]. Suffice it to say, at present, that a plough should as much as possible imitate the work done with a spade. It should cut a slice from the land by its coulter (*a*) vertically, and by the share (*b*), horizontally lift it up, and turn it quite over by means of the mould-board (*c*); and the art of the ploughman consists in doing this perfectly, and with such a depth and width as suit the soil and the intended purpose. In rich mellow soils a ploughed field should differ little from a garden dug with the spade. In tenacious soils, the slice will be continued without breaking, especially if bound by the fibres and roots of plants; the whole surface will be turned over, and the roots exposed to the air: it is of great consequence that each slice be of the same width and thickness, and the sides of it perfectly straight and parallel. The plane of the coulter must be perfectly vertical, and that of the share horizontal, in order that the bottom of the furrow may be level, without hollows or *baulks*, which are irregularities produced by the rising or sinking of the plough, or in clining it to either side. The antients were very particular in this respect, and recommended sounding the earth with a sharp stake, to ascertain whether the ploughman had

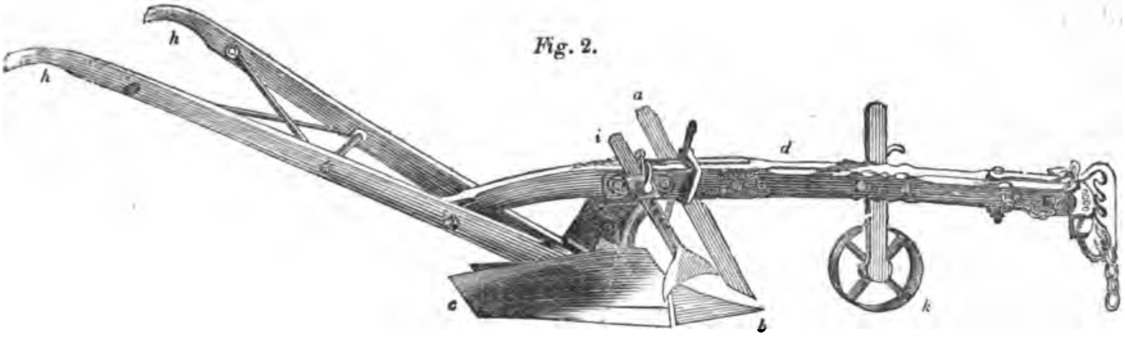
Fig. 1.



[Plenty's Swing Plough.]

a, The coulter.
b, The point of the share.
c, The mould-board.
d, The beam.
e, The chain by which it is drawn; *g*, a long iron link to which the chain is fixed which can be hooked in any of the notches *f f*, altering the line of draught.
h h, The handles, or stilts.
i, The hook to draw by.

Fig. 2.

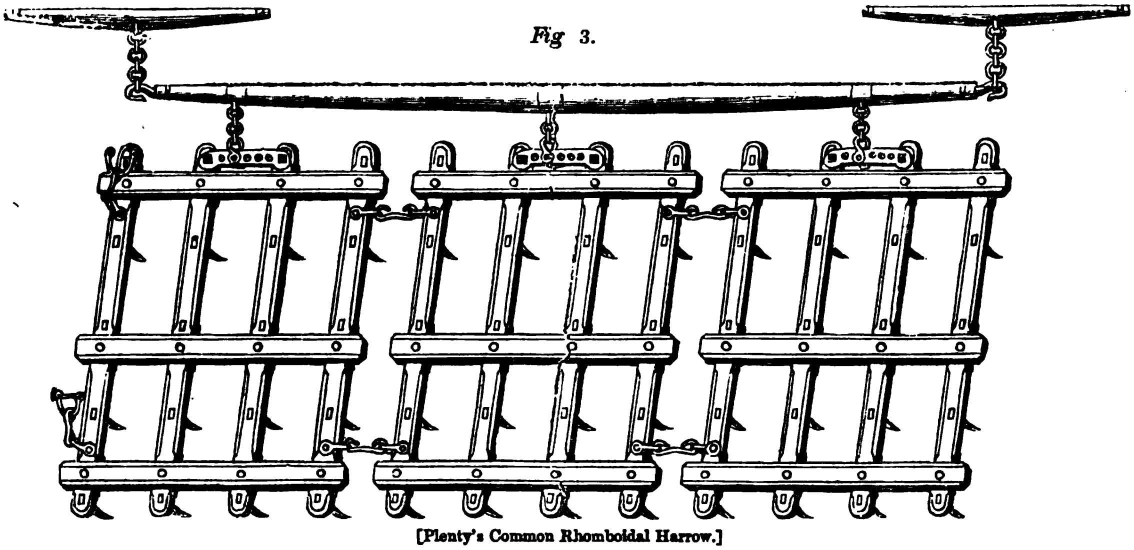


[Plenty's Improved Flemish Plough, with one wheel and skim coulter.]

This plough differs from the common swing plough, in having a small wheel (*k*) by which the depth of the furrow is more easily regulated,—and a skim coulter (*i*), which pares off the grass and weeds and turns them into the bottom of the furrow; it is also broader at the point. It is suited to light friable soils.

done his duty. There are various modes of ploughing land, either quite flat, or in *lands* or stitches, as they are called in England, and, in Scotland, *riggs*, that is, in portions of greater or less width, with a double furrow between them—somewhat like beds in a garden. Sometimes two ridges are set up against each other, which is called ridging or *bouting;* the land then is entirely laid in high ridges and deep furrows, by which it is more exposed to the influence of the atmosphere and kept drier; this is generally done before winter, especially in stiff wet soils. Sometimes two or more ridges are made on each side, forming narrow stitches. When the ground is to be ploughed without being laid in lands or stitches, and all the ridges inclined one way, the mould-board of the plough is shifted at each turn from one side to the other. The plough which admits of this is called a *turn wrest plough*, and is in general use in Kent, and in many parts of the continent, where the subsoil is dry and the land not too moist. In most other situations the ground is laid in *lands*, and the mould-board of the plough is fixed on the right side. When grass land or stubble is ploughed, care must be taken to bury the grass and weeds completely, and the slice cut off by the plough must be turned over entirely, which is best done by making the width of the furrow greater than the depth. When the grass and weeds are rotten, and the ground is ploughed to pulverize it, a narrow deep furrow is best; the earth ploughed up is laid against the side of the preceding ridge, which forms a small furrow between the tops of the ridges, well adapted for the seed to lodge in and to be readily covered with the harrows.

Fig 3.



[Plenty's Common Rhomboidal Harrow.]

Nothing has divided both practical and theoretical agriculturists more than the question whether the land should be ploughed deep or shallow; but a very slight attention to the purposes for which land is ploughed, and to the nature of the soil, will readily reconcile these apparently contradictory opinions. A deep, rich, and stiff soil can never be moved too much nor too deep: deep ploughing brings up rich earth, admits the air and water readily, and gives room for the roots to shoot, whilst the rich compact soil affords moisture and nourishment. Wherever trees are to be planted, the ground should be stirred as deep as possible, even in a poor soil: for grass and corn, this is not always prudent; their roots seldom go above three or four inches deep, and if they find sufficient moisture and humus, they require little more depth.

Whenever the soil below a certain depth is of an inferior quality, there can be no use in bringing it up; and where the soil is light and porous, the bottom had much better not be broken. Norfolk farmers know this well, and are very careful not to break the *pan*, as they call it, in their light lands: this *pan* is formed by the pressure of the sole of the plough and the tread of the horses, and opposes a useful bank to the too rapid filtration of the water; it lies from five to eight inches below the surface. If it is broken, the manure is washed down into the light subsoil, and the crop suffers, especially when sheep have been folded, their dung being very soluble. In such soils an artificial pan may be formed by the *land-presser* or *press-drill*. This instrument consists of two very heavy cast-iron wheels, *a a*, with angular edges, set on an axle, at a distance from each other equal to the width of the furrows, and a lighter wheel, *b*, to keep the instrument vertical.

It is drawn by a horse immediately after the plough, pressing two furrows at once, and going twice over each furrow. It leaves the land in regular drills, and the seed sown by hand falls into the bottom of the drills, and is covered by the harrows. When the plants come up they appear in regular parallel rows.

The great object in ploughing land is to divide it, expose every part of it to the influence of the elements, and destroy every plant or weed but those which are sown in it. To do this perfectly requires several ploughings, with certain intervals, and during that time no crop can be upon the land. This is the real use of fallows, and not, as was once supposed, to allow the land to rest; on the contrary, it ought then to have the least repose.

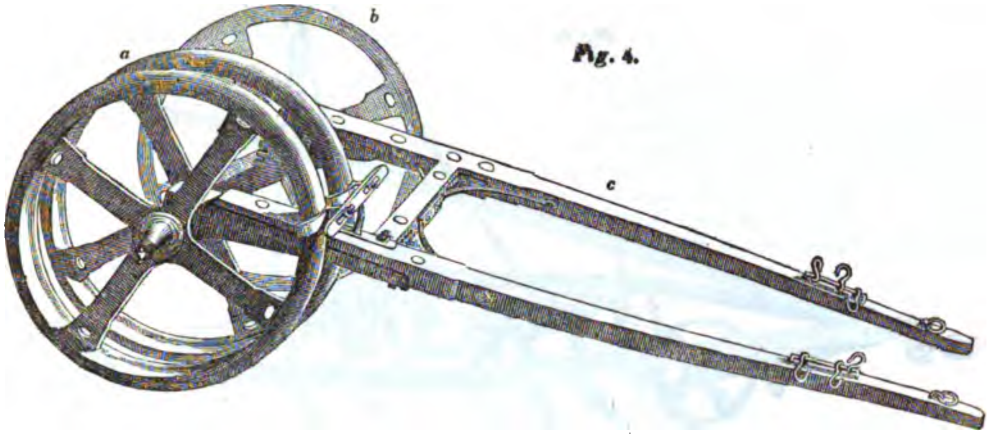


Fig. 4.

[Plenty's Press Drill or Land-Presser.]

Where the soil is good, with a porous subsoil, the greatest care should be taken not to go too deep; but where the subsoil is compact and impervious to water, but not wet for want of outlet or draining, it is useful to stir the soil to a great depth, but without bringing it to the surface, which may be done by a plough without a mould-board following a common plough in the same furrow. This is an excellent mode of draining, and at the same time keeping a reservoir of moisture, which in dry weather ascends in vapours through the soil and refreshes the roots.

The mode in which the soil is prepared most perfectly for the reception of the seed is best shown by following the usual operations on fallows. After the harvest, the plough is set to work, and the stubble ploughed in. The winter's frost and snow mellow it, while the stubble and weeds rot below. In spring, as soon as the weather permits, it is ploughed again, the first ridges being turned over as they were before: this completes the decomposition of the roots and weeds. It is then stirred with harrows, or other instruments, which tear up the roots which remained, and some of these, not being easily destroyed, are carefully gathered and burnt, or put in a heap to ferment and rot, a portion of quick lime being added. Another ploughing and stirring follows, at some interval, till the whole ground is mellow, pulverized, and free from weeds; manure is put on, if required, and immediately spread and ploughed in; the land is then prepared for the seed.

This has been the method universally followed by all industrious husbandmen from the oldest times. The Romans had names for each of the ploughings: the first was *fringere*, the next *vertere*, the third *refringere*, and the fourth *revertere;* more ploughings were often given, and in modern agriculture the direction of the third ploughing is sometimes changed across the old furrows, at a right, or acute angle, as Virgil recommends (*Georgica*, i. 98), by which the earth is still better divided and mixed.

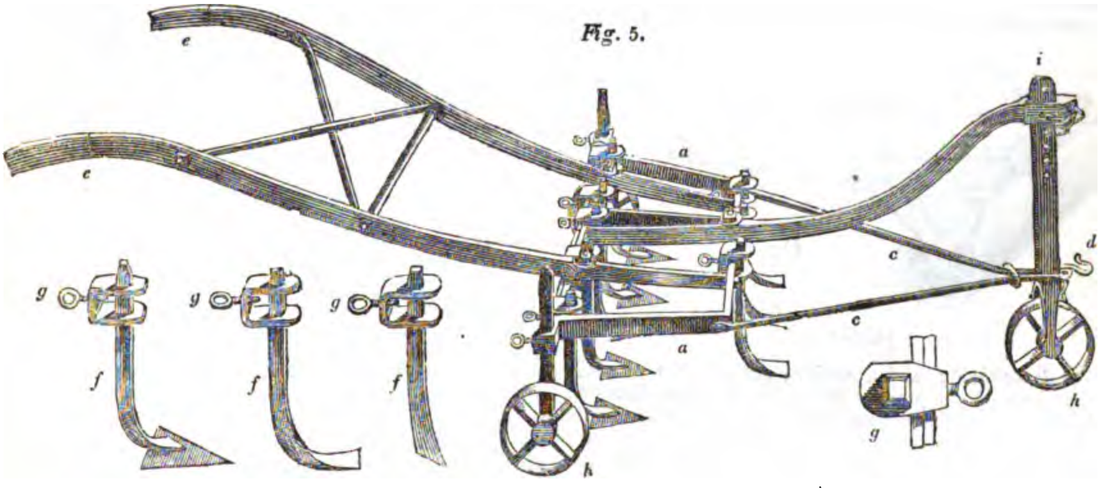


Fig. 5.

[Plenty's Scarifyer.]

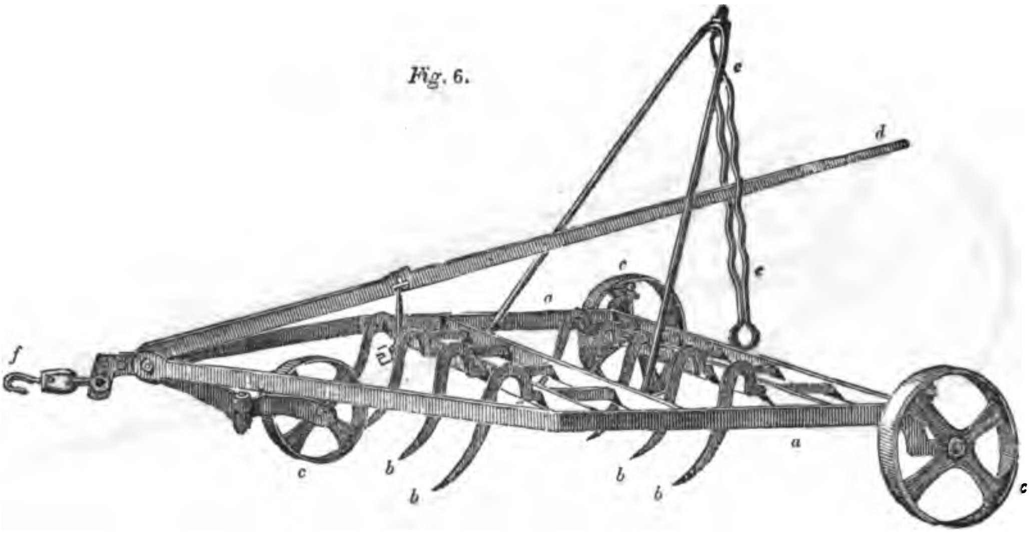
Various instruments have been invented to stir the earth and mix it, without so often using the plough, and also to loosen and separate roots and weeds; of these the principal are, the cultivator or scarifier, which enters but a few inches into the ground, and moves a great surface by means of tines, or iron teeth of various constructions. The whole instrument is made of iron: *a a* is the frame; *b*, the beam; *c*, rods by which it is drawn, the horses being attached by a hook at the point *d*; *e e*, the handles; *f f f*, different shaped shares and tines to be used according to the state of the soil; *g g g*, contrivances by which the teeth are fixed to the frame at any required distance from each other, and lengthened or shortened; *h h h*, three wheels to regulate the depth of the ground moved. By raising the beam and fixing it higher or lower on the piece (*i*), by means of an iron pin passed through the different holes, the whole instrument is raised or depressed in the ground.

This instrument divides the soil, but does not turn it over; it is well calculated to destroy roots and weeds, and let in the air; but, evidently, is only adapted to tolerably loose and mellow soils, where there are no large stones.

An ingenious harrow or cultivator has been invented by Finlayson, which rakes the weeds out of the ground, and throws them on the surface without clogging the instrument; it is excellent in light soils.

When the soil turned up by the plough is in large hard lumps, a roller, sometimes with spikes in it, is drawn over the land to break the clods, or mallets are used to break them by hand; but this is seldom necessary except where very stiff soils have been ploughed when too wet, and the ridges have dried, and been ploughed again in dry weather. Deep wet clay soils should be carefully watched, to know when is the proper time to plough them; nothing pulverizes them like frost, and if they are kept from wet by

Fig. 6.

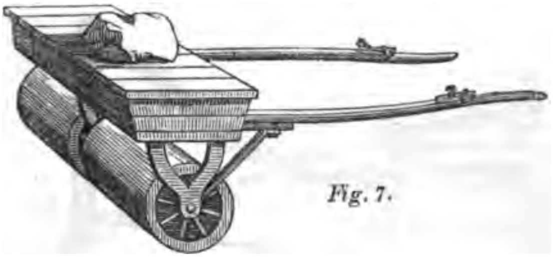


[Finlayson's Patent Harrow.]

a, a, The iron frame. *b, b,* The teeth, shaped so as to throw the weeds over.
c, c, c, Three small wheels, of which the foremost is brought forward by depressing the lever *d*, and raising the teeth out of the ground.
e, Is a contrivance to keep the lever, *d*, in any required position, so as to regulate the depth to which the teeth, *b, b,* enter the ground.
f, Is the hook by which the instrument is drawn.

careful draining and numerous water furrows in autumn, they will be loose and friable in spring; they had better not be touched than worked when too wet. On light soils the plain roller is used to advantage to produce firmness, without which the plough cannot so well turn the ground over completely, but merely pushes it to the right and left.

The great expense of teams for the plough has led to expedients and inventions to lessen the labour, but, in general, a more imperfect cultivation has resulted from it. Columella mentions one Celsus, whom he blames, because, to 'save the expense of a stronger team, he only scratched the ground with small shares and toothed instruments (*exiguis vomeribus et dentalibus*);' and a modern agriculturist of some note has revived the practice of Celsus. General Beatson, who had been in India, and had seen the simple instruments used there by the natives, has substituted for the plough and cultivators in common use, various light instruments, of which he has published an account. He recommends stirring the soil only a few inches deep, except occasionally; and, by means of burnt clay, which he uses in great abundance, he has produced a succession of good crops: but he has too high an opinion of the fertilizing qualities of burnt clay, which makes him undervalue animal and vegetable manure: and although he may improve the texture of his heavy soil by the burnt clay, which is insoluble and absorbent, he will soon find out, like the followers of Tull, that manures which contain soluble extract, or from which it can be formed, can alone maintain fertility.



[Roller.]

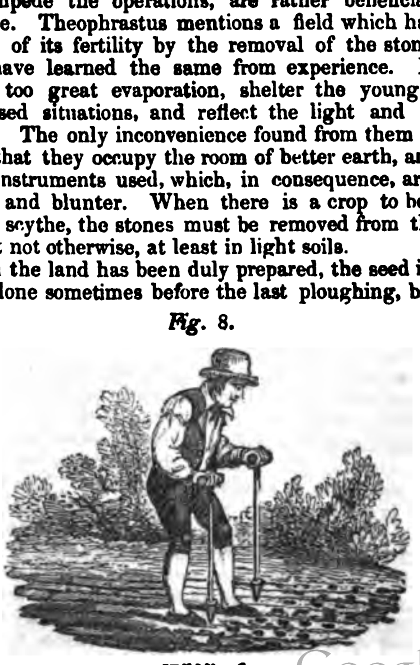
The influence of the atmosphere on the soil, and the increased fertility produced by pulverizing and stirring heavy lands, has led to the notion adopted by Jethro Tull, that labour might entirely supersede the necessity of manure: hence the origin of the horse-hoeing husbandry, which at one time was so highly thought of as to be called, by way of distinction, the *new* husbandry. Fallows and manuring were both discarded as unnecessary; the seed was sown in rows with wide intervals, which were continually kept worked and stirred. At first the result was highly satisfactory; all the humus, by exposure to the air, was converted into soluble extract, and taken up by the plants, which throve well as long as the supply lasted: but in the end it was exhausted; and the warmest admirers and supporters of Tull's system, Du Hamel and De Chateauvieux, besides many others, found to their cost, in practice, that pulverizing alone will not restore fertility. The system of drilling and horse-hoeing, when united with judicious manuring, has, however, been found a great improvement in agriculture.

In describing the various processes in general use in the cultivation of the soil, we have taken the year when the land is fallowed, because it is then that it receives the most perfect culture, which enables it to produce several crops afterwards with a much smaller quantity of labour. By such fallowing and proper manuring, the soil is fully restored to its highest degree of fertility. In light soils, which are generally poorer, turnips or other green crops are sown, on which sheep are folded, who, by their manure, still more enrich the soil, and it is only when this manure is ploughed in, that the land may be considered as possessing the proper degree of fertility.

There are some soils which are so mixed with pebbles and stones, that the foregoing observations will scarcely be applicable, and the instruments must be adapted to their texture. Some of these soils, abounding with chalk, are tolerably fertile, and the stones, when they are not so large as to impede the operations, are rather beneficial than otherwise. Theophrastus mentions a field which had been deprived of its fertility by the removal of the stones, and others have learned the same from experience. Pebbles prevent too great evaporation, shelter the young plants in exposed situations, and reflect the light and heat of the sun. The only inconvenience found from them in good soils is that they occupy the room of better earth, and wear out the instruments used, which, in consequence, are made stronger and blunter. When there is a crop to be mown with the scythe, the stones must be removed from the surface, but not otherwise, at least in light soils.

When the land has been duly prepared, the seed is sown. This is done sometimes before the last ploughing, but then

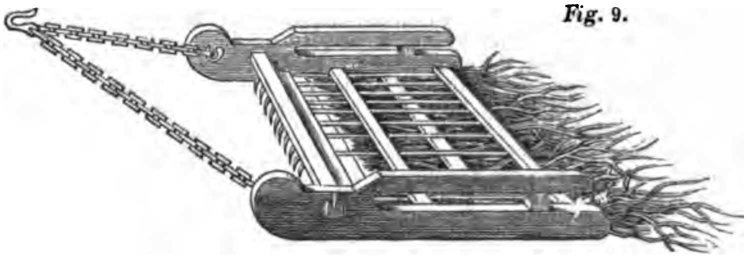
Fig. 8.



[Dibbling.]

the manure should have been ploughed in before; for, except in planting potatoes, which are not a seed, but a bulb, the manure should always be deeper, and not in contact with the seed. When the seed is ploughed in, the furrow should not be above two or three inches deep, and eight or nine wide; and it is only in particular soils that this mode is to be recommended. The most common method is to sow the seed on the land after the last ploughing, and draw the harrows over to cover it: when the land has been well ploughed, and especially if the press-drill has followed the plough, the seed will mostly fall in the small furrows made by two adjoining ridges, and rise in regular rows. But by far the most perfect way is, to sow it at a regular depth, by means of a machine, and in rows at regular distances [see DRILL], or to *dibble* it, which is an operation performed only in a few parts of England, especially in Suffolk, Essex, and Norfolk. A man makes small holes at the distance of four or six inches, and in rows nine to twelve inches asunder, with two rods about thirty inches long, one in each hand, having an oval ring for a handle at one end, and, at the other, an inverted cone three inches in the axis, and one and a half inch diameter at the base, which he pushes and turns with his hands in the ground to prevent the earth adhering, and makes the holes rapidly going backwards along the furrows; two or more children follow and drop three or four grains in each hole; a bush-harrow is drawn over the ground, and fills the holes with loose earth; when the corn comes up, it looks like a regular plantation.

Fig. 9.



[Bush-Harrow.]

The proper season for sowing each kind of grain, the choice of seed, and other particulars, will be given under the name of the different seeds usually sown. As a general rule, it may be observed, that the smaller the seed, the less it must be covered, and clover or grass seed are not usually harrowed in, but only pressed in with the roller.

Of the succession of crops or rotations.—It has been found by experience, that besides the general exhaustion of humus produced by vegetation, especially by those plants which bear oily or farinaceous seeds, each kind of crop has a specific effect on the soil, so that no care, or manure, can make the same ground produce equal crops, of the same kind of grain, for any length of time without the intervention of other crops. Whether this be owing to any peculiar nourishment necessary to each particular kind of plants, or because plants not indigenous degenerate in a foreign soil, the fact is certain with respect to most crops usually raised, and particularly red clover. This points out the advantage of varying the crops, according as they are found to succeed best after each other. In general, all kinds of grain succeed best after a crop which has been cut before the seed has ripened, or the stem is dried up. Those plants which have a naked stem with few leaves thrive best after leguminous plants, which have more succulent stems and more leaves, and which bear their seeds in pods, as peas, beans, tares or vetches; or after esculent roots, which strike deep into the ground, as carrots, parsnips, beet-roots, and turnips. From this circumstance, confirmed by universal experience, the different systems of rotation have had their origin, taking the nature of the soil into consideration.

The simplest rotation, and one which can only be adapted to the richest strong alluvial soils, is that of wheat and beans, alternately, and without any intermission. It is in use in some parts of Kent and Essex, and in a few places in Germany. The land is well prepared and manured for the beans, which are set or drilled in rows, so as to admit of horse hoeing between, as in Tull's method, till the beans get to a considerable height; besides this, careful hand-hoeing and weeding are practised, by which the land is cleaned and stirred as in a regular fallow. The beans being cut, the ground is ploughed once, and the wheat sown. It is the practice in some places to scarify the land immediately after harvest, to cut up the stubble. It is done in Kent with a plough without a mould-board, and with a very broad share, hence called *broad-sharing*, but most usually by the scarifier mentioned before: the stubble and weeds, if any, are raked up and burned: this is an excellent practice. Another equally simple rotation, on very poor light land, is that of turnips and barley alternately, which is mentioned by Arthur Young as being in use in the county of Durham, with the simple variation of clover occasionally. The turnips are always fed off by sheep folded on them. Where winter food for the sheep is scarce, this rotation may answer, but otherwise cannot be very profitable.

The oldest rotation known, and which was almost universal in Europe, from the time of the Romans, wherever any regular system of agriculture prevailed, is the triennial rotation of fallow, winter corn, and summer, or lent corn; that is, wheat or rye sown in autumn, and barley or oats sown in spring. This was called the three-field system; and on every farm, the arable land was divided into three parts, one of which was in fallow, one in winter corn, and one in summer corn. When properties were much intermixed and subdivided, the whole of a considerable tract was divided into three fields, and it was almost impossible for any individual to deviate from the established course; especially as a right frequently existed of pasturing all the sheep of the parish or district on the fallow field in summer, and on all the others after harvest. In England, this impediment was removed by the legislature passing acts of inclosure; but it is still felt in many parts of the Continent. This rotation had its advantages, or it could never have been so long in use. Where a sufficient quantity of manure could be collected by means of cattle fed on pastures and commons in summer, and in the strawyard in winter, to give a regular dressing to the fallows every third year, good crops were produced, and the fertility kept up. The labour was very equally divided throughout the year; and such was the regularity of every operation, that a large quantity of land might be cultivated by a proprietor at a considerable distance, with only occasional inspection, without an overseer or bailiff, provided he had honest servants. But, when pastures came to be broken up, and converted into arable land, and cattle consequently diminished, the land could not be manured on every fallow; the crops suffered; less straw being grown, the quantity of manure was diminished, and the land became gradually less and less productive, till, from necessity, a portion was left uncultivated, and returned to natural and inferior pasture; this gave the idea of laying the land down regularly to grass by sowing seeds, and gradually introduced the alternate and convertible system of which we will take notice hereafter.

The apparent loss of a third part of the land by the fallows introduced various crops, which were supposed not to exhaust the soil, but rather to enrich it: of this kind, one of the first was clover, introduced by the Flemish; and afterwards turnips, which have been found of such importance in light soils and moist climates. By substituting turnips for an entire fallow, or, more properly, sowing them early on the regular fallow, and interposing the clover between the summer and winter corn, the highly-improved Norfolk rotation has been obtained, viz. 1. Turnips, well manured. 2. Barley. 3. Clover. 4. Wheat, by which a sufficiency of food for sheep and cattle is obtained, without natural pastures, and the land, manured every fourth year at least is kept in a regular state of progressive improvement. The advantages of this rotation have made it a condition in many leases of light land, under heavy penalties in case of deviation. The first and principal inconvenience found in it was the failure of the clover in most soils, if sown every fourth year; this obliged the farmer to have recourse to other less profitable crops, such as ray-grass, peas, or tares, which, in light lands, are not equal to broad clover as a preparation for wheat. Where the soil is firm and rich, and at the same time mellow, a rotation may be introduced, compounded of the first and last mentioned; that is, beans, wheat, turnips, barley, clover, wheat, making a rotation of six years. This can only be introduced with advantage where there are considerable pastures, and much cattle is kept to supply manure for the land *twice* in the rotation, viz., for the turnips and for the beans, and where the drill husbandry admits of hoeing and weeding thoroughly; but with these advantages, no course can be more profitable, as is found in those parts of Kent and Essex where marsh pastures are attached to the farms. If the soil is too heavy and wet for turnips, and they cannot well be drawn off nor fed on the land, without injuring it, a clean fallow is substituted for the turnips, the other crops remaining the same; or cabbages are planted for the cattle, but seldom to a great extent. A long fallow from after harvest until the second spring, including two winters, prepares the land admirably for barley, so that it can be sown without any manure, which is reserved as a top-dressing for the young clover after the barley. This is a very excellent method. The clover or ray-grass will be more abundant, and the wheat after it will not be in danger of running to straw, or lodging, that is, falling down for want of a sufficient hold of the ground by the roots.

These rotations are sufficient to give some idea of the principles on which they have been adopted. In Scotland they adhere less strictly to particular rotations, nor are the tenants in general so much tied down as in England; seasons and circumstances cause deviations, which are sometimes judicious and often unavoidable. It is best, however, to follow some regular course, and in the end it will be found most profitable. A very common rotation in Scotland is fallow, wheat, clover, or grass, fed one, two, or three years, then oats, peas, or beans, and wheat again, if the land is clean and in good heart: for there is no rule better established, than that of never allowing the soil to be exhausted beyond a certain point, where manure and tillage can readily recruit it. The greedy cultivator is sure to pay dearly in the end for every crop forced from the land unreasonably.

Without preventing the tenant from using his discretion as to the mode in which his farm is best cultivated, a proprietor may be sufficiently protected against wanton deterioration of the land, by insisting on a green crop or fallow intervening between every two crops of grain, and consuming all the fodder and roots on the farm. For this subject we must refer to the article **Farm**. A proprietor with skill and experience, cultivating his own land, need only consider the state and quality of his fields, and what will most likely grow well in them; what is most in request, both for his own use and in the market; what will keep his men and cattle in most regular work, without confusion or hurry. If he allows his land to be impoverished for want of manure, or to run wild with weeds, for want of hoeing or fallowing, he has not the experience and judgment which are necessary for his pursuits.

The Flemish husbandry proceeds much on this principle. The greatest attention is paid to manuring and weeding. Much more manual labour is bestowed than with us, and the crops seem more certain, varied, and abundant. That it is not unprofitable we may conclude from the wealth of the peasants, the comfort of the labourers, and the sleek appearance of the cattle. From the very interesting account of Flemish agriculture in the work of Mr. Van Aelbroek of Ghent, written in Flemish, translated into French, and published at Paris in 1830, we learn with what great care the soil is cultivated in Flanders. After ploughing into lands as we do, every intervening furrow is deepened and cleared with the spade, the earth being thrown over the bed sown. Liquid manure (which is sadly thrown away in this country), chiefly the urine of animals and drainings of dunghills, is carefully collected, and is carried on and distributed over the poor light soils, by means of water-carts, before sowing, and again when the crop is come up. By this means such lands are made to yield crops of rape seed, clover, lucern, flax and corn, equal in luxuriance to those on the richest soils. Fallows are rendered unnecessary by the careful destruction of weeds. In short, it is a garden culture on an extended scale. All the land is in tillage, except where rivers occasionally overflow, and render the meadows rich and profitable. The cattle are mostly kept in stables, and fed with green food cut and brought to them; by which means one acre of clover, lucern, or other artificial grass, will maintain five times as many beasts, or more, as an acre of the best pasture: but the great object is to increase manure, especially in a liquid state, which is carefully preserved in reservoirs, without loss or waste, till wanted for the land. This system is also followed in Switzerland, which, considering its soil and climate, is one of the best cultivated countries in Europe.

We observed before, that the want of a sufficient supply of manure on the old three-field system led to the laying down arable land to pasture for a time and then breaking it up again. This was first practised in a regular rotation in Holstein and Mecklenburg, and raised these countries rapidly amongst agricultural nations.

In Holstein, on moderately good soil, they adopt the following course:—1. Oats, on newly broken up grass land. 2. A fallow to destroy grasses and weeds, and accelerate the decomposition of their roots. 3. Wheat with or without manure, according to the state of the land. 4. Beans, barley, or oats. 5. Wheat, manured, unless it has been done for the beans the year before. 6. Grass seeds pastured for three years or more, when the rotation begins again.

A Mecklenburg rotation, not unlike the Scotch, consists of;—1. Beans well manured, or potatoes. 2. Wheat or oats. 3. Barley or oats, unless sown the year before. 5. Peas or tares, *manured*. 6. Wheat. 7. White clover and grass seeds, which were sown among the wheat the year before, and are kept in pasture the 8th and 9th. There is no fallow, and in a moist climate it will be difficult to keep the land clean. It might, however, easily be introduced, as in the Holstein rotation.

Another rotation is,—1. Oats. 2. Beans well manured. 3. Wheat. 4. Tares manured. 5. Barley. 6. Clover and grass seeds mown for hay and green fodder; 7 and 8. ditto, fed. All these are excellent for a moderately good soil well managed. If the soil is very rich, the following is the most profitable of any:—1. Rape seed well manured. 2. Wheat. 3. Beans or potatoes manured and hoed. 4. Barley. 5. Clover. 6. Wheat. 7. Oats with white clover and grass seeds pastured two or three years. The principal object in this convertible system is to lay the land down in good heart, and as clear of weeds as possible: the grass will then be abundant, and continue good for several years. Liquid manure, carried upon it in spring, will so enrich it as to admit of making the crop into hay, or cutting it green for the cattle in the stables. In light soils, the tread of sheep and cattle is of great use; in heavy, wet soils, they would do harm. No wet land will bear this rotation.

We have now given a brief outline of the manner in which arable land may be cultivated and improved. If we should be asked, whether so much attention and labour upon land of a proper quality will be repaid by the value of the produce, after deducting the portion due to the landlord, or to the state? we shall answer, without any hesitation, in the affirmative, provided the cultivator is possessed of knowledge, judgment, and experience, and devotes all his time to the superintendence of his farm. The calculations on which this opinion is founded cannot be introduced here; some idea of them will be given in the article **Farm**. Agriculture is so healthy, so agreeable, and so moral an occupation, that it can never be extremely profitable: the competition for land will always prevent this. The butcher and cattle-dealer will always, if successful, make far greater profits than the farmer; and a decent livelihood, with a moderate interest on the capital laid out, is the most that a farmer can expect, even with the greatest assiduity. If he neglects his business, and leaves it to others less interested in the result, he must be a loser. Gentlemen who cultivate for pleasure, and employ bailiffs, are fortunate if they get a moderate rent after paying expenses. For careless farmers, the simplest system alone can prevent great loss; and grass land may be profitable in the hands of a proprietor, who would probably be ruined if his land were all arable and in his own hands.

Our limits will not permit us to enter into the important subject of improvements,—nor into the question of great or small farms, as most beneficial to the community:—these and various other branches of the subject will be found under proper heads; such as **Barren Land**, **Farm**, DRAINING IRRIGATION, MANURE, LABOUR, GRASS-LAND, CATTLE, &c.; and for the peculiar cultivation of the various products of agriculture, see WHEAT, BEANS, BARLEY, CLOVER, OATS, PEAS, &c. &c.

We shall only add the names of a few authors whose works may be studied and consulted with advantage, by all those who desire to have a competent knowledge of agriculture, either as a branch of general knowledge, or for the purpose of its practical application.

Of the Greek writers on husbandry we have hardly anything left, except in the collection of Cassianus Bassus, entitled *Geoponika* (earth-labouring). This collection, in twenty books, was made at the command of the Emperor Constantinus Porphyrogennetus, and was chiefly compiled from Greek writers, whose names are given. We are not aware that there is any foreign translation of the *Geoponika*, except the old German version of *Herren*, first printed at Strasburg in 1545, 4to. The Latin writers, Cato, Varro, Virgil in his *Georgics*, Columella, and Palladius, are well known: their works, especially the last two, will be found to contain many valuable remarks; and abridged translations of them, or extracts, would be very useful even to modern agriculturists. Of the above, the following have been translated by the Rev. T. Owen, rector of Upton Scudamen, Wilts:—1. *The Three Books of M. Terentius Varro, concerning Agriculture.* London, 1800. 8vo. 5*s.* 6*d.* 2. *The Fourteen Books of Palladius on Agriculture.* London, 1807. 8vo. 8*s.* The same author has also published *Agricultural Pursuits, translated from the Greek.* London, 1805, 2 vols. 8vo. 15*s.* Of the earlier English writers, we shall only mention Fitzherbert, Blythe, Hartlib, and Weston. Afterwards came Evelyn, Tull, Hale, and the great oracle of modern husbandry, Arthur Young; with Sir John Sinclair, to whom, as President of the Board of Agriculture, much useful information was communicated, which he industriously compiled. (Sinclair's *Account of Systems of Husbandry*, &c., 2 vols. 8vo.) The Surveys and Reports on the agriculture of the different counties, prepared for the Board of Agriculture, are replete with useful information as to what is the actual practice; and among a multitude of agricultural publications, journals, and proceedings of societies, we may notice Loudon's *Encyclopædia of Agriculture*, as a useful book of reference.

The French are rich in elementary works, among which the *Théâtre d'Agriculture*, par Olivier de Serres, is a standard work. It was written at the express desire of Henry IV. and his minister Sully, and published in 1600; the last edition, in four volumes quarto, Paris, 1804, with numerous additions, and the *Cours Complet d'Agriculture*, by various members of the Institute of France, published in 1820, contain everything that was then known of the science of agriculture. A little work of much merit may be mentioned, called *Le Manuel Pratique du Laboureur*, by Chambouillé Dupetitmont, Paris, 1826, two volumes, duodecimo; and also *Le Calendrier du bon Cultivateur*, par C. I. A. Mathieu de Dombasle (on the plan of Arthur Young's *Farmer's Calendar*), Paris, 1833, duodecimo, is a very useful work. Innumerable works on particular branches, and the annals and memoirs of various agricultural societies, appear daily. Among the German authors we shall only mention Thaer, whose works we have quoted above, and which form a most complete body of theoretical and practical agriculture: his experiments made on a large scale at the national farm of Mögelin near Frankfort on the Oder, and repeated for many years, can be fully depended upon. We have also quoted the work of Mr. Van Aelbroek, *De l'Agriculture Pratique de la Flandre*, Paris, 1830, octavo, as a useful and interesting work.

ARABS' GULF, a bay on the north coast of Africa, lying between Alexandria and some point west of Alexandria, which is not well defined. Ras-el-Kanys, 115 miles west of Alexandria, is the first very salient point as we advance westward.

The bay called *Plinthinêtes* (Herod. ii. 6) corresponded to, or formed a part of, the Arabs' Gulf.

ARACAN, or RAKHAIN, is a country of Asia, lying on the eastern shore of the bay of Bengal, and forming the westernmost part of the Peninsula beyond the Ganges. It extends from 20° 46′ to about 18° N. lat., and lies between 92° and 95° E. long. Its extreme length from N.N.W. to S.S.E. may amount to upwards of 230 miles, and its average breadth to about 50 miles. Its surface is estimated to contain 11,500 English square miles, so that it exceeds the principality of Wales by more than 3000 miles.

It is bounded on the east by a range of mountains, which separates it from the Burmese empire, from which it is also divided on the south by a small mountain-river. On the west it extends to the bay of Bengal, and on the north to Chittagong, a province of Bengal, and to the mountainous and woody tract which extends between Chittagong and Muneepoor. It is separated from Chittagong by the river Naf, or Nauf.

This country, which in 1826 was acquired by the East India Company from the Burmese, contains three districts, Proper Aracan, or Akyab, Sandoway, and Ramree.

Aracan Proper consists of a valley stretching nearly parallel to the shore, between a range of mountains and a ridge of hills. The mountain-range which divides it on the east from Ava is called Yeomadong by the Aracanese, and Anapectomiu by the Burmese: it extends from Cape Negrais (16° 2′ N. lat.) to the Tipperah Hills lying east of Dacca in Bengal, which, together with the hills bounding Silhit on the south, may be considered as the northern extremity of this range. Its mean elevation is about 3000 feet above the level of the sea, though, in some parts, it attains the height of 5000 feet. On the east, or towards the Irrawaddy in Ava, it declines by a succession of ranges; but towards Aracan its descent is steep and abrupt. Several passes conduct over these mountains to Ava, but only two can be passed with ease.

The heights which extend along the Bay of Bengal at no great distance from the shore and separate the valley from the sea, do not, probably, rise to more than 700 feet. They generally assume a conical shape, and do not form a continual range; some are insulated, others connected by narrow ridges, but all are scattered in an irregular manner and separated by many ravines, valleys, and confined level spots, each occupied by a stream, a lake, or a marsh. On the shore they are intersected by many rivers, creeks, and inlets of the sea, so as to form a series of peninsulas, isthmuses, and islands, by which the land communication is completely interrupted. The coast is fronted by numerous islands, moderately high and thinly inhabited.

The valley, which lies between the two ranges, varies in breadth: in some parts the hills advance from the shore so far to the east as to narrow it to 10 miles, and even less, whilst in other places they leave a space of 40 miles between them and the mountains. This valley is so little above the level of the sea, that the tide, which in the straits, rivers, and harbours rises 14 feet at full and change, inundates the flat borders of the rivers to a considerable extent, and its ebb converts them into a noisome swamp. With the exception of this swampy ground, the soil consists of rocks, crumbling on the surface, and covered by a thin layer of loose black soil. Where this layer has not been washed away by the rains, the country is covered with grass and jungle-shrubs. In July, when the periodical rains become very abundant, the whole valley is inundated, and resembles a channel of the sea, in which the few towns and villages appear like islands scattered in a large lake.

The small rivers which intersect this valley are so numerous as to form a complete labyrinth, one winding creek leading to another, so as to form an inland water-communication between the villages and towns for the greatest part of the year. Most of the small streams run to the northward, where the valley is lowest and broadest, and where the hills on the shore terminate, or rather leave a wide opening. Here they fall into a kind of bay full of islands of considerable extent, which seem to be low and partly uninhabited. This bay receives also the principal river of the country, the Keladyne or Huritung, which rises in the mountainous tract between Chittagong and Muneepoor, and may have a course of about 250 miles. The rivers, which, farther to the south, intersect the hills, as the Talak Keon and the Yanaway Keon, are small, but commonly navigable for boats eight or nine months in the year.

Many causes concur to render this ill-ventilated valley extremely unhealthy—the heat, the inundations, and the general moisture. Even in the dry season, in November, December, and January, occasional and sometimes heavy showers occur. In February, March, and April, they become more frequent, and still more in May and June, when the periodical rains set in and last till November. The rain in July amounts to nearly 60 inches, and in August to 43½. From the beginning of June to the end of September, it amounted, in 1824, to 196 inches, and then nearly the whole surface of the valley was under water. Heavy dews and thick fogs prevail during the nights even in the dry season, and great heat in the day-time. The thermometer rises in July to 89°, and in August to 94°, and is never under 77° in these months.

The fertility of this country is very great, and its soil fit for the culture of nearly all tropical productions; but in the actual state of agriculture rice only is cultivated to any great extent. Indigo, cotton, and tobacco, as well as hemp, are also raised, and their culture has lately increased, but not so as to produce any for exportation. Sesamum and mustard-seed are cultivated, on account of the oil which is extracted from them and largely used. The sugar-cane grows very luxuriantly, and might be cultivated to a great extent. Black pepper of a good quality grows wild near Aeng, but it is nowhere cultivated. Fruit is plentiful and of excellent quality. The pine-apples and plantains are, perhaps, the finest flavoured in the world, and are produced in the greatest abundance. Mangoes, jack-fruit (*Artocarpus integrifolia*, Linn.), sweet limes, and cocoa-nuts are also plentiful, but oranges are scarce. Of the vegetables raised, the principal are onions, garlic, and turmeric; but bhangans, red pepper, cucumbers, water-melons, papeyas, and raktalus are also abundant. No forest-trees grow in the valley, nor, as it seems, on the hills along the shore; but extensive forests of teak abound in the mountains at the sources and along the upper course of the Huritung; their great distance from the coast, however, and the want of roads prevent the people from bringing them to the more inhabited part of the country. This timber, therefore, is imported from Rangoon in Ava, or from Bengal. Other forest-trees abound in the same mountains and on the borders of Chittagong.

The zoology of this country is very little known. We learn only that the jungles abound in tigers and wild elephants, and that the latter are much more dangerous to the cultivated fields, than the former to the cultivators themselves. Of domestic animals only poultry and buffaloes are mentioned. The latter are most esteemed from their being docile and useful in cultivating and treading out rice. Silk is raised, but not enough for the consumption of the inhabitants. Bees abound in the country near the mountains. Fish is so plentiful that it not only supplies the principal food of the inhabitants, but also, when dried, an article for exportation.

Still less is known of its mineral riches. Silver, it is said, has been ascertained not to exist in the mountains, but there is iron-ore in abundance, and this is all we know. Salt is made in a great many places, and is an important article of exportation.

Aracan, 20° 43′ N. lat. and 93° 31′ E. long. the antient capital, is built on a plain entirely surrounded by hills, and intersected by several streamlets, which occasionally join each other or fall immediately into the river Huritung. One of these streamlets runs through the town and divides it into two parts connected by strong but clumsy wooden bridges. This stream ebbs and flows with the tide, and at high-water boats are able to navigate it. During the periodical rains the greater part of the town is inundated, and on this account here, as well as in the villages on the plain, the houses are raised upon piles or strong posts of timber, little more than four feet above the ground, that the water may have a free course under them. These houses, or rather huts, are miserable structures, only one story high, and thatched with straw or mats. They are ranged with considerable regularity in streets, the chief of which skirts the stream on each side. This town is about four miles in circumference, and of a quandrangular form. Before its occupation by the British troops (in 1824) it is said to have contained 13,000 houses and 95,000 inhabitants. Its actual population is not known, but it is certain that it has much declined since it has ceased to be the seat of the government of the country, which by the Company has been transferred to other places; and it is probable that at present it does not contain one-fifth of the number of inhabitants formerly assigned to it.

Within the town is a fort, a very antient building; the date of its erection is unknown. It is surrounded by three quadrangular concentric walls, each about 20 feet high and of considerable thickness. There are also four pagodas, built in the centre of the town on a hill about 100 feet high, and inclosed by a quadrangular wall. They contain numerous images of Gaudama, from one inch to twenty feet in height; but what renders them especially remarkable are some antient sculptures found in and about them, among which some sphinxes are observed, which confirm the striking analogy between the hieroglyphics of Ava and Egypt observed by Symes. Except the fort, the pagodas are the only stone-buildings in Aracan.

The heights which surround the town are covered with pagodas, the gilt spires of which, shooting up like pyramids from every pinnacle around and glittering in the sun, contribute greatly to the singular and picturesque appearance of this place. Upwards of sixty of these temples, of various forms, may be counted at once.

Akyab, the capital of the district which comprehends Aracan Proper, has a good harbour, but is little frequented, on account of its unhealthfulness. Two other places are worth notice, *Talak*, on the Talak Keon, and *Aeng*, on the Yanaway Keon. Both are places of some commerce, and owe this advantage chiefly to their being situated where the roads traversing the mountains terminate, and on the banks of rivers navigable for boats from June to April. The country along these rivers is improving in cultivation.

The district *Sandoway* comprehends chiefly the mainland between 19° and 18° N. lat., and is a mountainous country, intersected by valleys running east and west. Not being exposed to inundations, nor subject to fogs, it is tolerably healthy, and enjoys a cool sea-breeze, with temperate nights, nearly through the year. Agriculture is increasing, on account of the neighbourhood of Kyouk Phyoo. The capital, Sandoway (18° 28′ N. lat., and 94° 27′ E. long.), lies on a navigable river, and is a thriving town.

The district *Ramree* contains the two large islands of *Ramree* and *Cheduba*, and several smaller ones. The island of Ramree is of considerable extent, and divided from the main land by a narrow but navigable channel. It consists of hills, intermingled with much level ground, and has generally a very fertile soil. Besides the common productions of the country, excellent oranges are raised; horticulture is improving, and the cinnamon tree, which lately has been introduced, promises very well. On the southern extremity of the island is a ridge of hills, among which are several volcanoes, reported to discharge flames occasionally and a quantity of iron pyrites, but in their tranquil state only a greasy mud bubbles up, mixed with a little petroleum.

Kyouk Phyoo (meaning *the white stones*, because small white pebbles are washed on the beach during the S.W. monsoon) is at present the capital of Aracan, and begins to be a place of some trade. It is situated at the northern extremity of the island of Ramree, on a beautiful plain, with much high land in its vicinity, which is covered with forest trees, yielding timber of superior quality for masts and yards, and perhaps for other naval purposes. The harbour is spacious and good, free from fogs, with abundance of water and fire-wood. Lately a few cargoes of rice and dried fish have been shipped from this place to the Mauritius.

At the south end of Ramree is a safe harbour, called *Ramree*, or *Amherst Harbour*.

The island of *Cheduba* is divided from Ramree and the main land by a channel some miles broad, and navigable, but no safe harbour is found on it. From north-west to south-east the island extends about twenty-one miles, by about fifteen miles in breadth. It is of moderate height, with several hummocks on it; its soil is excellent, and well watered by hill-streams, on the banks of which rice, tobacco, cotton, red pepper, hemp, and sugar-cane, are cultivated. But the larger part of the island is still covered with jungle. In 1827 it contained about 2300 houses, and 12,000 inhabitants. Here also are several volcanoes, mostly of the description called mud volcanoes, strongly impregnated with sulphur. They are worshipped by the inhabitants, who think them occasioned by the great naga or serpent which supports the world, and takes this method of giving vent to its agony.

The actual population of Aracan is stated to amount to little more than 200,000 inhabitants, but it seems somewhat under-rated, if it be true that 400 square miles of the country are under cultivation. The aborigines, who to all appearance form almost exclusively the population, are called *Mugs* by the inhabitants of Bengal, but their national name is *Yakain*, or *Ma-ran-ma*. They are short, squat, robust, and fleshy, and differ in features greatly from Europeans. Their face is somewhat of the shape of a lozenge, the forehead and chin being sharpened, but the face at the cheek-bones very broad. The eyebrows project very little, and the eyes are very narrow, and placed rather obliquely in the head, the external angles being the highest. Their nose is very small, but has not, like that of the negro, the appearance of having been flattened; the hair is harsh, lank, and black. Though living in a very hot climate, they have not the deep hue of the negro or Hindu. From this description, it is evident that they belong to the same race as the Chinese.

Their language is one of those which may properly be called monosyllabic, from the mass of their radical words being monosyllables, like the spoken dialects of China. They have borrowed a considerable number of terms from the Pali, which exists among them as the language of learning and science; but in adopting these polysyllables, they suit them to their peculiar enunciation by pronouncing every syllable as a distinct word. Though monosyllabic, their language is quite distinct from that of China, but exhibits a very great affinity to that spoken by the Burmese, who consider the Rakhain, or language of Aracan, as the most antient and original dialect of the Burma language. According to Dr. Leyden, their literature is not scanty, for he enumerated twenty-nine different Rakhain compositions, of which, however, the greatest number are translations from the Sanscrit.

Though far from being civilized, according to our notions, they do not neglect education. A person rarely is met with who cannot read and write. Their records are kept on palm-leaves, beautifully lacquered in japan and red, generally on a gilt ground with dark letters. Their common accounts are written with a chalk pencil, resembling talc, on folds of paper made of the bark of a tree, and then covered with lamp-black, or on a smooth board smeared with the same substance. They have thirty-six letters in their alphabet, written from left to right, and in writing they hold the pen or pencil as we do, the lines being as fine and the characters as beautifully formed as if made with a pen and ink.

Their religion is that of Bhudda; their priests seem entirely occupied in the education of the children. In every village are two or three, and their schools are open to all. Their only remuneration seems to be a sufficient quantity of food, and the erection of a house, which answers as a residence, temple, and school-room, with generally a small pagoda annexed to it, having a number of poles and pendants hanging from it, much after the manner represented on common china-ware. Indeed all their habits, as well as their persons and dress, resemble those of the western parts of China.

The Mugs are distinguished for their simple honesty and inoffensive disposition: they are perfectly free from the servile hypocrisy of the Hindoos, and equally unlike them as to probity—their word being generally trustworthy. In dealing, they ask the price which they think the article to be worth, and no more. They are averse to lying, so that when detected after the commission of any felonious act, however serious, they almost invariably, and with the utmost frankness, confess the crime, and detail with the greatest minuteness the manner in which it was committed. Their religion enjoins them not to take away animal life; but they do not seem very bigoted to this part of their creed, as they have no objection to part with their oxen and buffaloes, and to eat every part when dead, even to the offal usually given to dogs.

The women dress much after the Chinese manner; but they are by no means secluded, having a full share in the common intercourse and transactions of life. As they are not precluded from instruction, they are often shrewd and intelligent. A peculiar usage of this nation is, that when a man wants to raise money, he pawns his wife for a certain period, or until the debt is liquidated.

The mountains which separate Aracan from the Burmese empire are inhabited by a nation called by the Burmese *Kyain*, but who term themselves *Koloon*, and whose language is peculiar, having little or no affinity to either Rakhain or Burma. They have preserved their independence, not by resisting the invasion of their more powerful neighbours, but by withdrawing themselves to other places in the interior of the range. They are a harmless and industrious race, cultivating rice in the valleys, fishing in the rivers, gathering the honey and wax of the wild bees, and fabricating a sort of cloth, called pujung, of the cotton of the wild cotton-tree, which abounds in the mountains. Dried fish, bees' wax, honey, and pujung are exchanged by them in Ava, or Aracan, for a few manufactured articles. They seem not to adhere to the doctrines either of Brahma or Bhudda.

A considerable traffic was formerly carried on between Aracan and Ava, the first exporting Hindostanee and European goods, such as velvet, broad-cloth, piece-goods, muslins, betel-nut, salt, &c., and receiving in return ivory, silver, copper, sugar, tobacco, oil, and lacquered ware. It seems that this commerce has been considerably reduced since the occupation of the British, but no later statement informs us to what extent it is still carried on by the passes over the mountains. The commerce by sea is not important: a few boats coasting along the shore to Chittagong, and from thence through the Sunderbunds to Calcutta, are sufficient for all their trade to the northward. About the same number goes to Rangoon in Ava, whence they bring back silk and other articles manufactured in that country, which are much superior to those made by themselves, and more valued than any yet brought by Europeans.

This country is dependent on the presidency of Calcutta. Each of the three districts, Akyab (Aracan), Sandoway, and Ramree, is governed by a civil judge or superintendent, under the immediate inspection of a commissioner, who usually resides at Chittagong. The revenue derived from it does not exceed three lacs of rupees and a half (360,000*l.*), produced principally by the rental of the land, the Company, as sovereign, considering themselves the proprietors of the soil. This revenue barely suffices to defray the expenses, though the garrison only consists of eight companies of sepoys, two at Akyab, two at Sandoway, and four with the head-quarters of the regiment at Kyouk Phyoo. (See Symes's *Embassy to the Court of Ava*; Francis Buchanan, Dr. Leyden, Paton, and Trant, in the *Asiatic Researches*; *Journal of the Lond. Geogr. Society*, vol. i.; *Asiatic Journ.*)

A'RACHIS, in Botany, the generic name of a kind of pulse, called the Earth-nut, which is much cultivated in the warmer parts of the world: it belongs to the pea tribe, to which and the bean it is botanically related. The circumstance by which the arachis hypogæa is particularly remarkable is the manner in which its fruit is produced: instead of hanging down from among the leaves in the manner of other plants, this conceals itself in the earth, in which it is deeply buried at the period when it becomes ripe, a phenomenon which happens thus:—The young fruit, instead of being placed at the bottom of the calyx, as in other kinds of pulse, is found at the bottom and in the inside of a long slender tube, which looks like a flower-stalk. When the flower has withered, and the young fruit is fertilized, nothing but the bottom of this tube with its contents remains. At this period, a small point projects from the summit of the young fruit, and gradually elongates, curving downwards towards the earth. At the same time the stalk of the fruit lengthens, until the small point strikes the earth, into which the now half-grown fruit is speedily forced, and where it finally ripens in what would seem a most unnatural position. When mature, it is a pale yellow, wrinkled, oblong pod, often contracted in the middle, and containing two or three seeds the size of a hazel nut. These are considered a valuable article of food in Africa, and the tropical parts of Asia and America. In flavour the nuts are as sweet as an almond; and they yield, when pressed, an oil in no respect inferior to that of olives.

The plant will only grow in a light sandy soil, in which its pods can readily be buried, and it requires a climate as hot at least as that of the south of France. Its stems grow from one to two feet high; its leaves are composed of four broad and blunt leaflets; and its flowers are small and of a pale yellow colour.

ARA'CHNIDA, a class of animals including spiders, mites, and scorpions, all ranked by Linnæus under Insects, but which are very properly separated from them, on account of external form, structure, and habits. The separation was first made, we believe, by Fabricius, who, looking chiefly at the structure of the mouth, characterized the greater number of the animals now ranked under arachnida, by the jaws (*maxilla*) being horny and furnished with a claw (*Unogata*). M. Lamarck afterwards made the arachnida a distinct class: but we owe to M. Latreille and Dr. Leach the establishment of characters more precise and extending to a greater number of genera. Much has been done in perfecting the knowledge of their structure, manners, and numerous species by Clerck, De Geer, Walckenaer, Treviranus, Leon Dufour, Herold, Straus-Dürckheim, Blackwall, and others. We shall condense into as short a compass as we can the most important points investigated by these naturalists.

The arachnida (*Acera*, Virey) differ from insects in having no antennæ; in the eyes being in most species eight, and, even when only two in number, never being placed laterally on the head; in the legs being usually eight, though in some species six, and in others ten; and in their respiratory apparatus consisting of radiated *tracheæ*, communicating with a sort of gills inclosed in pouches in the lower part of the abdomen.

The skin or crust of arachnida is in general more leathery than horny; but whether it be soft, as in most species, or hard, as in a few, it performs a similar office to the bones of larger animals in giving support to the soft parts and attachment to muscles, the legs being jointed upon, and radiating from, a common breast-plate (*sternum*) externally; while, according to Straus-Dürckheim, there is also an internal breast-plate of a gristly texture (*un sternum cartilagineux intérieur*) in form of a horseshoe, the two ends of which are directed forwards.

The greater number of the arachnida are carnivorous, and are furnished with appropriate organs for their predatory life. Some parasitic species, such as the minute parasite mites (*Lepti*, De Geer), which we have observed infesting numerous species of insects, from the largest butterflies to the smallest gnats, are furnished with a sucker, in some respects constructed like that of the gadfly (*Tabanus*). In other species, there may be distinguished a pair of upper jaws (*mandibula*), a pair of under jaws (*maxilla*), carrying jointed feelers (*palpi*), and between them a sort of tongue formed by a projection from the breast. At the back part of the mouth is placed a piece of a horny texture, which Savigny, Latreille, and Audouin term the *pharynx*, forming the entrance into the gullet. The gullet, together with a bulging on the fore part of it, termed the stomach, as well as the intestines, run in a straight line from the pharynx to the vent. Near the upper portion of the gullet are found salivary vessels, whose exterior aperture is in the first joint of the upper jaws. The saliva secreted by these vessels appears to be poisonous. Lower down are the biliary vessels, which resemble those of insects.

In the greater number of arachnida, there is a complete and very distinct circulatory system. The heart, which differs materially from the dorsal vessel, by some termed the heart in insects, occupies the abdomen, and its pulsations may be distinguished externally. It is a thick longitudinal vessel, giving origin to a certain number of arteries, and receiving veins by which the blood returns from the respiratory organs in other parts of the body.

The respiratory organs have two striking peculiarities, upon which M. Latreille founded his two great divisions of arachnida.

The division furnished with air-pipes, similar to those of insects, comprises harvest or shepherd spiders (*Phalangia*), mites, and several other genera. 'The presence of air-pipes (*trachées*),' says M. Latreille, 'excludes all complete circulation, that is, the distribution of blood to different parts, and its return from the respiratory organs to the heart.'

The other division of the class comprises the numerous species of spiders, and the scorpions which M. Straus-Dürckheim and Leon Dufour place first. Their respiratory apparatus consists of small cavities formed by the union of a great number of triangular white laminæ of extreme thinness. The number of these is usually two, but in some species there are four, and in others eight. The external apertures of these, termed spiracles, and, as M. Latreille well remarks, objectionably *stigmata*, are transverse chinks, corresponding in number with the pulmonary pouches.

The nervous system of the arachnida is ganglionic, consisting of nerve-knots (*ganglia*). In man and the larger animals a ganglion is composed of two substances similar to the cortical and medullary substances of the brain, and differs from nerves in being firmer in texture, and covered with a membrane of closer tissue. In the arachnida these nerve-knots are more concentrated, if the term may be used, than in insects, and they are uniform in composition, rather than a chain of ganglions equally separated. Thus in the harvest spiders (*Phalangia*) there are a pair of nerve-knots in front of the gullet, and at the back of the gullet a medullary mass, apparently consisting of three ranges of nerve-knots united.

We know nothing of the organ of hearing in arachnida, though it is certain enough that they do hear. Their eyes are all simple, not composite, like those of many insects. 'The eyes of spiders and scorpions,' says Swammerdam, 'are externally formed exactly in the same manner, and are smooth, glittering, and without divisions; and are as much dispersed as those that are disposed at random over the body. The wolf-spider, which catches its prey by leaping on it, has its eyes placed in the same manner.' In the greater number of spiders they are eight in number, but in some six (*Dysdera* and *Segestria*), and in others two (*Phalangium*). The arrangement of the eyes, when more than two, varies considerably in the different genera, and is taken advantage of in arranging them systematically, on the principle first, we believe, pointed out by Dr. Lister, and improved upon by Latreille, Leach, and Walckenaer. Figures of various arrangements of the eyes in spiders may be seen in *Insect Miscellanies*, pp. 125, 126, after Audouin.

With regard to the sexes, male spiders are always much smaller than the females, being often not more than one fourth the size. The feelers (*palpi*), also, in the male are furnished with organs at the tip, which are of various forms, but usually bulging, whereas the feelers in the female taper gradually to a point.

Looking at the size of the female spider, and the eggs which she lays, it appears almost incomprehensible how they could be contained in so small a body. But, by observing them more closely, it may be discovered that they have not, like the eggs of birds, a hard shell, but, on the contrary, are soft and compressible. Accordingly, before they are laid they lie in the egg-bag (*ovarium*) within the spider's body, squeezed together in a flat manner; and only come into a globular form after they are laid, partly in consequence of the equal pressure of the air on every side, in the same way as we see dew-drops and globules of quicksilver formed from the same cause.

The eggs of spiders, it is worthy of remark, are in most cases, though not always, placed in a roundish ball, and, as there is nothing in nature without some good reason, if we can discover it, we may infer that this form is designed to economize the materials of the silken web, which the mother spins around them by way of protection. Whether we are right or not in this conjecture, there can be no question as to the manner in which the ball is shaped, as the writer has often observed the process. The mother spider, in such cases, uses her own body as a gauge to measure her work, in the same way as a bird uses its body to gauge the size and form of its nest. The spider first spreads a thin coating of silk as a foundation, taking care to have this circular by turning round its body during the process. It then, in the same manner, spins a raised border round this till it takes the form of a cup, and at this stage of the work it begins to lay its eggs in the cup, not only filling it with these up to the brim, but piling them up above it into a rounded heap as high as the cup is deep. Here then is a cup full of eggs, the under half covered and protected by the silken sides of the cup, but the upper still bare and exposed to the air and the cold. It is now the spider's task to cover these, and the process is similar to the preceding, that is, she weaves a thick web of silk all round them, and, instead of a cup-shaped nest like some birds, the whole eggs are inclosed in a ball much larger than the body of the spider that constructed it.

There is a singular mechanism for the purpose of placing the eggs in the proper position. The eggs, different from what takes place in birds, are excluded from a cavity just behind the breast. Here there is an organ placed somewhat in form of a hook or a bent spatula, which the spider can move in such a manner as to direct every individual egg which it lays to the exact spot in the nest-cup, where it wishes it to be placed. The sense of touch in this organ must of course be very acute, as by touch it must be wholly guided, for its eyes, though eight in number, and very piercing, are situated on the upper part of the head, and cannot be brought within sight of the nest.

The hatching of the eggs of one species (*Epeira diadema*) has been traced with great minuteness, and the successive evolution of the embryo figured with great skill, by M. Herold of Marburg.

M. Latreille, whose method has been generally followed both in Britain and on the continent, arranges the arachnida into two orders:—

I. *Arachnida pulmonaria*, or *pulmonata*, distinguished by having pulmonary cavities for the purposes of respiration, and from six to eight simple eyes.

II. *Arachnida tracheana*, or *trachearia*, distinguished by having air-pipes (*tracheæ*), like insects, and more than four simple eyes.

Each of these orders comprises a number of genera which shall be noticed in their proper places.

ARACK, or ARRAC. This word is derived from the Arabic word *arak*, which properly signifies *perspiration;* hence *juice*, *sap*, and thus, lastly, *ardent spirit.* Under various modes of spelling it is employed as a general name for distilled spirits along the northern coast of Africa, including Egypt, over all Asia, and even in the north and eastern parts of Europe. This spirit is prepared from different substances, more especially from sweet juice (toddy) extracted from the unexpanded flowers of different species of the palm tribe. In Ceylon, where a large quantity of arack is manufactured, it is entirely distilled from coco-nut tree toddy. [See Coco-nut Tree.] Some authors assert that toddy is extracted from the branches of palm-trees, and even from incisions made in the stem, but erroneously. The 'toddy topes,' or coco-nut tree orchards, are very extensive in Ceylon, and their produce is collected for the distillation of arack, and the manufacture of sugar and oil.

In Ceylon, when it is intended to draw toddy from a tope, the toddy-drawer selects a tree of easy ascent near to the centre of the tope, the stem of which he surrounds with a number of bands made of creepers, about a foot distant from one another. Upon these bands he ascends the tree, and by means of the stems of creeping plants or *coir* ropes, he connects the heads of a number of trees, so as to enable him to pass from tree to tree in the subsequent operation of collecting the produce.

The ordinary implements of a toddy-drawer are a large broad knife, which he carries in a coffer or basket suspended by a cord tied round his body; a mallet, consisting of a piece of hard wood about a foot in length; and the shell of a large gourd, which is suspended round his waist. When a tree is in a state fit for yielding sweet juice, the toddy-drawer ties the flowering spath in different places, by means of the white leaves of young branches. This process has the effect of preventing a bud from blowing. The spath is then bruised along its whole length by means of slight blows with the mallet or bat of hard wood. This operation occupies a few minutes, and requires to be regularly repeated every morning and evening for six or seven days. In a few days after the spath has been tied, a few inches of it is cut off, by means of the broad knife. Two or three days after it is thus truncated, sweet juice exudes from the cut surface, which is received in an earthenware vessel attached to the spath. The liquor issues, drop by drop, and a good healthy blossom will yield from two to four English pints in twenty-four hours, and continue to afford that quantity for a period extending from three to five weeks. As the coco-nut tree blossoms every four or five weeks, two spaths on one tree sometimes yield sweet juice at the same time. The toddy-drawer generally ascends the trees, for the purpose of collecting the sweet juice that has exuded into the toddy pots, both morning and evening, and to cut off a fresh portion of the flowering spath. The toddy is poured from the earthen vessels into the gourd, which is conveyed to the ground by means of a line. The gourd is emptied into a large vessel by a person at the foot of the tree, and drawn up by the toddy-drawer for the purpose of being refilled.

Arack may be distilled from toddy the same day it is drawn from the tree, but sometimes this operation is delayed until it becomes sour. The process of distillation is carried on in the maritime provinces in copper stills, but in the interior of the island earthen vessels are chiefly employed. Toddy yields by distillation about one-eighth part of proof-spirit.

On the peninsula of India, arack is distilled from the flowers of the *Bassia longifolia*, Tell mee (*Cingalese*), the *Máhwah*-tree, and the *Bassia latifolia.* Mahwah-arack may be procured at the rate of an English pint for less than one penny.

Arack is prepared in the island of Java, where it is known by the name of *kneip*, from a mixture of molasses, palm-wine, and rice, in the following proportions.

Molasses	62 parts
Palm-wine (toddy)	3 ditto
Rice	35 ditto

100 parts of these materials yield 23½ of proof spirit.

The rice is first boiled, and after being cooled, a quantity of yeast is added to it and pressed into baskets. Each basket is placed over a tub for about eight days, during which time a quantity of fluid passes through the basket into the tub; this fluid is added to the molasses and toddy in large fermenting vats, where the mixture is allowed to remain until it is fit for distillation.

In most parts of Turkey, arack (*raki*) is made from the skins of grapes. It is flavoured with aniseed, and sometimes contains a solution of gum-mastic. The mountain Tartars distil it from sloes, elder berries, wild grapes, plums, &c., and the Calmuck Tartars distil it from milk.

Ceylon exports annually, and for the most part to the presidencies of Bengal, Madras, and Bombay, from 5000 to 6000 leaguers of arack, each containing 150 gallons. The custom duty on the exportation of arack amounts to 20 per cent. *ad valorem*, and in 1813, the Madras government imposed an excise duty of 440 per cent. upon Ceylon manufactured spirits. The prime cost of arack at Colombo varies from 8*d.* to 10*d.* per gallon. Ceylon arack is superior to Batavian arack, and it commonly brings a higher price of from 10 to 15 per cent. on the peninsula of India, than Javanese manufactured spirits. The quantity and estimated value of arack exported from Ceylon in 1825 amounted to 611,218 gallons, value 21,500*l.*, which is at the rate of nearly 8½*d.* per gallon. The following is a schedule of duties levied on the coco-nut plantations in Ceylon, average of three years, 1827-8-9, which will show the importance of the manufacture of arack in political and commercial points of view.

Distilling of arack	£ 3,644
Retail of ditto	24,975
Export of ditto	3,136
Export of coir	153
Export of jaggery	162
Export of copperas	1,539
Export of coco-nuts	1,551
Export of coco-nut oil	413
	£ 35,573

The tariff duty levied upon arack imported into the United Kingdom is 15*s.* 6*d.* per gallon. (See Marshall's *Contribution to a Natural and Economical History of the Coco-nut Tree; and* Bartolacci *on the Revenue and Commerce of Ceylon.*)

ARAD ISLAND. [See Bahrein.]

ARÆOMETER. [See Hydrometer.]

ARÆOSTYLE. This is a term composed of two Greek words, ἀραιὸς, signifying *rare* or *few, thin, weak*, and στύλος, *a column.* It is used by writers on architecture, who follow the absurd system of Vitruvius, as a name for one of what he terms 'the five species of temples.' As the term itself imports, it refers rather to the arrangement of columns than to the composition or structure of a temple. The kind of temple called aræostyle is, according to Vitruvius himself, that in which 'the columns are placed more distant from each other than in fact they ought to be.' This, the commentators upon that writer say, is when the space between columns, or the intercolumniation, is from four to five diameters. The aræostyle intercolumniation is generally assigned by the same authorities to what in the Vitruvian system is called the Tuscan order; for as the remains of the more classical architectural works of the Greeks and Romans, on which the system *professes* to be based, exhibit no examples of either the aræostyle intercolumniation, or of the Tuscan order of columns, each could with safety be assigned to the other. The east or market front of St. Paul's church, Covent Garden, in London, exhibits an example of what the followers of Vitruvius would term a Tuscan portico *in antis*, though the columns are hardly set widely enough to come up to the character which they have assigned to the aræostyle intercolumniation. [See also Eustyle.]

ARÆOSYSTYLE. This term is compounded of *aræo* and *systyle*, and was formed to designate an arrangement of columns not mentioned by Vitruvius. The French architect, Perrault, is understood to have introduced the term aræosystyle to designate an alternately very wide and very narrow intercolumniation, or, what is familiarly called coupled columns. This arrangement is alternately *aræostyle*—columns too far apart; and *systyle*—columns too close together.

Perrault's front of the palace of the Louvre in Paris, the western portico of St. Paul's cathedral, the porticoes, pavilions, and colonnades of the Pimlico palace, and numberless other edifices in London, exemplify the peculiarly inelegant mode of arranging columns which the term aræosystyle designates.

ARAFAT is the name of a hill near Mecca, where, according to the belief of the Mohammedans, Adam, conducted by the angel Gabriel, met Eve, after they had been separated for two hundred years, in consequence of their disobedience, and banishment from Paradise. The Mussulman pilgrims, after having visited the town of Mecca, perform their devotions on Mount Arafat on a fixed day, the ninth of Dsu'lhijjah, the last month of the Mohammedan year. Burckhardt, who, in 1814, visited those territories which the Mohammedans regard as sacred, in the disguise of a *haji* or pilgrim, describes Mount Arafat as a granite hill, rising on the north-east side of a plain, closely encompassed by mountains, but separated from them by a rocky valley. The hill is, according to him, about a mile or a mile and a half in circuit; its sides are sloping, and its summit is nearly two hundred feet above the level of the plain. 'On the eastern side,' says he, 'broad stone steps lead up to the top, and a broad unpaved path on the western, over rude masses of granite, with which its declivity is covered. After mounting about forty steps, we find a spot a little on the left, called Modaa Seydna Adam, where, according to Mohammedan tradition, the angel Gabriel first instructed Adam how to adore his Creator. On the summit of the hill the place is shown where Mohammed used to take his station during the pilgrimage; a small chapel formerly stood over it, but this was destroyed by the Wahhabites. The steps and the summit are covered with handkerchiefs to receive the pious gifts of the pilgrims. The top of the hill commands an extensive prospect. Several large reservoirs lined with stone are dispersed over the plain; they are filled from a fine aqueduct which supplies Mecca with fresh water from the eastern mountains.' From the summit of Arafat, Burckhardt counted about three thousand tents scattered over the plain; but the greater number of the pilgrims were without tents. The number of persons assembled here from all the Mohammedan countries he estimated at about seventy thousand, and that of the camels at from twenty to twenty-five thousand. 'There is, perhaps,' says he, 'no spot on earth where, in so small a place, such a diversity of languages are heard; I reckoned about forty, and have no doubt that there were many more.' The essential part of the ceremony at Mount Arafat consists in a procession of all the pilgrims towards the hill, the sides of which they cover from top to bottom; and in hearing a sermon, which is usually delivered by the kadhi of Mecca, and which lasts from about three o'clock in the afternoon till sunset. No pilgrim, although he may have visited all the holy places of Mecca, is entitled to the name of *haji* unless he has been present on this occasion. (See Burckhardt's *Travels in Arabia*, London, 1829, 8vo. vol. ii. p. 40, &c.)

A'RAGON, or ARRAGON, kingdom of, one of the provinces of Spain, situated between 40° and 42° 55′ N. lat., 35′ E. and 1° 55′ W. long., is bounded on the east by Catalonia and part of Valencia; by Navarra and Old Castile on the west; on the south by Valencia; and on the north by the Pyrenees. It extends, in its greatest length, about a hundred and thirty miles from east to west, and two hundred from north to south. Aragon may be compared to a large basin surrounded on all sides by mountains. The Pyrenean chain and its ramifications separate it from France, the Sierras of Molina and Cuenca from Castile, and those of Morella from Valencia. The principal of these mountains is the great Pyrenean chain. The offsets of this range, which penetrate into Aragon, form a number of lateral valleys with a rapid slope to the south. Taking Monte Perdido or Mont Perdu, elevated 11,168 feet above the sea, as a central point, the range descends westward in eight successive steps to the ocean. On the east, the same gradual descent is observed as far as the frontier of Catalonia, where it rises again in the Peña Maladeta to 11,424 feet; it again descends as far as the valley of Andorra, where it rises in the Moncal to 10,663 feet; from which point it makes another inclination, and rises again in the Canigú to 9141, and then makes a rapid descent to the Mediterranean. This circumstance at first led to the erroneous idea that the Canigú was the highest point of the range, for a spectator on its summit might observe the chain appear to descend in all directions, while the distance diminished the apparent height of the other summits; but by exact measurements this error has been rectified.

The first valley of Aragon which we find in the Pyrenean chain, as we advance from the east, is that of Benasque, the capital of which is the town of the same name, with a fortress and a custom-house. Proceeding westwards, we find the valleys of Bió, Brotó, Tena, the capital of which last is Sallen, in the centre of the range: about two miles from Sallen is the source of the river Gallego (an affluent of the Ebro), and not far from it are the mineral waters of Panticosa; then follows the valley of Canfranc (the Puerto, or opening which bears that name, is 6713 feet high); those of Aragües, Hecho; and the last, Ansó, on the frontier of Navarra. Every valley is separated from the adjoining by the gigantic offsets of the Pyrenees, which, running in an irregular southern direction from the main mass, form these lateral valleys. All the summits of the Pyrenees in this part are covered with snow nine months in the year, and even in June it is found five or six feet deep. The secondary chain of this province is that called by some geographers the Iberian, which runs in a direction from N.W. to S.E., under the names of Montes de Oca, 5436; Sierra de Moncayo (the Mons Caunus of the antients), elevated 4921 feet; Sierra de Molina, 4488; Sierra of Teruel, 4331, at the city of that name; and then enters Valencia, and terminates on the shore of the Mediterranean near the *desierto* of *las Palmas*.

Almost all the rivers of Aragon have their source in these two chains of mountains, and run in different directions to their common receptacle, the Ebro. This river crosses the province from N.W. to S.E. and divides it into two parts almost equal. Its affluents on the right bank within Aragon are, the Huecha, Jalon, Huerva, Aguas, Martin, Guadalope and Matarraña, which latter serves as the line of boundary between Aragon and Cataluña; and on the left, the Arvo, Aragon, Gallego, and Segre. (See Ebro.)

Several roads cross the province, passing through all the principal towns. The Canal Imperial de Aragon was commenced in 1529, by order of Charles V. The water was taken from the Ebro at Fontellas; a basin and a house were constructed three miles below Tudela in Navarra, and the canal was continued parallel to the river. This work was abandoned, and remained unfinished for nearly two hundred years. Under Charles III., in 1772, the conduct of the undertaking was entrusted to Don Ramon Pignatelli, a man of great activity and skill, under whose direction it was continued and carried six miles below Zaragoza. This canal crosses the Huecha, Jalon, and Guerva. If we consider it with respect to its width, we may assuredly say that it is one of the finest in Europe, but the benefits derived at present from it are very inconsiderable. There is sufficient water for vessels of from sixty to eighty tons, but in consequence of the canal not reaching the sea the trade is very limited: if ever the original project is completed, and the navigation continued to Tortosa, the advantages which Aragon, Navarra, and Catalonia will derive from it are incalculable. In 1819, the produce of this canal amounted to about 13,352*l*. The object of this canal is double, being designed both for irrigation and navigation.

The climate of Aragon varies according to the elevation and particular situation of the different districts, but in general, except on the mountainous parts, it is adapted to most of the productions of temperate climates. The winds that chiefly prevail are the Cierzo, or N.W., and the Bochorno, or S.E. These two continue during nine months in the year. The period that the S. or S.W. blows is very short. The W., which the Aragonese call *fagüeño*, and the Castilians *favonio*, is always welcomed by the husbandman, as it never fails to bring along with it abundant showers, which are favourable to vegetation.

The productions of the soil are, wheat, barley, rye, oats, Indian corn, leguminous vegetables, esparto, or Spanish broom, flax, hemp, sumach, barilla, madder, saffron, liquorice, fruits, oil, wine, and timber. The productions of the mineral kingdom are gold, silver, copper, iron, lead, quicksilver, cobalt, alum, jet, coals (near the source of the Martin, a tributary of the Ebro), and copperas; few of these mines are now worked. The chief mine is one of rock-salt at the village of Remolinos, near Alagon, which supplies Aragon and Catalonia with this article. Peat earth, which has been compared with that of Holland, is found in the district of Teruel, and used for fuel. The mountains abound in game; wolves and bears are likewise found, and numerous herds of cattle feed in the valleys. Before the Peninsular war, the number of sheep was 2,050,000 heads. The rivers produce exquisite fish, particularly trouts and eels; of the latter, the most celebrated are those of a lake, or rather pond, near Alcañiz. The produce of grain and wine is more than sufficient for the consumption; but there is a deficiency of horned-cattle and mules, which are supplied from France. The industry of Aragon is very limited, and consists principally in manufactories of common cloth, hemp sandals, sacks, and cordage, hats, leather, paper, earthenware, and some iron-foundries.

Aragon is, in a considerable degree, impregnated with salt; the water of many of its rivers is as saline as that of the sea, particularly the spring near Bujaraloz. At the bottom of the lake Gallocanta, between Bello and Tornos, fuci and other sea plants are found. Thermal springs are abundant both in the Pyrenees and the Iberian chain.

The province is divided into thirteen districts, or corregimientos, viz., Albarracin, Alcañiz, Barbastro, Benavarre, Borja, Calatayud, Cinco-villas, Daroca, Huesca, Jaca, Tarazona, Teruel, and Zaragoza; the capitals of these districts are the towns of the same name, which are likewise the principal towns in the province.

The population of Aragon, according to the census of 1803, amounted to 657,376 upon a surface of 1232¼ square leagues; the number of souls for a square league being 533, a proportion by no means great, even if we consider that mountains occupy a great part of the surface. (Antillon.) Asso states the area at 2000 square leagues, of 25 to a degree, which is equal to about 15,346 English square miles.

Aragon contains 1 archbishopric, 6 bishoprics, 8 collegiate churches, 1396 parishes, 228 convents of both sexes, 29 military commanderies, 23 hospitals, 2 universities, 12 cities, 239 villages, 688 hamlets. Like the rest of the peninsula, Aragon was successively under the dominion of the Carthaginians, Romans, and Goths. When the Arabs invaded Spain, those Aragonese who escaped the sword of the invaders sought a refuge in the fastnesses of the Pyrenees, where they assembled together in the valley of Sobrarbe in Navarra, and chose for their leader Garcia Iñiguez, called also Iñigo Arista, on account of his nimbleness, about A.D. 819. They stipulated with him that since by common consent they had elected him their chief, and put him in possession of the territory which they had wrested from the Moors, he was bound to swear to them, first, to maintain their fueros, or privileges, and to improve them; secondly, to divide with them the territory he should conquer from the enemy; not to enact laws without the advice and consent of his subjects; not to declare war, or make either peace or truce with any sovereign, without the assent of twelve of the most noble and twelve of the oldest and wisest men of the country. The chief agreed to these conditions, and declared that if he ever violated the compact established between them, they were free from their engagement, and might elect another chief, either Christian or Pagan (Zurita, book i. ch. v. p. 9). The Aragonese, not content with setting these boundaries to the royal authority, created a magistrate or officer peculiar to them, whom they denominated the *Justicia*. This officer was the guardian of the laws and the mediator between the king and the people. He was at first appointed by the king and the Cortes together, and his office was for life. His person and property were sacred; he was the supreme interpreter of the law: to him both king and subjects applied for redress against wrong: his decisions were without appeal, and he was only answerable to the nation duly assembled in Cortes. Once elected, he could neither be arbitrarily removed by any power, nor renounce the office. He had two substitutes, or lieutenants, to act for him, when he was unable to perform his duties. These officers were at first appointed by him, and enjoyed the same privileges as he did. Both the justicia and his substitutes were chosen from the order of caballeros, or middle class between the nobles and the commons. In 1461, a law was enacted by which the kings were empowered to nominate the deputies of the justicia. The Cortes deposited in a box the names of eight individuals as candidates for that office, out of which the king chose two by lot, when it was necessary to fill up the vacancies of those whose term had expired, or who had died. Their office lasted only three years, and none could be re-elected before the same number of years had elapsed. It is impossible to say when the office of the justicia began; Zurita and all the other historians of Aragon make its creation contemporary with that of the fuero of Sobrarbe, but no mention is made of the justicia before the conquest of Zaragoza.

The Cortes were composed of four *brazos*, or orders,—the ecclesiastics, the nobility, the caballeros, and the people. The ecclesiastics were not admitted into the Cortes until 1301. (Blanca's *Modo de Proceder en Cortes*, ch. vi. p. 14.) The first Cortes, where the *brazo* of the *universidades* or commons is distinctly mentioned, are those of Monzon, in 1131. These orders formed one house. Every brazo gave its vote separately, and the majority in each brazo decided the vote of that brazo, but the unanimous consent of the four brazos was requisite to the enactment of any law. Any individual might stop the proceedings of the Cortes by giving his veto in writing. The number of the nobles that generally sat in the Cortes were eight; the ecclesiastic brazo consisted of twenty-three, and the cities and boroughs that returned members were thirty-one. The number of the members for the cities and boroughs was not fixed. In the Cortes of Zaragoza, A.D. 1163, fifteen deputies from that city, besides many from Huesca, Jaca, Calatayud, Daroca, and Tarazona were present; and those of Lerida, in 1214, were attended by ten deputies from every principal city and borough in the realm. Thus Aragon had a popular representation nearly a century before any other nation in Europe.

The Cortes were summoned by the king, and were also dissolved by him. After the convocation, they adjourned from day to day, for an indefinite period of time. The adjournment was made by the justicia: if before the opening of the sessions, in virtue of his authority, as *juez* of the Cortes; and if after, by the order of the king and at the will of the Cortes themselves. When the king absented himself from the place where the Cortes were assembled, they were dissolved. The king presided in the Cortes in person, and when he was unable to do so, that body empowered the crown prince, or some other individual of the royal family, to supply his place.

On the opening of the assembly, a discourse was pronounced by the king, called the *proposicion*. In former times every brazo answered separately to the speech from the crown, but subsequently the archbishop of Zaragoza addressed the king in the name of the four brazos. On the first sitting every brazo appointed a certain number of individuals of their respective order to prepare and put in a proper shape the matters which were to be laid before the general assembly. These were called *promovedores*, or promoters, and *tratadores*, or discussers. Of the promovedores, two were so by virtue of their office, viz., the archbishop of Zaragoza for the ecclesiastic, and the *jurado* of the same city for the commons: the rest were elected by their respective brazos. The promovedores proposed the subjects and petitions which were to be subjected to discussion, and the tratadores examined and arranged them in proper order.

From the first opening of the Cortes, the justicia was obliged to sit in a place below the throne to hear the *greuges*, or grievances, which any Aragonese had to make against any individual, high or low, for infractions of the *fueros*, and 'this,' says Martel, 'was not done by way of supplication, but as a matter of right.' Certain officers called *recojedores* and *examinadores de greuges*, or collectors and examiners of grievances, were appointed, to decide whether the complaint presented was a constitutional greuge or not. When the king or any of his ministers were affected by the greuge, he was excluded at the time of giving the sentence, which was pronounced by the justicia and the Cortes. Both the positive infraction of the law, and the nonfulfilment of it, were a subject of greuge. As these complaints were more frequently made by persons of rank, some have erroneously supposed that this was a privilege of the nobility: but Blancas says, that if any officer of the crown had put to the torture (a thing contrary to the fueros) the most miserable farmer of the meanest village in the kingdom, the latter had a right to complain to the Cortes, and he should not only be attended to, but even be furnished by the nation with the necessary means for the prosecution of his cause.

The *servicio* or supplies were granted by the Cortes, but not until the several petitions of the deputies had been first granted. In former times, it was not called servicio, but *profierta* or *socorro*, offer or succour, and was made not in money, but in men. The first time that the kings of Aragon asked for the servicio in money was at the Cortes of Monzon, 1376, when Pedro IV. demanded a certain sum to pay one thousand lancers to continue his war with France. 'The deputies,' says Blancas, 'were amazed at this novelty never before heard of in the kingdom, and answered his highness, "that the Aragonese were not accustomed to serve their kings except with their persons; that it was the Jews and Moors that served theirs with money.'' The following still more striking fact is recorded by the same historian:—In the Cortes of Teruel, 20th of March, 1428, Miser Juan de Marguillen, treasurer to the queen, presented to the tratadores of the Cortes and the king an humble petition from *la Señora Reina*, requesting some pecuniary assistance for her support; to which they answered that such a thing had never before been done, and it was their opinion that it could not be done without great detriment to their liberties; a thing which *la Señora Reina* neither could nor ought to wish, and therefore they begged *Su Mercê* to bear patiently their refusal. On the treasurer's requesting them to consider again, both the petition and the answer they had given, their reply was, that they stood firm to what they had said, and they neither could nor would alter it in the least. In 1383, Pedro IV. obtained of the Cortes a loan of 60,000 florins, about 9000*l.*, *a buen tornar*, to be duly returned. In 1412, another sum was lent to Fernando I. upon the same condition. In course of time these debts were remitted to the kings, and by little and little, the custom was introduced of granting supplies of money, the first of which was the one made to Fernando el Catolico, for the conquest of Tunis and Bugia. The ordinary expenses of the state were defrayed by means of certain taxes imposed by the Cortes, which were granted generally for six years. These taxes were either direct, as the *bovage*, or a certain sum paid for every couple of oxen, the *monetage* or property tax, and the *focage* or house tax; or indirect, as the *sisas*, or a tax upon the articles of food. After the period for which these contributions had been granted, nobody could exact them, under the penalty of excommunication.

The last sitting of the Cortes was that called the *solio*, in which all the laws that had been enacted were solemnly proclaimed and sworn to, first by the king and the justicia, and then by two individuals for each brazo, and by all the public functionaries. The sanction of the king was absolutely requisite for the validity of any law; if he refused to give it, the deputies might insist, with all due respect, until the king signified that it was not his pleasure that it should be insisted upon any further. Though the king was present during the discussion, he was obliged to leave the Cortes when the vote was given.

By the Cortes and the justicia two deputies were appointed for each brazo to sit permanently until the next general assembly. The *diputacion*, in union with the justicia, watched over the observance of the law, and examined the accounts, and every thing in the financial department.

Among the many privileges of the Aragonese, the most notable were, the *privilegio de la manifestacion*, and those of the *union*. By the privilege of the manifestacion, when any Aragonese was injured by any tribunal of the king contrary to the fueros, he appeared before the justicia, and being asked by him whether he desired to be *manifestado*, if he answered in the affirmative, he was placed in the prison of the justicia, called the prison of the *manifestacion*, and his cause was taken from the judges of the crown, and examined by the court of the justicia. The privileges of the union were granted by, or rather wrested from, Alonso III. This prince having assumed and exercised the royal dignity without having first taken the necessary oath of allegiance to the constitution, his subjects formed a union, and with the Cortes at their head, threatened to withdraw their allegiance, unless he consented—not to prosecute capitally any member of the union, not to cause him any injury, or even to imprison him without previous sentence of the justicia to that effect, and with the approbation of the majority of the Cortes; secondly, that the king should be obliged thenceforward to assemble the Cortes every year at Zaragoza in the month of September, and to give the deputies the power to appoint his ministers, councillors, and other officers of the crown, and even the officers of his household, with the condition that the persons appointed should first swear to advise him well and loyally; and that in case he or any of his successors infringed any of these privileges, the members of the *union* would not acknowledge him as their king, and, without any charge of treason, might choose another. As a security for these privileges, seventeen castles in Valencia and Aragon were placed in the hands of the representatives of the *union*. This extraordinary transaction took place on the 29th of December, 1288. Pedro IV. abolished these privileges in the Cortes of Zaragoza, 1348; still the justicia of Aragon, in union with the diputacion of the Cortes, preserved the constitutional right of calling the nation to arms against the king, when he invaded the fueros of the kingdom.

The Aragonese devised an oath calculated to remind their monarchs of this privilege. 'The king,' says Antonio Perez, 'upon his accession to the throne, kneeling before the justicia, the latter being seated and with his head covered, swears solemnly to observe the fueros of the nation; then the justicia, in the name of the Cortes, says, *Nos, que valemos tanto como vos, os hacemos Rey y Señor, con tal que nos guardeis nuestros fueros y libertades, y sino, no*; that is, We, who are worth as much as you, make you our king and lord, provided you keep our laws and liberties, otherwise not.' (*Relacion* de Antonio Perez, p. 132.)

Under the monarchs of the Austrian dynasty, these institutions, which had lasted nearly eight centuries, began first to be undermined. The justicia Juan de Lanuza IV., having in virtue of his authority rescued Antonio Perez from the grasp of the king and the inquisition, seeing that the Castilian army was in march to invade the kingdom, called the Aragonese to arms, and the priests, both in the pulpit and in the confessional, exhorted the people to come forward in defence of their liberty; but the unfortunate Lanuza was shamefully deserted by the nobility, imprisoned while in the performance of his duties, and without any trial publicly beheaded. The king, Philip II., in a letter written with his own hand, without any signature of either secretary or minister, after the fashion of an Asiatic tyrant, said to his general, 'As soon as you receive this letter, you are to proceed to the imprisonment and execution of the justicia Don Juan de Lanuza, and let me hear of his execution as soon as of his imprisonment.' This order was strictly obeyed, and between the arrest and execution of Lanuza there was only the lapse of twenty hours. His charge, says Perez, was his arrest, and his defence his martyrdom. From that time the constitution of Aragon became an empty sound; but it was not actually abolished until the eighteenth century, when Philip V., the first of the Bourbon dynasty in Spain, abolished it, not only in virtue of the sovereign authority residing in him, but by the right of conquest, as the decree states. In civil concerns, however, the Aragonese are still governed by their own laws, and only apply to those of Castile in cases where their fueros are deficient.

The crown in Aragon, as well as in all the rest of Spain, from the time of the Goths, was elective: and although the king was generally chosen out of the family of the deceased monarch, following the order of primogeniture, until the fifteenth century, yet instances may be adduced both in Aragon and in Castile, of the nation having departed from this custom, and appointed as successor another in opposition to the one who might be called the rightful heir. We are not aware that there existed any positive law on this subject, previous to the constitution of 1812.

In accordance with its political constitution, all the other codes of Aragon were dictated by a more liberal and humane spirit than those of the neighbouring states; thus, while, in the surrounding nations, a criminal, or perhaps an innocent person, was inhumanly tortured, the Cortes of Zaragoza, in 1325, declared it unlawful to put any Aragonese, of whatever rank or condition, to the torture, or to confiscate his property; neither could foreigners be subjected to it, except for forgery.

Aragon was formerly the most powerful nation in the Peninsula: it embraced the provinces of Navarra, Catalonia, and Valencia; abroad, it possessed the Balearic islands and Sardinia. Ferdinand, the catholic, king of Aragon, was also king of the two Sicilies, and by his marriage with Isabel of Castile, the two kingdoms of Aragon and Castile were united under one sceptre.

The Aragonese are sullen and stern, scrupulously honest in keeping their word; brave, firm, and tenaciously opposed to all foreign dominion: the firmness of their character is proverbial, and often carried to excess.

A Chronological Table of the Kings of Aragon, from the separation of that kingdom from Navarra to its union with Castile, showing the years of accession —

A. D.
1035. Ramiro, son of Sancho el Mayor
1063. Sancho, son of Ramiro.
1094. Pedro, son of Sancho.

1104. Alonso, brother of Pedro.
1134. Ramiro II., brother of Alonso,
1137. Petronila, daughter of Ramiro II. Aragon and Catalonia were united by the marriage of this queen to Raimundo III., count of Barcelona.
1162. Alonso II., son of Petronila.
1196. Pedro II., son of Alonso II.
1213. Jaime, son of Pedro II.
1276. Pedro III., son of Jaime.
1285. Alonso III., son of Pedro III.
1291. Jaime II., brother of Alonso III.
1327. Alonso IV., son of Jaime II.
1336. Pedro IV., son of Alonso IV.
1387. Juan, son of Pedro IV.
1395. Martin, brother of Juan.
1412. Fernando, brother of Enrique III., king of Castile, and nephew to Martin.
1416. Alonso V., son of Fernando.
1458. Juan II., brother of Alonso V.
1479. Fernando II., son of Juan II., married Isabel of Castile, and thus Aragon and Castile were united under one sceptre in 1516.

See Zurita, *Anales de Aragon;* Blancas, *Rerum Aragonensium Commentarii, Modo de proceder en Cortes;* Martel, *Modo de celebrar Cortes, Fueros y Observancias del Reino de Aragon;* Miñano, Antillon, *Geografia de España;* Antonio Perez, *Relacion;* Coxe's *Memoirs of the House of Bourbon.* There is a work entitled *Historia de la Economia Politica de Aragon,* por D. J. de Asso, Zaragoza, 1798, small 4to. Antillon, in the preface to his Geography, gives it a qualified character.

ARAL, SEA OF, a great inland lake of Asia, situated east of the Caspian Sea, between the forty-third and forty-seventh degrees of north latitude, and the fifty-eighth and sixty-second degrees of east longitude. The only exact astronomical observation which has been made with the view of determining the position of the Aral Lake is that of M. Lemm, who found the longitude of the western shore, in latitude 45° 38′ 30″, to be 56° 8′ 59″ east of the meridian of Paris, or 58° 29′ 14″ east of that of Greenwich. Its greatest length is about 290 miles from N. to S.; its breadth from E. to W. is irregular, but it is no where less than 130 miles, and in some places 250. In superficial extent it far exceeds any *lake* in the eastern hemisphere, except the Caspian. Its depth is not great, and it abounds so much in sand-banks near its shores, that the Kirghiz fishermen, its only navigators, are obliged to use flat-bottomed boats. The southern extremity is studded with innumerable small islands at the mouth of the river Amoo, and from this circumstance it has received its name, Aral, which in the Tartar language signifies *island.*

The water is salt, but no experiments appear as yet to have been made to ascertain its specific gravity, and the nature of its saline contents—how far these are similar to the salts contained in sea-water: the probability is, that they are very different in quantities, and, in some respects, in their nature. It would be important to determine this with accuracy, in order to compare the results with those of similar experiments in future years; a great diminution of its superficial extent has taken place within a very recent period, and seems to be in progress, and it would be interesting to know whether any corresponding increase takes place in the saltness of its waters. Two rivers of considerable magnitude discharge their waters into this lake; the Syr-daria or Sihoun, the antient Iaxartes, flows into it from the east; the Amou or Jhoin, the Oxus of the antients, enters it from the south. The lake, like the Caspian, has no outlet; and the whole of the water supplied by these rivers, as well as that of some minor streams, must be carried off by evaporation. The evident proofs of a gradual lowering of the level of the lake, which we shall afterwards mention, show that the supply of water is not equal to the waste; in the heat of summer, the evaporation from so vast an expanse must be enormous, and the quantity poured in during this period must be greatly diminished, for the two great rivers become fordable in places where, in the spring, they are navigable, and the channels of the streams which flow from the steppes on the north become quite dry.

It has been ascertained, that in this part of Asia the continent, over an extent of more than 18,000 square leagues, is depressed below the level of the ocean; the Caspian Sea occupies the lowest parts of this depression. It was long suspected that the Caspian was lower than the Black Sea, and the fact was ascertained with great accuracy, in the year 1811, by the Russian travellers, Engelhardt and Parrot, who were sent by the Academy of Sciences at St. Petersburg to examine the mountainous region of the Caucasus. By a series of levellings at fifty-one different stations across the mountains, and by means of barometrical observations, they found the surface of the Caspian to be 54½ toises or 348·39 English feet lower than that of the Black Sea. This depression extends to a great distance on the north, for by the barometrical measurements of Helmersen and Hofmann in the years 1828 and 1829, the town of Orenbourg, on the Ural or Iaik river, is only fifty-two toises or 332·41 English feet above the Caspian, consequently very nearly sixteen feet lower than the level of the Black Sea. Now Orenbourg is 500 versts, or about 335 miles, in a direct line from the shores of the Caspian; and Humboldt is of opinion that the northern boundary of the depression runs between the neighbourhood of the towns of Orenbourg and Saratov, and consequently includes all the country lying between the Volga and the Ural south of that line, these rivers being in some places more than 300 miles distant from each other. Humboldt further states, that the great chain of the Himalaya extends westward, until, passing to the south of the Caspian, it joins the table-land of Azerdbijan, south-east of the Caucasus, and forms the southern boundary of the great depression.

On the north of the Aral Lake is a wild hilly region, thinly inhabited by half-civilized nomadic tribes, who are to be found all round the lake, wherever an *oasis* in the desert enables man to subsist. The Monghodjar mountains, which occupy the highest part of these steppes, are a continuation of one of the groups into which the great Ural chain divides itself towards its southern termination: the insulated cone, called Aïrouk, the highest point, is only 960 feet above its base. The Urals in the neighbourhood of Orenbourg are composed of a red sandstone, and the same rock extends into these steppes of the Kirghiz. Dr. Pander, the naturalist, attached to the Russian embassy to the Khan of Bokhara, found between Orenbourg and the Monghodjar mountains the red sandstone replaced by a pudding-stone composed of quartz pebbles united by a quartzose cement, and then passing into a white sandstone; he observed a stratum of coal in the bed of a brook in this sandstone; he found the pudding-stone covered by a limestone full of shells, with sharks' teeth, many belemnites and ammonites, some of the latter two feet in diameter; and he discovered beds of gypsum associated with the limestone: the Monghodjar mountains are composed of the sandstone associated with porphyry and greenstone. The hilly region gradually sinks to sandy plains towards the south and east, no branch of the Urals being prolonged so as to reach any part of the Altai chain. These plains are composed of clay, marl, and calcareous tufa, covered by loose sand, which is blown up into hillocks from thirty to forty feet high, and the aspect of the country is thus changed after every storm of wind. In these desert plains between the base of the hilly region and the shores of the Aral Lake are two ranges of low hills called the Great and Little Bourzouk; the latter terminates in a promontory, at the north-east angle of the lake, but the Great Bourzouk extends considerably westward. North-east of the Little Bourzouk are some hills composed of indurated marl full of marine shells, and the formation extends to the shores of the lake. The hills of Aigour and Sari-boulak, forty miles inland, are composed of it, and they seem to have been the antient shores of the lake. The northern sides of the hills, or those sloping *from* the lake, are gradual and covered with shrubs; but the side of Sari-boulak *next* to the lake presents a face of naked marl, furrowed by torrents, with conical masses cut by precipitous sides from 120 to 180 feet high, and the marl contains beds of shells and fishes' bones, from three to four feet thick. 'I mentioned to our Kirghisians,' says Baron Meyendorff, 'the traces of water on Sari-boulak, and they assured me that their fathers had seen the waters of the Aral Lake extend to the foot of this hill, although it is at present sixty versts distant from it. So great a number of the Kirghisians have told me the same thing, that I consider it as an undoubted fact, and it proves how very considerable, and at the same time how rapid, the diminution of the waters of the Aral Lake has been. It continues to diminish, and one of our guides pointed out a place in our route, far inland which he himself remembered to have seen the waters reach.' This remarkable fact may be compared with the statement of Colonel Monteith (*Journal of a Tour through Azerdbijan and the Shores of the Caspian*, in the third volume of the *Journal of the Royal Geographical Society*), that during his residence in that part of Asia from 1811 to 1828, the Caspian Sea, 'as well as every other lake in Persia, had decreased most sensibly in depth.'

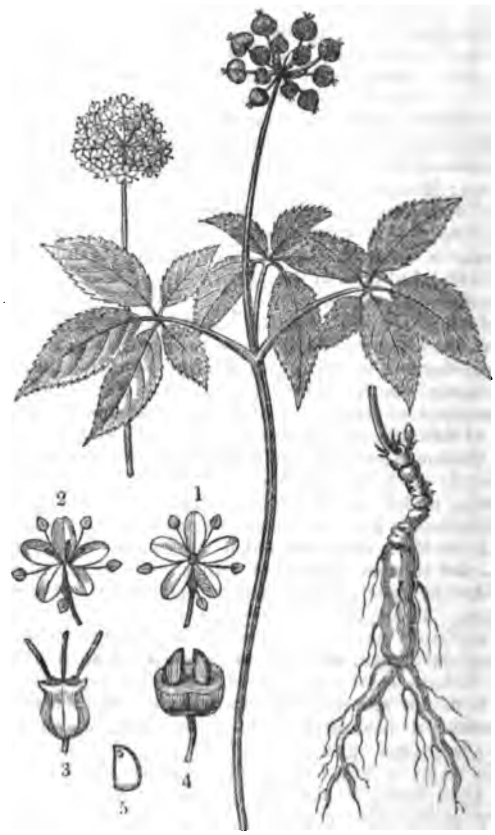
From the foot of the Mongbodjar mountains to the banks of the Syr-daria, a distance of more than 270 miles, not a single river traverses the sandy desert, which is covered with a number of shallow salt-water lakes, and has exactly the appearance of land from which the sea has retreated. These lakes are in some places dried up, and have left a cake of salt of dazzling whiteness, covering a surface of sometimes six or seven square miles. From the north-eastern part of the Aral Lake to the mouth of the Syr-daria, there is a great sandy desert called Cara-Coum (meaning *black sand*), which is in some places 175 miles broad. The country along the banks of the Syr, and especially near its mouth, is tolerably fertile, but that fertility is confined to a narrow band between the desert of Cara-Coum on the north, and one no less sterile on the south, the Kizil-Coum (or *red sand*), which extends to the banks of the Amou, an ocean of sand without one drop of fresh water. The base of the Kizil-Coum is an argillaceous red sandstone, which in some places rises above the surface; the plain is covered with sandy hillocks rising from twelve to sixty feet, and the view from the top of one of these is like looking over a stormy ocean transformed into sand.

The country between the Aral Lake and the Caspian, the Turcomanian isthmus, is but little known. Humboldt says that the southern prolongation of the Ural mountains may be followed from the table-land of Gouberlinsk near Orenbourg to Oust-ourt, between the Aral Lake and the Caspian. The chain of low hills of the Great Bourzouk, on the northern side of the lake, spreads out towards the west, and turning south extends through the isthmus to within ten days' journey of the town of Khiva; and there is a range of mountains in the isthmus called by the Kalmucks Mangislawski Gori. The caravans between Astracan and Khiva, and between Orenbourg and Khiva, pass through this isthmus, the route to Orenbourg lying along the shore of the Aral Lake, and the distance between the two places being about 470 miles. The English traveller, Thompson, who accompanied this caravan in 1740, describes the lake as being bounded on the north-west by rocky cliffs.

It has been supposed that the Aral Lake and the Caspian were at one time united; the Greek geographers appear to have been of this opinion, or rather were ignorant of the existence of the Aral Lake, for they make the Oxus and the Iaxartes flow into the eastern part of the Caspian. But until we are better acquainted with the structure of the isthmus, no sound opinion can be formed on the subject. That this part of Asia has undergone great changes in its physical structure, and that the relative position of land and water has materially altered since the existence of the Caspian Sea, there can be no doubt: but to what extent these have taken place within the historical æra can only be determined by a much more minute examination of the country than has yet been made, and by careful researches into the nature of the organic remains which are imbedded in the soil that has been abandoned by the waters. The narrowest part of the isthmus is not less than 150 miles wide, and a series of barometrical measurements by Messrs. Duhamel and Anjou of the French navy, from the Caspian to the Bay of Mertvoy Koultouk, on the western shore of the Aral Lake, have proved that the surface of the lake is 117 feet *above* that of the Caspian.

These steppes and sandy deserts cannot, from their nature, support a great variety of animals and plants. Violent heats in summer, succeeded by very rigorous winters, are unfavourable to the growth of trees or even of shrubs. Poplars and willows, which attain a height of five or six feet, are met with in groups in those *oases* where a river has overflowed its banks and deposited a covering of fertile soil, or where there are springs of fresh water. A species of tamarisk is common, and attains in favoured spots a height of twelve or fourteen feet. Liliaceous plants of the genera *hypoxis*, *iris*, *anthericum*, *asphodelus*, &c., are very generally diffused, and their bulbous roots are the principal food of the mammiferous quadrupeds found in these countries. These are chiefly of the smaller sized kinds, and such as burrow in the ground. Different species of the rat, mouse, dormouse, and marmot, are abundant, and the Baikal hare is not uncommon. Among carnivorous animals there are different species of the fox, marten, weasel, &c. For the botany and zoology of these countries the reader may consult Pallas's *Travels*, and Dr. Pander's *Appendix to Meyendorff's Travels;* A. W. Kephalides, *De Historia Maris Caspii*; Engelhardt und Parrot, *Reise in den Kaukasus*, Meyendorff, *Voyage d'Orenbourg à Boukhara;* Humboldt, *Fragmens Asiatiques.*

ARALIA'CEÆ are a small natural order of plants, nearly related to the umbelliferous tribe, from which they are solely known by their *young* fruit consisting of more parts than two. They are frequently shrubby, and not uncommonly furnished with powerful hard prickles; but they often are also herbaceous and unarmed, like umbelliferous plants themselves. As an illustration of the order, the American ginseng, *Panax quinquefolium*, may be taken.



[Panax quinquefolium.
1. A barren flower. 2. A fertile flower. 3. Ovarium and styles.
4. Fruit cut in half, with the seeds projecting.
5. A section of a seed, showing its minute embryo.

This plant, which is nearly related to the celebrated stimulating drug called *ginseng* by the Chinese (see PANAX), is found occasionally on the mountains of America, from Canada to the Carolinas. It has long since been introduced into our gardens, but it is now seldom seen. This natural order seems to possess little or no sensible properties, for the singular invigorating power ascribed to ginseng by the Chinese is considered to be apocryphal.

ARAM, אֲרָם, literally, the *high land*, is a geographical designation given in the Old Testament to all the countries between Phœnicia, Palestine, Arabia, the Tigris, and Armenia, or to those countries which the Greeks called Syria and Mesopotamia (Jer. vii. 8; 1 Kings xx. 26). Aram was divided into

1. Aram of Damascus אֲרָם דָמָשָק, the territory of Damascus, whose rulers waged almost continual war with the Hebrews from the time of David to that of the Babylonian exile (2 Sam. viii. 6; 1 Kings xi. 24, seq.; xvi. 5. seq.)

2. אֲרָם צוֹבָה, *Aram-Zobah*, which was, according to Syrian authorities, *Nisibin*, the Greek Nisibis. But this cannot be, because Nisibin is in *Aram Naharaim*, or Mesopotamia, which, according to Psal. lx., differs from *Aram-Zobah*. The passage to which we refer belongs to the

English authorized version of the first verse: 'When he (David) strove with *Aram-Naharaim* and with *Aram-Zobah*,' &c. We read also in the Holy Scriptures that the king of Zobah obtained auxiliaries from beyond the Euphrates from Aram-Naharaim. According to Benjamin of Tudela, Zobah means Haleb, or *Aleppo*. Spanheim and Bochart think that Aram-Zobah means that part of the territory of Hamath where the town of Zobah was situated, not far from Tadmor or Palmyra; because, according to 2 Chr. viii. 3, 4, 'Solomon marched to Hamath-Zobah, prevailed against it, and built Tadmor in the desert.' And according to 1 Chr. xviii. 3, When David went to recover his border towards the river Euphrates, he slew Hadadezer, the king of Zobah, and pursued him to Hamath. We think, therefore, that *Hamath*, being a part of Aram, sometimes went under the name of Aram-Zobah. The inhabitants of Aram-Zobah were frequently involved in war with the Hebrews, 1 Sam. xiv. 47; 2 Sam viii. 3; x. 6; 1 Chron. xviii. 3. Compare Hyde's note to page 60 of אגרת אור חות עולם, Oxonii, 1691, 4to.

3. אֲרַם נַהֲרַיִם, *Aram of the Two Rivers*, is the Mesopotamia of the Greeks, or the countries between the Euphrates and the Tigris (Gen. xxiv. 10; Deut. xxiii. 4; Judges iii. 8), which was also called פַּדַּן אֲרָם, *Padan Aram*, literally, *the flat of the high land* (Gen. xxv. 20; xxxi. 18), and שְׂדֵה אֲרָם, *the field of the high land*. (Bochart, *Phaleg*. ii. 6; Winer, *in Encyclop. von Ersch und Gruber:* Michaelis' *Spicil. Geograph. Hebr*., ii. p. 117, seq.)

ARAM was, according to Moses of Chorene (i. 13, p. 83, ed. Whiston), a conqueror who went from the western or Aramæan or Syrian Cappadocia, or from Armenia Minor, into the high-lands of Armenia, and from whom the present name of Armenia may be derived, like Anglia or England from the conquering colony of the Angles or Anglo-Saxons. This circumstance explains the fact, that the Aramæans and Armenians are sometimes confounded (as we see in Strabo, I. p. 41, 42, Casaub. and I. p. 112. Siebenkoes), and that the Armenians themselves, descending by Haik from Noah, do not use the name of Armenia, which first occurs in Herodotus and other Greek authors, and has been since adopted by oriental writers.

ARAMÆAN or **ARAMAIC LANGUAGE** (לְשׁוֹן אֲרַם, or אֲרָמִית, from the unusual root אָרַם, which is related to the cognate forms רָאַם, עָרַם, הָרַם, רָמַם, רוּם, *to be high*, or *he was elevated*), literally means the Highland-dialect, in contradistinction to לְשׁוֹן כְּנַעַן, the language of Canaan, or the Lowland-dialect. The Aramæan was thus denominated because those parts of Aram which bordered upon Palestine were higher than the territory of the Jews, and especially higher than the coast of the Mediterranean Sea inhabited by the Canaanites. Thus a designation became current which was improperly applied to the whole of Aram, many parts of which had a lower level than Canaan, but passed under the general appellation of Highlands, because Aram bordered by Mount Lebanon upon Palestine, and had a higher level in all points of immediate contact. Aramaic is spoken near Mardin and Mosul (see Niebuhr's *Reisebeschreibung nach Arabien*, t. ii. p. 352; and its French translation of 1780, tome ii. p. 275), where it is asserted that the Syriac is also spoken in several villages of the government of Damascus. Niebuhr calls the Christian idiom *Chaldee*. The Christians of Mardin and Mosul write even the Arabic in Chaldee characters, and the Maronites in Syriac letters. W. G. Brown mentions in his travels that the Syriac is spoken at *Malala* and *Wara*. Compare the *Journal of a Residence at Bagdad*, by Anthony Groves, London, 1832, 8vo.

The Aramæan language comprises two principal dialects, the Babylonian or East-Aramaic (which is usually, but improperly, called Chaldee), and the Syriac or West-Aramaic dialects; both dialects, though nearly extinct, are yet spoken by a few tribes dwelling in the antient Aram. This fact, mentioned by various travellers, we find also recorded in the *Journal* of Mr. Groves.

The sections in Daniel and Esra called Chaldee, and a few words in Jeremiah and Genesis, are the most antient remains of the East-Aramaic dialect, which is called by the Jews לְשׁוֹן תַּלְמוּד, *i.e.* the language of the Talmud, or the language of learning, because parts of the Talmud and many rabbinical writings are composed in this idiom, which is now usually written and printed in the Hebrew square characters, or לְשׁוֹן תַּרְגּוּם, *i.e.* the language of translation, because the Targums of Onkelos and Jonathan are paraphrastic translations of the Old Testament into the East-Aramaic language.

The oldest specimens of the West-Aramaic are much later; they consist of some Palmyrene inscriptions, one of which has been referred to A.D. 49. The characters of the West-Aramaic or Syriac differ greatly from the Hebrew. (See, for the various Aramaic characters, the articles ESTRANGELO, CHALDEE, SYRIAC, ASSYRIA.)

The Aramaic is one of the Shemitic dialects spoken by the descendants of Shem. Many forms of nouns and verbs, which in Hebrew and Arabic are polysyllabic, are shortened in Aramaic into monosyllables. The forms of nouns in Aramaic are less numerous than in Hebrew and Arabic. The dual is rare in the East-Aramaic. The personal pronoun of the second person singular combines both genders in one form אַנְתְּ.

Thus we see that the Aramaic has fewer grammatical forms than the cognate dialects, but we observe the reverse in the following instances.

The Aramaic has four active and four passive modifications, under every active modification, two participles, one of which has a passive signification, although the passive modifications have their own participles. The third person plural of the preterites distinguishes the genders by means of a double formation. A present tense is formed by the combination of participles with the personal pronoun.

The Aramaic seems to have fewer words than the Hebrew, but an exact notion of its lexicographical extent can hardly be formed till the dictionary of Bar Bahlul is printed and has become more generally accessible. Abulhasan Isa bar Bahlul composed his Syrian lexicon, explained in Arabic, in the convent of Kuzchaia, about A.D. 963. Manuscripts of this work exist at Oxford, Cambridge, and Florence.

While the Jewish community maintained its political independence in Palestine, the Hebrew continued to be the common language of the country, and, so far as we are able to judge, although not entirely pure, was, during that time, free from any important changes in those elements and forms by which it was distinguished from other languages. A few foreign words only had crept in along with the products of foreign commerce, arts, and inventions; and these, in consequence of the want of appropriate terms in the language of the country, received the right of citizenship. Even in the time of Hezekiah, the Hebrew dialect differed so much from the Babylonish-Aramæan, chiefly, it is probable, in respect of pronunciation, that the latter sounded in the ears of the common people of Jerusalem like an entirely foreign language, and was intelligible only to the principal officers of the court (comp. 2 Kings xviii. 26). But when the Assyrian and Chaldæan rulers of Babylon subdued Palestine, everything assumed another aspect. The Jews of Palestine lost, with their political independence, the independence also of their language. The Babylonish-Aramæan dialect supplanted the Hebrew, and by degrees became the prevailing dialect of the people.

The Babylonish-Aramæan language was very closely allied to the Hebrew; it stood to it in nearly the same kind of relationship as the Lower Saxon does to the High German. Both were the offspring of the original Shemitic language, which was used from the Halys in Cappadocia to the regions beyond the Tigris, and from the source of the Tigris to Arabia. Both of these, as well as the other Shemitic dialects, had the same stock of antient radical words, and essentially the same grammar. The principal features of their difference were, that many words of the old primitive language remained current in one dialect, which were entirely or partially lost in the other, *e.g.* the verb שְׁמַשׁ (to expose to the sun, or to dry) in Aramæan, of which only the noun שֶׁמֶשׁ (sun) remained in the Hebrew. The same word was sometimes in use in both dialects, but in different significations. The Babylonish dialect borrowed expressions from the northern Chaldæans, who made an irruption into the country. Traces of such additions are to be found in the names of the officers of state, and other terms having reference to the government. The Babylonish pronunciation was easier of utterance, and more sonorous than the Hebrew.

The numerous Aramæan colonies (2 Kings xvii. 24), which were substituted for the subjects of the kingdom of

Israel, carried to Assyria by Shalmaneser, retained their former language, and caused it to spread in the neighbourhood of their places of residence, even before the destruction of the kingdom of Judah. At a later period, the Babylonish-Chaldæan governors who ruled over Palestine; the standing forces which they had brought with them for the preservation of tranquillity, and which were composed of Aramæans and Chaldæans (2 Kings xxiv. 2); the host of foreign officers in their train, and the transactions of all public business in the Babylonish-Aramæan dialect, must have greatly tended to restrain the use of the national Hebrew dialect, since the Jews, who held public offices, or stood in any other near connexion with the new rulers, were compelled to become familiar with the ordinary dialect of these rulers. There is also reason to suppose that the Babylonish had still earlier been the court language at Jerusalem (see 2 Kings xviii. 26.)

The Aramæan language derives peculiar interest from having been spoken generally by the inhabitants of Palestine, from the Babylonian captivity to the final and general dispersion of the Jews. We find that Jesus Christ, when repeating on the cross the beginning of the twenty-second Psalm, does not quote the Hebrew original, but the Aramaic version. Many other occasional quotations and expressions used in the New Testament and in the writings of Josephus indicate the prevalence of the Aramaic language in Palestine in the age of Christ. The Greek, however, had been long firmly established in Palestine, where it was first introduced by the Macedonian conquests, and extended under the dynasty of the Seleucidæ. We know, both from positive testimony and the indirect evidence of inscriptions, &c., that Greek must have been as common in Palestine at this period as the French now is in Alsace, though it was no more the native tongue than the French now is in the province just mentioned. Greek was also the language of science and learning, as it contained nearly all the knowledge which at that time existed. Concerning the language of Palestine in the age of Christ, compare the dissertations of De Rossi and Pfannkuche, and a chapter in Hug's introduction to the New Testament; which have been translated partly in America, by Robinson, in the *Biblical Repository* for 1831, and partly in Edinburgh, in the *Biblical Cabinet*, 1833, vol. i. The standard work on the Aramaic language is, *Andreæ Theophili Hofmanni Grammaticæ Syriacæ libri tres, cum tabulis varia Scripturæ Aramaicæ genera exhibentibus*, Halæ, 1827, 4to.

English readers may compare Yates's *Syriac Grammar*; Harris's *Chaldee Grammar*, 1824, 8vo.; and ספר השרשים, a Hebrew and English Lexicon, containing all the words of the Old Testament, with the Chaldee words in Daniel, Ezra, and the Targums, and also the Talmudical and Rabbinical words derived from them, by Selig Newman, London, 1834, 8vo., price 21*s*.

Strabo calls the Aramæans (*Geogr*. i. p. 112, ed. Siebenk.) Αρμενίους καὶ Αραμαίους, and Αρίμους. Comp. Stephanus Byz. under Ἄριμα; and Gesenius, *Commentar zum Jesaiah*. t. i. 688, to chap. xxii. 6.

ARANDA, DON PEDRO PABLO ABARCA DE BOLEA, COUNT OF, descended from a very antient and noble family in Aragon, was born about the year 1718, and embraced the profession of arms. In 1743 he was severely wounded in an engagement against the Austrians, near Bologna in Italy, and left for dead on the field. The day after the battle one of his servants happened to pass by, and having recognised his master among a heap of bodies, procured him the necessary assistance. Aranda was appointed ambassador to Frederic Augustus II., elector of Saxony and king of Poland. On his return to Spain, he was sent to Portugal to supersede the Marquis of Sarria in the command of the Spanish army then invading Portugal. In August, 1762, he reduced Almeida and other places; and soon after peace was made. In 1765 Aranda was appointed captain-general of Valencia, and in the following year he was called to Madrid, that capital being then in a state of violent commotion against the minister Squillace. The conduct of Aranda in this emergency fully corresponded to the confidence placed in his talents. He was honoured with the presidency of the council of Castile. Not only was tranquillity restored in that capital, but by making a new municipal division of the city, by the establishment of a permanent garrison, and by other prudent regulations, the count prevented the recurrence of similar riots. During his travels in Europe, Aranda had improved his natural talents and knowledge. In Prussia, he had devoted his attention in particular to examine the military tactics adopted by the great Frederic, which were then the admiration of Europe, with a view to apply them to the military system of his own country. With a courage, firmness, and perseverance which no obstacle could daunt, he undertook the reform of abuses in every branch of the administration, and the adoption of those improvements of which his country stood so much in need. He diminished the asylums, confining their number to two churches in the capital of every province, and he reformed the municipal system by the establishment of the *diputados del commun*, or, deputies of the commons. The coin, which was greatly debased, was called in and replaced by sound money; a new and improved plan was adopted for recruiting the army; the order of the Jesuits was abolished, and new houses of education established; and the thickets of the Sierra Morena, until then the abode of wolves and desperate banditti, were colonized with an industrious population of Germans, Swiss, and French, through the efforts of the philanthropic Olavide. Aranda also endeavoured to check the papal power in Spain by reforming the tribunal called the *nunciatura*, which he composed of six native ecclesiastics proposed by the king, and confirmed by the pope, instead of a body of Roman jurists appointed by the pope alone, of which it formerly consisted; and by establishing a law that no papal decree should be valid in Spain without having first received the sanction of the council of Castile. The *pasos de semana santa*, or, holy week dramatic processions, the *rosarios*, and other pious or rather impious exhibitions, were also abolished by him. The power of the Inquisition was greatly diminished by the establishment of a political censorship, and, indeed, had it not been for the imprudence of the French encyclopædists, he would, perhaps, have abolished that sanguinary tribunal. When at Paris, Aranda frequented the society of Voltaire, D'Alembert, and other philosophers of that period, where he had often expressed his intention to abolish the Inquisition if ever he came into power. Not long after his appointment to the presidency of the council of Castile, an article appeared in some of the publications of the encyclopædists (see Coxe's *Memoirs*, vol. iv. ch. 67, p. 408, 4to. edit. 1815), wherein this confidential conversation was revealed to the world. When Aranda read this account, he was greatly vexed, and said, 'this imprudent disclosure will ruin me, and foil all my plans.' He was not mistaken in his conjecture: such a ferment was raised against him, that foreseeing his ruin unavoidable, he solicited to be appointed ambassador to France, and retired from the administration A. D. 1773. Aranda returned from Paris in November, 1787, but still remained in disgrace, with the honorary title of counsellor of state. After the accession of Charles IV. in 1788, Aranda superseded count Florida Blanca in the office of prime minister (1792); but he was not long after dismissed through the intrigues of Godoy. He retained, however, the presidency of the council of Castile until he was exiled to his native province, where he died, according to some authorities, in 1794, and according to others, which appear more to be depended on, in 1799, leaving behind him a young widow, without any children.

Aranda was a man of profound mind, and of a firmness characteristic of the Aragonese. Coxe relates the following anecdote. One day when Aranda was urging, with his usual perseverance, one of his measures of improvement, the king, who had exhausted all his objections against it, said: 'Count, you are as obstinate as an Aragonese mule.' 'Please your majesty,' replied the minister, 'I know another who is more obstinate than I.' On the question 'who?' 'His sacred majesty, Charles III., king of Spain and the Indies,' answered Aranda. The king smiled at the sally of his minister, and dismissed him with his usual complacency. The Marquis Caraccioli compared Aranda's mind to a deep well with a narrow mouth. (See Coxe's *Memoirs of the House of Bourbon*, vol. iv. ch. 67.)

ARANEA. [See SPIDER.]

ARANJUEZ (Ara Jovis), a town in Spain near the confluence of the Tagus and Jarama, in a plain surrounded by high and bleak hills, in 40° 2′ N. lat., 3° 36′ W. long., twenty-six miles S.S.E. of Madrid. Aranjuez was once a country-residence of the master of the order of Santiago; it came afterwards into the possession of the crown, and the kings selected it for their residence during the spring months, on account of its advantageous situation and the mildness of its climate. Philip II. was the first king who possessed it. The palace is a very handsome square building, with twenty-one windows in front, and a turret at each extremity. It was designed by the architect Juan de Herrera, and was begun under Philip II.; Philip V., Fernando VI., and Charles III. continued it, and Charles IV., who delighted in this residence, greatly contributed to its embellishment. The gardens, which are watered by the Tagus, are particularly admired for their natural beauties. In the time of the Peninsular war, this place suffered a truly Vandalic devastation. Not only the gardens were destroyed, but even the Ceres, a fine statue of the fountain of that name, entirely disappeared.

The town is of modern construction; the streets are broad, very well paved, and intersect each other at right angles. The actual population of Aranjuez amounts to 5245, which number is more than doubled during the residence of the court. In 1808, part of the ground, which had till that time been uncultivated, and was retained by the king as an appendage to the palace, was let to farmers, and brought into cultivation by them. From that period the population became more numerous; and the increased production of grain in consequence has had considerable influence on the markets of Madrid. Charles IV. established here a farm-house and menagerie, in which various foreign animals were very successfully reared. Trees and other productions of distant climates were also cultivated. The loss caused during the war has been partly repaired. (See Miñano; Ponz, carta v. vol. i.)

ARARAT (אֲרָרָט), the name of a region in the centre of the high-lands of Armenia, which was included in the former Persian province of Aran, but now in the present Russian government of Armenia (2 Kings xix. 37); the Armenians call it to this day Ararat. The mountains of this region are called the mountains of Ararat, on which the Ark rested (Gen. viii. 4). The whole of Armenia is called the kingdom of Ararat (Jer. li. 27). That Ararat was originally a name of the region appears from Moses of Chorene (*Compendium Geographiæ Universalis*, p. 46, 52), who derives the name from Araji Arat, *the spot of Araji*, who was king of Armenia in the days of Semiramis. (See Schroederi *Thesaurus Linguæ Armeniacæ*, p. 55; and Moses Chorenensis, *Hist. Armen.* ed. Whiston, pp. 289, 308, 358, 361.)

The antient interpreters render אֲרָרָט, Ararat, in Genesis and 2 Kings, by the word Armenia, as Aquila did with Symmachus, Theodotion, and the Vulgate. At present the Armenians give the name Ararat in preference to that mountain, which they call also Macis or Massis, and the Persians, Koh-i-Nuh, the mountain of Noah. (See Wahl's *Asien*, pp. 518, 806, &c.; Gesenii *Thesaurus*.)

ARARAT, MOUNT, a celebrated mountain of Armenia, situated to the south-west of the town of Erivan, about five miles from the right bank of the river Aras, the antient Araxes. It rises majestically from the midst of a great plain, detached from the other mountains of the country, in two conical peaks, one of which rises far above the limit of eternal snow. Humboldt, on the authority of the Russian traveller, Parrot, states its height above the level of the sea to be 2700 toises, which is equal to 17,260 English feet. Thus it is 6389 feet higher than Ætna, 4792 feet higher than the volcanic peak of Teneriffe, and exceeds by 1528 feet Mont Blanc, the point of greatest elevation in Europe. It does not, however, ascend to this great height from its base, for it stands upon the table-land of Armenia, which is stated by Ritter to be 7000 feet above the level of the sea. The smaller cone is separated from the greater by a plain of great extent, and is considerably lower, for the snow disappears from its summit in summer, and it serves as a calendar to the surrounding people, who regulate their agricultural operations by the progress of the melting of the snow on the little Ararat. The appearance of this mountain is well described in the travels of Sir R. Ker Porter and of Mr. Morier. The former approached it from the north, and paints in glowing colours the magnificence of the spectacle when he first came in sight of Ararat, rising from a widely-extended green plain, fertilized by the clear waters of the Araxes, and covered with villages. He had the advantage of seeing it unveiled by clouds from its base to its summit, and the ice-clad cones shone with dazzling splendour against the clear blue expanse of the heavens. Mr. Morier, who approached it from the south, speaks in strong terms of admiration of the beauty of its form. Such a mountain must naturally be seen from a vast distance, and it is said to serve as a landmark to the navigators of the Caspian sea. A remarkable circumstance, as connected with the traditions belonging to this mountain has been observed, namely, that when seen from afar and in certain positions, the summit has a striking resemblance to a ship. The whole country round is full of traditionary stories about Noah's ark and the flood. The Armenians call Ararat, Massisseusar, or Mountain of the Ark, the Persians Koh-i-Núh, or Mountain of Noah. It is a common belief that the remains of the ark still exist on the summit, and that the wood is converted into stone. In a church at Nova Schamachia, near the junction of the Aras with the Kur, they show a cross, made many centuries ago, out of a plank of the ark. Peter the Great, in 1720, sent some Armenians and Russians to ascertain the fact, and they reported that, to their amazement, nothing of the kind was to be seen. The report, however, in no way shook the faith of the true believers; who, with great reason, rested upon the conviction that the summit of the mountain is unapproachable. The Armenian monk who brought the plank from which the cross was formed, when nearly exhausted in his effort, was met by an angel, who had compassion on him, and handed to him the precious relic. The higher regions are usually covered with clouds, and when these are dispersed and the summit is unveiled, the devout Armenians fall on the ground, cross themselves, and pray. At Erivan, they show the spot where Noah first planted the vine, and the name of another town, Nachichevan, or Nakhdjovan, means, according to Chardin, 'place of descent,' being the place where Noah first settled when he came out of the ark.

Several attempts have been made to reach the top of the mountain, but no one has got much beyond the snow limit. The enterprising Tournefort, in 1700, made the attempt; but after undergoing great fatigue he was obliged to give it up. About twenty-five years ago, a Turkish pacha fitted out an expedition and built huts well supplied with provisions at different stations; but his people suffered severely in their struggle amid the snow and masses of ice in so rarefied an atmosphere, and returned without accomplishing their purpose. From all the accounts we have of its structure, there is little reason to doubt that Ararat is, partly at least, a volcanic mountain. Its conical shape and its detached position are in favour of this supposition. Tournefort, describing the ascent, says, that they passed over a great and beautiful plain to the base of the mountain; that at the beginning of the ascent they found moving sand, which continued for a great way up, their feet sinking in it so that they slipped back at each step, which made the ascent exceedingly laborious; that they afterwards came upon sharp fragments which cut their shoes to pieces, and then to large blocks piled upon one another. This description indicates a volcanic mountain covered with ashes and lava in a state of decomposition, but it is rendered still more clear by what Colonel Monteith says in his Memoir in the third volume of the *Journal of the Geographical Society*. He ascended some way up Mount Ararat, and says that he passed great quantities of pumice-stone. On the side of the greater cone there is a vast cleft, which Tournefort describes as a deep abyss, with lofty precipitous sides, and sharp pinnacles of black rock. This cleft is so great that it can be seen distinctly from Erivan; and between it and the foot of the mountain there is a succession of low round-topped eminences. One can hardly hesitate to consider this hollow as the crater of an eruption from the side of the mountain, an event which would be in accordance with the phenomena observed in all volcanos of great elevation; for in these, such as the Peak of Teneriffe and Ætna, there is seldom an eruption from the top, but almost always from the sides, as if the great mass heaped up by successive ejections afforded a greater resistance to the volcanic force than the sides. But no eruption, nor any indication of volcanic action, has been recorded within the historical æra. In the Chronicle kept by the monks of the monastery of Eitschmajadzen, in which everything relative to this sacred mountain has been carefully recorded for the last 800 years, there is no mention of any eruption. Many parts of the region around Ararat are decidedly volcanic: Sevellan, mountain 13,000 feet high, between Ararat and the Caspian, is volcanic, and Colonel Monteith thinks that it has perhaps been the latest in activity in that country. Extensive beds of lava are visible on its side, and there are warm springs all round the base. The same traveller, describing the lake of Goukeka, or Sevan, a body of water 47 miles long, and in some places 21 broad, situated eastward of Erivan and between Ararat and Sevellan, says, that he found on its banks high perpendicular cliffs of lava, vast quantities of obsidian or volcanic glass scattered over the country, and the shore of the lake covered with pumice-stone, light enough to float on the water.

A remarkable circumstance is mentioned by Tournefort connected with Mount Ararat, namely, that the middle region, and even the borders of the snow limit, are inhabited by tigers. He says that he saw them within 700 yards of him, and that he and his people threw themselves on the ground for the sake of concealment while the tigers passed by. He adds that the young ones are caught in traps by the people round the mountain to be exhibited in shows of wild beasts throughout Persia. (Tournefort, *Voyage dans le Levant;* Sir R. Ker Porter's *Travels;* Mr. Morier's *Travels;* Humboldt, *Fragments Asiatiques;* Von Hoff, *Geschichte der Veränderungen der Erdoberfläche;* Monteith's *Tour through Azerdbijan, &c.*)

ARARAT, or PILOT MOUNTAIN. [See NORTH CAROLINA.]

ARAS, or ERAS, is a large river of Armenia, mentioned by Greek and Roman writers under the name of Araxes. It rises at Dekman in Mount Bin-Gheul, from a number of sources, about 20 miles S.E. of Erzerum, and about 39° 47′ N. lat., 41° 9′ E. long. A branch of the North Frat or Euphrates rises on the opposite or western side of the same elevation, a fact known to Pliny (vi. 9). Its general course from this point is east, with a slight deviation to the north, through Basen and along the borders of the province of Cars to within eight or ten miles of Erivan, at a place called Sahathaphos. From this point it takes a bend to the S.E. (passing the eastern base of Ararat) as far as the ruins of old Julfa in the province of Nakhdjovan: at Sahathaphos, the frontier of Erivan, its breadth, according to Tournefort, is about equal to that of the Seine at Paris. Erivan and Nakhdjovan are now in the Russian province of Armenia, which was ceded by Persia in 1828. Between the bend to the S.E. and the latitude of Ararat, the river makes numerous windings. From the ruins of Julfa (within a few miles, the most southern point of the river's course) the general course of the river is E. to the limits of Khaphan, where it turns N.E., running in this part of its course, with some considerable bends, through part of Nakhdjovan, Kaphan, and the Karabagh to near Jevat, where it is joined by the Kur (Cyrus) coming from the Caucasus. The united stream, after running about thirty miles east, turns suddenly to the south, and enters the Caspian Lake by three mouths (about 39° 20′ N. lat.); a long projecting tongue of land, or delta, is here formed between the Caspian on the east, and the small gulf of Kizilgatch on the west. After its junction with the Kur, the river separates Great Armenia on the south from Shirvan, and part of the antient Albania on the north. Its length cannot be less than 600 or 700 miles, if its general course on our maps is correct; but the Djihan-Numa assigns to it a length of only 150 parasangs.

The Araxes receives numerous tributaries, but none of them are of any considerable magnitude compared with the chief stream: on the north side, the Hassan-Caleh in Basen, the Dchenkli, which comes from a lake of the same name in Cars, and the Arpatchai (according to Rennel, the Harpasus of Xenophon, *Anab.* iv. 7) in the same province; the Arpatchai runs in a deep ravine, with numerous ruined castles on its high banks; the Zenghi, one branch of which flows from the large lake Sevan, said to be about 5000 feet above the sea, runs past Erivan, and joins the Araxes twenty-four miles from this town; the river of Nakhdjovan, &c. Other streams of about the same size, but fewer in number, enter it on the south bank. There is a bridge at Dekman, one in the province of Basen, a third at Khaphan, and a fourth at Jevat, below the junction of the Kur. There was a bridge at Julfa (38° 54′ N. lat.), of which the ruins remain, and similar traces of bridges are seen in other parts of the river. The Aras, when not swollen by sudden rains or the melting of the snow on the high mountains of Armenia, is easily passed either in boats or at the fords, particularly in the upper parts; but in its swollen state the current is extremely impetuous and dangerous. In Khaphan there is a considerable cataract at a place called Erespar; it is *said* (*Journal Asiatique*), that the fall leaves at the bottom a space wide enough to allow men and a whole caravan to pass. But there is probably some exaggeration in this statement, if these falls are the same which Colonel Monteith describes as not more than six feet high, and which he considers to be the falls of Erespar, or Aras Bar. This is probably the cataract alluded to by Strabo (p. 531), according to whom there was an old tradition, that the Araxes, after its exit from the high mountain region, spread out into a great lake, till at length a rent was effected in the mountain barrier like that which made a passage for the waters of the Peneus in Thessaly, and the plain was drained. The position of this cataract appears also to correspond to the great break in the mountain chain which Colonel Monteith places about forty miles below Julfa. (See Monteith's *Map*, and Rennell's *Atlas.*)

Many of the affluents of the Araxes rise in mountains covered with oaks, pines, and firs. The water of the river is pure and wholesome. It abounds in a great variety of excellent fish, of which the chief are the janar, a fish of large size and delicate flavour, met with in the province of Basen; the leog, still larger than the janar, a long slender-shaped fish; the deghin-port, which sometimes weighs an okha (45 ounces, if that of Constantinople is meant), and the carmrakhet (red-skin), so called from its external colour, but the flesh itself is white.

The Araxes was known to Herodotus, though only from hearsay (i. 202, iv. 40); he describes it as flowing eastward from the country of the Matieni, and dividing at its approach to the Caspian into forty channels, only one of which made its way clear to the Lake, the rest being obstructed so as to form swamps. This seems in substance to agree with Strabo's description of the outlets of the Cyrus and the Araxes (p. 501). It is a question much disputed, what river Herodotus means by the Araxes; but we think there is little doubt that he meant the Aras of Armenia. If this supposition will not reconcile all the difficulties, as it certainly will not, his ignorance of the regions bordering on the west, east, and south of the Caspian, helps to complete the solution of our difficulties. (See Mannert, *Geog. der Griechen und Römer, Armenien.*)

Strabo, according to the fashion of his countrymen, explains the word Araxes as being of Greek origin, and having reference (according to its supposed derivation from *ἀράσσω*, *to strike*, or *break*) to the gap where it passes through the mountains. 'The Peneus of Thessaly,' he adds, 'was once called Araxes on account of its having separated (*διὰ τὸ ἀπαῤῥάξαι*) Ossa from Olympus by forming the gorge of Tempe.' Such remarks are mere trifling; and it is more important to observe that the name Araxes was given to various rivers and places in countries widely separated. An Araxes (now the *Bund Emir*) flowed through mountainous Persia and entered the Lake of Bakhtegan. Xenophon, in his *Anabasis*, gives the name of Araxes to the Aborras, or Chaborras, now the Khabour, an affluent of the Euphrates. Araxus was also the name of a promontory on the N.W. coast of the Peloponnesus, near the confines of Elis and Achæa. (See *Journal Asiatique de Paris*, No. 71, 1833; *Journal of London Geographical Society*, vol. iii.)

ARA'TUS, the author of an astronomical poem in Greek, which has come down to us. Neither the date of his birth nor death is exactly known; but, from other circumstances, we infer that he must have been alive in the 125th Olympiad, that is, he lived about the time of the first Punic war, and must be placed, as to the time of his notoriety, between Euclid and Apollonius of Perga, with both of whom, in the most extended sense, he may have been contemporary. The materials for his life are chiefly collected from an anonymous account of him in Greek, printed by Petavius in his *Uranologion*, and various scattered notices and allusions in classical authors. There are, in fact, three anonymous lives of Aratus, besides the notices in Suidas and Eudocia. All that is worth recording amounts to this, that he was certainly born in Cilicia, some say at Tarsus, others at Soli (afterwards called Pompeiopolis); that his calling was medicine; that he was invited to the court of Antigonus Gonatas, king of Macedon, son of Demetrius Poliorcetes, where he passed the rest of his days. It is also stated that he was educated by a Stoic named Dionysius Heracleotes in the principles of that sect.

By the desire of Antigonus, Aratus turned the *Phænomena* of Eudoxus into verse. It does not appear whether he had any remarkable astronomical qualification for the task. It is a question whether he made any original observations or not; but it is certain, from the commentary of the celebrated Hipparchus, which is yet extant, that he made many alterations; for this commentator frequently cites the prose of Eudoxus and the poetry of Aratus together. The work of the former has not come down to us; in fact, Aratus is the second Greek writer on astronomy extant, Autolycus being the first. We are inclined to think that Aratus was neither an observer nor a mathematician, and for this reason, that, in his description of celestial phenomena, he uses no higher degree of precision than might have been attained by a mere spectator of the heavens. For instance: he describes the head of the dragon as never setting, but only just touching the waves. This, at his æra, answered to a latitude of 38° 7′; but, in another place, he describes the intersection of the northern tropic and the horizon as if he was in latitude 40° 54′, more than 2¾° greater than the former. The second latitude answers to some of the southern parts of Macedonia.

The poem of Aratus is divided into two parts; the Φαινόμενα or *Phænomena*, and the Διοσημεῖα or *Prognostics;* the first contains 732 lines, the second 417. It opens with a declaration of the dependence of all things upon Jupiter, *whose children all men are*, and who has given the stars as the guides of agriculture. The passage in italics (τȣ̃ γὰρ καὶ γένος ἐσμὲν) is remarkable as having been, at a much later period, quoted by St. Paul in his address to an Athenian audience (Acts of the Apostles, chap. xvii. v. 28), 'For in him we live, and move, and have our being: as certain also of *your own* poets have said, For we are also his offspring.' If the words in italics represent the correct text, they remarkably serve to show the notoriety of the poem, if it be recollected that Paul was a countryman of Aratus; but some manuscripts of the New Testament (see Griesbach's edition) support the reading κάθ' ἡμᾶς.

Aratus then proceeds to lay down the doctrine of the immovability of the earth and the motion of the heavens round a fixed axis. He describes the names and configurations of all the constellations then in use, their relative times of rising and setting, the march of the sun through the zodiac, and the milky way, which is described as one of the great circles of the heavens. The planets are simply mentioned as bodies having a motion of their own, but no idea is given of the length of periods. There is nothing on the orbit of the moon, or on the unequal motion of the sun in longitude. There are many mistakes as to the placing of the stars; for example, it is said that Lyra has none but small, and Cygnus none but moderate, stars, though there is one of the first magnitude in both. There are various phenomena which are irreconcilable with any one latitude, an instance of which we have noticed; and there are others which could not have coexisted at any one epoch; for example, his separate description of the winter and summer solstice belongs to periods distant by 900 years from each other.

The book of *Prognostics* consists of predictions of the weather from observation of astronomical phenomena: except that the celebrated cycle of 19 years is mentioned in it, it adds nothing to our knowledge of the existing state of astronomy. It contains various accounts of the effect of weather upon animals, with directions, and is, on the whole, more like the *Georgics* of Virgil than any other poem of antiquity. The latter work contains several imitations of the *Prognostics.* There is not a word of astrology either in the *Phænomena* or the *Prognostics.*

Aratus is also said to have written poems on Homer, on the *Iliad*, on osteology, on medicine, a hymn to Pan, a funeral ode on his brother Myris, and a poem called Σκυθικὸν or *Scythian.* More than thirty epistles of his were extant at the time of his anonymous biographer.

The number of commentators upon Aratus is very great. The elegance of the verse caused his work to be for a long time in circulation among the Greeks. Petavius gives a list of thirty-six commentaries in Greek; among the authors of which are Aristarchus, Geminus, Eratosthenes, and Hipparchus. The last has come down to us, and owes its origin to the difference which Hipparchus had observed between the descriptions of Aratus and his own observations. According to his account, Aratus had frequently altered *Eudoxus* for the worse; but the latter is also shown to have so far fallen short of what might have been expected even with the then existing means of observation, that Delambre conjectures the whole system to have been formed, not from the heavens, but from a globe, on which the stars had been incorrectly laid down.

A full account as well of Aratus as of his commentators will be found in Delambre's *Histoire de l'Astronomie Ancienne.* The anonymous *Life of Aratus*, is, as before noticed, in the *Uranologion* of Petavius, together with the commentary of Hipparchus and another, which has been attributed sometimes to Hipparchus, sometimes to Eratosthenes, but which is given by Petavius to Achilles Tatius.

The *Phænomena* was translated into Latin by Cicero when a very young man. Several fragments of this translation still exist, and are given by Grotius in his edition of Aratus. It was also translated by Germanicus Cæsar and by Festus Avienus, both of which versions are to be found in the same edition, which was published at Leyden in 1600, and contains also the original Greek with notes.

There are numerous editions of Aratus. The first is by the elder Aldus, Venice, 1499, folio; this edition contains other writers on astronomy. The latest is by Bekker, with scholia, Berlin, 1828, 8vo. J. H. Voss published a critical edition of the Greek text of Aratus, at Heidelberg, 1824, 8vo., and accompanied it with an excellent German poetical version.

ARA'TUS, son of Cleinias, was born at Sicyon 271 B.C. His native city, distinguished in the history of Greece as a school of art more than for its political importance, had long been harassed by the conflicting pretensions of various persons, who in succession became, to use the language of Greece, its tyrants or princes. Cleinias held that precarious dignity for a short time: but he was killed by Abantidas, who assumed his power, and suffering a like fate gave way to Paseas, who was succeeded by Nicocles. Aratus was but seven years old at his father's death. He fled in the tumult, and falling into humane and honourable keeping, was concealed for a time, and then conveyed to Argos. There he grew up to manhood, distinguished for his bodily powers, a frequenter of the *palæstra*, or place of exercises, and a frequent victor in the rough games which the youth of Greece loved to practise and were proud to excel in. When Nicocles succeeded to the tyranny, Aratus was just entering upon manhood, and he became the object of that person's especial fear. This jealousy was not unfounded. Aratus already meditated the bold enterprise of restoring himself to his native country; and he endeavoured to associate in his views the numerous exiles who had been banished from Sicyon in its successive changes of masters. A few only joined him; the greater number doubted the capacity of the young and inexperienced plotter to conduct such an enterprise, and shrunk from its dangers. He persevered however, and carried on his design with secresy and boldness. He deceived the spies whom Nicocles employed to watch his motions, by an affectation of careless and riotous extravagance; and when his plans were ripe, he made a night march from Argos to Sicyon, with a small number of followers, whom his own resources, and those of his friends, enabled him to arm and retain. The details of this spirited enterprise may be read with pleasure in his life by Plutarch; he succeeded in scaling the walls, forced his way to the tyrant's residence, and mastered his guard. Nicocles escaped by secret passages. Aratus immediately sent round the city to summon his friends; and at break of day the population assembled in the theatre, where proclamation was made that Aratus, son of Cleinias, invited the citizens to resume their liberties. This striking revolution was effected, B.C. 251, without the loss of a single life, either in the heat of contest or as a measure of policy or revenge. Still the new order of things was far from being safely established. Both justice and expedience prompted the restoration of all exiles to their civil rights: and those who returned, in number near 600, naturally sought to recover the possessions which they had formerly enjoyed. This difficulty of adjusting the conflicting claims of emigrants and actual possessors was recently experienced in France, after the restoration of the Bourbons. Aratus, seeing the newly-recovered liberty of Sicyon threatened at once by civil discord and by the ambition of Antigonus Gonatas, king of Macedonia, whose policy was directed to the establishment of tyrants in all the Grecian cities, gave up something of independence for greater security, and procured the enrolment of Sicyon as a member of the Achæan confederacy. [See ACHÆI.] Aratus had cultivated the friendship of Ptolemy Euergetes, king of Egypt, by sending presents of the most valuable productions of Grecian art; and he now undertook a voyage to Egypt, and gained so much upon the king's esteem, that he presented him with a large sum of money (150 talents), the whole of which Aratus employed, on his return to Greece, in satisfying the indigent exiles, and re-establishing concord. He was appointed commissioner, with full power to adjudicate all questions connected with their claims. Unwilling, however, to bear the whole responsibility, he associated fifteen citizens in the task; which was fulfilled with so much justice and liberality, that the restored exiles erected a brazen statue of him, with a laudatory inscription, in testimony of their gratitude.

The talents and services, and perhaps the intrigues, of Aratus soon made him captain-general (*strategus*) of the Achæan league; which under his prudent counsels grew up from a confederacy of a few insignificant cities for mutual defence into a formidable body exercising a powerful influence in Greece. He held this office for the first time B.C. 245; in which year he invaded Locris and Calydonia, on the northern side of the Corinthian gulf. Being re-elected in 243, after the necessary interval of a year, he conceived the project of wresting Corinth from Antigonus. The Acrocorinthus, or citadel, was considered the key of southern Greece. Antigonus, after long coveting, at last gained possession of it by treachery, and held it with a strong garrison. But the faithlessness of two soldiers in his service disclosed a weak point in the fortifications and a practicable path up the precipitous mountain; and Aratus undertook the bold enterprise of mastering the strongest fortress of Greece, by night, with only 400 men. For the particulars of this remarkable escalade we must again refer the reader to Plutarch. It proved successful, though not without much difficulty; and the advantage gained was secured by the arrival of a larger body of Achæan troops, to whom the Corinthians gladly gave admittance. Early in the morning the citizens assembled in the theatre, and Aratus, appearing on the stage in his armour, was received with the warmest demonstrations of joy and gratitude. He restored to them the keys of the city, which, since the reign of Philip of Macedon, they had not had in keeping, and invited them to join the Achæan league. They acceded to the proposal; and the Acrocorinthus was thenceforward occupied by an Achæan garrison. Aratus also gained possession of Lechæum, one of the ports of Corinth, and before the end of his year of office prevailed on the state of Megaris to join the league. Troezen and Epidaurus soon followed the example, and the confederacy was further strengthened by the friendship and support of the king of Egypt.

The powerful city of Argos had long been held by a succession of tyrants. To re-establish the commonwealth was a favourite object with Aratus; and he made several attempts, which proved abortive, not being seconded by the temper and wishes of the people. It was not until B.C. 227 that Aristomachus, being tyrant for the time, was induced by the counsels of Aratus to resign his power, and bring over Argos to the Achæan league. Cleonæ, an antient city of the Argian territory, had become a member of it some time before. Phlius was admitted to it at the same time. The resignation of Aristomachus was probably prompted by the example of Lysiadas, tyrant of Megalopolis, who, emulating the virtues and the reputation of Aratus (if Plutarch rightly represents his motives), had retired into private life, and induced his city to join the league, B.C. 232. Lysiadas was rewarded by the popular favour, and was three times chosen strategus, alternately with Aratus. Each probably felt jealous of the other, for continual bickerings existed between them. Lysiadas was killed in battle with the Lacedæmonians, about B.C. 225.

In prosecution of his favourite policy, Aratus made several attempts to drive the Macedonians from Athens. That which he could not obtain by arms, he effected by money, soon after Antigonus, surnamed Doson, began to reign, B.C. 237, when Diogenes, the Macedonian governor, delivered up the fortresses which he held, together with the isle of Salamis, for a bribe of 150 talents, of which Aratus contributed twenty from his private fortune. At the same time Ægina, Hermione, and a considerable part of Arcadia joined the Achæan league.

It will be seen, on reference to the map of Greece, that during a period of about twenty years, in which the affairs of the Achæan league had been chiefly managed by Aratus, that body had grown up from the union of a few weak cities for mutual defence into a powerful confederation, including the whole northern coast of Peloponnesus from the promontory of Araxus to Scyllæum, with the lands of Corinth and Megara, and the greater part of Arcadia. This change was wrought, in a great measure, by the probity and high personal character of Aratus; who, as we are told by Plutarch, even during those years when the forms of the constitution prevented his having the name of strategus, still had the authority of the office, 'because the people saw that he set neither glory, nor wealth, nor the friendship of kings, nor the good of his own country, nor any other thing, before the general advantage of the Achæan league.' Accordingly, he was elected general oftener, it should seem, than the law strictly allowed; for in a period of thirty years from his first elevation, B.C. 245, to his death, B.C. 213, he held the office seventeen times. The leading feature of his policy was the expulsion of those petty tyrants whom it had been the favourite object of the Macedonian kings to establish in all the cities of Greece, as the readiest way of retaining them in subjection; to exclude the Macedonians from Peloponnesus; and to give vigour to the Greek nation by uniting them in one confederacy of well-organized commonwealths. We have seen that he succeeded to a great extent in this virtuous, and judicious, and truly patriotic design. But he was constantly opposed by the Macedonian kings, Antigonus and his son Demetrius, and very frequently by the Ætolians, a warlike and turbulent people, who derived much of their wealth from plunder, and were ever opposed to peace and to good order. Hence, though sometimes led to alliance with the Achæans by a common jealousy of the power of Macedon, they were much more frequently arrayed against them; and in one of their predatory incursions into Peloponnesus, they were defeated by Aratus at Pellene with considerable slaughter. By this victory Aratus acquired considerable renown: for the most part, however, he was unsuccessful in the open field, and cautious to excess in his movements; a singular fault in one who was so bold in attempting, and so successful in effecting, the capture of the strongest fortresses by sudden assault, a species of enterprise in which, above all others, prompt contrivance and bold execution are required. His personal courage did not escape unquestioned, and in certain circumstances he doubtless betrayed a weakness and want of steady purpose. He seems to have done best where he had least time for reflection; he saw and did what was expedient on the spur of the moment, but hesitated and became perplexed where he had time to deliberate: so that, according to Polybius, qualities totally opposite were united in him, and in different circumstances he was no longer the same man.

Shortly after the accession of Argos to the Achæan league, war broke out (B.C. 226) between the Lacedæmonians and Achæans; a war to which neither party seems to have been averse. The Achæans looked with contempt upon the youth of Cleomenes, king of Sparta; and Cleomenes was both desirous of military fame, and hoped to find in the events of war some favourable opportunity for effecting the civil changes at home which he desired. Aristomachus, the late tyrant of Argos, was strategus when the war began. Aratus had dissuaded him from engaging in it, and had sufficient influence to prevent his giving battle when the hostile armies were first opposed to each other at Pallantium, in Arcadia, though the Achæans were 20,000 strong, and the Lacedæmonian army consisted of only 5000 men. This raised the spirits of the Lacedæmonians, and in the following campaigns Cleomenes was generally successful. He defeated Aratus in the next year at Mount Lycæum in Arcadia; but the Achæan general retrieved this mishap by gaining possession of Mantineia in his retreat. Soon after, another battle was won by Cleomenes under the walls of Megalopolis, in which Lysiadas was killed; and on this occasion Aratus was loudly, and it should seem justly, censured for his slackness and want of enterprise. The war languished while Cleomenes was occupied by the revolution in Sparta; but when that was completed, he resumed his successful career. He regained Mantineia, invaded Achæa, and won a great victory at Dyme; he took Pellene and some other towns; Argos, Phlius, Epidaurus, Trœzen, Hermione, went over to him; and Corinth passed into his hands, with the exception of the Acrocorinthus, which still remained in custody of the Achæans. Aratus, though reelected, had refused to accept the office of strategus, whether from anger at some censures which had been passed on him after his late defeats, or from a fear of being unable to extricate the Achæans from the difficulties in which the war with Sparta had involved them. He was much censured, both in his own time and afterwards, for having brought the vessel of the state into danger, and then abandoning the helm to others. Though ostensibly in a private station, he continued to exercise his usual controlling influence. To extricate himself from the difficulties in which he was involved, he adopted the disgraceful expedient of inviting back the Macedonians, whom he had been at so much pains to expel from the Peloponnesus. He had been already engaged in negotiation with Antigonus Doson, during that course of successes which put Argos and so many other places into the hands of Cleomenes. Having prepared the way for reconciliation, and ascertained that Antigonus was not unwilling to form an alliance with the Achæans after the battle of Dyme, he advised them to make a formal application to that monarch for assistance. Antigonus, however, required that the Acrocorinthus should be placed in his hands as the price of his services; and this open invasion of the liberties of Corinth, a confederate city, could not be tolerated. But the voluntary revolt of the Corinthians removed this difficulty, and the Achæans forthwith transferred the citadel to the custody of Antigonus. Cleomenes took up a station to defend the Isthmus, but he was obliged to abandon it in consequence of a counter-revolution at Argos, which returned to the Achæan alliance, and Antigonus entered Peloponnesus unopposed (B.C. 224). He took several cities in Arcadia, which he delivered to the Megalopolitans, and going to Ægium to confer with the Achæan congress, was appointed commander-in-chief of the confederate army. In the following year he took Tegea, Orchomenus, and Mantineia; but this success was counterbalanced by the loss of Megalopolis, which Cleomenes plundered, and almost destroyed. In the following year, B.C. 222, Antigonus defeated Cleomenes in the decisive battle of Sellasia, which put an end to the war. The Macedonian king entered unopposed into Sparta, but he treated it with respect, and contented himself with undoing the changes which Cleomenes had made. Cleomenes fled to Egypt, where he died, and Antigonus died shortly after in Macedonia, enjoining Philip, his nephew and successor, to regulate his policy in Greece strictly by the counsels of Aratus.

Peace followed the battle of Sellasia, and for a time Peloponnesus was quiet. This, however, was of short duration. Of the character of the Ætolian tribes we have already spoken. Sometimes in alliance, sometimes at war, with the Achæans, as their interest prompted, they were never in firm friendship with a people whose conduct was directed in the main to the upholding of peace and order, while they led themselves a life of rapine, gathering by the strong hand those luxuries from their neighbours which they were too indolent or ignorant to procure by honest industry. A series of gross provocations induced the Achæans to declare war against these turbulent mountaineers. Aratus took an active part in urging this measure, and being elected strategus for the ensuing year (it was near the period of changing officers when these transactions occurred), he anticipated by five days the proper time for entering on his office, that he might hasten his march against the Ætolians, who were already engaged in ravaging Messenia. He failed signally in the conduct of this campaign: once at Caphyæ, by giving battle too hastily, in which he was defeated, B.C. 220; afterwards by suffering the enemy to continue their depredations unchecked, and neglecting opportunities of which a more active general would have availed himself. Great complaints were made at the next congress; and Aratus himself seems to have been sensible that his conduct was open to exception, since, in defending himself, he urged his former services as a plea for passing lightly over his error, if it should be judged that any fault had been committed by him. The appeal was probably successful; and he continued to retain his wonted influence.

In the course of this war, Philip II., the young king of Macedonia, acted as general of the Macedonian and Achæan army. For some time he observed his uncle's dying commands, and regulated his own conduct strictly after the counsels of Aratus; and he displayed such ability, prudence, and justice, as gave rise to the fairest expectations of his reign. Some however of his confidential ministers, jealous of the influence, and opposed to the views of Aratus, used every means to destroy that statesman's weight with their prince, and they induced Philip to procure the election of Eperatus as strategus, an avowed opponent of Aratus, to the exclusion of Aratus himself. This interference produced much discontent among the Achæans. The successful candidate was a person of little estimation, and humble ability, and affairs went on so ill in his hands, that Philip was forced to seek a reconciliation with Aratus. The war was then prosecuted with success both in Ætolia and Peloponnesus. All parties, however, became desirous of peace. Philip sought to take advantage of the distress to which the Romans were reduced by Hannibal; the Achæans wished to conclude peace while the advantage was on their side; and the Ætolians were glad to put an end to a struggle in which they had the worst. Peace was concluded B.C. 217, each party retaining what they then possessed.

The extensive prospects of ambition opened to the Macedonian king brought to light the seeds of evil in his character. Hitherto his conduct towards his Grecian allies had been generous and faithful; henceforth his desire was to reduce all Greece under his power, and he scrupled at few things which promised to forward his views. The counsels of Aratus became distasteful to him, and the authority which that statesman had insensibly acquired over him became irksome. Latterly indeed the policy of Philip became so hateful, that Aratus withdrew entirely from his court and society, fearing to incur the odium of the crimes which he was constantly committing. Still the recollection of Aratus checked, and rendered him uneasy; and to rid himself of this restraint (if Plutarch's tale be true, and it is confirmed by Polybius), he procured the death of his old friend and guide by a slow poison. Aratus felt the blow, and knew the author; but feeling that complaint was useless, he endured it in silence, with the single exception that he once observed to a friend who was shocked at seeing him spit blood, 'Such, Cephalon, are the rewards of the friendship of kings.' (Polyb. viii. 14.) He died B.C. 213. The honour of being his burial-place was disputed between Sicyon and Ægium in Achæa, where he died, and adjudged by the Delphian oracle to the former. He was splendidly interred there, and a monument erected to him. He was honoured by the Sicyonians as the father, founder, and saviour of their city; and twice a year, on the anniversary of his birth, and of the restoration of liberty to the city, a religious festival was celebrated in his honour.

He wrote a history of his own times, entitled *Commentaries* (ending with the year 220), which, unfortunately, have not come down to us. It has received high praise from Polybius, as containing 'very faithful and clear memorials of his own times;' and from the close of this work Polybius chose to commence his own history. Particulars of the life of Aratus will be found in Polybius, lib. ii. to ix. inclusive; and in Plutarch, Lives of *Aratus*, and *Cleomenes*.

There is a chapter devoted to this subject in the *Encyclopædia Metropolitana*, from which the dates here given sometimes vary. We have followed our usual guide, Clinton, in his '*Fasti Hellenici*, from the 124th Olymp. to the death of Augustus.' See also Schlosser's *Universalhistorische Uebersicht* (ii. 1.), whose judgment on the character of Aratus is unfavourable, and perhaps just.

ARAUCANIANS, the name given to a South American tribe, inhabiting a country comprised between 36° 44′ and 39° 50′ S. lat., and 70° and 74° 30′ W. long., and bounded on the E. by the great Cordillera of the Andes, by the Pacific Ocean on the W., by the river Bio-bio on the N., and by the Valdivia or Callacalla on the S. It extends about 186 miles along the coast; the breadth from the sea to the crest of the Andes is perhaps about 150 miles. The people take the name of Araucanians from the province of Arauco, which is the smallest in the state; and pride themselves in being called Auca, which, according to Molina, means frank, or free. The Spaniards, who had served in the Netherlands, and afterwards fought in Chili, called the country Araucanian Flanders, or the Invincible State. The productions of the soil are in general the same as those of Chili.

The territory of Araucania has been divided from time immemorial from north to south into four parallel *vuthan-mapus* (otherwise written *uthalmapus*), or tetrarchies, almost equal in extent, which are called *lauguen-mapu* or the maritime country, *lelvun-mapu* or plain country, *inapire-mapu* or country at the foot of the Andes, and *pire-mapu* or country of the Andes. Every *vuthan-mapu* is subdivided into five *illarehues* or provinces, and every *illarehue* into nine *rehues* or districts. The maritime country comprises the provinces of Arauco, Jucapel, Illicura, Boroa, and Nagtolten. The plain country includes those of Encol, Puren, Repocura, Maquegua, and Mariquina. That at the foot of the Andes comprises the districts of Marven, Colhue, Chacaico, Quecheregua, and Guanagua. The province of the

Andes was formerly possessed by a separate tribe, called Puelches, which afterwards became united to the Araucanians.

The government of the Araucanians is aristocratical, and is composed of three orders: the *toquis*, the *apo-ulmenes*, and the *ulmenes*. The *toquis* are four independent chiefs, every one presiding over one vuthan-mapu; their name is derived from the verb *toquin*, to judge or rule. Though independent of one another, they form a federal union for the public welfare. The apo-ulmenes have the command of the provinces under their respective toquis, and the ulmenes preside over the *rehues* or districts. The badge or device of the toqui is a porphyry or marble axe. The apo-ulmenes and ulmenes have staves with silver heads, but the former are distinguished by a silver ring round the middle of their staves. All these dignities are hereditary in the male line, in the order of primogeniture. The toquis possess but a shadow of sovereignty; the real power resides in the *vutacoyag*, or *aucacoyag*, the great council, or council of the Araucanians. This diet is composed of the toquis, the apo-ulmenes and ulmenes, and is held in some plain or valley, whenever any affair of importance is to be decided upon. Previous to their meeting they have their games and sports.

Their *admapu* or code of laws consists simply of traditionary customs. The laws which are the most distinctly defined are those which regard the district of every toqui, and the succession and union of the tetrarchies. The election of the principal officers in time of war and the convocation of the diet reside in the toquis. No toqui can ever rule over more than one tetrarchy. The subjects are not bound to render their chief any sort of personal service except in time of war; he supports himself by his own private property. When the male line of the chief becomes extinct, the people choose another ruler out of the family that is most agreeable to them, but before giving the new sovereign his power, they present him to the other toquis to be acknowledged by them.

The crimes which are visited with the greatest severity of the law are treason, murder, adultery, theft, when to any considerable amount, and witchcraft: the murderer may escape punishment by compounding with the offended family. Fathers possess the right of punishing their children, or any other individual of their family, even with death, whenever they may think proper. The sorcerer is first tortured by fire in order to compel him to declare his accomplices, and then stabbed. The smaller crimes are punished by the law of retaliation, called by them *thaulonco*. Any one found guilty of a capital offence is immediately put to death, prisons not being in general use when Molina wrote.

The military government of the Araucanians, though not more complete than the civil and criminal codes, shows a considerable degree of intelligence. When the council has decided upon war, they proceed to choose a commander from among the four toquis, but if none of them possess the necessary qualifications, an ulmen, or even any other inferior officer, is chosen. The general having accepted the office, assumes the title of toqui, and takes the axe, which all the other toquis are obliged to lay down during the time of his dictatorship. This ceases with the war. Both the toquis and all the other officers swear allegiance to him: the general then appoints a vice-toqui and the officers of his staff, the latter nominating their subaltern officers. The vice-toqui is generally taken from the tribe of the Puelches. A messenger, called *huerquen*, is then sent to announce the war to the friendly tribes, and even to the Indians who live among the Spaniards. His credentials consist in a small bundle of arrows tied with a red thread; if the war has already begun, they put in the centre the finger of a dead enemy. This expedition is called the *púlquitun* or running the arrow, and is done with such secresy, particularly in the possessions of the Spaniards, that it has rarely been discovered. The dictator then requires from each of the toquis his allotted contingent of men, and the levy is made by the apo-ulmenes and ulmenes without any difficulty, as no Araucanian ever refuses to come forward in defence of his country's liberty. Thus the army is formed with the greatest facility and promptitude. It consists generally of five or six thousand men, besides a large body of reserve.

The Araucanian army consists of cavalry and infantry: the former was not known among them before the arrival of the Spaniards; but they soon reared a fine breed of horses, and in 1568 they were able to equip some squadrons for the field. The toqui Cadeguala was the first who established a regular body of cavalry in 1585. The infantry is formed into regiments, each consisting of 1000 men divided into ten companies; every regiment has a flag with a star embroidered upon it, which is the arms of the nation. The cavalry is divided in the same way, but the number of horsemen is not always the same. The soldiers wear no uniform, but they put on, under their usual dress, a cuirass made of leather hardened by means of a certain varnish. Their helmets and shields are also constructed of the same material. The cavalry are armed with lances and swords, and the infantry with pikes and clubs furnished with iron. Formerly they used the sling and the bow, but experience has taught them that close combat was more effectual against the fire-arms of the Spaniards. The Araucanians have never been able to discover the secret of manufacturing gunpowder. They were at first very anxious to possess it. Having observed some negroes among the Spaniards, they supposed that gunpowder, from its blackness, was extracted from their bodies. One of these poor negroes having had the misfortune to fall into their hands offered them the opportunity of trying the experiment. He was first flayed from head to foot, and then burnt to cinders, but the result only served to show them the fallacy of their chemical knowledge. They have occasionally made use of the guns which they have at different times taken from the Spaniards, but, perhaps from their strong prejudice against anything derived from the Europeans, they have never generally adopted them. The army, on its march, is always preceded by an advanced guard to prevent any surprise. The infantry is usually all mounted on horseback until they discover the enemy, when they immediately dismount and form themselves into companies. Each soldier carries with him his own provisions, consisting of some roasted meal or flour in a bag, a small quantity of which mixed with cold or warm water serves them for food until they arrive at the enemy's territory. In this manner their armies, unincumbered with any sort of baggage, move with great expedition. The prudence displayed in their encampments, particularly at night, is admirable. Having formed an entrenchment round the camp with ditches covered with branches of trees and brambles, they place their centinels around. Every soldier, to show his vigilance, is obliged to keep a fire all night before his tent.

After the battle, every soldier is the rightful master of the prize which he himself has made, but when the booty has been taken in common, it is divided equally among them all, the toqui himself having no greater share in it than the private soldier.

One of the laws of the military code of the Araucanians prescribes, that after the battle one of the prisoners must be sacrificed to the manes of the heroes who have fallen. This ceremony is called the *pruloncon* or dance of the dead. Fortunately this horrid custom is so rarely performed, that in the space of two hundred years, it is said, only two of these festivals occurred.

When the enemy sues for peace, a great congress is held, generally in an extensive plain between the rivers Bio-bio and Dunqueco, on the boundaries of Chili and Araucania. The Spanish president and the Araucanian toqui, accompanied by four deputies from the respective uthalmapus, without the unanimous consent of whom the peace cannot be ratified, repair thither. The two nations then encamp at the distance of two miles from each other. The conference is opened by many tedious compliments on each side, and in sign of reciprocal friendship, the staves of the ulmenes and that of the Spanish president are tied together, and placed in the middle of the assembly. An Araucanian orator then makes a long harangue in the Araucanian language, expatiating at great length on the evils of war and the advantages of peace: a similar one from the Spanish president is made in reply, which is translated word for word by an interpreter. The articles of the treaty are then signed and ratified by the sacrifice of several Chilihueques or Chilian llamas, with the blood of which the toqui sprinkles a branch of cinnamon, and presents it to the president as a token of friendship. A festival is then held, in which the Spanish president dines with the toqui and the ulmenes, and makes them a magnificent present in the name of his sovereign.

The religious system of the Araucanians is in accordance with their political system of government. They acknowledge a Supreme Being, whom they call *Pillan*, a word derived from *pulli*, 'the soul,' which means the essential soul or spirit. They give him the epithets of *Guenu-Pillan*, or 'the Spirit of Heaven,' *Vuta-Gen*, 'Great Being,' *Vilvemvoe*, 'Creator of All,' &c. The universal government of their *Pillan* is similar to their own. He is the great toqui of the universe, and has his apo-ulmenes and ulmenes to preside over the inferior affairs. The principal of these inferior deities are, the *Epunamum*, or 'god of war,' and the *Meulen*, 'the beneficent god, the friend of the human kind.' There is also the *Guecubu*, or *Huecuvu* (for it is indifferent which initial letter is used), who is the author of evil. No misfortune happens to an Araucanian which is not attributed to this malignant being. If a horse is tired, the Guecubu has been riding on its back; if the earth quakes, it is because the Guecubu has shaken it; if a friend dies, he has been suffocated by the Guecubu. On the contrary, the good Meulen, by the agency of his celestial ulmenes, is constantly endeavouring to check his malignant influence. These spirits or genii are male and female; the former are called *Gen*, and the latter *Amei-Malghen*, or spiritual nymphs, one of which latter is constantly attendant on every Araucanian; and so firmly are they persuaded of the truth of this influence, that when any one has been fortunate in anything, he expresses his satisfaction by saying, *Nien cai ñi Amchi-Malghen*, that is, 'I have my nymph by me.' As their earthly rulers require no particular service of them, the Araucanians suppose that the Supreme Being also requires no sort of worship; accordingly, they have neither temples, idols, nor priests, and offer no sacrifices except on some solemn occasion, when they offer a llama, and burn tobacco, as the incense most grateful to their divinities. They are very superstitious: an Araucanian, who faces a cannon with intrepid valour, is terrified at the sight of an owl.

One of the chief articles of their religion is, the immortality of the soul. They acknowledge that man is formed of two substances, the *anca*, or body, and the *am* or *pulli*, soul, and that the latter is *ancanolu*, or incorporeal, and *mugealu*, immortal. After the death of the body, the soul is taken by a spirit to a place called *guelcheman*, or the abode of the men on the other side of the mountains, which place, according to some, is divided into two regions, one of bliss for the good, and another of misery for the wicked; but others pretend that they will all be there eternally happy, and that their actions during the life of the body have no influence on their future state.

As soon as an Araucanian dies, the body is laid upon the ground, and all the friends of the deceased sit round it uttering mournful lamentations for some time. It is then placed on a high bier, clad in the richest garments, and the night is passed in weeping, eating, and drinking. This funeral festival is called *curicahuiñ* or the black festival, that colour being with them the colour of mourning. On the following day, and sometimes two or three days after death, the body is taken to the *eltun*, or burial-ground of the family, which is generally on some high hill or in a wood. Two young men on horseback, running at full speed, precede the funeral procession; these are followed by the bier, which is carried by the nearest relations of the deceased. A number of women accompany the procession, uttering lamentable cries, and another woman follows behind, strewing the road with ashes, which they imagine will prevent the soul returning to its earthly abode. When they arrive at the burial-ground, the body is placed in the grave, surrounded by his arms if a man, and by female implements if a woman, together with several dishes full of victuals, and some vessels full of *chicha*, or wine. Sometimes a horse is killed, and buried with the body. It is then covered with earth, and several stones piled up in the form of a pyramid. A great quantity of chicha is then poured upon it as a funeral libation, and the company return home.

In the new state of existence, the soul being free from the incumbrance of the body, pursues with greater facility and perfection all the occupations that it had in the body. Wives return to the bosom of their husbands, and children rejoin their parents, but no new children are born.

They also preserve the tradition of a universal deluge from which a few persons were saved on the top of a mountain having three points, called by them the *Thegtheg* or 'Thundering Mountain,' which floated upon the waters. As this deluge was preceded by an earthquake and a volcanic eruption, whenever these phenomena take place the inhabitants betake themselves to one of those mountains in the Andes which resembles the Thegtheg, carrying with them an abundant supply of provisions, and several wooden plates to protect their heads against the excessive heat of the sun in case the mountain should be raised too near to that body.

The Araucanians divide their years into seasons, months, and days, as we do. Their year is solar, and begins on the 22d of December, or immediately after their summer solstice, which they call *thaumathipantu*, that is, 'the end and beginning of the year,' and the winter solstice they call *udanthipantu*, or 'divider of the year. These points they determine with some degree of accuracy by the solstitial shadows. Their *thipantu*, or year, is divided into twelve *cuyen*, or moons, of thirty days each, and five days are added, probably, to the last month. They name their months from some occurrence which takes place in each, as *Avun-cuyen*, 'month of the fruit,' which corresponds to our January; *Coji-cuyen*, February, or the 'harvest month,' &c. They divide the natural day into two equal parts, and these again they subdivide into twelve parts, six for the day and six for the night; thus their *uagantu*, or hour, is equal to two of ours. They measure their hours by the altitude of the sun in the day, and by the stars at night, without the aid of any instruments. In civil affairs they reckon their time by days, mornings, or nights. They divide the stars into *pal*, constellations, and distinguish them by the number of stars which every one consists of: thus, the pleiades they call *caju-pal*, or 'the constellation of six.' They also distinguish them from the planets, which they call *gau*, from the verb *gaun*, to wash, supposing that when they set they sink into the sea. They believe them to be inhabited, for which reason they call them countries, as *cuyen-mapu*, the country of the moon. Eclipses are not considered by these people as bad omens, but as simple natural phenomena, the cause of which they do not know. An eclipse of the sun they call *lay-antu*, and that of the moon *lay-cuyen*, that is, 'the death of the sun or moon.' Comets are considered by them as terrestrial exhalations which become ignited in the atmosphere, but they are not terrified by their appearance.

The only sciences which they cultivate are, oratory, poetry, and medicine. Of these sciences oratory is that which they hold in the highest esteem. The eldest son of an ulmen who is not a proficient in this art is excluded from the succession: for this reason they take their children to their national assemblies, and accustom them, at a very early period, to speak in public. Their poets are called *gempin*, 'or lords of speech.' Their poems, which are transmitted from father to son, generally have reference to the exploits of their heroes, and the measure most generally adopted in their compositions is that of eight or eleven syllables. They are so careful to preserve their language in all its purity, that when a foreigner settles among them he is obliged to change his name for an Araucanian one; even the missionaries have been compelled to adopt that practice, and to submit to be interrupted in their sermons by their auditory at every fault they make. Though many Araucanians know the Spanish language, they will rather submit, on all public occasions, to the tedious explanation of an interpreter than adopt the Spanish tongue.

The language, though not written by the Araucanians, is very copious. Molina says that, according to the vocabularies which are in existence, the best of which is far from perfect, its radical words, which are generally monosyllables or dissyllables, amount to 1973. These roots are susceptible of an indefinite number of combinations. Owing to the want of guttural and harsh sounds, and to the great variety in accentuating the words, it is very sweet and harmonious; its etymology is very simple and regular. There is not a single noun or verb irregular. One declension serves for all nouns, and the signs of the different cases are the same in the singular, dual, and plural: thus they say *chao-ñi*, of the father; *chao-egu-ñi*, of the two fathers; and *pu-chao-ñi*, of the fathers. The genders are confined to words designating animate beings. The masculine is expressed by *huentu*, a male, and the feminine by *domo*, a female—*e.g. huentuthehua*, a dog, *domothehua*, a bitch. In the masculine the sign is generally omitted. The mechanism of the conjugation is also very simple. The terminations of the indicative present are *n*, *imi*, *i*, for the singular, *iu*, *imu*, *igu*, for the dual; and *ign*, *imen*, *igen*, for the plural, which terminations are the same in all tenses. The number of tenses in the indicative and subjunctive is, two for the present, three for the past, two for the future, and two aorists. The characteristic sign of every tense is placed between the radical and the termination. Thus from *elun*, I give, is formed elu-a-n, I will give, and elu-bu-n, I did give; the passive is formed with *gen*, to be; *e. g.* elu-gen, I am given; elu-ge-a-n, I will be given. Substantives, adjectives, adverbs, and even interjections, are converted into verbs by adding an *n* to the word—*e.g. elu*, a gift, *elu-n*, to give; *cume*, good, *cume-n*, to be good; *ina*, close, *inan*, to be close by; alúlú, ah! *alúlún*, to feel a pain. Adjectives are converted into abstract substantives by adding *gen* to them—*e. g. cume*, good; *cumegen*, goodness. Intransitive verbs are changed into active by means of certain particles: thus from *in*, to eat, *ileln*, to cause one to eat. There is in this language a great latitude for stringing words together, and very often a single word expresses one or two sentences: thus the word *rucatunmaclopaen* means, 'pray come and help me to build a house;' which word is composed of *ruca*, a house; *tun*, build; *ma*, a sign of entreaty; *clo*, help; *paen*, come. The only books existing in this language are catechisms, sermons, prayers, and other religious books, translated or composed by the Jesuits, to whose labours we are also indebted for most of the grammars and dictionaries of this tongue.

The physicians are of three classes,—the *ampives*, or empirics, the *vileus*, or methodical, and the *machis*, who cure by spell; the first of these physicians employ principally simples in curing diseases, and are excellent practitioners; the *vileus* pretend that all contagious diseases proceed from insects. When all the efforts of the ampives and vilous have proved inefficient in curing a patient, a machi is sent for, who, after practising some mysterious ceremonies, pretends he has discovered the place where the magic poison lies, and reveals the name of the person supposed to have administered it, hereby very frequently endangering the life of some innocent individual. They have likewise two sorts of surgeons,—the *gutarve*, who cures fractures, dislocations, ulcers, &c.; and the *cupove*, or anatomizers, so called because they are principally employed in opening the bodies of such as die of unknown maladies. Besides the above-mentioned professions, they have mechanics, such as blacksmiths, silversmiths, carpenters, &c.

The Araucanians have as many wives as they can support, or rather are able to purchase; but, as in all other countries where polygamy is permitted, it is only the rich who enjoy this privilege: the poor content themselves with one or two. Celibacy is disgraceful among them. An old bachelor is called *vuchiapra*, which means a useless old man; and *cudepra*, a useless old woman, is the word by which they designate an old maid. The marriage ceremony is very simple, and consists in carrying off the bride by pretended violence. When the bridegroom has fixed with his future father-in-law the sum that he is to give him for his daughter, he goes, accompanied by some of his friends, to surprise the bride in some retired spot; she is then seized, placed upon the horse of her future husband, and conducted to the house of the bridegroom, where the nuptial festival is celebrated. The first wife, called *unendomo*, is always considered the legitimate one, and respected as such by all the *inandomo*, or secondary wives. Each wife is obliged to present her husband every day with a particular dish cooked by herself at her own fire. Thus the most civil manner of asking an Araucanian how many wives he has is, *mivu cuthalgeimi?* or, 'how many fires have you?' It is, besides, the duty of every wife to furnish her husband with the necessary articles of dress, and with one *poncho* every year. The Araucanian women are noted for the cleanliness not only of their houses and clothes, but even of their persons. They comb their hair twice a day, and wash their head at least once a week with the bark of the *quillay*, or *quillaja saponania*, which they make use of instead of soap. Their habitations are placed near the banks of rivers, in which, during summer, the men bathe several times a-day, and in winter at least once a-day. The women also bathe regularly, and on the very day of giving birth to a child they wash both the infant and themselves in the stream, and then lay it upon a sort of rush cradle, which is hung on the ceiling, covered with soft skins, and return to their daily occupations. The child is generally unclothed until it begins to walk, when they put on it a very loose gown. Their moral education is not more constrained than their physical. Their parents instruct the males in the management of arms, and in speaking their language with freedom, elegance, and purity, allowing them to do everything without restraint; they very seldom inflict on them any corporal punishment, as in their opinion this practice tends to degrade them and make them cowards.

The Araucanians are of a moderate stature, strong, muscular, and well-built, and naturally have a very martial air. It is exceedingly rare to find among them a deformed person; not because, as some have erroneously supposed, they destroy the infants who are born with any imperfection, but because the modes of life and other obstacles, which among civilized nations prevent the action of nature, are unknown among them. Their colour, like the rest of the Americans, is that of copper, although somewhat lighter; their face is oval, their eyes small, but lively and full of expression, the nose rather flat, the mouth pleasing, with fine regular teeth; the legs well formed and muscular, with small and flat feet. In general, they have no beard, because they take particular care to eradicate every hair that grows on any part of the body except the head, the hair of which they never cut, but dress it round in tresses. Old age is seldom perceptible in the Araucanians before their sixtieth year, and it is not a rare occurrence to see an Araucanian eighty years of age without a single grey hair. Frequently they attain the age of ninety or a hundred years. Their moral qualities correspond to the physical. They are bold, intrepid, courageous, constant in enduring the fatigues of war, and fearlessly expose their lives when the liberty of their country is at stake. They are also exceedingly jealous of their honour; hospitable, honest, grateful, generous, and humane to the enemies they have conquered; but they are indolent when not at war, addicted to intoxication, presumptuous, and haughty.

The dress of the men consists of a shirt, a sort of jacket, with small tight breeches, and a *poncho*, which is a piece of cloth simply with a hole in the middle for the head to pass through, falling before and behind down to the knees, and open at the sides like a cassock. The colour of their dress is generally blue, which is their favourite colour. On their heads they wear a sort of band like a diadem, which in time of war is ornamented with feathers; they also wear a sash of different colours round the waist. Persons of distinction make use of woollen boots of different colours and leathern sandals, which they call *chelle;* but the people go bare-footed.

The dress of the women is very simple and modest, consisting of a long tunic or gown without sleeves, called *chiamal*, fastened to the shoulders with silver buttons; a sash round the waist; and a short mantle called *ichella*. This dress is never altered, but they are allowed to add to it all the ornaments which their fancy or vanity may prompt them. The colour of their dress is also blue. The hair is divided into several tresses, which they allow to fall down their shoulders; their head is adorned with false emeralds, called *llianca*, to which they attach a high value. They also wear necklaces and bracelets of glass beads, and a sort of square ear-rings made of silver. Even the poorest of the Araucanian women has upon every finger a ring of the same metal.

The Araucanians build their habitations along the banks of rivers, or in plains where there is a facility for irrigation, and every family is anxious to occupy that piece of land which they inherited from their ancestors. They never build large towns, and much less walled cities, which they consider as marks of servitude.

The games of skill with which they amuse themselves are *comican* or chess, and the *quechu*, similar to backgammon, both of which they knew previous to the arrival of the Spaniards. Gymnastic exercises they practise most passionately; besides wrestling and racing, they have a peculiar game called the *peuco*, representing a siege. Twelve young men form themselves into a ring, holding each other by the hands; in the middle a child is placed; an equal number of assailants attack the ring, and endeavour to carry off the child.

Since the first invasion in 1537, the Araucanians have sustained an almost uninterrupted war against the Spaniards for nearly three hundred years. Valdivia, one of the first who undertook the conquest of Chili, founded on the Araucanian territory the settlements of Imperial, Villarica, Valdivia, and Angol, all which were almost entirely destroyed by the toqui Paillamachu in 1602. The siege of Villarica lasted two years and eleven months. The pious Father Valdivia, a Jesuit who had been a missionary among the Araucanians, convinced the Spanish government of the necessity and advantage of being at peace with them, and the negotiations were in a state of forwardness when the unfortunate circumstance occurred of a Spanish lady, who was the slave of the toqui Ancanamon, making her escape, and carrying with her two of his little children, and four of his wives and daughters, whom she had persuaded to embrace the Catholic religion. The Spanish governor naturally took the lady and her converts under his protection. The toqui, in high indignation at the loss he had sustained, listened to no further proposals, and the war was again renewed with fresh vigour. In 1641 the governor, Marques de Baydes, at last entered into a treaty of peace with the toqui Lincopichion. In 1655 war raged once more from causes which are not known; and it lasted until 1773, when Spain was forced to acknowledge the Araucanians as an independent nation, and to allow them to send an ambassador, who should reside at Santiago de Chili. During the time of the presidency of Don Ambrosio O'Higgins this people continued to enjoy the blessings of peace; and we are informed by Vancouver, that this enlightened and humane governor had in some measure succeeded in introducing among them a spirit of industry, and that he had the pleasure to see them endeavouring to excel each other in the cultivation of the ground, the breeding of cattle, and other peaceful arts. In the late contest between the colonies and the mother country the Araucanian toqui promised to observe a strict neutrality, and was faithful to his promise. Schmidtmeyer, who visited Chili in 1820, says, that in the independent army of that country some Araucanian youths of the first rank served as officers, and that, according to the opinion of the creoles, they fought like Mars, and drank like Bacchus; 'two characteristic national features,' adds he, 'which still appear strongly marked in that people.' The exploits of this warlike nation have been celebrated by their enemies. Six different poems are still in existence: the best of those that we are acquainted with is the *Araucana*, by Alonso de Ercilla [see Ercilla], who was himself engaged in the wars which he describes in his poem. (See Molina's *History of Chili*, written in Italian, and translated into Spanish by Mendoza, Madrid, 1788, 2 vols. At the end of the second volume is a list of more than sixty writers and works on matters relating to Chili. *Compendio della Storia naturale e civile del Regno di Chile*, Bologna, Anonymous. Vancouver's *Voyage of Discovery to the North Pacific Ocean*, vol. iii., chap. 5. Schmidtmeyer's *Travels into Chili over the Andes in* 1820-21, chap. xv. Febres's *Arte de la Lengua General del Reino de Chile.*)

ARAUCA'RIA, in Botany, is the name of a singular genus of gigantic firs, found scattered over the southern hemisphere. It is known from all the other firs by its stiff broad leaves, by a long leafy appendage with which the scales of its cones are terminated, and by its anthers having many cells. Only three certain species have been described, of each of which we shall give some account.

Araucaria excelsa, commonly called the Norfolk Island Pine, is found not only in the spot after which it has been named, but also in several other places in the South Seas, as in New Caledonia, Botany Island, Isle of Pines, and in some parts of the east coast of New Holland. It is described as a most majestic tree, growing to the height of from 160 to 228 feet, with a circumference sometimes of more than 30 feet. Its trunk rises erect, and is sparingly covered with long, drooping, naked branches, towards the extremities of which the leaves are clustered; these latter, when the plant is young, are long, narrow, curved, sharp-pointed, and spreading, but when the tree is old they have a shorter and broader figure, and are pressed close to the branches; old and young trees are consequently so different that one would think them distinct species. The bark abounds in turpentine; the wood, which is destitute of that substance, is white, tough, and close-grained. It was once expected that this tree would have been valuable for its timber, and that it would have afforded spars for the navy of great size; but it has been found on trial to be too heavy, and so unsound, that Captain Hunter could only find seven trees fit for use out of thirty-four that he caused to be felled. Its wood is, however, useful for carpenters' indoor work. Several specimens of this tree exist in the collections of this country. Unfortunately it will not live in the open air in the winter, and its growth is so rapid as to render it very soon too large for the loftiest greenhouses. A supposed species, called the Moreton Bay Pine, or *Araucaria Cunninghami*, is scarcely distinguishable from this. It is a highly interesting fact, that a plant very nearly the same as this araucaria excelsa certainly once grew in Great Britain. Remains of it have been found in the lias of Dorsetshire, and have been figured in the Fossil Flora, under the name of *Araucaria primæva.*

[Araucaria excelsa.]

Araucaria Dombeyi, or, as it is more commonly called, *A. imbricata*, is a noble species, inhabiting the mountains of the Araucanian Indians in South America, whence the name of the genus derives its origin. This species has its branches closely covered with broad, lance-shaped, very rigid and pungent dark-green leaves; it produces its branches in circles around its erect stem; and when old it acquires an appearance not very unlike that of the Norfolk Island pine, only it is much less graceful. Its wood is said to be durable, and it yields a great quantity of resin. It is expected to be naturalised in this country, as some individuals now exist as far north as London, which have survived several winters with but little protection. It is, however, not a native of so low a latitude as is commonly supposed, and does not exist on the mountains farther to the southward than the volcano of Villarica.

Araucaria Brasiliensis is extremely like the last, but the leaves are longer, weaker, and less densely imbricated; and it is much more impatient of cold. It is found wild in the southern provinces of Brazil.

All these species are multiplied with difficulty, unless by their seeds; and the latter are so seldom brought to England in a living state, as to render all the species still extremely rare. Travellers may, however, bring them home in safety, by packing them in earth rammed hard into boxes, and kept dry and in the dark, and exposed to as little variation of temperature as possible.

ARAVULLI is a mountain-range, which forms one of the most remarkable features of northern India. Its southern extremity may be placed where the 24th parallel is cut by the 73rd meridian, to the north of Edur, or Eder. From this point it extends in a N.N.E. direction to 28° N. lat., where it terminates some minutes to the east of 76° E. long. Its whole length, therefore, may amount to upwards of 300 miles. Its breadth is various: from the southern extremity to the fortress of Komulmair it extends about sixty miles from west to east, and is composed of numerous high ridges generally running south-west and north-east. To the north of Komulmair it forms one uninterrupted and compact range of table-land, from six to twenty miles in width. Thus it continues up to the town and valley of Ajmeer where it begins to lose its tabular form, and, breaking into lofty ridges, sends numerous branches through the territories of the rajah of Tejpoor and Alwar, which terminate to the south of Kanound and Rewaree.

This mountain-chain is not remarkable for its height. On an average it does not rise to more than 3000 feet above the level of the sea, though, perhaps, some summits may attain a thousand more; but the extreme steepness of its declivity to the west renders it impossible for the boldest invader to attack India on this side. Here it is skirted by an extensive plain, the Indian desert, called by the inhabitants Maroost'hali (the region of death), a country which rather resembles the high plains of Persia than the Sahara of Africa. A general might conduct an army to the foot of the Aravulli, but he would find it impossible to march over this chain, across which no carriage road can be made, at least none that is practicable for artillery. Thus every invader of India is obliged to enter that country by the plain which extends from the north-eastern extremity of the Aravulli, and of the Maroost'hali, to the Himalaya mountains; and India, in a military point of view, may be considered as an island, joined to the continent by an isthmus of about 100 miles in length, and perhaps less in breadth. This circumstance must render the means of defence of that rich country easy and effective in the hands of an active and well-constituted government.

The southern extremity of the Aravulli range is united to the Vindhya mountains by an extremely hilly and broken country, extending from Edur to Lunawarra, on the river Myhie, occupying all the country on the upper part of that river and its branches, and joining the Vindhya mountains near Champanair. By the same hilly country it is united to the table-land Pat'har, from which the principal range is only separated by the valley of Oodipoor.

That part of the Aravulli mountains lying to the south of Komulmair is in possession of a number of communities, composed of aboriginal races, living in a state of almost savage independence, owning no paramount power, paying no tribute, and preserving all the simplicity of small republics, though their leaders, having the title of Rawut, are hereditary. The rawut of Oguna can bring into the field 5000 bows. Their habitations are dispersed through the valleys in small rude hamlets, near their pastures or places of defence. To the north of Komulmair the range is inhabited by a mountain-race called *Mair*, who formerly, when the surrounding countries were in a state of war approaching to anarchy, issued from their fastnesses, infested their neighbours, and robbed them of their most valuable property; but since the East India Company has become the protector of Rajast'han, they have been peaceable subjects. They possess upwards of 150 villages and hamlets, scattered over the rocks and valleys, which are abundantly watered, and not deficient in pasture. The produce of the cultivated ground, though of comparatively small extent, is commonly sufficient for the wants of the inhabitants; but it is raised with infinite labour on terraces, as in Switzerland and the Tyrol. This is effected by constructing, on the narrow level tract along the rivers and upon the shelving sides of the mountains and hills, a series of terraces rising over each other, and by forming above the terraces pools or reservoirs, by means of large trees, from which pools the water is conducted so as to irrigate successively the terraces, on which rich crops of sugar-cane, cotton, rice, and Indian corn are raised.

The rills which rise in the short valleys of this range are numerous, and by their union form some rivers. Those descending from the eastern declivity fall into the Bunas, a tributary of the Chumbul; and those running to the west join the Loony, or Salt River, which enters the Rin.

This range is composed of rocks of primitive formation. 'The granite reposes,' as Colonel Tod reports, 'in a variety of angles (the general dip is to the east) on massive compact dark blue slate, the latter rarely appearing much above the surface or base of the superincumbent granite. The internal valleys abound in variegated quartz and a variety of schistus slate of every hue, which gives a most singular appearance to the houses and temples when the sun shines upon them. Rocks of gneiss and of syenite appear in the intervals; and in the diverging ridges west of Ajmeer the summits are quite dazzling with the enormous masses of vitreous rose-coloured quartz.' Tin, which also yielded much silver, was once worked; copper, of a very fine description, is still extracted in sufficient quantity to supply the currency of Rajast'han. Garnet, amethystine quartz, rock crystal, chrysolite, and some inferior kinds of emerald, are found in a few places.

The name Aravulli implies 'the strength of refuge,' which is very appropriate, as at all times it has afforded protection to the antient sovereigns who held dominion either to the east or to the west of it. (Tod's *Annals and History of Rajast'han*; *Maps* by the Society for the Diffusion of Useful Knowledge, *India, VI.* and *IX.*)

ARBE, one of the Quarnaro islands, in the gulf of Quarnaro, on the coast of Dalmatia, and within the circle of Zara in that province, from which it is separated by the canal of Morlacca. It is twenty-nine miles in superficial extent, and is very mountainous; it contains four valleys, which have a very productive soil. The climate of this island, when northerly winds are prevalent, is at times so inclement, that thousands of sheep have frequently been frozen to death in one season. It produces wine, olives, figs, and corn; these, together with its fishery, salt-pans, and numerous flocks, afford lucrative occupation to its inhabitants. The latter are above 3000 in number, and dwell in the town and a market-village, or live dispersed in separate tenements: they profess the Roman Catholic faith. There are six monastic establishments and sixty ecclesiastics on the island. The town is *Arbe*, in the bay of Campora, with a good harbour it is the seat of a bishopric, and contains about 900 inhabitants. The name of the market village is *Barbado*. Lat. 44° 50′ N., long. 14° 50′ E. (according to the twelfth edition of Stein's *Atlas*).

ARBE'LA, now Arbîl or Erbîl, a miserable village, which lies on the ordinary route from Bagdad to Mosul, in 36° 11′ N. lat., according to Niebuhr's observations. It is situated between the Little and Great Zab (the Lycus), but nearer the latter, in a hilly and tolerably fertile district. Arbela was once in possession of an hereditary race of Mohammedan princes, whose dominion extended to Tabreez in Azerdbijan, and it was then a large city, defended by a castle situated on a hill of a conical shape. Niebuhr describes the castle as existing when he passed through, though its outer wall was gone: Kinneir remarks, that the castle probably stood on the hill, from which it would be a fair inference, but perhaps not a true one, that the castle is no longer there. Part of the town, which consists of wretched houses built of sun-dried bricks, is on the hill, and part around it. There are no antiquities here, but there is a minâreh belonging to a mosque at a little distance, which was erected by Sultan Musaffer. This minâreh is strongly built of burnt bricks and mortar, and has two entrances facing one another, each leading to a flight of steps, by which two persons may ascend the tower without seeing one another till they meet on the top.

Arbela is best known for having given name to the last great battle between Alexander and Darius, B.C. 331. The battle was not fought at Arbela, but at a spot called Gaugamela, now Karmelis, a little place about 36 miles (Niebuhr) W. by N. from Arbela (but 600 stadia according to Arrian), on a small stream called the Chaser, the Bumadus or Bumelus of Arrian. (*Anab.* iii. 8.) After the battle, Alexander, in his pursuit of Darius, crossed the Lycus, and arrived at Arbela. [See ALEXANDER; Niebuhr's *Travels*, vol. ii. p. 342, Copenhagen edition; Kinneir's *Memoir of Persia*.]

AR'BITER, was a term in the Roman law signifying a judge invested with a discretionary power, and was applied to different kinds of judicial functionaries. The *arbiter compromissarius* answered to the arbitrator of modern jurisprudence, and his office will be treated of under the article ARBITRATION.

Another species of arbiter, peculiar to the law of Rome, partook more nearly of the character of an ordinary judge. In order to understand the nature of his office, it must be borne in mind, that all actions were commenced before the prætor, and the preliminary proceedings carried on before him; and when the altercations of the parties formally expressed had raised a question of fact disputed between them, a person was appointed to whom the adjudication of this fact was referred: the title and powers of this person depended on the nature of the action. The different kinds of actions known to the Roman law were divided into three classes: actions of strict law, actions of good faith, and arbitrary actions: under the first class were comprehended all actions upon contracts called unilateral, that is, where only one of the parties is bound, as in the case of money borrowed, where the borrower is bound to repay, but no further obligation lies upon the lender. In these actions the person appointed to adjudicate was styled a judge (*judex*), and the only question for him to decide was, simply whether the plaintiff had completely established his case as originally stated.

In the two other classes of actions the person appointed to adjudicate was allowed a greater latitude of judgment, and was styled an arbiter. Actions of good faith were such as were founded on bilateral contracts, that is, on contracts by which an obligation is imposed on both parties, such as the contract of sale, where the seller is bound to deliver the goods, and the purchaser to pay the price. In all these actions the arbiter was not compelled, as in actions of strict law, either to grant or to reject altogether the claim of the plaintiff, but might enter into the merits of the case, and decide according to what seemed to him to be just and equitable between the parties.

To the third class, viz., that of arbitrary actions, belonged those chiefly in which the restitution of property, or some specific performance, was required of the defendant. In these cases the arbiter had authority to estimate the just claims of the plaintiff, and to condemn the defendant to some greater penalty, as for instance to pay fourfold in case of his not performing the judgment. (Just. *Institut.* lib. iv. tit. 6; Heineccii, *Elem. Jur. Civ.* § 1181, § 1196; Idem, *Antiq. Rom.* iv. 6, 36.)

ARBITRATION is the adjudication upon a matter in controversy by private individuals selected and appointed by the parties. This mode of settling differences is very frequently resorted to as a species of amicable litigation, and a means of avoiding the delay and expense of a lawsuit, and the publicity of a trial. It has the further advantage of providing an efficient tribunal for the decision of many causes —such, for instance, as involve the examination of long and complicated accounts,—which our ordinary courts of law are, from their mode of proceeding and the want of proper machinery, incompetent to investigate.

The person appointed to adjudicate is called an arbitrator, or referee. The matter on which he is appointed to adjudicate is said to be referred or submitted to arbitration. His judgment or decision is called an arbitrament, or, more usually, an award.

Any matter actually in controversy between private persons may be referred to arbitration; but a prospective agreement to refer any differences which may hereafter arise is not binding. Nor can any injury be the subject of an arbitration, unless it is such as may be a matter of civil controversy *between the parties:* a felony, for instance, which is a wrong, not to the party injured merely, but to society in general, is incapable of being referred.

There are no particular qualifications required for an arbitrator. In matters of complicated accounts, mercantile men are usually preferred. In other cases, it is generally considered advisable to appoint barristers, who, being accustomed to judicial investigations, are able to estimate the evidence properly, to confine the examination strictly to the points in question, and, in the making of the award, to avoid those informalities for which it might afterwards be set aside. Both time and expense are thus saved by fixing on a professional arbitrator. Any number of persons may be named as arbitrators: if the number is even, it is usually provided that, if they are divided in opinion, a third person shall be appointed, called an umpire, to whose sole decision the matter is then referred. [See UMPIRE.]

A dispute may be referred to arbitration, either—1. When there is an action already pending between the parties relating thereto, or—2. When there is no such action.

1. In the former case, the parties to the action, if *sui juris*, are in general competent to submit to arbitration. The reference may be made at any stage of the proceedings: if before trial, it is effected by a rule of the court, either of law or equity, in which the action is brought; if at the trial, by an order of the judge or an order of Nisi Prius, either of which may afterwards be made a rule of court. The usual mode of proceeding is for the parties to consent that a verdict shall be given for the plaintiff for the damages laid in the declaration, subject to the award of the arbitrator.

The person named as arbitrator is not bound to accept the office, nor, having accepted, can he be compelled to proceed with it. In either case, if the arbitrator refuses or ceases to act, the reference is at an end, unless the contingency has been provided for in the submission, or unless both parties consent to appoint some other person as arbitrator in his stead.

Previously to the late statute for the amendment of the law, 3 and 4 Will. IV. c. 42, the authority of the arbitrator was revocable by either party at any time before the award was made; but by that statute it is declared that the authority of an arbitrator cannot be revoked by any of the parties without the leave of the court or a judge: but it is still determined by the death of any of the parties, unless a clause to obviate this is inserted in the submission; and if one of the parties is a single woman, her marriage, being in law a civil death of all her rights, will have the same effect. The order of reference usually provides that the award shall be made within a certain period; and if the arbitrator lets the day slip without making his award, his authority ceases, but a clause has usually been inserted to enable the arbitrator to enlarge the term; and now, independently of any such clause, the court, or any judge thereof, is, by the late statute for the amendment of the law, empowered to do so. The authority of an arbitrator likewise ceases as soon as he has made or declared his award. After this (even though it be before the expiration of the time appointed) he has no longer the power even of correcting a mistake.

When the arbitrator has accepted his office, he fixes the time and place for the parties to appear before him. Each of them furnishes him with a statement of his case, which is usually done by giving him a copy of the briefs on each side; and on the day appointed he proceeds to hear them (either in person, or by their counsel or attorneys), and to receive the evidence on each side, nearly in the same manner as a judge does at an ordinary trial: but he is frequently invested by the order of reference with a power, which courts of law in no case possess, of examining the parties themselves.

No means existed of compelling the attendance of witnesses, or the production of documents, before an arbitrator, until the statute 3 and 4 Will. IV. c. 42, authorized the court or a judge to make an order to that effect; disobedience to which order, if served with proper notice of the time and place of attendance, becomes a contempt of court. The witnesses, thus compelled to attend, are entitled to their expenses in the same manner as at a trial. And where the order requires the witnesses to be examined upon oath, the arbitrator is by the same statute authorized to administer an oath or affirmation, as the case may require; and any person giving false evidence may be indicted for perjury.

The extent of an arbitrator's authority depends on the terms of the reference: it may either be confined to the action pending between the parties, or it may include any other specified grounds of dispute, or all disputes and controversies whatever existing between them at the time of the reference. Where the matters referred to him are specified, it is his duty to decide upon them all: where they are not specified, it is his duty to decide upon as many as are laid before him. In no case is an arbitrator authorized to adjudicate upon anything not in fact comprehended in the reference; such, for instance, as any claims or disputes which may have arisen after the reference was made, or, where the reference is specific, anything not expressly included in it. As nothing can be referred by the parties but the differences existing between themselves, an arbitrator can have no authority to bind any one who is not a party to the reference.

An arbitrator being a judge appointed by the parties themselves for the final settlement of their differences, his decision on the merits of the case submitted to him is conclusive; the question is set at rest, and never can be agitated between them again. But if his award be partially or illegally made, the superior courts have the power of setting it aside, upon application being made within reasonable time. This happens either, 1. where the award is not co-extensive with the arbitrator's authority; or, 2. where it appears on the face of it to proceed on mistaken views of law, or to fail in some of the qualities required for its validity [see AWARD]; or, 3. where any misconduct has been committed. This may happen in two cases: 1st, where the arbitrators have been guilty of corruption or other misbehaviour, as, if they have proceeded to arbitrate without giving notice of the meeting, have improperly refused to receive evidence, or committed any other gross irregularity in practice: 2dly, where it is proved that the arbitrator has been misled by fraud used by either of the parties. Where an award is absolutely void, as where it is made after the authority of the arbitrator has ceased, it is not in general necessary to set it aside, as it is incapable of being enforced.

When the award has been made and delivered, if one of the parties refuses to comply with it, the other may bring an action against him on the award. But the most prompt and efficient remedy is to apply to the court for an attachment, grounded on the contempt of court which he has been guilty of by disobeying the order of reference. [See ATTACHMENT, CONTEMPT.] In opposing this application, the other party may insist on any objection apparent on the award itself; but if there were any other objections affecting its validity, and he has neglected to apply to the court to set it aside within the time fixed by them for that purpose, it is too late for him to avail himself of them.

When, in the original action, a verdict has been given for the plaintiff subject to a reference, if the *defendant* does not abide by and perform the award, the plaintiff may, by leave of the court, enter a judgment and sue out execution for the whole damages mentioned in the verdict.

2. Where no action has been commenced, the parties may refer their differences to arbitration by mutual agreement. Every person capable of making a disposition of his property may be party to such an agreement: no peculiar form is necessary for its validity.

Whether the submission be verbal or in writing, it is in the power of either of the parties to revoke it, and thus put an end to the authority of the arbitrator at any time before the award is made. In order to prevent this, it is usual for the parties to make it a part of their agreement, that they will abide by and perform the award; and if after this either of them should, without sufficient reason, revoke his submission, or otherwise prevent the arbitrator from proceeding with the arbitration, he will be liable to an action for the breach of his agreement.

The time for making the award may be enlarged, if there be a clause to that effect in the agreement of submission, or if all the parties consent to it, but not otherwise. There are no means of compelling the attendance of witnesses, nor has the arbitrator the power of administering an oath; but the witnesses and—if they have agreed to be examined—the parties are sworn either before a judge, or, in the country, before a commissioner. They may, however, be examined without having been sworn, if no objection is made to it at the time.

The courts cannot enforce performance of the award by attachment; the only remedy is an action on the award itself, or rather on the agreement of submission. The defendant may insist on any objection apparent on the award itself, but where there is any other ground for setting it aside, his only remedy is by a bill in equity.

Thus it will be seen that where the reference is by agreement, many inconveniences occur, particularly from the deficiency of the remedies; but the legislature has enabled parties to put such references on the same footing as those which are made where a cause is depending, by enacting, by 9 & 10 Will. III. c. 15, that they may agree that their submission (which it is held in this case must be in writing) shall be made a rule of any of his Majesty's courts of record, (and in practice courts of equity have long enjoyed concurrent jurisdiction), and insert such agreement in their submission; and this submission may at any time afterwards be made a rule of court, by producing the affidavit of its execution made by a witness thereto. The provisions of the new statute 3 & 4 Will. IV. c. 41, apply as well to arbitrations made in pursuance of such agreements of submission, as to those made by order of court; and the law is the same in both cases, except in some few points of practice.

The settlement of disputes by arbitration seems to have enjoyed in all ages a high degree of public favour. Aristotle, to give an instance of a metaphor that is appropriate without being obvious, quotes a passage from Archytas, in which he compares an arbitrator to an altar, as being a refuge for the injured. (Arist. *Rhetor*. lib. iii. ch. 2.) There were at Athens two modes of proceeding which passed by the name of arbitration—the Greek word for which is diæta (*δίαιτα*). In one of these the arbitrators appear to have constituted what in modern jurisprudence would be called a Court of Reconcilement. A certain number of persons, of a specified age, were annually chosen from each tribe, as official referees; and from among these the arbitrators to decide upon each particular case were afterwards also chosen (*Petit. Leges Atticæ*, p. 345; *Heraldi Animadversiones*, p. 370), and were then bound to act, under pain of infamy. They sat in a public court, and their judgments were subscribed by the archons. (*Petit.* p. 346.) An appeal lay from their decision to the ordinary courts; and sometimes the arbitrator referred the cause to their judgment at once, without pronouncing any sentence of his own. (*Heraldi Animadversiones*, p. 372.) In either case, all the writings connected with the trial were sealed up and delivered to the court before which the cause was brought. And it is said that originally no action could be introduced into the ordinary courts without having been first carried before the Court of Arbitrators. (*Petit.* p. 345; Pollux, viii. 10.) Their jurisdiction, however, was confined to Athenian citizens, and they took no cognizance of suits in which the sum in dispute was less than ten drachmæ, such smaller actions being disposed of in a summary manner by a special tribunal. (*Ibid.*) The litigant parties paid the expenses of the arbitration. (Boeckh, *Public Œcon. of Athens*, i. 316, *English Trans.*) When their year of office expired, the arbitrators were liable to be called on for an account of their conduct, and if found guilty of corruption or misconduct, were punished with infamy.

In the other mode of proceeding, which was strictly in accordance with the definition which we have given of arbitration, the parties were at liberty to refer their differences to whomsoever they chose. The submission was generally made by a written agreement, which frequently contained an engagement by third persons to become sureties for its performance. (Demosthenes's *Speech against Apaturius*, chap. 4.) The arbitrator was not required to adhere to a rigid interpretation of the law, but might decide according to the individual merits of the case before him. (Aristot. *Rhet.* i. 14.) There lay no appeal from his award to any other tribunal whatever. (See the law quoted by Demosthenes against Meidias, chap. 26.)

The Roman law upon this subject is much better understood, and is of infinitely greater importance. Its influence has extended over the whole of Europe, and even in our own country it is evident that references made by virtue of a mutual agreement—apparently the first species of arbitration known in our law—are mainly founded upon the doctrines contained in the *Digests* of Justinian, lib. iv. tit. 8. The only mode of referring a matter to arbitration in the Roman law, was by an agreement called *compromissum*, which contained the names of the arbitrators (hence called *arbitri compromissarii*), the matters intended to be referred, and an undertaking by both parties to abide by the award, or in default thereof to pay to the other a certain sum of money as a penalty. The rule which forbids matters of public interest to be submitted to the judgment of a private referee, was not confined in its operation to criminal prosecutions and penal actions only, but extended to preclude arbitrators as well from entertaining any question affecting the civil condition (*status*) of any individual,—his freedom, for instance,—as from deciding on the validity of any contract which it was attempted to set aside on the ground of its having been obtained by fraud or force, &c.

The persons named as arbitrators were not bound to undertake the office, but having once done so, they might, by an application to the prætor, be compelled to go through with it. Their authority was, however, terminated by the death of either of the parties, unless his heirs were included in the submission; by the expiration of the time limited for the decision; by either party having broken the agreement, and so incurred the penalty; or by his becoming insolvent, and his property in consequence of a *cessio bonorum* being vested in his creditors. Their authority also ceased by what we should call an implied revocation, if the subject matter of the reference perished, or if the parties settled the dispute in some other way, referred it to other arbitrators, or proceeded with an action respecting it. Besides the cases in which his authority was thus at an end, an arbitrator could not be compelled to proceed with the reference if he could allege any sufficient excuse, as, for instance, that the submission was void, that there had arisen a deadly enmity between him and one of the parties, or that he had been prevented by ill-health, or by an appointment to some public office in the state.

The extent of the arbitrator's authority depended upon the terms of the submission, which might be either special or general. The submission usually appointed a certain day for the making of the award, but power was generally given to the arbitrators to enlarge the time if necessary, but they could not give their award on an earlier day without the consent of the parties. On the day originally appointed or on that subsequently fixed by the arbitrators, they formally pronounced their award, and (unless it had been agreed otherwise) the parties were required to be present, and if one of them failed to appear, the award was not binding, but the party who had thus prevented the arbitration being completed incurred the penalty specified in the submission. If there were several arbitrators, all were bound to attend: they were not, however, required to be unanimous, but the opinion of the majority prevailed; and if they were equally divided, it is said that they might of their own authority appoint an umpire, and in case of their refusing, the prætor had the power of compelling them to do so. When their award was pronounced, their authority expired, and they could neither retract nor alter their decision.

The award when made had not the authority of the sentence of a court of justice, nor was there any direct method of enforcing the performance of it; but as the parties had bound themselves to abide by the arbitrator's decision, if either of them refused to perform it, or in any other way committed a breach of his engagement, he was liable to an action; and however unsatisfactory the award might appear, there was no appeal to any other court. If, indeed, the arbitrators had been guilty of corruption, fraud, or misconduct, or if they had not adhered to their authority, their award was not binding: there was, however, no direct method of setting it aside; but if an action was brought to enforce the award, such misconduct might be insisted on as an answer to it. (Heineccii *Elem. Jur. Civ.* part i. § 531-543; Voetii *Commentarius ad Pandect.* vol. i. pp. 290-300.)

The Roman law was, with some slight modifications, adopted in France (Domat's *Civil Law*, part i. book i. tit. 14; and *Public Law*, book ii. tit. 7; Pothier, *Traité de Procédure Civile*, part ii. chap. iv. art. 2), and notwithstanding the changes which have been introduced from time to time, it still forms the groundwork of the system. There are at present three kinds of arbitration; the first is voluntary arbitration, which is founded, as in the Roman law, upon an agreement of the parties. The mode of proceeding in this case is treated of at considerable length, and with minute attention to details, in the *Code de Procédure Civile*, art. 1003-1028.

The ordinary courts exercise a much greater control over the proceedings in references than they do in England, but they have never had the power which the magistrates had at Rome—of compelling a person who had once undertaken the office of arbitrator to proceed with it; nevertheless, if he fail to do so, without a sufficient excuse, he is liable to an action for the damages occasioned by his neglect of duty. In order to understand clearly the peculiarities of the French system, it will be necessary to bear in mind that the proceedings before the arbitrators are much more nearly on the same footing with the regular administration of justice than is the case with us, and that many of the details are merely adopted from the practice of the ordinary courts: for instance, there is a system of local judicature established in France, and as the judge is resident in the neighbourhood of the suitors, it has been found necessary—in order to guard against partiality or the suspicion of partiality—to allow either party to refuse or challenge a judge, as in England they would challenge a juryman; and in the same manner an arbitrator may be challenged, but this can only be in respect of some objection which has arisen since his appointment, for the very act of appointing him is an implied waiver of any objections which might have existed up to that time; but if there is no ground for challenge, the arbitrator's authority cannot be revoked without the consent of both parties.

An arbitrator's decision or award is considered as a judgment, and all the formalities required for the validity of a judgment must therefore be observed; but execution of it cannot be enforced until it has received the sanction of the public authority: this sanction is conferred by a warrant of execution granted by the president of the tribunal within the jurisdiction of which the cause of the action arose: the granting of this warrant is called the homologation of the award. If the arbitrator has not strictly pursued his authority, the warrant of execution may be superseded, and the award declared null by an application to the tribunal from which the warrant issued. Besides this, the same modes of obtaining relief may be resorted to in the case of an award, as in that of any other judgment. If any misconduct or irregularity has occurred, the award may be set aside by what is called a *requête civile;* and even where nothing can be alleged against the formal correctness of the proceedings, if one of the parties be dissatisfied with the judgment, he is at liberty (unless the right has been expressly renounced) to appeal to a superior court: when this happens, the whole case is re-opened before the tribunal of appeal, and the merits investigated anew; and when an award is brought under the consideration of a court in any of these ways, any final judgment which the court may have pronounced may be brought before the Court of Cassation, and there quashed if erroneous in point of law.

The second kind, which is called 'compulsory arbitration,' is where the parties are by law required to submit to a reference, and are precluded from having recourse to any other mode of litigation. The antient laws of France introduced this species of arbitration very extensively for the settlement of disputes respecting either mercantile transactions or family arrangements; but by the codes now in force, it is admitted in one case only, that of differences between partners. Over such differences the ordinary courts have no jurisdiction whatever in the first instance, even by the consent of the parties; but the commercial courts exercise a superintending and controlling authority over the proceedings. Thus the arbitrators may either be appointed by the deed of partnership, or afterwards nominated by the partners; but if, when a dispute has arisen, one of the partners refuses to nominate an arbitrator or nominates an improper person, the commercial court, upon application made by the other partner, will appoint one for him; but the authority of the person so appointed will be superseded, if at any time before he enters upon his functions an arbitrator is duly nominated by the partner in delay: and when the firm consists of several partners, upon an application being made by any one of them, the court, after taking into consideration how far their respective interests are identical and how far they are conflicting, will regulate accordingly the number of arbitrators to be appointed by each. The sentence of the arbitrators, howsoever appointed, is decided by the majority of votes.

The authority of the arbitrators in this case partakes more of the judicial character than it does in voluntary arbitration; they are considered as being substituted for the ordinary commercial tribunal; their sentence is accordingly registered among the records of the court: and for the same reason also they stand upon the same footing with the court, both in the power of sentencing the parties to imprisonment and, unless the right has been renounced by the parties, in the liability of appeal from their decision. (*Code de Commerce*, art. 51-64.)

Besides the compulsory arbitration in matters of partnership, the parties who enter into any engagement are at liberty to stipulate that all differences arising between them shall be submitted to arbitration. This stipulation is compulsory, and the court will, if requisite, appoint an arbitrator ex officio for the party who should refuse to do so; but it is not exclusive, so as to take away the jurisdiction of the ordinary tribunals; it may be rescinded by the consent of the parties, or waived by their acts.

The third kind of arbitration is distinguished by the appellation of the persons to whom the reference is made; they are not called, as in the other cases, *arbitres*, but *aimables compositeurs*, or in the older law, *arbitrateurs*. The peculiar characteristics of this amicable composition are, that the referees are not, as in other cases, bound to adhere rigorously to the rules of law, but are authorized to decide according to what they conceive to be the real merits of the case; that in the exercise of this discretion their decision is final, and without appeal to any other tribunal. In case of irregularity or misconduct, the award may be set aside by the judgment of a court, but this judgment cannot be further questioned in the Court of Cassation. This modification of the general law may be introduced into all arbitrations, whether voluntary or compulsory. (See Pardessus, *Cours de Droit Commercial*, § 1386-1419.)

In Denmark and its dependencies, *Courts* of Arbitration or Conciliation were established about the year 1795, and are said to have been attended with extremely beneficial effects. In Copenhagen the court is composed of one of the judges of the higher courts of judicature, one of the magistrates of the city, and one of the representatives of the commonalty. In other towns, the chief magistrate proposes five or six of the more respectable citizens for arbitrators, of whom the commonalty of the town elect two. In the country, the bailiffs or sheriffs are the arbitrators, and generally act as such personally; but in extensive districts they have authority to appoint deputies. All matters of civil litigation may be referred to these official arbitrators; who in the country sit once in every week, and in the capital as often as occasion requires. It appears that, after investigating a disputed case, the arbitrators in these tribunals have no power to compel the parties to settle their differences in the manner proposed by the court: if they agree, the terms of the arrangement are registered, and it has then the force of a judicial decree; if, after stating their differences and hearing the suggestions of the arbitrators, the parties still disagree, no record is made of the proceeding, and they are at liberty to discuss their respective rights in the ordinary courts of justice. It is necessary, however, that before a suitor commences an action in the superior courts, he should prove that he has already applied to one of the courts of conciliation. These courts, which are attended with very small expense to the suitors, were, soon after their establishment, multiplied rapidly in Denmark and Norway, and are said to have produced an astonishing decrease in the amount of contentious litigation. (See *Tableau des Etats Danois*, par Catteau, tome i., p. 296.)

ARBLAST, or ARBALEST, was the name more particularly given to the cross-bow. Robert of Gloucester, in his *Chronicle*, published by Hearne, p. 378, makes an especial difference between the bowmen and the *arblastes* or *arblasters*, the cross-bowmen. In the Latin of the middle age it is called arcubalista, from *arcus*, a bow, and the Greek word *βάλλω*, to cast or shoot.

The precise date and origin of the arbalest is unknown; but it seems easily derivable from the larger species of balistæ. Vegetius is inclined to consider the *scorpio* to be the same as the cross-bow; he speaks of scorpions, which he says they now name *manuballistæ;* and in later writers the modern weapon is sometimes termed *scorpio manualis*.

Pitiscus, in his *Lexicon*, has assigned the introduction of the arbalest into the Roman armies to the time of Constantine, or a little earlier.

Strutt thought that the cross-bow was introduced into England about the thirteenth century; but Daines Barrington comes probably nearer to the truth (*Archæologia*, vol. vii. p. 46), when he inclines to the opinion, that it was the arbalest, and not the long bow, which was used with such destructive effect at the battle of Hastings by the Normans. There can be little doubt but that the arbalest was introduced by the Normans at their first arrival. We have no mention whatever of it in any writer or document of the Saxon times, but in the *Domesday Survey*, compiled in 1086, we have several *arcubalistarii*, captains of cross-bow men, among the tenants in chief. No such appellation is given in that record to any person who held lands in the time of King Edward the Confessor.

Brompton, in Twysden's *Scriptores*, col. 1278, says, that the use of the arbalest having been laid aside, was revived by King Richard I., who was afterwards killed by an arrow shot from one at the siege of Chalus.

The arrows for the cross-bow were called quarrels, from the French *carreaux*. More will be said of the use of the cross-bow in the account of ARCHERY.

ARBOGAST, LOUIS FREDERIC ANTOINE, was born at Mutzig in Alsace, in 1759. According to the account given in the *Biographie Universelle*, he was successively professor of mathematics at the school of artillery at Strasburg, and rector of the university of the same town. He afterwards represented the department of the Lower Rhine in the national convention, where, however, he took no prominent part in politics, and his name only appears to some reports on scientific subjects. He was also a principal actor in the formation of the committee of public instruction, to the affairs of which he particularly devoted himself. After the dissolution of the convention, he became professor of mathematics in the central school of his department at Strasburg, where he died April 8, 1803, leaving a name which must be placed high among those of the analysts of his day, and a character without reproach.

Arbogast's first work was presented to the Academy of Sciences, under the title of *Essai sur de Nouveaux Principes de Calcul Différentiel et Intégral, indépendants de la Théorie des infiniment Petits, et de celle de Limites*. This essay is not printed, but from his own account of it in the preface to the *Calcul des Derivations*, it appears that he had, partially at least, anticipated the leading points of the *Théorie des Fonctions* of Legrange.

In 1790 (Lacroix, *Calc. Diff.*, 1792; *Biog. Univ.*) he gained the prize proposed by the academy of Petersburg for an essay on the nature of the arbitrary functions contained in the integrals of partial differential equations. In this paper he takes, and in the opinion of Lacroix finally establishes, the view maintained by Lagrange and Euler against D'Alembert, in favour of the discontinuity (Lacroix, *Calc. Diff.*, vol. ii., p. 686).

But his great work is the *Calcul des Derivations*, published at Strasburg in 1800. Its main object, and we can here state no more, is the law of derivation of the successive coefficients of a development from one another, when the expression is more complicated than a function of a binomial. Therefore Taylor's theorem and common differentiation are particular cases of Arbogast's method. It is an embarrassing work to read, on account of the number of new notations, and the complexity of the algebraical part; but it contains much that is elegant, and which may eventually become useful. M. Lacroix thinks that it has not been received with sufficient favour, and cites an unpublished memoir of M. Francais, who was in habits of intimacy with M. Arbogast, and corrected the proofs of his work, in which the former had applied the method to a question of mechanics, and had succeeded in a development which he (M. Lacroix) thinks would be almost impracticable by common methods.

We must not omit to mention, that the *Calcul des Derivations* contains the first *use* of the separation of symbols of operation and of quantity, which has since thrown so much light on the connexion of various parts of analysis. (See Lacroix, *Calc. Diff.*, vol. iii., p. 726.)

ARBOIS, a town in France, in the department of Jura, and the arrondissement of Poligny, about six miles N.N.E. from the town of Poligny, and twenty-three miles in the same direction from Lons le Saunier, the capital of the department. It is on the south bank of the little river Cuisance (a feeder of the Loue, which empties itself into the Doubs, and so into the Saone and Rhone), not far from the north-eastern ridge of Jura. It is neat and well built. The wines of the neighbourhood of Arbois are highly esteemed, especially that which, from being made at the commencement of winter, has the name of *vin-de-gelée* (frost wine). Leather, paper, and china, are among its manufactures. The population in 1826 was between 6000 and 7000. It is the seat of a *tribunal de première instance* (a subordinate civil and criminal court) under the *Cour Royale* (assize court) of Besançon. Before the revolution there were several religious establishments at Arbois.

It possesses some Celtic and Roman monuments, and has the ruins of an antient castle, which is considered by the inhabitants to be haunted. The tradition is thought to have originated from, or been confirmed by, an act of cruelty committed by Mahaut of Arbois, Countess of Burgundy, who when some poor persons had taken refuge with her in time of famine, ordered them to be confined in a large building, and burnt in it. Lat. 46° 55′ N., long. 5° 50′ E. of Greenwich.

This town gave birth to General Pichegru. (M. Brun, Balbi, *Dict. Universel de la France*.)

ARBROATH. [See ABERBROTHWICK.]

ARBUTHNOT, JOHN, a celebrated wit and physician in the latter part of the seventeenth and the early part of the eighteenth century. His father was a clergyman of the Scotch episcopal church.

Arbuthnot was educated in the University of Aberdeen, where he took his doctor's degree in medicine. The revolution having deprived his father of his church preferment, and a small paternal estate being insufficient for the comfortable support of the family, the Doctor came to London in pursuit of fortune. He began by teaching mathematics as a means of subsistence. Dr. Woodward's *Essay towards a Natural History of the Earth*, published in 1695, contained an account of the universal deluge, which Dr. Arbuthnot thought to be irreconcilable with philosophical truth. He therefore drew up a work entitled *An Examination of Dr. Woodward's Account of the Deluge, with a Comparison between Steno's Philosophy and the Doctor's, in the case of Marine Bodies dug out of the Earth*, 1697, 8vo., which brought him into notice as an author. His extensive learning and conversational talents introduced him gradually into practice, and he became eminent in his profession. He had the good fortune to be at Epsom, when Prince George of Denmark was suddenly taken ill; and being called in to attend him, his treatment was so successful, that the prince, from the time of his recovery, employed him as his regular physician. Arbuthnot was appointed physician in ordinary to Queen Anne in 1709, and admitted a fellow of the College of Physicians. He had for some years before been a Fellow of the Royal Society.

His talents, learning, and fascinating manners, introduced him to an intimate correspondence and friendship with Pope, Swift, Gay, Parnell, and other leading wits of the period, who were all associated as members of the Scriblerus Club. In 1714 he engaged with Swift and Pope in a design to write a satire on the abuse of human learning in every branch. It was to have been executed in the humorous manner of Cervantes. Fictitious adventures were to have been worked up with mock solemnity and all the pretensions of history. But the project was stopped by the queen's death, when nothing more than an imperfect essay towards it had been drawn out, under the title of the first book of the *Memoirs of Martinus Scriblerus*. This fragment is to be found in some editions of Pope's works. There is nothing like it in our language, nor to the best of our knowledge, in any other; it is characterized by a brilliancy and exuberance, not to say extravagance, of wit and humour, which is pretty sure to tempt any who has once read it to a second perusal. *Gulliver's Travels* are said by Warburton to have been first intended as a part of these Memoirs: allusion is made to them in the 13th chapter. The treatise, *Of the Art of Sinking in Poetry*, the *Virgilius Restauratus*, and the report *Stradling* v. *Stiles*, are detached portions of the same work; of which the eminent writer above named speaks thus:—'Polite letters never lost more than by the defeat of this scheme, in which each of this illustrious triumvirate would have found exercise for his own peculiar talent, besides constant employment for that they all held in common. For Arbuthnot was skilled in everything which related to science: Pope was a master in the fine arts; and Swift excelled in the knowledge of the world. Wit they had all in equal measure; and this so large, that no age, perhaps, ever produced three men to whom nature had more bountifully bestowed it, or art had brought it to higher perfection.' The humorous political pamphlet of *John Bull*, which has served as the model for many *jeux d'esprits* upon the same plan, is generally believed to have been written by Arbuthnot, though attributed at the time to Swift, and published in the collection of his works. Swift, however, in his letters names Arbuthnot as the author. This piece, which is entitled *Law is a Bottomless Pit, or the History of John Bull*, contains a burlesque account of the war which broke out on the accession of a branch of the house of Bourbon to the throne of Spain in 1700, and was terminated by the peace of Utrecht in 1711. The war is described under the semblance of a lawsuit, carried on by the contending parties of England, Holland, and Austria against France and Spain, which are designated by names emblematic of the national distinctive qualities usually ascribed to each of them.

The queen's death, and the consequent disasters which befell his friends, deeply affected Arbuthnot's spirits. As a relief to his melancholy, he went to Paris; but after a short stay returned to London, and having lost his place and official residence at St. James's, he took a house in Dover-street, observing to Swift, that he still hoped to be able to keep a little habitation warm in town. In 1705 he published *Tables of Antient Coins, Weights, and Measures*, &c., in octavo, republished in 1727 in quarto. He continued the practice of medicine with success, and amused his intervals of leisure in writing papers of wit and humour. In 1731 he published his Essay on the *Nature and Choice of Aliments*, which was followed the year after by an Essay on the *Effects of Air on Human Bodies*. He is thought to have been led to the subjects of these treatises by studied attention to his own asthma, which had gradually increased with years, and at length was found to be incurable. In 1734 he retired to Hampstead in hope of some relief; but died at his house in Cork-street, Burlington-gardens, in February 1735. He was married and had four children.

His son George enjoyed a profitable place in the Exchequer, and was one of Pope's executors. Two daughters survived him, but died unmarried. Anne was honoured by a legacy in Pope's will. His son John died two years before him; and from Arbuthnot's affectionate expression, that he 'would willingly have redeemed his life with his own,' it is probable that grief aggravated his disease, and hastened its termination.

Pope, in a letter to Digby, says that the first time he saw the Doctor, Swift observed to him that the Doctor was a man who could do everything but walk. The observation was made in reference to a peculiar slouch in his gait, upon which Swift comments in one of his letters. Arbuthnot appears to have been in every respect a worthy and accomplished man. He was inferior to none of his brilliant contemporaries in humour, liveliness, and learning, and few of them could compare with him in the strict performance of moral duties, or in acts of humanity and benevolence. The fortitude displayed in his letter to Pope, written almost on his death-bed, could have been inspired only by a conscience void of offence, and the calm retrospect of a well-spent life. No person of right mind and feelings can read that letter without admiring the writer, and feeling better from the perusal. In 1751 two volumes in 12mo. were published at Glasgow, entitled the *Miscellaneous Works of the late Dr. Arbuthnot*. It is stated in an advertisement, that 'the contents of these volumes, and what is inserted in Swift's *Miscellanies*, comprehend all the pieces of wit and humour of this admirable author.' The collection contains many of his undoubted productions; but the genuineness of several pieces is negatived both by the internal evidence of discrepant style and inferior taste, and by the direct testimony of Mr. George Arbuthnot. To his other accomplishments, Dr. Arbuthnot added the knowledge of music, and some skill in composition. Sir John Hawkins, in his *History*, mentions an anthem composed by him. Kippis, *Biog. Britann.*; also Pope and Swift's *Correspondence*.

A'RBUTUS, a genus of evergreen shrubs, belonging to the natural order *Ericeæ*. It is characterised by its fruit being a berry, containing many seeds. The most remarkable species is the arbutus of Virgil, now called *A. unedo*, or the strawberry tree, from the resemblance borne by its berries to that well-known fruit. It is a native of the south of Europe and the Levant; in our gardens it proves a hardy evergreen tree, sometimes as much as eighteen or twenty feet high, bearing its greenish-yellow blossoms in October and November, and its bright yellow and red berries, which are studded with little projections, in November and the succeeding months. The most interesting specimens in this country are at the lake of Killarney, where they form groves of great beauty: the plant can scarcely, however, be considered indigenous to Ireland on this account. Its berries are hardly eatable: taken in too great quantities they are apt to produce stupefaction; nevertheless a wine, said to be pleasant enough, is prepared from them in Corsica. Three varieties are found in the nurseries; one with deep red flowers, called the scarlet arbutus, which is much more beautiful than the original species; a second, with double greenish flowers and a smaller foliage; and a third, with leaves which are not at all cut at the edge: the two last are mere objects of curiosity. They are all increased by grafting upon the wild species, and by cuttings or layers of the young shoots; the wild kind itself springs up readily from seeds, by means of which it may be multiplied in great abundance. Considering this circumstance, and its great beauty, it is quite surprising that we do not see it more frequently planted in large masses.

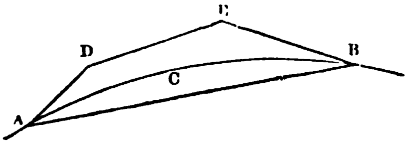
The *Oriental Arbutus*, *A. andrachne*, is superior to the last in beauty both of leaves and flowers, but it is much more tender, and does not bear fruit in Great Britain. It is readily known by its broader and less serrated leaves, and by its bark peeling off so as to leave the stem always smooth and of a clear, bright cinnamon-brown. Native of the Levant.

A. hybrida, or the mule arbutus, is apparently a hybrid between the two last, agreeing with *A. unedo* in the general aspect of its foliage, which is, however, larger and more handsome, and with *A. andrachne* in flowers and in the deciduous bark. It is hardy, and very ornamental, but it does not bear berries.

The other species are chiefly American, and of less general interest: one of them, *A. procera*, exists in the gardens of this country, but it does not seem likely to be able to endure our climate. It is a native of New Albion, where it forms a moderately-sized tree; another, *A. mucronata*, from the Straits of Magellan, is a hardy evergreen bush, with small, very dark, pointed and serrated leaves, among which hang numbers of solitary white blossoms. It has lately begun to flower about London, but is still a rare plant. It requires to be grown in peat soil.

For other species of arbutus see ARCTOSTAPHYLOS.

ARC, from the Latin *arcus*, a bow, signifies any part of a curve line, as A C B. The straight line A B, which joins the extremities of the arc, is called its CHORD.



For the arc of a *circle*, see ANGLE, where the method of finding the arc from its angle, and the converse, is given. For the properties of the arcs of various curves, see their several names.

It is found necessary to assume the following axiom previously to any general investigation of the properties of an arc. Every arc is greater than its chord, but, when concave to the chord throughout, is less than the sum of the sides of any rectilinear figure which contains it. Thus A C B is greater than A B, but less than the sum of A D, D E, and E B. If x and y be the co-ordinates of any point in the curve, the general method of finding the arc is by the integration of the formula

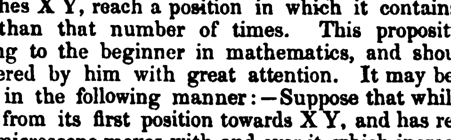
$$\sqrt{dx^2 + dy^2},$$

or, in the language of the fluxional calculus,

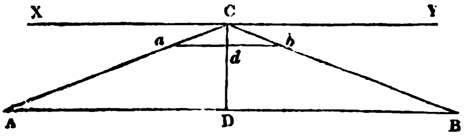
$$\text{fluent of } \sqrt{\dot{x}^2 + \dot{y}^2}.$$

The practical method of finding the length of an arc, which is an approximation to the preceding process, is as follows. Divide the arc into a number of smaller arcs, making the number large in proportion to the degree of accuracy required, and add together the chords of the smaller arcs. The sum of the chords will differ very little from the arc, even when the number of sub-divisions is not very large. For instance, the arc of the quadrant of a circle, whose diameter is ten million of inches, is 7,853,982 inches, within half an inch. Divide this quadrant into ten equal parts, and the sum of the chords is 7,845,910 inches: divide the quadrant into fifty parts, and the same sum is 7,853,659 inches, which is not wrong by more than one part out of 24,316. For only twenty subdivisions the sum of the chords is 7,851,963 inches, wrong only by one part out of 3890. Therefore, for every practical purpose, an arc of a circle (and the same may be said of every other curve) is the polygon made by the chords of a moderate number of sub-divisions of the arc.

The preceding property is (but in what manner our limits will not permit us to show) a consequence of the following proposition. Let there be a number of arcs, such as A C B, cut off the same curve, having their chords parallel to the tangent



X C Y. Then, as A B moves parallel to its first position towards X Y, C D not only decreases without limit, but its proportion to A B decreases without limit; that is, let any number, however great, be named; then shall A B, before it reaches X Y, reach a position in which it contains C D more than that number of times. This proposition is startling to the beginner in mathematics, and should be considered by him with great attention. It may be illustrated in the following manner:—Suppose that while A B moves from its first position towards X Y, and has reached $a\,b$, a microscope moves with and over it, which increases in magnifying power as $a\,b$ moves in such a manner that $a\,b$ always appears in the glass as large as A B to the naked eye. Then a C b will not be magnified into the form A C B, but into A Q B, where Q D grows less and less without limit, as $a\,b$ approaches towards X Y. But if two straight lines had been taken, as in the following figure, $a\,b$ could not have been magnified to A B without changing a C b into A C B.



Formerly, the term arc was frequently confounded with angle, which arose from the practice of measuring angles by arcs of the circle. For such terms as ARC OF ELEVATION, &c., we refer to ANGLE OF ELEVATION, &c.

ARC, JOAN or JEANNE OF, surnamed the 'Maid of Orleans,' from her heroic defence of that city, was born about the year 1410 or 1411, in the little hamlet of Domremy, near the Meuse, and about three leagues south of Vaucouleurs, on the borders of Champagne. Her parents were humble and honest peasants. The district was remarkable for the devout simplicity of its inhabitants, as well as for those romantic superstitions which in a rude age are so often allied with religion. It appears from the copious depositions of witnesses from the neighbourhood of Domremy, examined at Joan's trial, that she was unremitting in her prayers, and other religious exercises, and was strongly imbued, at a very early age, with the prevailing superstitions of her native place.

IANA · LOTHARINGA · DIGNA · HEROINA · LIBERATRIX · AVREL ·

During that period of anarchy in France, when the supreme power which had fallen from the hands of a monarch deprived of his reason was disputed for by the rival houses of Orleans and Burgundy, the contending parties carried on war more by murder and massacre than by regular battles. When an army was wanted, both had recourse to the English, and these conquering strangers made the unfortunate French feel still deeper the horrors and ravages of war. At first, the popular feeling was undecided; but when, on the death of Charles VI., the crown fell to a young prince who adopted the Armagnac side, whilst the house of Burgundy had sworn allegiance to a foreigner (Henry V.) as king of France, then, indeed, the wishes and interests of all the French were in favour of the Armagnacs, or the truly patriotic party. Remote as was the village of Domremy, it was still interested in the issue of the struggle. It was decidedly Armagnac, and was strengthened in this sentiment by the rivalry of a neighbouring village which adopted Burgundian colours.

Political and party interests were thus forced upon the enthusiastic mind of Joan, and mingled with the pious legends which she had caught from the traditions of the Virgin. A prophecy was current, that a virgin should rid France of its enemies; and this prophecy seems to have been realised by its effect upon the mind of Joan. The girl, by her own account, was about thirteen when a supernatural vision first appeared to her. She describes it as a great light, accompanied by a voice telling her to be devout and good, and promising her the protection of heaven. Joan responded by a vow of eternal chastity. In this there appears nothing beyond the effect of imagination. From that time the voice or voices continued to haunt Joan, and to echo the enthusiastic and restless wishes of her own heart. We shall not lay much stress on her declarations made before those who were appointed by the king to inquire into the credibility of her mission. Her own simple and *early* account was, that 'voices' were her visitors and advisers, and that they prompted her to quit her native place, take up arms, drive the foe before her, and procure for the young king his coronation at Rheims. These voices, however, had not influence enough to induce her to set out upon the hazardous mission, until a band of Burgundians, traversing and plundering the country, had compelled Joan, together with her parents, to take refuge in a neighbouring town: when they returned to their village, after the departure of the marauders, they found the church of Domremy in ashes. Such incidents were well calculated to arouse the indignation and excite the enthusiasm of Joan. Her voices returned, and incessantly directed her to set out for France; but to commence by making application to De Baudricourt, commander at Vaucouleurs. Her parents, who were acquainted with Joan's martial propensities, attempted to force her into a marriage; but she contrived to avoid this by paying a visit to an uncle, in whose company she made her appearance before the governor of Vaucouleurs, in May, 1428. De Baudricourt at first refused to see her, and, upon granting an interview, treated her pretensions with contempt. She then returned to her uncle's abode, where she continued to announce her project, and to insist that the prophecy, that 'France, lost by a woman (Isabel of Bavaria), should be saved by a virgin from the frontiers of Lorraine,' alluded to her. She it was, she asserted, who could save France, and not 'either kings, or dukes, nor yet the king of Scotland's daughter'—an expression which proves how well-informed she was as to the political events and rumours of the day.

The fortunes of the dauphin Charles at this time had sunk to the lowest ebb; Orleans, almost his last bulwark was besieged and closely pressed, and the loss of the 'battle of Herrings' seemed to take away all hope of saving the city from the English. In this crisis, when all human support seemed unavailing, Baudricourt no longer despised the supernatural aid promised by the damsel of Domremy, and gave permission to John of Metz and Bertram of Poulengy, two gentlemen who had become converts to the truth of her divine mission, to conduct Joan of Arc to the dauphin. They purchased a horse for her, and at her own desire furnished her with male habits, and other necessary equipments. Thus provided, and accompanied by a respectable escort, Joan set out from Vaucouleurs on the 13th of February, 1429. Her progress, through regions attached to the Burgundian interest, was perilous, but she safely arrived at Fierbois, a place within five or six leagues of Chinon, where the dauphin then held his court. At Fierbois was a celebrated church dedicated to St. Catherine, and here she spent her time in devotion, whilst a messenger was despatched to the dauphin to announce her approach. She was commanded to proceed, and reached Chinon on the eleventh day after her departure from Vaucouleurs.

Charles, though he desired, still feared to accept the proffered aid, because he knew that the instant cry of his enemies would be, that he had put his faith in sorcery, and had leagued himself with the infernal powers. In consequence of this, Joan encountered every species of distrust. She was not even admitted to the dauphin's presence without difficulty, and was required to recognize Charles amidst all his court; this Joan happily was able to do, as well as to gain the good opinion of the young monarch by the simplicity of her demeanour. Nevertheless, the prince proceeded to take every precaution before he openly trusted her. He first handed her over to a commission of ecclesiastics, to be examined; then sent her for the same purpose to Poictiers, a great law-school, that the doctors of both faculties might solemnly decide whether Joan's mission was from heaven or from the devil; for none believed it to be merely human. The greatest guarantee against sorcery was considered to be the chastity of the young girl, it being an axiom, that the devil would not or could not take part with a virgin; and no pains were spared to ascertain her true character in this respect. In short, the utmost incredulity could not have laboured harder to find out imposture, than did the credulity of that day to establish its grounds of belief. Joan was frequently asked to do miracles, but her only reply was, 'Bring me to Orleans, and you shall see. The siege shall be raised and the dauphin crowned king at Rheims.'

They at length granted her request, and she received the rank of a military commander. A suit of armour was made for her, and she sent to Fierbois for a sword, which she said would be found buried in a certain spot within the church. It was found there, and conveyed to her. The circumstance became afterwards one of the alleged proofs of her sorcery or imposture. Her having passed some time at Fierbois amongst the ecclesiastics of the place must have led, in some way or other, to her knowledge of the deposit. Strong in the conviction of her mission, it was Joan's desire to enter Orleans from the north, and through all the fortifications of the English. Dunois, however, and the other leaders, at length overruled her, and induced her to abandon the little company of pious companions which she had raised, and to enter the beleaguered city by water, as the least perilous path. She succeeded in carrying with her a convoy of provisions to the besieged. The entry of Joan of Arc into Orleans, at the end of April, was itself a triumph. The hearts of the besieged were raised from despair to a fanatical confidence of success; and the English, who in every encounter had defeated the French, felt their courage paralyzed by the coming of this simple girl. Joan announced her arrival to the foe by a herald, bearing a summons to the English generals to be gone from the land, or she, the Pucelle, would slay them. The indignation of the English was increased by their terror; they detained the herald, and threatened to burn him, as a specimen of the treatment which they reserved for his mistress. But in the mean time the English, either from being under the influence of terror, or through some unaccountable want of precaution, allowed the armed force raised and left behind by Joan, to reach Orleans unmolested, traversing their entrenchments. Such being the state of feeling on both sides, Joan's ardour impelled her to take advantage of it. Under her banner, and cheered by her presence, the besieged marched to the attack of the English forts one after another. The first carried was that of St. Loup, to the east of Orleans. It was valiantly defended by the English, who, when attacked, fought desperately; but the soldiers of the Pucelle were invincible. On the following day, the 6th of May, Joan, after another summons to the English, signed 'Jhesus Maria and Jehanne La Pucelle,' renewed the attack upon the other forts. The French being compelled to make a momentary retreat, the English took courage, and pursued their enemies: whereupon Joan, throwing herself into a boat, crossed the river, and her appearance was sufficient to frighten the English from the open field. Behind their ramparts they were still, however, formidable; and the attack led by Joan against the works to the south of the city is the most memorable achievement of the siege. After cheering on her people for some time, she had seized a scaling-ladder, when an English arrow struck her between the breast and shoulder, and threw her into the fosse. When her followers took her aside, she showed at first some feminine weakness, and wept; but seeing that her standard was in danger, she forgot her wound, and ran back to seize it. The French at the same time pressed hard upon the enemy, whose strong hold was carried by assault. The English commander, Gladesdall, or Glacidas, as Joan called him, perished with his bravest soldiers in the Loire. The English now determined to raise the siege, and Sunday being the day of their departure, Joan forbade her soldiers to molest their retreat. Thus in one week from her arrival at Orleans was the beleaguered city relieved of its dreaded foe, and the Pucelle, henceforth called the Maid of Orleans, had redeemed the most incredible and important of her promises.

No sooner was Orleans freed from the enemy, than Joan returned to the court, to entreat Charles to place forces at her disposal, that she might reduce the towns between the Loire and Rheims, where she proposed to have him speedily crowned. Her projects were opposed by the ministers and warriors of the court, who considered it more politic to drive the English from Normandy than to harass the Burgundians, or make sacrifices for the idle ceremony of a coronation; but her earnest solicitations prevailed, and early in June she attacked the English at Jargeau. They made a desperate resistance, and drove the French before them, till the appearance of Joan chilled the stout hearts of the English soldiers. One of the Poles was killed, and another, with Suffolk the commander of the town, was taken prisoner. This success was followed by a victory at Patay, in which the English were beaten by a charge of Joan, and the gallant Talbot himself taken prisoner. No force seemed able to withstand the Maid of Orleans. The strong town of Troyes, which might have repulsed the weak and starving army of the French, was terrified into surrender by the sight of her banner; and Rheims itself followed the example. In the middle of July, only three months after Joan had come to the relief of the sinking party of

Charles, this prince was crowned in the cathedral consecrated to this ceremony, in the midst of the dominions of his enemies. Well might an age even more advanced than the fifteenth century believe, that superhuman interference manifested itself in the deeds of Joan.

Some historians relate that, immediately after the coronation, the Maid of Orleans expressed to the king her wish to retire to her family at Domremy; but there is little proof of such a resolution on her part. In September of the same year, we find her holding a command in the royal army, which had taken possession of St. Denis, where she hung up her arms in the cathedral. Soon after, the French generals compelled her to join in an attack upon Paris, in which they were repulsed with great loss, and Joan herself was pierced through the thigh with an arrow. It was the first time that a force in which she served had suffered defeat. Charles immediately retired once more to the Loire, and there are few records of Joan's exploits during the winter. About this time a royal edict was issued, ennobling her family, and the district of Domremy was declared free from all tax or tribute. In the ensuing spring, the English and Burgundians formed the siege of Compiègne; and Joan threw herself into the town to preserve it, as she had before saved Orleans, from their assaults. She had not been many hours in it when she headed a sally against the Burgundian quarters, in which she was taken by some officers, who gave her up to the Burgundian commander, John of Luxemburg. Her capture appears, from the records of the Parisian parliament, to have taken place on the 23rd of May, 1430.

As soon as Joan was conveyed to John of Luxemburg's fortress of Beaurevoir, near Cambray, cries of vengeance were heard among the Anglican partizans in France. The English themselves were not foremost in this unworthy zeal. Joan, after having made a vain attempt to escape by leaping from the top of the donjon at Beaurevoir, was at length handed over to the English partizans, and conducted to Rouen. The University of Paris called loudly for the trial of Joan, and several letters are extant, in which that body reproaches the bishop of Beauvais and the English with their tardiness in delivering up the Pucelle to justice.

The zeal of the University was at length satisfied by letters patent from the King of England and France, authorizing the trial of the Pucelle, but stating in plain terms that it was at the demand of public opinion, and at the especial request of the bishop of Beauvais and of the University of Paris,—expressions which, taken in connexion with the delay in issuing the letters, sufficiently prove the reluctance of the English council to sanction the extreme measure of vengeance. After several months' interrogatories, the judges who conducted the trial drew from her confessions the articles of accusation: these asserted, that Joan pretended to have had visions from the time when she was thirteen years old; to have been visited by the archangels Gabriel and Michael, the saints Catharine and Margaret, and to have been accompanied by these celestial beings to the presence of the Dauphin Charles; that she pretended to know St. Michael from St. Gabriel, and St. Catharine from St. Margaret; that she pretended to reveal the future; and had assumed male attire by the order of God. Upon these charges her accusers wished to convict her of sorcery. Moreover, they drew from her answers, that she declined to submit to the ordinances of the church whenever her voices told her the contrary. This was declared to be heresy and schism, and to merit the punishment of fire.

These articles were dispatched to the University of Paris, and all the faculties agreed in condemning such acts and opinions, as impious, diabolical, and heretical. This judgment came back to Rouen; but it appears that many of the assessors were unwilling that Joan should be condemned; and even the English in authority seemed to think imprisonment a sufficient punishment. The truth is, that Joan was threatened with the stake unless she submitted to the church, as the phrase then was, that is, acknowledged her visions to be false, forswore male habits and arms, and owned herself to have been wrong. Every means were used to induce her to submit, but in vain. At length she was brought forth on a public scaffold at Rouen, and the bishop of Beauvais proceeded to read the sentence of condemnation, which was to be followed by burning at the stake. Whilst it was reading, every exhortation was used, and Joan's courage for once failing, she gave utterance to words of contrition, and expressed her willingness to submit, and save herself from the flames. A written form of confession was instantly produced, and read to her, and Joan, not knowing how to write, signed it with a cross. Her sentence was commuted to perpetual imprisonment, 'to the bread of grief and the water of anguish.' She was borne back from the scaffold to prison; whilst those who had come to see the sight displayed the usual disappointment of unfeeling crowds, and even threw stones in their anger.

When brought back to her prison, Joan submitted to all that had been required of her, and assumed her female dress; but when two days had elapsed, and when in the solitude of her prison the young heroine recalled this last scene of weakness, forming such a contrast with the glorious feats of her life, remorse and shame took possession of her, and her religious enthusiasm returned in all its antient force. She heard *her voices* reproaching her, and under this impulse she seized the male attire which had been perfidiously left within her reach, put it on, and avowed her altered mind, her resumed belief, her late visions, and her resolve no longer to belie the powerful impulses under which she had acted. 'What I resolved,' said she, 'I resolved against truth. Let me suffer my sentence at once, rather than endure what I suffer in prison.'

The bishop of Beauvais knew that if Joan were once out of the power of the court that tried her, the chapter of Rouen, who were somewhat favourably disposed, would not again give her up to punishment; and fears were entertained that she might ultimately be released, and gain new converts. It was resolved, therefore, to make away with her at once, and the crime of relapse was considered sufficient. A pile of wood was prepared in the old market at Rouen, and scaffolds placed round it for the judges and ecclesiastics: Joan was brought out on the last day of May, 1431; she wept piteously, and showed the same weakness as when she first beheld the stake. But now no mercy was shown. They placed on her head the cap used to mark the victims of the Inquisition, and the fire soon consumed the unfortunate Joan of Arc. When the pile had burned out, all the ashes were gathered and thrown into the Seine.

It is difficult to say to what party most disgrace attaches on account of this barbarous murder: whether to the Burgundians, who sold the Maid of Orleans; the English, who permitted her execution; the French, of that party who brought it about and perpetrated it; or the French, of the opposite side, who made so few efforts to rescue her to whom they owed their liberation and their national existence. The story of the Maid of Orleans is throughout disgraceful to every one, friend and foe; it forms one of the greatest blots and one of the most curious enigmas in historic record. It has sometimes been suggested that she was merely a tool in the hands of the priests; but this supposition will hardly satisfy those who read with attention the history of Joan of Arc.

It is asserted (*Biog. Univ.*, art. Jeanne d'Arc), and probably correctly, that there is no genuine likeness of Joan of Arc extant. Our medal is taken from a French work: *Les Familles de la France illustrées par les monumens*, &c. *Tirées des plus rares et curieux cabinetz du Royaume*, &c. Par J. de Bie Calcographe, Paris, 1634.

The works on the subject of Joan of Arc are very numerous. M. Chaussard enumerates upwards of four hundred, either expressly devoted to her life or including her history. Her adventures form the subject of Voltaire's poem of *La Pucelle*, and of a tragedy by Schiller; but perhaps the best production of the kind is Mr. Southey's poem bearing her name.

(The sources which have been here consulted are the original memoirs of the times, together with the numerous biographies. That of M. Lebrun des Charmettes is the fullest. It was written by a prefet, at the epoch of 1815, to flatter the Bourbons. The publication by M. Laverdy, however, of extracts from MSS. in the Bibliothèque du Roi, contains every thing relating to the trials of the Pucelle; and is a source at once ample and respectable. Unfortunately, the very trials themselves are full of partiality; that which took place afterwards for the reversal of Joan's condemnation records the testimony of witnesses, given all one way, and dictated evidently by the reaction of the period.)

ARCADE signifies a series of arches on insulated piers, forming a screen, and also the space inclosed by such. This is, perhaps, a limitation of the term within that usually given to it; but arcade is properly a correlative of *colonnade*, and should not therefore have a more extensive signification, What, by a strange perversion of the term, are in this country called *piazzas*, and most particularly the part so termed of the buildings in Covent Garden, London, are strictly *arcades;* and the new market within the inclosed area of that same place or square, to which the term *piazza* properly applies, exemplifies, in a great part of its exterior, the correlative term *colonnade*.

Arcade is but another and a substantive form of *arched;* and although it may be well to restrict it, as a substantive, to the meaning given above, yet it may be conveniently and appropriately used, as an adjective, instead of *arched*, as in the description of the antient Roman aqueduct; though it would be somewhat absurd to designate such works as the bridges over the Thames at London *arcades*, or to speak of them as arcaded.

ARCA′DIA, one of the antient provinces of the Peloponnesus, now the Morea, comprising the central part of the peninsula, and bounded on all sides by mountains. It extended from about 37° 15′ to 38° N. lat., and from 21° 52′ to 22° 36′ E. long. Its greatest length from Kalávryta, the antient Cynætha in the north to Samará in the south, near which it must have been separated from Laconia, was about 50 miles. Its breadth varied from 35 to 41 miles.

On the north and north-west it was separated from Achaia and Elis by a range of mountains, which branching off from Cyllene (now Zyria), the highest point of the Peloponnesus, said to be about nine stadia, or 5400 Greek feet in height (Steph. Byz.), ran in a westerly direction, and was known by the several appellations of Aroanius, Lampeia, Erymanthus and Pholöe: on the west it was separated from Triphylia by mountains which are a southerly continuation of Pholöe, but the names of which have not been transmitted to us: on the south, its boundary towards Laconia may be considered the high land from which the water flows in opposite directions, southwards into the Eurotas and northwards into the Alpheus: its separation from Messenia was the high land W. of Lycosura, running between the bed of the Neda and the sources of the Pamisus, and containing the great mountain Tetrázi (Cerausium), a part of Lycæum. On the east it was separated from Argolis by the ridge known under the several appellations of Parthenium, Artemisium, and Trachy. Its area is calculated by Mr. Clinton (*Fasti Hellenici*, i. 385) at 1701 English square miles, being next in size to Laconia, which was the largest and most populous province of the Peloponnesus. According to the calculation of the same author, the free population of Arcadia may have amounted to 107,850 persons, and by adding half that number of slaves, he makes the aggregate amount 161,750—about ninety-five persons to each square mile, which, considering that a large part of Arcadia is fertile, is probably below the truth, at least in its most prosperous days.

Arcadia may be regarded as the Switzerland of Greece, though its mountains are of much less elevation. The centre of the Morea may be considered as a high table-land, which is traversed by numerous ridges of hills: the valleys of Tegea, Mantineia, Orchomenus, and Caphyæ, which run from south to north on the east side of Arcadia, are of considerable extent when compared with others in the Morea, and show the general level of the eastern side of this table-land: from the west side of these valleys the long slope lies westward, as we see by the course of the Alpheius and its tributaries; that to the eastern coast is more steep and shorter. The plains of Caphyæ, Tegea, Mantineia, and Orchomenus, which last is only separated from that of Mantineia by a low narrow ridge, may be considered as one: its length is about twenty-five miles, with a breadth varying from one to eight. The modern town of Tripolitzá (probably on the site of Pallantium) is on this elevated plain, where, in the month of March, the ground is often covered with snow, while the sea-coast enjoys warm and pleasant weather. These eastern valleys have a very peculiar appearance, from being so enclosed by mountains that the water is often unable to find an outlet. At the lowest parts of them small lakes and marshes are formed, though sometimes the water is carried off by subterraneous tunnels. Such phenomena are of frequent occurrence in this part of Arcadia, which is a limestone country: these high valleys, in fact, belong neither to the water system of the Alpheius nor to that of the small streams which enter the sea on the east coast. Being now entirely deprived of wood, and of its three great cities, Tegea, Mantineia, and Orchomenus, the extensive plain of Tripolitzá presents one dull, uninteresting level. In the south and west, along the valleys of the Alpheius, the Arcadian scenery exhibits its most picturesque features, recalling to our recollection all the beautiful descriptions of the poets. The valley of Megalopolis still abounds in delightful scenery. The sides of the majestic mountains a. covered with oaks, chestnuts, and plane-trees, while th lower hills are clothed with underwood, and refreshed by numerous rivulets.

The Alpheius, the principal river of the Peloponnesus, has its source near the southern frontier of Arcadia, and runs N.W., not far from the western boundary of the province, till it encounters the slopes of Mount Pholöe, when it enters the valley of Olympia, and, flowing in a westerly direction, reaches the sea. (See ALPHEIUS.) It is joined on the east by the rivers Helisson, Gortynius, Ladon, and Erymanthus, celebrated in mythology for the scene of Hercules' exploit in killing the savage boar; on the west the mountains approach so closely to its banks that the courses of its tributaries are short, and in summer most of them dry.

The Arcadians were divided into many independent states, and each of these contained several inferior towns or villages. Of their number some idea may be formed from the fact that the inhabitants of forty of them were transferred, B.C. 371, to form the new state of Megalopolis, which was founded near the frontiers of Laconia, and which seems to have had a territory assigned to it more extensive than that of any other Arcadian state, running northwards for about twenty-three English miles. (Pausan. viii. 27. 5. 35. 5. 36. 2.) At the time when Strabo wrote, about A.D. 14, he tells us that there was scarcely a city in the whole extent of its territory, and that even Megalopolis had been reduced almost to a desert. There are now a number of insignificant villages in Arcadia, but the only place of any importance is Tripolitzá, which during the existence of Turkish oppression in this unfortunate country was the chief residence of the pacha. We may mention a few of the principal antient cities, though the sites of some of them are unknown, or at least doubtful. In the north lay Psophis, near the modern Khan of Tripotamo, on the banks of the river Erymanthus, remarkable for the strength and singularity of its site: Cynætha, probably Kalávryta, whose inhabitants were distinguished from the rest of the Arcadians by the peculiar savageness and ferocity of their disposition, qualities which Polybius (iv. 21) attempts, at great length, to prove arose from their hatred to music, which was particularly cultivated by their fellow-countrymen: Stymphalus, the remains of which are found about an hour W.S.W. of the village of Zaraka, on the banks of the Palus Stymphalia, once the fabled haunt of the birds called Stymphalides: Caphyæ, the remains of which are found at Khotúsa, celebrated for the defeat of Aratus and the Achæans [see ARATUS] by the Ætolians in the Social War: Orchomenus, at Kalpáki, under which is a plain in a great measure occupied by a small lake formed from the rain-water which descends from the surrounding hills: on the east lay the important city of Mantineia, at the site of Paleopoli, celebrated for the death of Epaminondas in the great battle between the Thebans and Lacedæmonians, B.C. 362: Tegea, at Paleo Episcopi, once one of the most powerful states of Arcadia: on the west there were no cities of any great importance.

Besides the antient authorities already quoted, the reader may consult Strabo, viii. 388; Pliny, iv.; and also Breitenbauch, *Geschichte von Arcadien*, Frankfort, 1791; Leake's *Morea;* Gell's *Narrative of a Journey in the Morea.*

ARCADIANS, an indigenous race, according to their own account, who had occupied the central parts of the Peloponnesus from time immemorial. According to Aristotle (see Scholium on the Clouds of Aristophanes, l. 397), the Arcadians expelled a prior race from the country, and were therefore not the primitive possessors, if we adopt this tradition. We have no difficulty, however, in making out that they were a branch of the great Pelasgic nation, which seems to have extended, at one time, nearly in a continued line from the Italian peninsula to Asia Minor. A strong confirmation of this statement is, that Arcadia furnishes specimens of antient polygonal walls, (such as at Mantineia, and at Lycosura)—a species of architecture supposed to be peculiar to the Pelasgi; and their first king is reported to have been the earth-born Pelasgus. Pausanias, in his account of its early history, presents us only with fable; and it is therefore unnecessary to enumerate the names of the kings, which he pretends to have learned from diligent investigation.

As Arcadia is a mountainous country, and abounds in forests and grass lands, the character of its antient inhabitants and their mode of life were, to a great extent, determined by these physical circumstances. The tending of cattle and hunting were their chief occupations, and we find them often represented in all the rudeness of an uncultivated state. Men and swine alike lived on acorns, and Philostratus (lib. iii.) paints the Arcadians as little superior to the animals which they fed. With these testimonies, therefore, as to their character, we cannot but wonder how the Arcadian shepherds could have acquired their reputation for mildness and innocent simplicity, qualities by which they are best known to us. Polybius, their countryman, partly explains this circumstance, when he tells us that the Arcadians, at first fierce and savage, were softened by their diligent application to music.

In the second Messenian war, B.C. 685-668, we find the Arcadians under the command of a king, Aristocrates, whom they stoned to death on account of his treacherous behaviour to the Messenians, and the country was then divided into a number of small republics. Herodotus (vii. 202) tells us that they took part with their countrymen against Xerxes, B.C. 480, and that they sent to Thermopylæ a body of 2120 men to oppose that monarch. But if they had no larger number in the field than this, it does not speak highly for their patriotism, nor do we think that their subsequent history proves that they possessed the feelings of a united people. They were mere soldiers of fortune, ready to draw their swords in defence of any one willing to pay them. In the celebrated Sicilian expedition, B.C. 415, they were found in the ranks of both armies, nor do they appear to have acted as a nation till they had founded, under Epaminondas, the city of Megalopolis, B.C. 371, which became the metropolis of the country. From this time the Arcadians appear as a confederated state with a general council to manage the affairs of the nation. It is said to have consisted of 10,000 members (οἱ μύριοι), and if it were not frequently mentioned by antient writers under this appellation, we should be inclined to imagine that there must be some mistake. What makes it still more inexplicable is, that it possessed the executive and judicial powers, but not the legislative, which resided in the whole assembled people. Pausanias, in his *Arcadica* (chap. xxxii.), mentions the council-chamber (*βουλευτήριον*) of the Ten Thousand. It was Epaminondas and the Bœotians who assisted the Arcadians in establishing this constitution, and in rendering them independent of the power of the Spartans. On the death of Alexander, B.C. 323, we find the country a prey to a number of petty tyrants, and the part they took in the Achæan league did not relieve them from their difficulties, or enable them to re-establish peace and security. The Romans at last made themselves masters of their country, and included it in the province of Achaia, but their days of prosperity never returned. Strabo states, that in his time the country was desolate, and that Tegea was the only city of importance which it contained; but Strabo himself did not visit Arcadia. Pausanias, who examined Arcadia about A.D. 174, gives a minute account of its ruined cities, and of the numerous antiquities with which it abounded. (See Pausanias, book viii.; Thucydides, vii. 57; Xenophon, *Hellenica*, vii.; Diodorus, book xv.; Herodotus, viii. 73, &c.)

ARCA'DIUS, emperor of Constantinople, son of Theodosius the Great, whom he succeeded A.D. 395. Neither his personal character, nor the transactions in which he was engaged, are of a nature to attract much of our attention. He was a mere puppet in the hands of ambitious men, who pursued their own interests without reference to the prosperity of the empire or the happiness of the people. The genius of Rome expired with Theodosius; he was the last of the successors of Augustus and Constantine who was acknowledged by the whole Roman empire, and who appeared at the head of its armies. By his will he divided this mighty empire between his two young sons, Arcadius and Honorius. Arcadius became emperor of the east, reigning over the provinces of Thrace, Asia Minor, Syria, and Egypt, from the lower Danube to the confines of Persia; Honorius became, at least, nominal emperor of the West. The line which separated the two kingdoms was, in fact, much the same as that which now divides the empire of Austria from Turkey. The accession of Arcadius marked the final establishment of the empire of the East, which subsisted, till the taking of Constantinople by the Turks, during a period of 1058 years, in a state of continual decay.

It is curious, that though the period is copiously furnished with historical materials, it is not possible to fix on a single action which properly belongs to the son of Theodosius the Great. His history is nothing else than that of the men to whom he entrusted the affairs of his empire. He was at first the submissive tool of Rufinus, who had raised himself by his talents to the notice of Theodosius, and was employed by him to direct the studies of the young prince Arcadius. Rufinus employed all his influence to inveigle Arcadius into a marriage with his daughter, but failing in this object, he was accused of inviting the Huns and Goths into Asia and Greece, and was at last murdered in the presence of the emperor by the soldiers of the celebrated Stilicho. His place was soon supplied by a eunuch, Eutropius, who exceeded even Rufinus in acts of oppression and cruelty. Arcadius saw every thing with equal indifference, and cared neither for his own honour nor the security of his subjects, provided he was allowed to enjoy the pompous luxury which we find described in the eloquent sermons of St. Chrysostom, an eye-witness of the scenes which he narrates. We cannot, perhaps, give a clearer insight into the sort of life spent by these pageant emperors than by the following quotations from St. Chrysostom. (*Opera*, tom. xiii. p. 192-196.) 'The emperor wears on his head either a diadem or a crown of gold decorated with precious stones of inestimable value. These ornaments and his purple garments are reserved for his sacred person alone; and his robes of silk are embroidered with figures of golden dragons. His throne is of massive gold. Wherever he appears in public, he is surrounded by his courtiers, guards, and attendants. Their spears, shields, cuirasses, the bridles, and trappings of their horses, have either the substance or the appearance of gold. The two mules that draw the chariot of the monarch are perfectly white, and shining all over with gold. The chariot itself, of pure and solid gold, attracts the admiration of the spectators, who contemplate the purple curtains, the snowy carpet, the size of the precious stones, and the resplendent plates of gold that glitter as they are agitated by the motion of the carriage.' In the later years of his life, Arcadius was entirely under the control of his wife, Eudoxia, whose character is best shown by the fact that she persecuted the virtuous St. Chrysostom. Arcadius died May 1, 408, leaving his empire to his infant son, Theodosius. The facts of his life are to be gleaned from Claudian, Suidas, and Theodoretus.

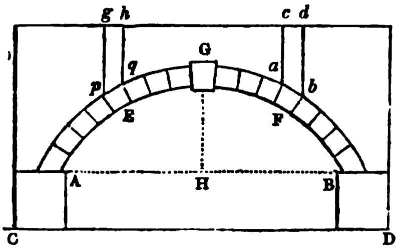
ARCESILA'US was born at Pitana, a city of Æolis in Asia Minor; of his personal history we are able to collect a few facts from Suidas, and his Life by Diogenes Laërtius. He was born B.C. 316, and began, according to Apollodorus, to attract the attention of the learned by the acuteness of his remarks before he had reached the age of seventeen. He died B.C. 241, at the age of seventy-five. He was the pupil of the mathematician Autolycus, his compatriot, and afterwards proceeded to Athens, where it was intended that he should devote his time to the study of rhetoric. Philosophy, however, had greater charms for him, and accordingly he became the pupil of Theophrastus the peripatetic, and then of Crantor. He also made himself acquainted with the subtile dialectics of the Megaric school, and the scepticism of that of Pyrrho. He attached himself more particularly to the Academic sect, and became one of their leading philosophers, though he introduced so many changes, that he was considered the founder of what has been called the Middle Academy. The Academic sect was instituted by Plato, and continued through Speusippus, Xenocrates, Crantor, Polemo, and Crates, to Arcesilaüs. It is a point which has been disputed, whether Arcesilaüs had established his school in the lifetime of Polemo and Crates, or whether we are to consider him as the successor of Crates; but we think that Mr. Clinton (*Fasti Hellenici*, vol. i. p. 367) satisfactorily proves, by reference to many passages in antient authors, that Arcesilaüs established his school at the death of Crantor, who died before Polemo and Crates; that from this period he was the rival of Zeno and Epicurus; that Polemo and Crates, strictly speaking, had no successors; that the old academy expired with them, and was superseded by the school of Arcesilaüs, which had been founded in their lifetime.

Arcesilaüs revived the Socratic mode of teaching, which had fallen into disuse; he propounded no dogmatic principles of his own, but discussed with much eloquence and art the points proposed to him by his pupils. He brought forward all the arguments that could be suggested on both sides of a question, and endeavoured to prove that there was no certainty in philosophical knowledge, and that in all purely speculative subjects we must refrain from coming to a decision, because the mind of man cannot sufficiently distinguish truth from falsehood. He does not, however, appear to have carried these sceptical opinions into the every-day affairs of life, but to have restricted them to philosophy and science, though his opponents asserted, and with much reason, that such doctrines as he advocated tended to undermine all virtues and morality. In the world he admitted we must act as others do. The saying of the philosopher Cleanthes respecting him, clearly proves that his doctrines were not carried beyond his closet, and that in the world he was strictly attentive to all the duties of life. 'Leave him to himself,' says Cleanthes to some who lamented the tendency of his doctrines, 'for if Arcesilaüs loosens the ties of morality by his words, he knits them again by his actions.' Yet he is accused by some of carrying the pleasures of love and wine to an excess little suited to his character as a philosopher; but we think that all such accusations ought to be received with considerable caution. He was succeeded in his school by Lacydes, B.C. 241. The reader may consult the fourth book of Cicero's *Academic Questions* for an eloquent and masterly exposition of the arguments for and against the philosophical doctrines of Arcesilaüs and the sect which he founded.

ARCH, the same word as arc in its etymological derivation, and an older English form (having been always used in the sense of arc until that continental form superseded it), is now applied to any solid work, whether of masonry or otherwise, of which the lower part is formed into an arc of a curve supported at the two extremities. We proceed to give some idea of the question of theoretical mechanics connected with this word, referring, for all matters connected with the support, to ABUTMENT, BUTTRESS, IMPOST, PIER, and for history and general information to BRIDGE.

In practice, we have not only the arch itself to consider, but the loose matter with which the space above it is filled, and the roadway or building thereon constructed. The two extreme effects of this load may be thus stated. If it were fluid, the common law of hydrostatics would direct us to consider every small portion *a b* (*fig.* 1) of the arch as sustaining a pressure perpendicular to itself, equivalent to the weight of a column of fluid having the *horizontal* base *a b*, and the mean of *a c* and *b d* for its altitude. On the other hand, if the whole superincumbent load could be considered as perfectly solid and wholly unsustained by lateral pressure, the portion *p q h g* might be considered as a part of the arch-stone underneath. In the absence of all trustworthy experiments to determine how far the real superincumbent pressure, where resulting from loose materials, partakes of one or the other supposition, we shall adopt the latter as probably nearer the truth than the former: which is equivalent to treating of the arch only after its superincumbent weight has been added to each arch stone.

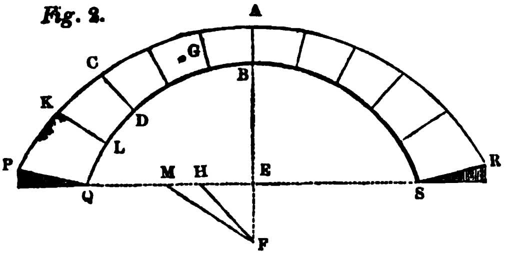
Fig. 1.

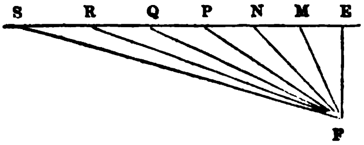


A C and B D are called the piers of the arch; it is said to *spring* from A and B; A E and B F are the flanks, and G the *crown*. The lower line of the arch stones is called the *intrados* or *soffit*, the upper, the *extrados* or *back;* the arch-stones are called *voussoirs*, and the highest stone, G, the *key-stone*. A B is the *span* of the arch, and G H its *height*. The voussoirs are cemented together, and if the cement were sufficiently strong, any form might be given to the arch, or at least any form which would stand if cut out of the solid material. If we suppose the stones uncemented, their friction upon one another would tend to prevent the disturbance of equilibrium, and allow considerable variety of form in arches constructed with stones of the same weight. But if we suppose the stones perfectly smooth, so that each of them is kept from slipping only by the pressure of the adjoining two, then each intrados has one particular form of extrados and one only, so long as the manner in which the stones are cut follows one given law.

Let P Q, R S (*fig.* 2.) be parts of the pier, which we suppose firmly fixed, and let there be no key-stone, or suppose the key-stone divided in the middle at A B. Let the portion A C D B be taken, composed of several arch-stones, and let its centre of gravity be G. Then the weight of A B C D, collected at G, is sustained by pressures at the surfaces A B and C D, perpendicular to those surfaces. Take E F in the continuation of A B, of any length, and draw F H parallel to C D. It is a known theorem, that any three forces which balance each other, are proportional to the three sides of a triangle, the directions of the sides of which are perpendicular to the direction of the forces. In the present case, H E F is such a triangle; for H E being horizontal is perpendicular to the direction of all weights; F E is the continuation of A B, and therefore perpendicular to the pressure at A B, while F H, being parallel to C D, is perpendicular to the pressure at C D. Hence H E bears to E F the same proportion as the weight of A C D B to the pressure at A. In the same manner it may be shown that, F M being parallel to K L, the weight of the portion A B K L is to the pressure at AB as M E to E F, from which it follows that the weight of A K L B bears to that of A C D B the proportion of M E to H E. Hence the following theorem:

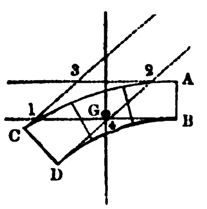
Fig. 2.





Let E F be vertical, E S horizontal, and F M, F N, &c., parallel to the divisions between the voussoirs of an arch which is divided at its highest point: then, no friction being supposed, there can be no equilibrium unless the weights of the successive voussoirs, reckoned from the highest point, are to one another as E M, M N, N P, &c.

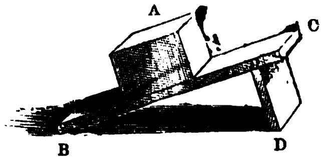
It is also necessary to the equilibrium that the vertical drawn through the centre of gravity G of the part A C D B should cut the parallelogram 1 2 3 4, made by perpendiculars to A B and C D drawn from their extremities: for otherwise there would be no point in the vertical through G (at some part of which the weight must be supposed to act), at which the directions of the perpendicular pressures could meet, and no three forces can maintain equilibrium unless their directions pass through one point.

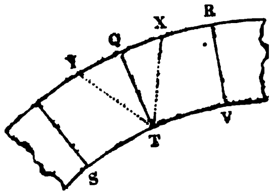


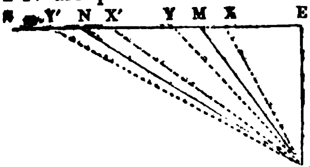
The application of analysis to the preceding conditions gives the common theory of arches. It may be found in most elementary works on statics; but we do not proceed further here, because, as will presently appear, nothing but a very considerable departure from the principles of it can endanger the construction of an arch. We need not therefore dwell upon this.

An arch constructed upon the preceding principles would, if the stones were perfectly smooth, be totally overturned by the least addition to, or subtraction from, the weight of any one arch-stone: for each arch-stone is only just kept in equilibrium by the pressures of the two adjoining. Such an arch, therefore, would not serve for a bridge, which must bear a considerable addition to its weight at different times.

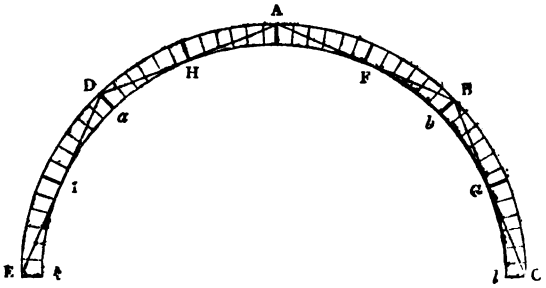
It is to the friction and cements that the power of sustaining additional weights is due. It is evident that before the arch, kept in equilibrium as above, can be overturned, the additional pressure must be such as to overcome the friction against some one arch-stone exerted by the two adjoining. And the advantage is the greater, since the additional pressure itself increases the friction which opposes it. The effect of friction may be thus represented. First ascertain the extreme angle at which a mass of stone, such as the arch is to be built of, would rest upon an inclined plane of the same material: that is, raise the stone A upon the stone plane B C until the least additional elevation would make it slide down. Measure the angle C B D. Now suppose P Q R S T V to be part of an arch kept in equilibrium without friction. From T on both sides make the angles Q T X, QTY equal to CBD above measured: then the effect of friction is this, that instead of the two arch-stones meeting in T Q, their line of junction might have been anywhere in the angle Y T X, without endangering the mere equilibrium. Or if, as in a preceding figure, F M and F N are parallel to the lower sides of two arch-stones, and the angles M F X, M F Y, N F X′, N F Y′, be made equal to the angle B C D above-measured, then, instead of its being required that the proportions of the weights resting on those sides should be strictly that of E M to E N, they may be in the proportions of any two lines, which, being set off from E towards S, have the end of the first between X and Y, and that of the second between X′ and Y′. The great latitude which this gives to the constuction (since B C D is, for some materials, as great as 40°) renders attention to the system of equilibration without friction almost unnecessary, so that any arch which does not very materially differ from the arch kept in equilibrium without friction, may be considered as safe from all fracture which arises from the slipping of an arch-stone. We can find no instance mentioned of an arch which broke in this manner.





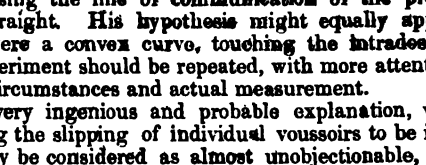


The difficulty in the way of determining the best figure of an arch, lies in our comparative ignorance of the manner in which pressure is actually communicated. The materials supposed in mechanical problems are usually perfectly rigid; those of nature are compressible: and though it is clear that a very slight alteration of form might throw the pressure of one arch-stone almost entire upon a very small part of the adjoining, we do not know enough of the nature of the materials even to guess at the law of distribution. Again, if a part of an arch be overloaded, but prevented from falling by the friction or cement, a new force, not contemplated in the preceding theory, is exerted upon the remainder. Dr. Robison, as far as we know, was the first who brought forward this method of considering the subject. He was led to it by observing an arch which fell, the account of which we give in his own words (*Mechanical Philosophy*, vol. i. p. 640): 'It had been built of an exceedingly soft and friable stone, and the arch-stones were too short. About a fortnight before it fell, chips were observed to be dropping off from the joints of the arch-stones, about ten feet on each side of the middle,' that is at H and F, 'and also at another place on one side the arch about twenty feet from its middle,' that is at I and G. 'The masons in the neighbourhood prognosticated its speedy downfall, and said it would separate in those places where the chips were breaking off. At length it fell: but it first split in the middle, and about fifteen or sixteen feet at each side,' that is at D and B, 'and also at the very springing of the arch,' that is at *k* and *l*. 'Immediately before the fall, a shivering or crackling noise was heard, and a great many chips dropped down from the middle between the two places from whence they had dropped a fortnight before,' that is from *a* and *b*. 'The joints opened above at these new places more than two inches, and in the middle of the arch the joints opened below, and in about five minutes after this the whole came down. Even this movement was plainly distinguishable into two parts. The crown sunk a little, and the haunches rose very sensibly, and in this state it hung for about half a minute. The arch-stones of the crown were hanging by their upper corners. When these splintered off, the whole fell down.'



The preceding method of fracture also took place in several model arches of chalk, loaded for the purpose, and Dr. Robison explains the phenomena as follows. He supposes that the pressure from the crown is communicated in a straight line along as many voussoirs as one straight line will pass through. That is, he considers each of the four parts E D, D A, A B, B C, as one separate stone, not liable to be broken. The preliminary chipping from I, H, F, and G he supposes to have arisen from the whole superincumbent pressure being there sustained at the corner of the arch-stones. When the arch opened underneath A, the whole pressure was supported at *a* and *b*, since the opening at B and D deprived the arch of the support at those points. This occasioned the chipping there observed just before the fall. We must, however, remark, that the loose manner in which the preceding account is given renders it impossible to say whether or no Dr. Robison was justified in supposing the line of communication of the pressure to be straight. His hypothesis might equally apply, if A H D were a convex curve, touching the intrados at H. This experiment should be repeated, with more attention to minute circumstances and actual measurement.

This very ingenious and probable explanation, which, supposing the slipping of individual voussoirs to be impossible, may be considered as almost unobjectionable, led its author to recommend that the arch should always be made so flat as to admit the same straight line being drawn so as to pass through some point of every voussoir on each side of the key-stone. That such an arch cannot be destroyed without either removing the pier, or crushing the material, is evident in the case of a triangular arch, *slipping being supposed impossible*, since there is no part of the arch which exerts any effort to overturn the rest, but only to crush it. Blackfriars bridge has arches of this kind, not indeed triangular, but so flat that a straight line can be drawn through all the voussoirs in the manner recommended by Dr. Robison.



On this subject we refer the reader to Dr. Robison's work above cited, and to the article 'Bridge' in the *Encyclopædia Britannica*. For the method of building an arch, see CENTERING, to which also we must defer the account of a method of constructing arches lately invented by Mr. Brunel, in which the stones are so joined that each half of the arch supports itself independently of the other.

ARCH. The origin of that species of construction called an arch is still unknown; it cannot be stated with any degree of certainty, either in what country or at what epoch it was first used. There is good reason to think that it was unknown to the Greeks at the time when they produced their most beautiful temples, in the fifth, fourth, and third centuries before the Christian æra. No structure answering to the true character of an arch has been found in any part of those works, though many occasions occur in which the application of the arch would have been of great service, and could not have been passed over by an intelligent and ingenious people like the Greeks, if they had been acquainted with the principle. The want of the arch would necessarily lead them to contract the intercolumniation, or spaces between the columns, and to the general and frequent adoption of columns as the only mode of supporting a superstructure. That the Greeks, before the time of Alexander, and perhaps even at a somewhat later epoch, were not acquainted with that mode of arranging materials upon which arching depends, might perhaps be considered sufficient evidence that it was unknown in Asia and Africa, even if the Indian, Egyptian, and other monuments of early date did not prove the same thing. If these nations had known this admirable expedient they would doubtless have applied it in many instances in which it is obvious that it would have been of the greatest use; and if it had been used in Egypt, it could hardly have remained unknown to those nations who were in the habit of trading with the Egyptians. We know that both the European and the Asiatic Greeks had commercial factories in Egypt, even in the reign of Amasis. (Herod. ii. 178.) [See Amasis.]

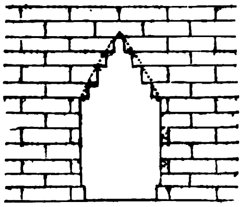
It is maintained, however, by some, that there are brick-arches at Thebes in Egypt, which belong to a very remote epoch, and one long prior to the Greek occupation of that country. Minutoli (*Reise zum Tempel des Jupiter Ammon*) has given two specimens of Egyptian arches, one of which is a false and the other a true arch. The first specimen is from the remains at Abydos in Egypt (p. 245), where the roof has the appearance of an arch, but is formed by three horizontal stones, of which that which occupies the centre and lies over the other two, is the largest; the three stones are cut under in such a way as to form a semicircle. The true specimens are at Thebes, on the west side of the river (p. 260), near and behind the building which contains the fragments of the enormous statue. They are circular arches, and formed of four courses of bricks (see pl. 29), and on the walls there are Egyptian paintings and hieroglyphics. (See also Belzoni's *Plates*, No. 44, and his remarks on the brick arches of Thebes.) Should these be admitted to be old Egyptian arches, it seems difficult to conceive why the arch should not have come into more general and early use. The stone arches in the Nubian pyramids can hardly be adduced in proof of the origin of the arch, as these edifices are probably not of very high antiquity. (See Cailliaud's *Plates*, No. 43.) Etruria seems, from the best evidence that can be obtained, to have been the birth-place of the arch, and to the Etrurians, with great probability, may be assigned the honour of the invention, and certainly that of its earliest applications, as far as our positive and undisputed information goes. The great sewer of Rome, commonly called the Cloaca Maxima, is an arched construction, which can hardly be referred to any period in the history of the city with so much probability as to that to which it is assigned by uniform tradition, namely, the age of the Tarquins. But though we may readily admit this early date, we cannot say who were the architects, whether they were Roman or Etrurian.

The application of the arched structure is one of the most useful mechanical contrivances ever discovered by man. By means of it small masses of burnt clay, and conveniently sized pieces of soft and friable sandstone, are made more extensively useful for the economic purposes of building, than the most costly and promising materials were in the hands of the Greeks and Egyptians. By means of it cellars are vaulted; subways, or sewers, are made to pass under heavy structures and along streets with certainty and safety; and secure and permanent road-ways for every purpose of communication are formed across wide, deep, and rapid rivers.

Extensively as they made use of the arch, the Romans did not deviate much from the semi-circular form. Arches of smaller segments were certainly used by them, as well as elliptical arches, but in these cases they were fortified with enormous abutments, which proves that the architects, who probably in nearly all cases were Greeks, knew very well the weak points of such a construction. It was reserved for the architects of the middle ages, or rather those of the twelfth, thirteenth, and fourteenth centuries, to show what could be done by varying the form and construction of the arch.

The pointed arch, upon its invention or first introduction into Europe, seems to have exercised the ingenuity of architects in varying its form and application. This we observe in the numerous ecclesiastical structures in this country, in our beautiful pointed styles, and most particularly in some of the greater churches and cathedrals.

The origin of the pointed arch has been almost as much disputed as the discovery of the principle of the arch itself. It became general in most parts of Europe at nearly the same time, and about the period of the return of the warrior-priests and pilgrim-soldiers of the first crusade. This, and other circumstances which might be adduced, added to the tolerably well ascertained fact of the pointed arch being used in Asia before that period, and that an arch of the pointed form cannot be satisfactorily shown to have been used at all in the northern and western parts of Europe anterior to it, give, in the opinion of some people, a reasonable degree of certainty to the supposition that the notion was brought from the east by the crusaders. Its origin may be this:—Before arching was understood, or its principle known, the use of long lintel stones was sometimes avoided, and, indeed, a trifling degree of strength was gained, by jutting stones over from each side of an opening in three or four courses until they nearly met in the middle then a stone of common size and ordinary length only was required to close in at the top, instead of a long and large one to serve as a lintel The projecting lower angles of the stones, which corbelled or battened over, were disagreeable to the eye, and might also be inconvenient; and therefore they would be generally cut off, as indicated by the dotted lines, leaving the head in the form of a pointed arch Such an explanation is, however, far from satisfactory; and it appears to us that the following extract from Mr. Rickman (*An attempt to discriminate the Styles of English Architecture*, by Thomas Rickman) contains a more probable solution of the difficulty, at least as far as concerns the origin of the pointed arch in early English buildings.



"Intersecting arches were most likely an early, and certainly a very widely-spread mode of embellishing Norman buildings, and some of them were constructed in places and with stones requiring centres to turn them on, and the construction of these centres must have been by something equivalent to compasses. Thus, even supposing (which could hardly have been the case) that the arches were constructed without a previous delineation, the centres would have led to the construction of the pointed arch; and when once formed, its superior lightness and applicability would be easily observed. To this remark it may be added, that the arches necessarily arising in some parts from Norman groining, would be pointed. A careful examination of a great number of Norman buildings will also lead to this conclusion, that the style was constantly assuming a lighter character, and that the gradation is so gentle into early English, that it is difficult in some buildings to class them, so much have they of both styles: the same may be said of every advance; and this seems to be a convincing proof that the styles were the product of the gradual operation of a general improvement guided by the hand of genius, and not a foreign importation."

We propose to treat of the various forms and decorations of the arch under the several divisions indicated in the article Architecture.

ARCH, TRIUMPHAL, a structure which the Romans used to erect across their roads, or bridges, or at the entrance of their cities, in honour of victorious generals or emperors. They were of two kinds; temporary arches made of wood, on the occasion of a triumph, when the procession passed under the arch, and the conqueror had the triumphal crown placed on his head. These arches were removed after the ceremony. The others were permanent structures, built first of brick, afterwards of hewn stone, and lastly made of, or at least cased with, marble. Their general form is that of a parallelopipedon, which has an opening in the longer side, and sometimes a smaller opening on each side of the large one. These openings are arched over with semicircular arches, and the fronts are decorated with columns and their accessories on lofty pedestals the whole is surmounted by a heavy attic, on the faces of which inscriptions were generally placed.

Triumphal arches were erected under the Republic. An arch of P. Cor. Scipio Africanus (Liv. xxxvii. 3.) is mentioned as having been built on the Clivus Capitolinus. (See also Liv. xxxiii. 27, on the arches of L. Stertinius.) The Fabian arch is mentioned by Cicero (*Pro Planco*) under the name of ‘Fabianus fornix:’ it stood by the Via Sacra, near the spot afterwards occupied by the temple of Antoninus and Faustina. It was raised in honour of Fabius, surnamed Allobrogus from his victory over the Allobroges. This arch is also mentioned by Seneca, who calls it ‘Fabianus arcus.’ The term used by Dion Cassius for a triumphal arch is ἀψὶς τροπαιόφόρος. The arches of Stertinius and Scipio were ornamented with gilded statues; and that of Scipio with two horses also. Whether they precisely resembled the later arches as to their columns, rilievos, and other accessory parts, we cannot say. As far as we can judge from medals, these early triumphal arches consisted of a single arch with a column on each side, without a stylobate; the arch was surmounted by a simple border as a kind of architrave.

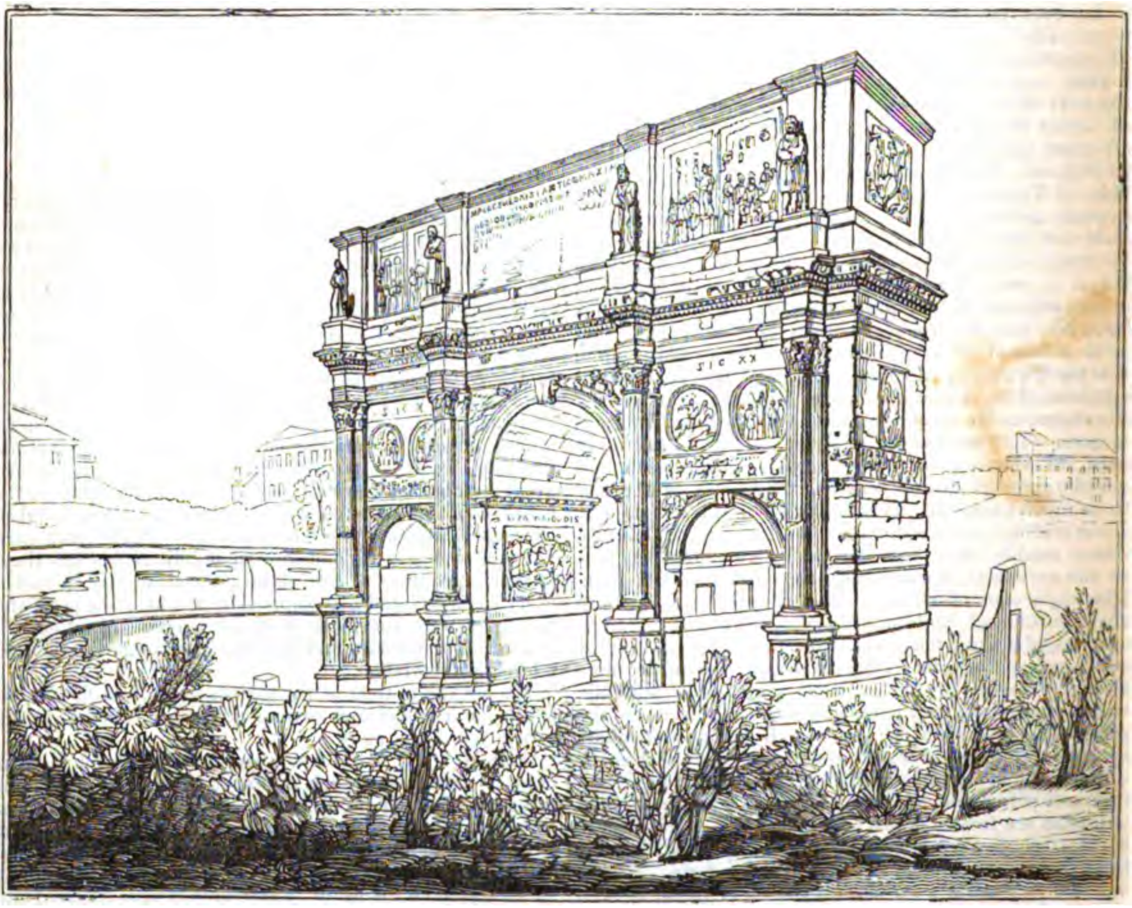
Under the emperors these monuments became very numerous, and were overcharged with ornaments. Drusus, the stepson of Augustus, is mentioned as the first who had one raised to him after death, and Livia, the wife of Augustus, was the first woman to whom a similar honour was decreed. Augustus himself had several triumphal arches erected to him, of which the one at Rimini, where the Flaminian Way terminated, still remains, and serves as a gate to the town on the side towards Rome. Another arch, also erected to Augustus, though inferior in beauty to that of Rimini, exists at Susa, at the commencement of the road which leads over Mont Genèvre into France. Of the triumphal arches remaining at Rome, that of Titus is the oldest. It was erected to him after his death by the senate in memory of his conquest of Judæa. This arch is ornamented with sculptures representing the triumph of the conqueror, and with the ornaments of the temple of Jerusalem which he brought as spoils to Rome. But arches were not erected solely to commemorate victories and conquests; they were also raised in honour of emperors for benefits conferred on their country on some particular occasions · such is the fine arch of Trajan on the old mole of Ancona. It is of white marble, and chaste in its style; the inscription states that it was raised ‘by the senate and people of Rome to Trajan, Emperor and Cæsar, son of Nerva, the conqueror of the Germans and Dacians, high pontiff, &c., a most provident prince, for having at his own expense constructed the mole, and thus rendered the access to Italy on this side safer to navigators.’

Central Inscription on Trajan's Arch.

Imp. Caesari. Divi. Nervae. F. Nervae.
Trajano. Optimo. Aug. Germanic.
Dacico. Pont. Max. Tr. Pot. XVIIII. Imp. IX.
Cos. IV. P. P. Providentissimo. Principi.
Senatus. P. Q. R. Quod. Accessum.
Italiae. Hoc. Etiam. Addito. Ex. Pecunia. Sua.
Portu. Tutiorem. Navigantibus. Reddiderit.

On the Right.	*On the Left.*
———	Divae
Plotinæ	Marcianae
Aug.	Aug.
Conjugi. Aug.	Sorori. Aug.

Bronze statues of Trajan, of his wife Plotina, and his sister Marciana, were placed on the summit of the arch, but they have been destroyed. Another fine arch in memory of Trajan exists at Benevento; it is ornamented with fine rilievos, and is in very good preservation. All these are single arches; but others have two smaller archways, one on each side of the great central one. These are consequently oblong in their shape, and have a heavier appearance than the single arch. Two of these triple arches still exist at Rome, that of Septimius Severus, and that called the arch of Constantine, which we have chosen for our illustration. The view here given is from an original drawing. The arch of Constantine is in the valley at the foot of the Palatine Hill, and near the Colosseum. It is the most complete of all the triumphal arches at Rome: that of Titus has



[Arch of Constantine.]

only a central archway, and that of Septimius Severus is more dilapidated, and more encumbered by accumulations of soil. The style of Constantine's arch is also, for the most part, superior to that of the age in which it was executed, as it consists, in great measure, of the materials of a similar monument which had been erected to Trajan. But at the same time, owing to its being chiefly built of old materials, and owing to want of skill in the architect and sculptor, it presents some striking discrepancies of parts, and some specimens of bad taste. The captive Parthians, and other sculptures, which were historically appropriate on the arch of Trajan, are here employed to decorate that of Constantine. Our view indicates an excavation, bounded by a wall of an elliptical form, within which the monument stands. Accumulations of soil had raised the level of the ground nearly up to the bases of the columns; the excavation was made for the purpose of clearing away the rubbish, and the wall with the view of protecting the monument.

The number of marble arches, in honour of emperors and other personages, existing in antient Rome alone, is stated to have been at one time thirty-six: only five or six are now remaining. Other arches are found in various parts of Italy, at Aquino, Aosta, Pola in Istria, &c.; several in the south of France, of which those of Nismes and Orange are the best preserved; several in Macedonia, at Athens, and in other parts of Greece, all however belonging to the Roman period; several in Syria, and in Barbary, particularly one at Tripoli; and another at Constantina, described by Shaw. In modern times, triumphal arches have been raised in imitation of the Roman ones. Those of the gate St. Denis and the gate St. Martin at Paris were raised in honour of Louis XIV. Bonaparte also had one constructed on the Place du Carousel; it is a triple arch, and has all the heaviness of that particular species of structure. Another, and a much finer one, was begun by his order at Milan, on the opening of the famous road across the Simplon. It was interrupted by the overthrow of the French empire, but has since been continued by order of the Austrian government, under the appellation of the Arch of Peace. It is now nearly finished. In London, two structures of the same kind have been raised of late years, a single arch at Hyde Park Corner, and a triple one in front of the Pimlico palace. On Roman triumphal arches the reader may consult Pitiscus, *Lexicon Antiquitatum Romanorum*, art. Arcus.

The arch of Augustus at Rimini is sixty feet in height and twenty-seven in depth or thickness; the gateway is thirty-one feet, being the widest opening among all the antient arches in Italy. The front is decorated with two Corinthian columns thirty-two feet high. It is made of Istrian marble.

The arch of Septimius Severus is sixty-one feet high, seventy-one feet long, and twenty-two feet deep. The central archway is thirty-six feet high, and twenty-two feet wide. The side arches are twenty-two feet high and ten wide.

The arch of Orange, in the south of France, supposed, but upon no certain grounds, to have been erected in honour of Caius Marius, is seventy feet high and sixty-six long. It is a triple arch.

ARCHANGEL, or properly **ARKHANGELSKOE**, 'the land of the archangel,' was one of the three roots from which the gigantic empire of all the Russias has sprung. Great is our land, and rich in fruits; but there reigns no order in it. Come, then, be princes unto us, and hold dominion over us.' At this summons from the Slavonians of Nowgorod, Rurik, Sineus, and Truwor, three brothers, chieftains of note among the warlike Warages, or Waragie-Russians, with whom both Normans and Anglo-Saxons claim kinship, descended from the Gulf of Bothnia, and divided the sovereignty of their adopted country among them. Rurik selected Nowgorod for his residence; Truwor established himself at Isbörsk; and Sineus, receiving the northernmost lands for his share, took up his quarters at Bielo-O'sero, or 'the White Lake.' The two younger brothers having died within two years after their arrival, Rurik, the survivor, in 864 became sole ruler over the three states, and the founder of a new empire, which is known among northern writers by the name of the 'Holmgard Empire.' Archangel is no less celebrated, in the description given by Alfred the Great of the Scandinavian nations, as the seat of the extensive empire of Biarmia (or Permia), which rose at the mouth of the Dwina, and spread across the countries which range between that stream and the sources of the Volga. Tradition reports, that even in those early times navigators were accustomed to sail round the coasts of Norway in quest of the produce of Biarmia.

The province of Archangel is now one of the nineteen provinces, or governments, which constitute that portion of the Russian dominions called 'Great Russia;' and is not only the most northern but the most extensive province of Russia in Europe. It comprehends part of antient Biarmia, Russian Lapland, the range of country inhabited by the Wainotan branch of the European Samoiedes, Nowaia Zemlya, or Nova-Zembla, and other islands in the Icy Ocean. Its most eastern limit is about 66° E. long., and its most western 29° 54′; its southernmost point is in 61° 10′ N. lat., and its most northern limit extends to lat. 76°, the extreme point of Nova Zembla. The superficial extent of this province is variously estimated; by some writers at two hundred, by others at two hundred and seventy, and by more than one even at three hundred and fifty thousand square miles. Including the 27,000 miles contained in the recent addition of the circle of Kem, we conceive that its superficial extent may be safely set down at upwards of 300,000 square miles. In this respect, therefore, it exceeds the superficial area of the whole of the Austrian dominions, and is more than three times as large as Great Britain. But its population does not exceed 280,000 souls at the utmost, or about one to a square mile. Its continental limits are the government of Tobolsk on the north-east and east, Wologda on the south and south-east, Olonetz on the south-west, and Finland on the north-west; its northern shores are washed by the Icy Ocean, and the great gulf of the White Sea. The northern part of the main land in this province is situated within the Frigid Zone, and presents as desolate and sterile an aspect as the eye can dwell upon: this is particularly the case towards the east, where an immense tract of black soil, covered with moss and crusted with ice for nine months in the year, is better known among the natives by the name of the 'Tundri.' It stretches 150 miles into the country from the seacoast; and except its mossy coat, a little sorrel, and an occasional handful of berries, exhibits few signs of vegetation. South of the Tundri lie forests of pines, birches, alders, and willows. The land in the north abounds in lakes and swamps, and is traversed by several rivers, but is not capable of cultivation; the westernmost part of it only, formerly called Russian Lapland, produces here and there a few cabbages, turnips, and other sorts of vegetables, as well as berries. Even that portion of the province, which lies most to the south, affords but a scanty and precarious return to the husbandman; though in proportion as we leave the northern regions, vegetation becomes more vigorous, and grass and extensive forests show themselves. The province is in general a continuous flat, particularly that part of it which lies to the west, between the frontiers of Finland and the river Mezen: the only exception arises from the course of the Scandinavian range of mountains through the circle of Kem and Lapland; it is in this direction that they terminate in the promontories of Orlow on the White Sea, and Swiàtoi Noss or 'Holy Point' on the Icy Ocean. In the eastern parts of the province two ridges encircle the bay of Tsheskai, the westerly branch of which ends at Cape Kanin: these are independent of the low chain of hills which crosses the steppe of Tundri, and rising at a distance of seventy miles from the banks of the Petshora, takes a north-easterly course, and joins the Ural, from which point the latter forms the boundary between Archangel and Siberia. This portion of the Ural range is called 'the desert Ural.'

The great river of the province is the Dwina, or 'the double river.' In its upper course from Lake Kubinskoi, it bears the name of 'Sukhona,' which it retains north-eastwards as far as Ustyug-Weliki; there it receives the name of the 'Jug,' or Upper Dwina, and afterwards that of the Dwina. It abounds with fish, and is navigable for 300 miles and upwards to the frontier of the province of Wologda; it widens to a breadth of nearly five miles at the town of Archangel, whence it flows by three channels into the White Sea. [See Dwina.] The Sukhona communicates with the Neva and Wolga by means of the Kubinskoi canal and the lake of Bielo Osero. The Onega, whose whole length is nearly 400 miles, is likewise a navigable stream of some consequence; it enters the province from the adjoining government of Olonetz, and flows into a bay of the White Sea studded with islands. The same sea, west of Archangel bay, also receives the Panoi, the longest river in Lapland; and the Mezen, a considerable stream, which rises in the marshes of the steppe of Petshora, and flows in a north-westerly direction for nearly 500 miles. The Petshora rises in the Ural mountains, ranges over a distance of full 700 miles of dreary waste, and, before it crosses the boundary between the provinces of Wologda and Archangel, receives the Usa and Elma, and then enters the sea, between Capes Bolvanski and Kostianoi, where its surface is spotted with islands: it is navigable immediately after quitting the Ural mountains, but is locked up by ice for nine months in the year; its dreary banks are rarely the resort even of the hardy Samoiede.

The province of Archangel abounds in lakes, separated by sterile rocks, in almost countless numbers; the most considerable lie in that part of it which is situated immediately north and west of the White Sea. Amongst these are the Imandra, Kowda, Toposero, Angosero, and upper and lower Koutno.

The climate of this province, particularly the northern districts, partakes both of the extremes of heat and cold. The heat of the summer season is often oppressive; and the transition from heat toc old, on a change of wind, is frequently so instantaneous, that a man who has been working in his shirt is forced to have immediate recourse to his fur-cloak. But the climate becomes more intensely severe in proportion as we advance eastward. Every river between the Mezen and Petshora is frozen up by the end of September or beginning of October; the Dwina, on the other hand, does not usually close until a month later, and is again free from ice by the end of April or the first week in May. In those parts which lie between the Petshora and Siberia, the Samoiede himself yields to the inclement cold: no stream is open until June, and scarcely one is free from ice by the middle of September. Spring, summer, and autumn are thus reduced to an interval of three months.

The northern districts of Archangel are wholly uncultivable, and its soil, even in the south, does not yield grain enough even for the support of its scanty population. The bread in use is a compound of meal, moss, scrapings of the bark of the pine, and grated roots; yet this food, coarse as it is, is unknown to more northern palates, which must be content with dried fish. The southern districts grow hemp and flax, and a few kinds of vegetables; and in some parts, on each side of the Dwina more especially, there is pasture ground of good quality. But Archangel contains a still unexhausted mine of wealth in its forests, which give profitable employ to the labourer, the artisan, boatman, mariner, shipwright, merchant, and even the more humble gleaner of the berries which grow beneath their shade. The predominant species of timber are firs, pines, birches, alders, and larches, which are of great dimensions and lofty growth. These forests are the resort of a variety of wild animals, which the natives turn to good account. In the Tundri and sea-coast are the bear, wolf, rein-deer, squirrel, ermine, hare, martin, glutton, fox (both the common species and the beautiful polar-fox), wild duck and goose, swan, water-hen, and eider-fowl. To these may be added an abundance of marine animals, in pursuit of which hunting parties resort to Nova Zembla in particular, where they build cabins with the wood they have brought with them, and pass the winter, employing themselves in catching seals, sea-cows, and morse, or in hunting the polar-bear, fox, or rein-deer. The seas, lakes, and rivers of Archangel furnish food to the inhabitants from their ample store of whitings, pikes, eels, salmon, perches, and other fish. The only domestic companion of the Laplander and Samoiede is the rein-deer; their stock of this invaluable animal forms the criterion of wealth; hence the individual who has two thousand is accounted rich, but the man is poor who cannot muster more than thirty or forty. Archangel is but slenderly supplied with horses and cattle, and they are in general of diminutive size: the districts of Kolmogory and Shenkursk, however, which are rich in pastures, have formed an exception ever since the time of Peter the Great, when a handsome race of oxen, which have no way degenerated, were imported from Holland by that monarch: the calves of this species are kept warm, and fed on milk for nine months; at this age they weigh sometimes as much as six or eight hundred pounds, and are so white and delicate in flesh, that they are sent to St. Petersburg, where they fetch uncommonly high prices. Neither sheep, swine, nor goats are bred in any considerable numbers; what little mutton is eaten is of indifferent quality, and the fleece is fitted only for making the coarse cloth termed wadmal. The country is also so well-stocked with game, that scarcely any poultry beyond the cock and hen are kept. With regard to minerals, salt is the staple product of this province: it is obtained in various quarters, particularly in the neighbourhood of Totma, and from the waters of the Kouda and Lesenga by the process of boiling. Bog-iron is found in considerable abundance, and between 700 and 800 tons of it are exported annually.

The manufacturing and mechanical industry of the people is principally confined to ship-building, the preparation of pitch and tar, and the weaving of linen, which latter occupation fills up the leisure hours of the peasant's wife in the circles of Kolmogory and Archangel, and constitutes a lucrative branch of their commerce with St. Petersburg, Moscow, and other Russian marts. In some years, 3000 tons of pitch have been boiled down, and 13,000 barrels of it exported; whilst the ports of the White Sea have despatched tar to the extent of 25,000*l.* in value to foreign parts. There are four refineries for sugar in the province, and seven rope-manufactories, but only three of them can be said to be of any importance. From 400,000 to 500,000 deals are often exported from the capital in a single twelvemonth. Tallow also is shipped in very large quantities from the White Sea, sometimes to the extent of 2500 tons and upwards yearly; but the bulk of this article is brought down from the adjacent provinces. The less important productions of Archangel which find their way outwards, are train-oil, hemp, flax, mats, canvas, skins, and furs.

The majority of the population of Archangel is of Russian extraction, in the proportion of ninety-five out of every hundred souls; the remaining portion consists of about 7000 Samoiedes, 6000 Syriaenese (or Siriáni, a Samoiede race, who inhabit the districts lying around the upper banks of the Petshora), and 1700 Laplanders, besides a few Fins, who are domesticated in the circles of Kem and Kola. The tenets of the Greek faith are professed by all but a few thousand pagans, amongst whom the forcible conversion directed by an ukase of the year 1825 has, we trust, been as successful in respect of their religious convictions, as it has been of their numbers; for within five years from the sending out of the missionaries three churches were built for the use of the 3500 heathens who had been prevailed upon to embrace Christianity. These converts consist almost exclusively of the Samoiede hordes who inhabit that part of the province of Archangel which stretches from the Mezen to the frontiers of Siberia,—a tract of country than which Russia in Europe does not contain a colder, wilder, or more inhospitable climate. This uncivilized race of beings, whose name implies 'eaters of one another,' though there is no trace whatever of their having deserved to be branded as cannibals, originally migrated from Siberia; but they are not the primitive inhabitants of the soil; for the ruins of whole lines of antient dwellings, which are found on the banks of lakes and rivers, show that the Samoiede was by no means the first occupant of this country. The name has been in use among the Russians ever since the eleventh century; but the Samoiede himself admits no other than that of Chassowa, signifying, in his own language, 'man.' He is of middling stature, has a broad, flat, round face, brownish-yellow complexion, small black eye, black hair and eyebrows, and but a slender beard,—in every respect the counterpart of his Asiatic brethren, who are far more numerous in the north of Siberia, where there are upwards of 60,000 of them. The dialect of the European Samoiede is poor and imperfect, and spoken by no stranger but a few Cossack dealers; the use of written characters is unknown among them. They seldom attain to a greater age than sixty or seventy, lead a wandering life, and, with the assistance of their rein-deer, shift their encampment as inclination or necessity prompts them. They live by breeding that animal, catching fish, and following the chase; which enables them to discharge their annual 'Jassàk,' or tribute of furs and hides, to the Russian crown. This is fixed at three foxes' skins for every Samoiede who carries bow and quiver; and is collected by the oldest among them, who must make their appearance at Mezen in the months of December or January, and deliver the yearly quota to the Russian authorities. What they succeed in collecting for their individual benefit is sold to the travelling Russian dealer, or carried to the open markets in the adjacent provinces. Indeed they are frequently known to transport their merchandise 500 miles and upwards for a sale; many of them resorting to so distant a spot as Obdorsk in the month of February, where they exchange their wares for Russian bread. Erman, indeed, tells us that they will at times trace the immense distance of 1500 miles, which lies between Archangel and Turnkhansk on the Jenisei, from mere fondness for shifting their quarters. [For further details, see the article SAMOIEDES.]

Archangel consists of eight circles, namely, the city and dependencies of Archangel, Kholmogory, Shenkursk, Pinega, Onega, Kem, and Mezen. Independently of Archangel itself, the circle of that name contains Nowa-Dwinskaia-Krepost, a fortress, about ten miles distant from the capital, on an island of the Dwina, the entrance of which it defends; close upon the ramparts is a town of about two hundred houses, which are mostly used as stores by the merchants of Archangel. The island of Soloweskoi, in the White Sea, is also within the limits of this circle: it is the largest of a cluster lying about 150 miles N.W. of Archangel, and, besides a monastery, to which numbers of pilgrims resort, contains a borough town, the inhabitants of which prepare a peculiarly pure description of isinglass, considered by some to be the finest that Russia produces. The chief town in the circle of Kholmogory bears the same name, and is situated on an island in the Dwina, thirty-five miles south of Archangel: it has a building-yard for ships, and a school for navigation: its environs afford pasturage for the finest breed of cattle in this quarter of the world. The population scarcely exceeds 500 souls. Shenkursk is the capital of the circle so called, and lies on the Waga, about 170 miles S.E. of Archangel· it is said to have been inhabited by the Tshudes, who are supposed to have been a Finnic race, before the Russians settled in the country; and the remains of a fort, built by them, are still to be seen on an adjacent eminence. In the circle of Pinega is the inconsiderable town of the same name, on the banks of the Pinega, which flows into the Dwina. The chief town in the circle of Onega bears the same appellation, and is situated at the mouth of the Onega, which runs into the bay of that name in the White Sea. It lies about 80 miles S.W. of Archangel, and possesses a good harbour, is engaged in shipbuilding, and exports timber, tar, and pitch. The number of its inhabitants is about 2000. Kem, the capital of the circle of that name, which once formed part of the province of Olonetz, and has latterly been incorporated with that of Archangel, is a small town with a harbour, not far from the afflux of the Kem into the White Sea. Kola, or Kolkoi-Ostrog, the principal place in Russian Lapland, in 32° 30′ E. long. 68° 20′ N. lat., is the northernmost town of Russia in Europe, and next to Wardöe, a port on a promontory in eastern Finmark in Norway, which lies in 31° 7′ 30″ E. long., 70° 22′ 36″ N. lat., and to Hammerfest, which is on an island likewise on the Norwegian coast, (70° 38′ N. lat., 23° 49′ E. long.) is the northernmost town in Europe: it is situated close upon an arm of the White Sea, between two rivers, the Tuloma and Kola, and possesses a harbour formed by the mouth of the latter stream. Its inhabitants, in number about 1200, are employed in catching walruses, cod, and whales, and traffic in furs and hides. There is a copper-mine in its vicinity, and at the extremity of the gulf is the port of Ekatèr nakaia. Kola is about 630 miles north of St. Petersburg. It should here be observed, that the Fälleds districts, formerly belonging to Norway, have constituted a portion of Russian Lapland, by virtue of the frontier treaty concluded between Russia and Sweden, ever since the year 1826. Part of the river Pasvig, and the Jacob's Elve, now separate Swedish from Russian Lapland. Neiden and Peise, two places within the latter, are the resort of the native traders. The capital of the circle of Mezen, as well as the chief town in the territory of the European Samoiedes, bears the same name as the circle, and lies on the river Mezen, twenty-eight miles from the Icy Ocean, where it forms a harbour: it is inhabited wholly by Russians, who make excursions on an extensive scale to Spitzbergen and the islands of Kalguiew and Nova-Zembla, and bring back with them the produce of their toils by land and sea, in such quantities as to give rise to considerable traffic. It is about 140 miles E.N.E. of Archangel. The other spots deserving of notice in the land of the European Samoiedes are Pust-Osersk, the central point of their dealings, which lies on a lake of the same name connected with the Petshora, consists of about fifty houses, and has seventeen villages dependent upon it: this place is resorted to even by the fur-dealers of Wologda, St. Petersburg, and Moscow, who reach it in October and November, and leave it shortly before Christmas. The natives breed rein-deer in such large numbers that many of them possess herds of 1000 each. Pust-Osersk is about 150 miles to the N.E. of Mezen, and lies on a lake near the mouth of the Petshora. About 140 miles eastwards of Pust-Osersk lies Ust-Zülma, on the right bank of the Petshora; it contains 120 houses, and has four villages within its district: besides rearing rein-deer and raising barley, the inhabitants deal largely with the Russian traders in furs and the produce of their fisheries. And about sixty miles farther onwards stands Ishma (or Ishemskaja-Slobodka) on the banks of the Ishma; it consists of sixty-four houses, and has several villages within its jurisdiction. Rye and barley are cultivated near this spot; the natives breed considerable numbers of rein-deer, and carry on a thriving trade in furs, tallow, butter, and dried fish.

The islands of Kalguiew, Warandei, Waigats, Nova-Zembla, and Tshorni, which are the chief among the insular dependencies of the province of Archangel, will be noticed under their respective heads.

ARCHANGEL (known amongst the Russians by the name of *Gorod Arkhangelskoi*, or town of the convent of 'St. Michael' the archangel) is the capital of the province of Archangel, and the most northern emporium of trade in the Russian dominions. Its site is a low flat; it extends about two miles along the right bank of the Dwina, and is forty miles from the mouth of that river. It is not accessible to vessels of heavy burthen, owing to the shallowness of the stream and a bar which runs across it, with only twelve feet of water, about five miles below the town. Archangel is the oldest port in the Russian dominions: in the eyes of our own countrymen, however, no circumstance can render it an object of greater interest than its celebrity in the annals of British enterprise. The discovery of a passage to the coasts of the White Sea has been truly said to have formed an epoch in the history of commerce; for it gave an entirely new direction to the trade of the north. This took place in 1553, when Richard Chancellor, the commander of a vessel which was despatched, in company with two others, to find out a north-eastern passage to China, navigated the White Sea and sailed up the bight of St. Nicholas, into which the Dwina pours its waters. From this point he made his way to the court of Ivan II., who, being thus convinced of the practicability of navigating seas hitherto deemed inaccessible to the mariner, gave directions shortly afterwards for building the port of Archangel, which was commenced by Nashtshokin, the woiwode of those parts, in the year 1584, upon a spot previously selected as a homestead by the members of a religious establishment. Russia at this time possessed no ports on the Baltic; and, indeed, for a long period subsequent, no other port but Archangel in its whole dominions. It is now become the chief mart of its northern trade, as it was, in its early days, the centre of all traffic between Muscovy and foreign parts. The benefit of the discovery, after it had been for some time confined to our own countrymen, was afterwards shared with the Dutch and Hamburghese. Archangel is mentioned in the travels of the Holstein ambassadors to Muscovy and Persia, as a considerable port in 1636; it is remarked, that from 300 to 400 ships, principally English and Dutch, were sometimes seen in the port. (Olearius, *Voyage de Moscovie*, p. 159.) The prosperity of the port received however a shock from the establishment of St. Petersburg, from which it did not recover till the Empress Elizabeth placed its immunities on a level with those of the metropolis in the year 1762. It has since been increasing gradually in importance. During the hundred years which preceded 1827, the exportations of Archangel did not amount to more than 23,350,000*l*., or, on an average, 233,500*l*. a-year: whereas, in 1829, they were to the extent of 562,000*l*. In that year, too, the number of vessels which entered was 412; being an excess of 95 over the return for 1825. Its trade has been improved of late years by the opening of a communication by canal with Moscow and Astrachan. The bulk of its shipments still consists, however, of the growth and manufacture of Siberia, and more northerly latitudes; such as fish, fish oils, tallow, candles, timber wrought and unwrought, pitch, tar, wax, iron, linseed, furs, hides, bristles caviar, &c. When the navigation of Archangel is open, the river, from the roadstead to the town, is covered with vessels and boats of all sizes; the quays and shores are peopled with multitudes, variously and actively employed; and the great road from Siberia is covered with travellers and loaded carts and waggons. Archangel does not contain above 2000 houses, and its inhabitants do not exceed 15,000: in both respects it stands much on a par with Berwick-upon-Tweed. Mixed with the native-born subjects of Russia are a few Englishmen, Dutchmen, and Germans, who are, almost without exception, merchants or mechanics. In a manufacturing point of view, Archangel is of minor importance: there are some sugar-refineries, and manufactories of canvas and cordage; there is also much ship and boat building going on; and eleven miles below the town lies the government yard, with three slips for building ships of war. This establishment is protected by the lines of Nowadwinka, which command the entrance into the Dwina, and afford security to the property of the Archangel merchants, which is deposited in the adjacent storehouses. The females employ themselves in spinning yarn, and making a coarse sort of linen, both of which are in much request in the interior of Russia. The houses are almost universally constructed of wood, the external covering being laid horizontally, and, in some instances, doubly covered, and coloured outside: most of them are two stories high; they form a comfortable residence, and, when inhabited by the wealthier class, are provided with every species of convenience, and indeed luxury. The most striking of the stone edifices is the Gostinnoi-Dwor (caravansera, or court of the trading guests), an extensive mart for the exhibition and sale of goods, which is surrounded by high walls, with six large towers, and a ditch. The churches are eleven in number; ten for the Greek and one for the Protestant form of worship; but most of them are built of wood, and the Greek churches gorgeously decorated within. The marine hospital is a building of some extent, and open to foreign as well as native seamen. But its greatest ornament is a number of open spaces, on which the merchants and dealers erect their stalls: here all articles of the same class are ranged in successive rows, and they are of almost endless variety. There are several schools in the town, at the head of which are a seminary for ecclesiastics, a gymnasium, and academies for teaching navigation and engineering. Upon the whole, Archangel is an ill-built place; the two main streets run in a zigzag direction parallel with the Dwina, and are connected by narrow lanes; they are moderately broad, and kept tolerably clean, but, instead of pavement, are floored with timber in a rough state. Its supplies of provisions are brought from a distance, as the soil in the neighbourhood grows no grain or vegetables, and breeds no cattle; this is a consequence of its position—close upon the line at which the growth of corn and fruit ceases; this line being, near the mouth of the Dwina, under the 65th degree of latitude. An association was formed at Archangel in the year 1803, under the title of the 'White Sea Company;' it despatches a fleet of vessels every year on fishery expeditions to the coasts of Nova Zembla, Kalguiew, and Spitzbergen, at the last of which the crews frequently winter. Here they contrive to maintain themselves without much difficulty by the chase, but they depend, both for their rude wintry dwellings and their fuel, on the timber thrown up by the ocean. Archangel is the seat of an archbishopric, and the residence both of a civil and military governor. The neighbouring island of Solombalsk, which is formed by the Kushenida, contains an admiralty and marine-barracks. Archangel lies in 64° 32′ N. lat., and 40° 33′ E. long., or about 400 miles N.E. of St. Petersburg.

ARCHÆO′LOGY, literally 'the study of antiquity or antient things,' from ἀρχαῖος, *antient*, and λόγος, *a discourse*. Though the term is often used, its meaning in this country has not always been very exactly fixed; but there is nothing properly belonging to it which is not included under the heads of ANTIQUITY and ANTIQUITIES. In general, the term archæology is confined to the study of Greek and Roman art, but it is sometimes used to express generally the study of all that concerns the early history of any nation or country. The divisions of the subject are consequently very numerous, and the chief works on each will be noticed under their respective heads, such as EGYPT, GREECE, MEDALS, SCULPTURE, &c.

The great extension which the study of archæology has received of late years, and is still receiving, seems to require now more than ever the *united* exertions of all who devote themselves to it. In this point of view, the Archæological Institute of Rome, founded in 1829, seems likely to be of great utility. (See *Thatsachen des Archäologeschen Instituts in Rom*. Von Dr. Eduard Gerhard, 1832.)

ARCHBISHOP. For what belongs to the episcopal character and office generally, we refer to the word BISHOP: we mean to confine ourselves in this article to what belongs more peculiarly to the archbishop. For though, in this country, and generally throughout Europe, the archbishop has his own diocese in which he exercises ordinary episcopal functions like any other bishop in his diocese, yet he has a distinct character, having an admitted superiority and a certain jurisdiction over the bishops in his province, who are sometimes called his suffragans, together with some peculiar privileges. This superiority is indicated in the name. The word or syllable *arch* is the Greek element αρχ, (which occurs in ἀρχὴ, ἀρχὸς, ἀρχων, &c.,) and denotes precedence or authority. It is used extensively throughout ecclesiastical nomenclature, as may be seen in Du Cange's *Glossary*, where there are the names of many ecclesiastical officers into whose designations this word enters, who were either never introduced into the English church, or have long ceased to exist. Exalted officers of state have sometimes designations into which this word enters, as *arch-duke*. Why this word was used peculiarly in ecclesiastical affairs rather than any other term denoting superiority, is probably to be explained by the fact that the term ἀρχιερεὺς, for chief-priest, occurs in the Greek text of the Christian Scriptures. *Patriarch* is a less obvious compound of the same class, denoting the chief-father; and is used in ecclesiastical nomenclature to denote a bishop who has authority not only over other bishops, but over the whole collected bishops of divers kingdoms or states; it is analogous in signification to the word *pope* (papa), a bishop to whom this extended superintendence is attributed.

Whatever might be the precise functions of the episcopus (ἐπίσκοπος, bishop), the term itself occurs in the writings of St. Paul, Phil. i. 1, 1 Tim. iii. 2, and elsewhere; but the word ἀρχιεπίσκοπος, or archbishop, is not found till about or after the fourth century. Cyrillus Archiepiscopus Hierosolymitanorum, and Celestinus Archiepiscopus Romanorum, occur under these designations in the proceedings of the council held at Ephesus, A. D. 431. Other terms by which an archbishop is sometimes designated are *primate* and *metropolitan*. The first of these is formed from the Latin word *primus*, 'the first,' and denotes simple precedency, the first among the bishops. The latter is a Greek term, which rendered literally into English would be *the man of the mother-city*, that is, the bishop who resides in that city where is the mother church of all the other churches within the province or district in which he is the metropolitan.

The term metropolitan, when thus analyzed, points out to us the origin of whatever real distinction there is between bishop and archbishop, or, in other words, the cause of that elevation which is given to the archbishop above the bishops in his province, when it is not to be attributed to mere personal assumption, or to be regarded only as an unmeaning title. The way in which Christianity became extended over Europe was this: an establishment was gained by some zealous preacher in some one city; there he built a church, performed in it the rites of Christianity, and lived surrounded by a company of clerks engaged in the same design and moving according to his directions. From this central point, these persons were sent from time to time into the country around for the purpose of promoting the reception of Christianity, and thus other churches became founded, offspring or children, to use a very natural figure, of the church from whence the missionaries were sent forth. When one of these subordinate missionaries had gained an establishment in one of the more considerable cities, remote from the city in which the original church was seated, there was a convenience in conferring upon him the functions of a bishop; and the leading design, the extension of Christianity, was more effectually answered than by reserving all the episcopal powers in the hands of the person who presided in the mother church. Thus other centres became fixed; other bishoprics established; and as the prelate who presided in the first of these churches was still one to whom precedence at least was due, and who still retained in his hands some superintendence over the newer bishops, *archbishop* became a suitable designation. Thus in England, when there was that new beginning of Christianity in the time of pope Gregory, Augustine, the chief person of the mission, gained an early establishment at Canterbury, the capital of the kingdom of Kent, through the favour of King Ethelbert. There, in this second conversion, as it may be called, the first Christian church was established, and from thence the persons were sent out, who at length christianized the whole of the southern part of England. Paulinus, in like manner, a few years later, gained a similar establishment in the kingdom of Northumbria, through the zeal of King Edwin, who received Christianity, and built him a church at York, one of his royal cities, which may be regarded as the chief city of Edwin's kingdom. From York the light of Christianity was diffused over the northern parts of England, as from Canterbury over the southern. It seems to have been the peculiar diligence and dignity of Paulinus which procured for him the title of archbishop, and gave him a province, instead of a diocese only, as was the case with the other members of the Augustinian mission. This was done by special act, under the authority, it is said, of Justus, an early successor of Augustine. But the precedence of the real English metropolitan is acknowledged in two circumstances: in the style, the one being a primate of England, and the other the primate of all England; and in the rank, precedence being always given to the archbishop of Canterbury, and the lord chancellor of England being interposed in processions between the two archbishops.

There is evidence sufficient to show that Christianity had made its way long before the time of Gregory among the Roman inhabitants of Britain and the Romanized Britons; and it is not contended that either Scotland or Ireland owed its Christianity to that mission. Wales has no archbishop; whence it seems to be a legitimate inference that the Welsh church is only a fragment of a greater church in which the whole of England and Wales was comprehended, the church, as to what is now called England, being destroyed by the Saxons, who were Pagans. Yet some have contended that there was an archbishop at Caer-Leon; and others, on grounds equally uncertain, that bishops, under the denomination of archbishops, were settled in those early times at London and York.

The precise amount of rights of superintendence and control preserved by the archbishops over the bishops in their respective provinces, does not seem to be very accurately defined. Happily, these rights are very seldom called into exercise. Yet it seems to be admitted that if any bishop introduced irregularities into his diocese, or was guilty of scandalous immoralities, the archbishop of the province in which his diocese lay might visit, inquire, call to account, and punish. He might, it is said, even deprive. Whether he could depose is a more doubtful point.

One right he possesses of so remarkable a character as to require a specific notice. Every bishop has the patronage of certain dignities or benefices within his diocese, that is, the right of nominating the person who is to enjoy them. At every consecration of a new bishop, or every translation of a bishop from one see to another, the archbishop in whose province the bishopric is has the right of selecting one of these dignities or benefices to be filled up by his nomination whenever it becomes vacant. This is called the archbishop's option; and the right is now regarded as belonging so much to the person of the archbishop and not to his office, that if the archbishop die before the incumbent of such benefice or dignity, the right of nominating descends to the heir or devisee of the archbishop. This existed originally in the form of a demand of the archbishop on each bishop to provide for some one of his chaplains.

The archbishop also nominates to the benefices or dignities pertaining to the bishops in his province, if not filled up within six months from the time of the avoidance.

Certain of the bishops are nominally officers in the Cathedral of Canterbury, or in the household of the archbishop. The archbishop has also certain honorary distinctions; he has in his style the phrase 'by Divine providence,' but the bishop's style runs 'by Divine permission;' and while the bishop is only installed, the archbishop is enthroned.

The archbishops may nominate eight clerks each to be their chaplains. The archbishop of Canterbury claims the right of placing the crown upon the head of the king at his coronation; and the archbishop of York claims to perform the same office for the queen consort. The archbishop of Canterbury is the chief medium of communication between the clergy and the king, and is consulted by the king's ministers in all affairs touching the ecclesiastical part of the constitution; and he generally delivers in parliament what, when unanimous, are the sentiments of the bench. The two archbishops have precedence of all temporal peers, except those of the blood-royal; and except that the lord chancellor has place between the two archbishops. Before the Reformation, the archbishop of Canterbury occupied a very elevated station with reference to the whole church, having at general councils the precedence of all archbishops, and being regarded somewhat in the light of a patriarch, presiding, as he was supposed to do, over the several kingdoms of England, Wales, Scotland, and Ireland.

The province of the archbishop of York consists of the six northern counties, with Cheshire and Nottinghamshire; to these were added, by Act of Parliament in the time of Henry VIII., the Isle of Man: in this province he has four suffragans, the bishop of Man, the bishop of Durham, the only see in his province of Saxon foundation, and the bishops of Carlisle and Chester. Of these, the bishopric of Carlisle was founded by King Henry I. in the latter part of his reign, and the bishopric of Chester by King Henry VIII.; so thinly scattered was the seed of Christianity over the northern parts of the kingdom in the Saxon times. The rest of the kingdom forms the province of the archbishop of Canterbury, in which there are twelve bishoprics of Saxon foundation; the bishopric of Ely, founded by Henry I.; the bishoprics of Bristol, Gloucester, Oxford, and Peterborough, founded by Henry VIII.; and the four Welsh bishoprics, of which St. David's and Llandaff exhibit a catalogue of bishops running back far beyond the times of St. Augustine. The twelve English bishoprics of Saxon foundation are London, Winchester, Rochester, Chichester, Salisbury, Exeter, Bath and Wells, Worcester, Hereford, Lichfield and Coventry, Lincoln, and Norwich. The dioceses of the two English archbishops, or the districts in which they have ordinary episcopal functions to perform, are, for Canterbury, the greater part of the county of Kent, a portion of that county forming the diocese of Rochester, a number of parishes distinct from each other, and called Peculiars, in the county of Sussex, with small districts in other dioceses, particularly London, which belonging in some form to the archbishop, acknowledge no inferior episcopal authority. The diocese of the archbishop of York consists of a great portion of the county of York, and the whole county of Nottingham, with some detached districts. Exact knowledge of the diocesan division of the country is of general importance as a guide to the depositaries of wills of parties deceased; but since the introduction of the funding system, there being scarcely a family which has not a share in the kind of property thus created, wills are generally proved in the court of the archbishop of Canterbury, as the Bank acknowledges no probates but from thence.

Lives of all the archbishops and bishops of England and Wales are to be found in an old book entitled *De Præsulibus Angliæ Commentarius*. It is a work of great research and distinguished merit. The author was Francis Godwin, or Goodwin, bishop of Llandaff, and it was first published in 1616. A new edition of it, or rather the matter of which it consists, translated and recast, with a continuation to the present time, would form a useful addition to our literature. There is also an octavo volume, published in 1720, by John le Neve, containing lives of all the Protestant archbishops, but written in a dry and uninteresting manner. Of particular lives there are many, by Strype and others; many of the persons who have held this high dignity having been distinguished by eminent personal qualities, as well as by the exalted station they have occupied.

St. Andrew's is to Scotland what Canterbury is to England; and while the episcopal form and order of the church existed in that country, it was the seat of the archbishop, though till 1470, when the pope granted him the title, he was known only as the Episcopus Maximus Scotiæ. In 1491, the bishop of Glasgow obtained the title of archbishop, and had three bishops placed as suffragans under him.

In Ireland there are four archbishoprics, Armagh, Dublin, Tuam, and Cashel. Two of these, Tuam and Cashel are, by the Act 3 and 4 Will. IV., c. 37, to be reduced to bishoprics on the occurrence of the next vacancies. Catalogues of the archbishops of Ireland and Scotland may be found in that useful book for ready reference the *Political Register*, by Robert Beatson, Esq., of which there are two editions.

To enumerate all the prelates throughout Christendom to whom the rank and office of archbishop are attributed would extend this article to an unreasonable length. The principle exists in all Catholic countries, that there shall be certain bishops who have a superiority over the rest, forming the persons next in dignity to the great pastor pastorum of the church, the pope. The extent of the provinces belonging to each varies, for these ecclesiastical distributions of kingdoms were not made with foresight, and on a regular plan, but followed the accidents which attended the early fortunes of the Christian doctrine. In Germany, some of the archbishops attained no small portion of political independence and power. Three of them, viz. those of Treves, Cologne, and Mentz, were electors of the empire. In France, under the old regime, there were eighteen archbishoprics, all of which, except Cambray, claimed to have been founded in the second, third, and fourth centuries; the foundation of the archbishopric of Cambray was referred to the sixth century. The French have a very large and splendid work, entitled *Gallia Christiana*, containing an ample history of each province, and of the several subordinate sees comprehended in it, and also of the abbeys and other religious foundations, with lives of all the prelates drawn up with the most critical exactness.

The word *suffragan*, used in this article, may require some explanation. A suffragan, in the more ordinary sense of the term, is a kind of titular bishop, a person appointed to assist the bishop in the discharge of episcopal duties; and among the reforms meditated at the close of the reign of King Henry VIII., was the introduction of a considerable number of suffragan bishops of this class, and some persons were actually consecrated. But every bishop within his province is sometimes spoken of as a suffragan of the archbishop, being originally, in fact, little more. Questions have been raised respecting the origin of the word suffragan, which is by some supposed to be connected with *suffrages* or votes, as if the bishops were the voters in ecclesiastical assemblies; but more probably, if connected with suffrages at all, the term has a reference to their claiming to vote in the election of the archbishop. A great question respecting the right of election of an Archbishop of Canterbury, between the suffragans of his province and the canons of Canterbury, arose in the time of King John, and is a principal occurrence in the contest which he waged with the pope and the church.

ARCHDEACON. In contemplating the character and office of the bishop in the early ages of the church, we are not to regard him as a solitary person acting alone and without advice. He had a species of clerical council around him, persons who lived a kind of collegiate life in buildings attached to the great cathedral church, each of whom, or at least several of whom, possessed distinct offices, such as those of chancellor, treasurer, precentor, and the like. These persons are now often called canons; but the most general name by which they are to be known, as the institution existed in remote times, is that of deacon, a term of which dean is a contraction. Deacon appears to come from the Greek term διάκονος, the name of that officer in the church of whose appointment we have an account in Acts, cap. vi. To one of these deacons precedence was given, and no doubt some species of superintendence or control, and to him the title of *archdeacon* was assigned.

In the name, then, there is no indication of any peculiar employment. What now belongs to the archdeacon was antiently performed by the officer in the bishop's court, called the chorepiscopus; and the manner in which the archdeacon usurped upon this obsolete officer and attracted to himself the functions which belonged to him, is supposed to have been this;—being near the bishop and much trusted by him, the archdeacon was often employed by the bishop to visit distant parts of the diocese, especially when the bishop required particular and authentic information, and to report to the bishop the actual state of things. Hence it was, that the archdeacon was spoken of by very early Christian writers as being the *bishop's eye;* and from this power of inspection and report the transition was easy to the delegation to him of a portion of episcopal authority, and empowering him to proceed to reform and redress, as well as to observe and report.

If this is a just account of the origin of the archdeacon's power, it is manifest that originally the power would be extended over the whole of a diocese; but at present it is confined within certain limits. In England, according to the *Valor Ecclesiasticus* of King Henry VIII., there are fifty-four archdeaconries or districts through which the visitorial and corrective power of an archdeacon extends. This distribution of the dioceses into archdeaconries cannot be assigned to any certain period; but the common opinion is, that it was made some time before the conquest. Each of these districts is assigned to its own archdeacon, with the same precision and certainty as other and larger districts are assigned to the bishops and archbishops; and the archdeacons are entitled to certain annual payments, under the name of procurations, from the benefices within their archdeaconries.

As the archdeacon in antient times intruded upon the chorepiscopus, so in recent times he has extinguished the authority and destroyed almost the name of another officer of the church, namely, the rural dean. The archdeaconries are still subdivided into deaneries, and it is usual for the archdeacon when he holds his visitations to summon the clergy of each deanery to meet him at the chief town of the deanery. Formerly, over each of the deaneries a substantive officer, called a dean, presided, whose duty it was to observe and report, if he had not even power to correct and reform; but the office has been laid aside in some dioceses, though in others it has been re-established. But where it has been superseded, the duties are discharged by the archdeacon. It may be added, that though the office of rural dean has been found extremely useful, no emolument whatever is attached to it.

The archdeacons are nominated by the respective bishops. Their duty now is to visit their archdeaconries from time to time; to see that the churches are kept in repair, and that everything is done conformably to the canons and consistently with the decent and orderly performance of public worship; and to receive presentations from the churchwardens of matter of public scandal. They have the power in their courts to enforce reform or to punish the contumacious; an appeal, however, always lies to the superior court of the bishop.

In the revenue attached to the office of archdeacon, we see the inconvenience which attends fixed money payments in connexion with offices which are designed to have perpetual endurance. It arises chiefly from pensions paid by the incumbents. These pensions originally bore no contemptible ratio to the whole value of the benefice, and formed a sufficient income for an active and useful officer of the church; but now, by the great change which has taken place in the value of money, the payments are little more than nominal, and the whole income of the archdeacons is very inconsiderable. The office, therefore, is generally held by persons who have also benefices or other preferment in the church.

Catalogues of the English archdeacons may be found in a book entitled *Fasti Ecclesiæ Anglicanæ*, by John le Neve.

ARCHELA'US, a Greek name composed of two words, signifying *rule* and *people*. Moreri has distinct articles on fourteen persons who bore this name; and the reader will find a list of authors so called, in the index to Fabricius's *Bibliotheca Græca*, with some account of them in the body of the work. We shall only notice,

1. **ARCHELAUS**, king of Sparta, known only as one of the reigning kings when Lycurgus remodelled the constitution.

2. **ARCHELAUS**, son of Perdiccas, king of Macedon, who succeeded his father B.C. 413 (Clinton), early in the year. The chronology of his reign has been a subject of controversy; and some writers have erroneously supposed that he was succeeded by a son of the same name. Not much is known of him: the most certain facts are comprised in one sentence of Thucydides, who says that 'Archelaus, son of Perdiccas, having become king, built the fortifications now in the land, and cut straight roads, and set the military affairs of the nation on a better footing, as to the provision of arms, horses, and other equipments, than all the eight kings who had preceded him.' (lib. ii. 100.) He is connected with the history of Athens through one event, the revolt of Pydna, a valuable sea-port of Macedonia, towards the close of the Peloponnesian war. He besieged that town, and took it, B.C. 410; and to diminish the chance of future insurrections, by rendering it harder to call in foreign aid, he removed the city farther inland by a distance of twenty stadia, about two miles. These scanty indications seem to point him out as a wise and useful prince. Though he improved the military establishment, he seems to have cultivated peace, for the only war in which we know him to have been engaged, is that for the reduction of Pydna: the few other notices of his reign refer either to his private character, or

to his patronage of arts and literature. The tragic poet Euripides resided for some time at his court, and died there. Plato is said to have been 'very dear' to him; and he sent a pressing invitation to Socrates, who declined to accept it. Zeuxis visited and executed many pictures for his palace, which in consequence became a place of great resort for strangers. He established games at Dium in honour of Jupiter and the nine Muses, which, from the description, 'magnificent religious festivals and dramatic contests' (*θυσίας μεγαλοπρεπεῖς καὶ σκηνικοὺς ἀγῶνας*, Diod. xvii. 16), we may presume to have been of as literary and refined a nature as the great festivals of southern Greece.

[From a silver coin in the British Museum.]

The character of this prince, however, has been drawn in darker colours by Plato, who says, that Archelaus was of illegitimate birth, the son of Perdiccas by a slave, and that he gained the kingdom by a series of murders. (*Gorg.* 471, vol. iii. p. 208, ed. Priestley.) His private character was open to various imputations, for which the reader who is curious on this head may consult Bayle; and there is the testimony of Plato and Aristotle, that his excesses led to his death by conspiracy. Diodorus (xiv. 37) says, that he was killed accidentally when hunting, by his favourite, Craterus, or Cratenas. The close resemblance between this tale and that of William Rufus's death cannot fail to strike the reader. Archelaus died B.C. 399, after a reign of fourteen years. (See Mitford, chap. xxxiv. sect. 1; and Clinton, Appendix 4, besides the authorities above quoted.)

3. **ARCHELAUS**, an eminent general in the service of Mithridates, king of Pontus, and the opponent of Sylla when the Mithridatic war was carried on in Greece. In the celebrated siege of Athens, when that city was taken by Sylla, he threw himself into the Peiræus, and defended it obstinately. Compelled at last to evacuate his stronghold, he retreated into Thessaly. He was twice defeated by Sylla, after which he received instructions from his master to make peace on the best terms which could be obtained. Being apprehensive of danger from the jealous temper of Mithridates, he went over to the Romans, by whom he was well received. (See Appian, *Mithridatica;* Strabo, l. xii. and xvii.)

4. **ARCHELAUS**, son of the preceding, obtained the dignity of high-priest of the temple of Comana in Pontus, where there was a temple sacred to Enuo, to which a considerable tract of land and numerous slaves were annexed. He served in the expedition to Egypt of Gabinius, to reinstate Ptolemy Auletes on the throne then occupied by his daughter Berenice; but having gained the affections and the hand of Berenice under the false pretence that he was the son of Mithridates, he went over to her party, and after a six months' reign was slain in battle against the Romans.

5. **ARCHELAUS**, son of the above, succeeded him as high-priest of Comana, and was expelled by Cæsar, B.C. 47, to make room for Nicomedes the Bithynian. Between his wife, Glaphyra, and Mark Antony, an intrigue is said to have subsisted; and from Antony,

6. **ARCHELAUS**, son of Archelaus and Glaphyra, received the kingdom of Cappadocia, B.C. 36. He fought on Antony's side at the battle of Actium, and yet had the rare good fortune to retain his kingdom under Augustus, and even to enlarge it by the acquisition of the lesser Armenia and part of Cilicia. Incurring the displeasure of Tiberius, as it is said, because he neglected the future emperor during his exile at Rhodes, he was summoned to Rome, where he died, A.D. 16, apparently by a natural death brought on by age and infirmity. He is said by Dion to have counterfeited dotage for the purpose of turning aside the tyrant's suspicions. (Tacitus, *Ann.* ii. 42; Dion, lvii.; Bayle, *An. Un. Hist.*)

ARCHELAUS the Milesian, an eminent philosopher of the Ionic school, and the last who presided in it in direct succession from Thales. He succeeded Diogenes Apolloniates as the recognised leader of that school; and was the pupil of Anaxagoras, the predecessor of Diogenes. Removing to Athens, he left no one to occupy his chair; and it may be from this circumstance, or from his having taught publicly what Anaxagoras only taught in private (for Anaxagoras clearly taught the same or similar doctrines before him), that Archelaus is said to have transferred the Ionic school of philosophy to Athens, where he became popular, and numbered Socrates, and according to some authorities, Euripides, among his hearers. He was called 'physicus,' either because physical doctrines formed the most prominent part of his system, or because he was the first who openly taught in Athens the physical doctrines of the Ionic school; and Suidas says, that he composed a work on physics (*συνέταξε φυσιολογιάν*).

His principal doctrines, so far as we are acquainted with them, are these:—

The principles of all things he taught to be air and infinity (*τὸ ἄπειρον*). What he meant by infinity is a question which Brucker, in his history of antient philosophy, professes himself unable to decide. Some, however (as Plutarch, *Plac. Philos.* i. 3), say that he supposed infinite air, by its rarefaction and condensation, to be the cause of all things.

The principle of motion he defined to be the mutual secession of hot and cold: the hot being in motion, and the cold stationary.

The sun he thought to be the largest of the stars; the earth round or egg-shaped, and in the centre of the universe.

He taught that men and animals were originally generated out of mud or slime by the heat of the earth, and he attributed mind to both alike.

He taught, like his master, Anaxagoras, that everything was made up of small parts similar to itself as wood of atoms of wood, metal of atoms of metal, bon of atoms of bone, &c.

Speech he defined to be motion of the air; but this correct view is also attributed to Anaxagoras.

He maintained the dangerous doctrine, that just and unjust are produced entirely by law; and that, anterior to law, nothing is either one or the other. It appears probable that by law he meant solely human institutions; but we do not know enough of his doctrine to assert positively that he meant to exclude a moral law of conscience derived from the Deity.

Archelaus seems to have commenced teaching at Athens about B.C. 450, in the interval between the first and second visit of Anaxagoras to that city (see Clinton on that year) the dates of his birth and death we do not find clearly laid down. (Diog. Laert.; Brucker, *Hist. Philos.* vol. i. p. 518; Fabricius, *Bibl. Gr.*)

ARCHELA'US, bishop of Carrhæ in Mesopotamia, is remarkable only for his dispute with the heretic, Manes, about A.D. 278. He published the controversy in two books, entitled *Acta Disputationis*, &c., in Syriac, which were translated into Greek by Hegemonius. A fragment of this work is extant, edited by Valesius, in the notes to his Socrates (pp. 197, 203, lib. i. c. 22); and again in a more complete form by Zaccagnius, in his 'Collectanea Monumentorum veterum Ecclesiæ Græcæ,' Rom. 1698. (Fabricius, *Bibl. Gr.*)

ARCHELA'US, the second son of the fifth wife of Herod the Great: his mother, Malthaka, was a Samaritan. His father's last will declared him heir to the throne. Immediately after the death of Herod, A.D. 3, he exercised the regal power, but did not assume the title till his nomination should be confirmed by the Roman emperor. As soon as he had celebrated the obsequies of his father, he received the homage of the people. The Jewish nation having long groaned under the yoke of Herod, received with joy the fair promises which the uncertainty of Roman favour extorted, at the commencement of his reign, from the policy of Archelaus. But before he received the imperial sanction to his authority, he gave abundant proof of a temper as cruel and a purpose as tyrannical, as those which had characterized his father's reign. On the feast of the Passover a number of factious Jews stationed themselves in the temple, and instigated the populace to demand that Archelaus should avenge the death of two favourite teachers who were executed during Herod's reign for having destroyed a golden eagle. Archelaus sent a party of his guards to seize the ringleaders, but the rabble killed most of the soldiers. Upon this he employed the whole force of his arms against the rioters, and 3000 of them were massacred. The rest escaped to the neighbouring mountains.

Archelaus presented himself in person before Augustus at Rome, and solicited the ratification of his power on the grounds of being the successor appointed by his father, and of his attachment to the Roman customs and government. His claim was disputed by many members of his family, who produced a former testament of Herod, in which Antipas was named as heir to the throne. Petitions against his appointment were also presented to the emperor by the Jewish nation, who deprecated the confirmation of the authority of Archelaus, on the ground of his having already exercised injustice and cruelty, and they requested an alteration in the form of government. Archelaus was also accused of retaining the legacies of Herod. The emperor gave a patient hearing to all parties. He considered that it would be impolitic to accede to the demands of the Jews, but he placed only the districts of Judæa Proper, Idumæa, and Samaria, forming about half of the dominions of Herod, under the government of Archelaus. The rest, with some small exceptions, was divided between Herod Antipas and Philip. These three princes were not called kings but ethnarchs, and their territories were not called kingdoms but ethnarchies. Archelaus built the city called after his own name, Archelais. We learn from Josephus (ed. Hudson, i. 865), that Archelais was built before the tenth year of Archelaus's reign. He married Glaphyra, widow of his brother Alexander, by whom she had children: this was a direct violation of the Jewish laws. Irritated by his conduct, and weary of the oppressive tyranny of his administration, in the tenth year of the reign of Archelaus the Jews again appealed to Augustus. Their complaints appearing well founded, and being accompanied by accounts of frequent insurrections, the emperor dispossessed Archelaus of his authority, banished him to Vienna in Gaul, and confiscated his property. It is supposed that he ended his days in the place of his exile, leaving no posterity.

To understand the history of Archelaus in connexion with preceding and subsequent events, the reader must refer to Josephus, *On the Jewish War*, from book i. chapter 28, to book ii. chapter 8; and the *Antiquit.* book xvii. Compare יוסיפן ב׳ גוריון, ed. Breithaupt, v. 35, from page 497 to 528, and also page 564.

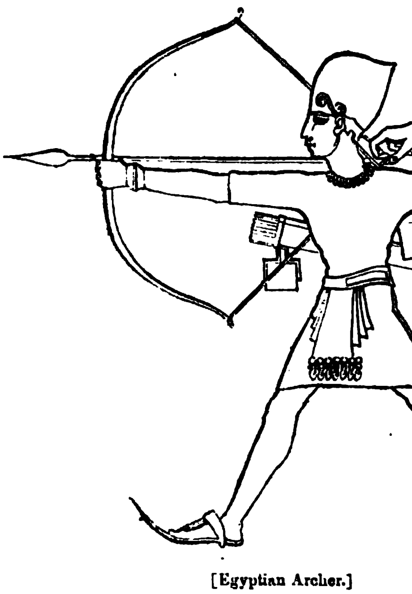
ARCHENHOLTZ, JOHANN WILHELM VON, was born at Danzig in 1745. He entered the Prussian army, in which he served during the whole of the seven years' war, and was made a captain. He afterwards retired from the service, and travelled over a considerable part of Europe, and at last settled at Hamburg, where he published several works, which became very popular in Germany. The first work that established his literary reputation was his *England und Italien*, published in 1785, in which he gave, not the journal of a tour, but a methodical description of the two countries, especially with regard to their social and moral features, and their political institutions. The part concerning England is the most elaborate, and may be considered upon the whole as one of the most detailed accounts of this country given by a foreigner. Archenholtz had visited England repeatedly and stayed there nearly six years between 1769 to 1779. He had been likewise several times in Italy, and had resided there about three years. He dedicated his book to his friend Wieland, who was then at Weimar. The work went through several editions, and was translated into French. In the preface to the second German edition, 1787, Archenholtz replied to the charges of injustice and asperity towards Italy with which he had been reproached. In fact he had placed in juxtaposition two countries widely dissimilar; he had viewed Italy with the eye of a political and moral philosopher, rather than with that of a poet, or painter, or classical scholar, and the point of view which he chose was the most unfavourable to that country. Italy has changed considerably since that time, and many of Archenholtz's observations are no longer applicable. Archenholtz's admiration of England, on the other side, displeased many persons on the continent; he cannot, however, be called a blind admirer, for he points out many faults in the English institutions at that period, and exposes with no sparing hand the vices and follies of London. The next work of Archenholtz was a *History of the Seven Years' War*, in which he collected the information scattered through many memoirs and records of those memorable campaigns, and especially consulted the valuable work of Major Tempelhof of the Prussian artillery, *Geschichte des Siebenjährigen Kriegs*, published at Berlin in 1785. But these were professional works, and Archenholtz's object was to write a history suited to the common reader. His *Seven Years' War* was published at Hamburg in 1788. It was translated into Latin by Professor Reichard, 'for the benefit,' as the Professor states, 'of readers of other countries who were unacquainted with the German language, and published at Baireuth in 1792, under the title of *Historia Belli Septennis in Germania*. Archenholtz next wrote a history of Gustavus Vasa, the restorer of Swedish independence, preceded by a summary of the history of Sweden from the oldest records to the end of the sixteenth century. In prosecuting his researches on this subject, he consulted the old Swedish and Danish chroniclers and his work is valued for its accuracy. It was published at Hamburg in 1801, and was translated into French and published at Paris, under the title of *Histoire de Gustave Vasa*, 2 vols. 8vo. 1803. Archenholtz wrote also several other minor works. About the time of the French revolution, he became editor of the *Minerva*, a German literary journal, published at Hamburg, which enjoyed considerable reputation for many years. In the number for February, 1793, Archenholtz warmly remonstrated against the imprisonment of General La Fayette, who, having escaped from the proscription of the French terrorists, was arrested by the allies and confined in the fortress of Olmutz in Moravia. Archenholtz died in 1812.

ARCHER (*Tóxotes*, Cuv.), in zoology, a genus of acanthopterygious fishes, belonging to the family squamipennæ, or those which are distinguished by having, not only the soft parts, but often the very spines of the dorsal and anal fins, covered with scales like the rest of the body, and not always very easily distinguished from it. Though the single species upon which this genus is founded had been long known to naturalists, and described under the various names of *Scarus schlosseri*, *Sciæna jaculatrix*, *Labrus sagittarius*, and *Coïus chatareus*, by the different writers on ichthyology, yet it was left for Baron Cuvier to point out its appropriate generic characters, and to distinguish it definitely from the different groups with which it had been previously confounded. These characters are found in the short and compressed form of the body; in the dorsal fin being situated very far back, provided with very strong spines, and like the anal, which is placed very nearly opposite to it, covered on its soft parts with large tough scales; in the short, depressed shape of the muzzle, and in the length of the under jaw, which considerably surpasses the upper, and entails upon the animal the singular habit from which it has derived the name of *the archer*. The gills have six branchiostegous rays; the teeth are small, sharp, and dispersed over the jaws, tongue, and palate; the stomach is short and broad, the air-bladder large, and the pylorus provided with twelve cœcal appendices. The only known species is

The *Toxotes jaculator* of Cuvier, which is found in Java and Sumatra, and has been long celebrated for the singular instinct which it displays in catching flies and other insects which are its prey. Comparatively speaking, there are very few species among the numerous class of fishes distinguished by superiority of instinct or address: but the very rarity of their occurrence makes the partial instances which are occasionally met with still more remarkable, and among these the means which the archer and a species of chætodon (*C. Rostratus*) employ for procuring food are entitled to especial notice. The tubular form of the mouth in these animals permits them to squirt or project small quantities of water to some distance, and with considerable force; when, therefore, the archer perceives a fly or other insect resting on the leaves of the aquatic plants which overhang or swim on the surface of the stream, it projects, or, as it were, shoots a single drop, not directly towards the insect, but obliquely upwards, in such a manner as to strike it in falling, thus preventing it from perceiving its danger and escaping in time. With such accuracy is the aim taken, that though frequently projected to the height of four or five feet, the drop seldom fails to hit the mark and precipitate the insect into the water, where it is, of course, within reach of the archer. The fish itself is of a yellowish colour, marked on the back with five brown spots.

ARCHERY, the art of shooting with a bow and arrow. With respect to the origin of archery, the use of the bow may be traced to the remotest antiquity, and it occurs in the history of many different nations; but some people, the antient Britons for instance, did not use the bow. The first notice which we find of it is in Genesis (xxi. 20), where it is said that Ishmael the son of Abraham 'dwelt in the wilderness and became an archer:' a bow-shot too is mentioned in an earlier verse of the same chapter as a measure of distance. In the Greek mythology we find Apollo armed with the bow and arrow (Homer, *Iliad*, i. 45), and Hercules also, as described in the *Odyssey* (xi. 606). The use of these weapons we may therefore conclude to be of very high antiquity among the Greeks. In the war of Troy, the main force of the Greeks appears to have consisted of soldiers who had heavy defensive armour; but the soldiers of Philoctetes were archers. The Cretans maintained their reputation as skilful bowmen to a late period in their history; and we find Meriones, the companion of the Cretan king Idomeneus, carrying off the prize from Teucer himself (*Iliad*, xxiii. 882). Teucer, the brother of Ajax, who came from the island of Salamis, excelled in the use of the bow and arrow, which appear however to have been considered less honourable weapons than the spear and sword. Ulysses in the *Iliad* fights with the spear and sword, but in the *Odyssey* we find the strength of the suitors tested by the bow which Ulysses had left at home, and which he afterwards uses against his domestic enemies.

In the later times of Greece, archers formed a part of the light-armed troops, in the same manner as the Sagittarii among the Romans afterwards formed a part of the Velites. Procopius records it as a great improvement when the Roman auxiliaries were instructed to draw the right hand to the ear. But the practice itself is of much greater antiquity, as we see in the representations of the sea-fight on the walls of Medinet-Habou, at Thebes in Egypt. (*Egypte, Antiq.*, vol. ii.) It was also, as we learn from Procopius, the fashion with the antient Persians.



[Egyptian Archer.]

The time when the use of the long-bow commenced in England, as a military weapon, is unknown. That which the Normans used at the battle of Hastings was the *arbalest* or *cross-bow*. In the reign of Henry II. we find several facts recorded which show the continuance of the use of the cross-bow; and in that of Henry III. we find cross bowmen forming the vanguard of the army. As a military weapon of England, the arbalest, in all probability, was last used at the battle of Bosworth in 1485, though as late as 1572 Queen Elizabeth engaged by treaty to supply the King of France with 6000 men, armed partly with long, partly with cross bows. It was also used on the Continent in the wars of the sixteenth century.

From the reign of Edward II. the mention of the *long-bow* becomes frequent in our history. At Crécy, at Poictiers, and at Agincourt, as well as in several battles which were gained over the Scotch, the victory is ascribed to the English bowmen: and it is particularly noticed that at Crécy the rain, which had slackened the strings of the Genoese cross-bows, had not weakened the effect of the long-bows which our countrymen used. Edward III. enjoined the use of the long bow in two precepts addressed to the sheriffs of counties; and in the reign of Richard II. an act was passed to compel all servants to shoot with it on Sundays and holidays. By the 7 Hen. IV. the heads of arrows were to be well boiled or brazed, and hardened at the points with steel; all heads otherwise manufactured were to be forfeited, and the makers imprisoned: all arrowheads, moreover, were to be marked with the maker's name. Henry V. ordered the sheriffs of several counties to procure feathers from the wings of geese, picking six from each goose. Two feathers in an arrow were to be white, and one brown or grey; and this difference in colour informed the archer in an instant how to place the arrow. In the time of Edward IV. an act passed ordaining that every Englishman should have a bow of his own height; and butts were ordered to be constructed in every township for the inhabitants to shoot at on feast days; and if any neglected to use his bow, the penalty of a halfpenny was incurred. An act, 1 Richard III., complains, that by the seditious confederacy of Lombards using divers ports of this realm, bow-staves were raised to an outrageous price; that is to say, to eight pounds a hundred, whereas they were wont to be sold at forty shillings. This act provided that ten bow-staves should be imported with every butt of malmsey or Tyre wines, brought by the merchants trading from Venice to England, under a penalty of 13*s.* 4*d.* for every butt of the said wines in case of neglect. By 6 Henry VIII., chap. 2, all male servants were to provide themselves with one bow and four arrows, which their master was to pay for, stopping the purchase-money out of their wages. Another statute, enjoining the use of archery more extensively, was passed in 33 Henry VIII. It ordained that every man under sixty, except spiritual men, justices, &c., should use shooting with the long-bow, and have a bow and arrows continually in his house; that he should provide bows and arrows for his servants and children: that every servant, above seventeen and under sixty years of age, should pay 6*s.* 8*d.* if he was without a bow and arrows for one month. The inhabitants of every city, town, and place were to erect butts, and practise shooting on holidays, and at every other convenient time. Latimer, in one of his sermons before King Edward VI., published in 1549, enforced the practice of archery from the pulpit. 'Men of England in times past,' he says, 'when they would exercise themselves (for we must needs have some recreation, our bodies cannot endure without some exercise), they were wont to go abroad in the fields of shooting, but now it is turned into glosing, gulling, and whoring within the house. The art of shooting hath been in times past much esteemed in this realm; it is a gift of God that he hath given us to excel all other nations withal; it hath been God's instrument whereby he hath given us many victories against our enemies. But now we have taken up whoring in towns instead of shooting in the fields. A wondrous thing, that so excellent a gift of God should be so little esteemed! I desire you, my lords, even as ye love the honour and glory of God, and intend to remove his indignation, let there be sent forth some proclamation, some sharp proclamation to the justices of peace: for they do not their duty. Justices now be no justices; there be many good acts made for this matter already. Charge them upon their allegiance that this singular benefit of God may be practised, and that it be not turned into bowling, glosing, and whoring within the towns: for they be negligent in executing these laws of shooting. In my time, my poor father was as diligent to teach me to shoot, as to learn me any other thing, and so I think other men did their children. He taught me how to draw, how to lay my body in my bow, and not to draw with strength of arms as other nations do, but with strength of the body. I had my bows bought me according to my age and strength; as I increased in them, so my bows were made bigger and bigger: for men shall never shoot well except they be brought up in it. It is a godly art, a wholesome kind of exercise, and much commended in physic.' Holinshed reports that Henry VIII. shot as well as any of his guards.

The encouragement thus given to shooting with the long-bow caused archery to become a fashionable amusement after the bow had ceased to be used as an instrument of war. Edward VI. was fond of this exercise; and there seems every reason to believe that it was practised by King Charles I. This monarch issued a proclamation in the eighth year of his reign, to prevent the fields near London from being so inclosed as 'to interrupt the necessary and profitable exercise of shooting.' He is also represented in the frontispiece of Markham's *Art of Archery*, 1634, in the dress and attitude of a bowman. Public exhibitions of shooting with the bow were continued in the reigns of King Charles II. and King James II.; and an archer's division, at least till within these few years, formed a branch of the Artillery Company.

The most important society of this kind now existing is 'The Royal Company of Archers, the King's body-guard of Scotland.' The exact time of its institution is unknown, but it is referred by the Scottish antiquaries to the reign of their James I., when a commission being appointed to oversee and enforce the exercise of archery in different counties of that kingdom, the most expert bowmen were selected from the mass of those raised, to form a body-guard for the king on perilous occasions; and are stated to have conducted themselves with skill, loyalty, and courage. The rank of the King's body-guard for Scotland was understood from tradition to be vested in the Royal Company, and they accordingly claimed the honour of acting in this capacity to his majesty King George IV. on the occasion of his visit to Scotland in 1822. They attended his majesty at court and on all state ceremonies during his residence in Scotland, and accompanied him on his visit to Hopetoun House, from whence he embarked for London. The captain-general has since been appointed gold-stick for Scotland, and the Royal Company now forms part of the household.

From their own minutes, still extant, it appears that an act of the privy council of Scotland was passed in 1677, conferring on this body the name and title of 'His Majesty's Company of Archers,' and granting a sum of money for a piece of plate to be shot for as a prize. No permanent king's prize, however, was established till 1788, when a sum of money was granted by King George III. to be shot for annually, with which a piece of plate was to be purchased.

During the Revolution of 1688 the Royal Company were opposed to the principles then espoused, and were all but suppressed. On Queen Anne's succession they were revived, and in 1703 received a royal charter confirming all their former rights and privileges, and conferring others upon them. The affairs of the Royal Company, which now consists of about 500 members, are managed by a council of seven, who are chosen annually by the members at large, and in whom is vested the power of receiving or rejecting candidates for admission, and of appointing the officers of the company civil and military. The field uniform of the Royal Company is of dark green cloth, faced with black braiding, with a narrow stripe of crimson velvet in the centre. The hat is of the same colour, with a handsome medallion in front, and a plume of black feathers. They have two standards. New colours, as well as a confirmation of the Royal Company to be the king's body-guard for Scotland, have been given to them by King William IV.

About fifty years ago, the revival of archery as a general amusement was attempted, under the patronage of the then Prince of Wales; and at that time, and subsequently, numerous societies of archers were formed, many of which printed their rules and orders. Some few, it is believed, are still in existence.

The more curious books on the subject of archery are Ascham's *Toxophilus*, 4to., 1545, 1571, 1589; *Certain Discourses, written by Sir John Smythe, Knight. concerning the Long Bow, as also the great Sufficiencie, Excellencie, and wonderful Effects of Archers*, &c., 4to., London, 1590; *A Brief Treatise to prove the Necessitie and Excellence of the Use of Archerie*, by R. S., 4to., London, 1596; Nead's *Double-Armed Man*, 4to., London, 1625; Markham's *Art of Archerie*, 8vo., London, 1634; and Wood's *Bowman's Glory*, 8vo., 1682. To these may be added, the *Ayme for Finsburie Archers*, 12mo., London, 1628; and the *Ayme for the Archers of St. George's Fields*, 8vo., 1664.

The distance to which an arrow could be shot from the long-bow depended much upon the strength and art of the bowman; but, in general, the distance was reckoned from eleven to twelve score yards. In 1794, the Turkish ambassador's secretary, in a field behind Bedford Square, near the Toxophilite ground, with a Turkish bow and arrow, shot 415 yards partly against the wind, and 482 yards with the wind. He said that the then grand sultan shot 500 yards, which was the greatest performance of the modern Turks; but that pillars stood on a plain near Constantinople, commemorating ancient distances about 800 yards. The Baron de Tott says, in his *Memoirs*, Paris, 1785, tom. ii., p. 107 'Les empereurs Turcs ont eu presque tous la vanité de prétendre à ce genre de célébrité.' 'Nearly all the Turkish emperors have had the vanity of wishing to acquire this kind of celebrity.'

Ascham has enumerated fifteen sorts of wood, of which arrows were made in England in his time, namely, brazell, turkiewood, fusticke, sugercheste, hardbeame, byrche, ashe oak, service-tree, alder, blackthorn, beach, elder, aspe, and salow. Of these, asp and ash were preferred to the rest, the one for target-shooting, the other for war. Whistling arrows have been once or twice found on fields of battle of the time of Edward IV. They were chiefly used, it is believed, for giving signals in the night. The Chinese have used whistling arrows from time immemorial. The arrows shot from cross-bows were called quarrels, or bolts. They were usually headed with a large square pyramid of iron; but had sometimes other forms given to them.

For many of the materials of this article, we are indebted to Barrington's *Observations on the Practice of Archery in England*, printed in the Archæologia; and to the late Mrs. Banks's *Manuscript Collections on Archery*, preserved in the British Museum.

ARCHES, COURT OF, is the supreme court of appeal in the archbishopric of Canterbury. It derives its name from having formerly been held in the church of St. Mary le Bow (*de Arcubus*), from which place it was removed about the year 1567 to the Common Hall of Doctors' Commons, where it is now held. The acting judge of the court is termed Official Principal of the Court of Arches, or more commonly Dean of the Arches. This court has ordinary jurisdiction in all spiritual causes arising within the parish of St. Mary le Bow and twelve other parishes, which are called a deanery, and are exempt from the authority of the bishop of London. The Court of Arches has also a general appellate jurisdiction in ecclesiastical causes arising within the province of Canterbury, and it has original jurisdiction on subtraction of legacy given by wills proved in the prerogative court of that province. The Dean of the Arches for the time being is president of the College of Doctors of Law practising in the Ecclesiastical and Admiralty Courts, incorporated by royal charter in 1768, and the advocates and proctors who practise in these courts receive their admission in the Arches Court. The judge is the deputy of the archbishop, who is, in legal consideration, the judge of the court. The Dean of Arches has always been selected from the College of Advocates. There are four terms in each year, and four sessions in each term. Causes are conducted by libel (*libellus*, a little book) and answers, or by articles, according to their respective nature. Responsive pleas are termed allegations. Depositions of witnesses are taken in private by examiners of the court appointed for that purpose by the registrar, with the approbation and sanction of the judge and archbishop. The evidence being read either before trial by the judge, or read over at the trial, and the case argued by counsel, judgment is pronounced in open court. For the last twenty years and upwards, reports of decisions in the Ecclesiastical Courts have been laid before the public, which was not the case formerly. Execution of the sentence may be enforced by the compulsory process of contumacy, significavit, and attachment. An appeal lay from this court to the Court of Delegates, or more strictly to the king in chancery (st. 25 Henry VIII. c. 19), by whom delegates were appointed to hear each cause, the appeal being to him as head of the church in place of the Pope. By 2 and 3 Wm. IV. c. 92, appeals are transferred from the Court of Delegates to the king in council. The ecclesiastical courts are competent to entertain criminal proceedings in certain cases, and also to take cognizance of causes of defamation; for which last offence persons were formerly directed to do penance, but this has very rarely been required by the Arches Court of late years. There is no salary attached to the office of judge; and his income arising from fees, as also that of the registrar, is very small. One judge has for many years presided in the Arches and in the Prerogative Courts. It is understood that a measure is in preparation by which this court, in common with all the ecclesiastical courts, will be much modified

A'RCHIAS, A. LICI'NIUS, a Greek poet of Antioch in Syria, whose name would never have reached us but for the beautiful oration of Cicero, pronounced in his defence. We cannot, however, regard him as anything else than a fly preserved in amber. nor are we inclined to think, though he was the intimate friend of many illustrious men at Rome, and gave lessons to Cicero in Greek philosophy and rhetoric (*Arch.* c. i.), that his talents were of that high order which Cicero would have us believe. He had undertaken to celebrate, in verse, the grand event in the orator's history—the conspiracy of Catiline—and nothing more was required to gain the good-will of that great though vain man. Archias came to Rome in the consulship of Marius and Lutatius Catulus, B.C. 102, and lost no time in recommending himself to these leading persons by a poem in celebration of their victories over the Cimbri. He was, in fact, the poet-laureat of those days: he was the intimate friend of Lucullus, and we find him chanting the praises of that luxurious Roman in a poem on the Mithridatic war. It was chiefly through the influence of Lucullus that he was admitted to the freedom of Heraclea, one of the most powerful Greek cities in the south of Italy, and one whose citizens were entitled to all the privileges of Romans. It was thus that Archias became a naturalized citizen of Rome. Why a certain Gratius should have contested this right, we have no means of discovering; but as the public archives of Heraclea had been destroyed by fire, Archias was unable to produce any legal document in proof of his claim. The result of the trial, which took place at least after the consulship of Cicero, B.C. 63, is unknown, but it is not probable that the jury resisted the eloquent harangue of the orator and the influence of the leading men of Rome. If we could be certain that the epigrams published under his name, in the *Anthologia Græca*, were his productions, we should feel satisfied that we had justly appreciated his character. They are in general below mediocrity, but as there were several of the same name as the poet, we cannot decide to whom they really belong. These epigrams have been published separately by Ilgen, *Animadvers. Histor. et Critic. in Cic. Orat. pro Archia*, Erfurdt, 1797; and by Hülsemann, in his edition of *Cicero's Oration for Archias*, Lemgo, 1800, 8vo. We may observe, that lately an attempt has been made to prove that this oration of Cicero in defence of Archias is not genuine; but we think that the discovery by Angelo Mai, in the Ambrosian library at Milan, of a commentary on the oration by Asconius Pedianus, who flourished A.D. 30, puts the matter beyond any reasonable doubt. (See the work to which we allude by Schroëter, *Oratio quæ vulgo fertur pro Archia rec. suasque Observationes adjecit.* Lips. 1818; and the opposite view of the question by Platz, in the *Krit. Bibliothek von Seebode*, 1820.)

ARCHIA'TER (in Greek *ἀρχίατρος*), an honorary distinction conferred on physicians in the times of the Roman emperors, and still employed in some of the continental countries. Physicians generally occupied a very subordinate station in Rome during the republican period: in fact, no well-educated medical men existed among the Romans at that time; and the Greek physicians who went to Rome were not at first favourably received. Julius Cæsar at length bestowed the rights of Roman citizenship on the foreign physicians practising at Rome; and the Emperor Augustus, after his recovery from a dangerous illness, not only conferred on his own physician, Antonius Musa, the honours of knighthood, but is said to have exempted all physicians from the payment of taxes and other public burdens. The Emperor Nero first gave the title Archiater (*chief of the physicians*) to his medical attendant, Andromachus the elder, well known as the inventor of a celebrated compound preparation called Theriaca. It is probable that the Emperor only intended to express, by this title, the consideration in which he held his own physician; but it appears that, soon afterwards, the Archiatri were charged with some kind of superintendence over the medical profession. Thus Galen says of Andromachus: "It appears to me that he was appointed by the emperor at that time to reign over us;" and we also find that the word *Archiater* was translated into Latin by the words *superpositus medicorum*, 'superintendent of the physicians.' At a later period, however, the rank or office of the Archiatri seems to have undergone some change; and we find two classes of them distinguished, viz., the Archiatri of cities, and those of the court. The first law regarding the Archiatri of cities (*Archiatri populares*) was given by Antoninus Pius. He ordered each smaller town to have five, the larger seven, and the largest cities to have ten physicians, distinguished by the above name, and wholly exempted from the payment of taxes and public burdens: thus it appears that the exemption of all practitioners, if it ever existed, was found too extensive a privilege. At Rome, there were fourteen Archiatri appointed for the different districts of the city, besides one for the vestal virgins, and another for the gymnasia: they were elected by the citizens and proprietors, and approved by their colleagues. In later times, the Archiatri of a higher rank appear to have had the sanction of the emperor; and it is not improbable that some sort of examination was also requisite for their admission. Besides enjoying the privileges alluded to, the Archiatri derived from the towns certain remunerations in kind (*annonaria commoda*), as well as salaries. It was their business to treat poor patients gratuitously, but in treating other persons they were authorized to take fees like their professional brethren. They formed medical committees or colleges in each city, and superintended the public health, and the state of the medical profession, and they also taught the principles and practice of medicine. Thus a decree of Constantine the Great says, "We order rewards and salaries to be given to them, that they may the more readily imbue many pupils with liberal studies and the said arts." There is a variety of laws relative to the Archiatri, shewing that the Romans regarded the members of the medical profession as deserving and requiring the attention and protecting care of government. The physicians attached to the imperial court took the title of Archiatri of the palace, and also formed a corporation, with certain rights, privileges, and distinctions of rank, which became more important during the reigns of the later emperors, when strict rules of precedency were established for all persons connected with the court and government. The *Count of the Archiatri* was a "*vir spectabilis*," and equal in rank to the dukes and to the vicars of the emperor.

In modern times, the name of Archiater has, in imitation of the antient fashion, sometimes been assumed by physicians holding public appointments in cities, but more frequently by the physicians of kings and princes. In Sweden and Denmark, however, the dignity of Archiater still exists, as the highest honour conferred on medical men: in Sweden there are only two Archiatri, who act as physicians to the king.

ARCHIDA'MUS. Five kings of Sparta are known to us by this name. They were of the royal line of the Proclidæ, and were not the least distinguished of their family. The first lived before the historical age of Sparta, and his name, mentioned by Herodotus (viii. 131), is the only memorial left of his existence.

ARCHIDA'MUS II., son of Zeuxidamus, succeeded to the throne when his grandfather, Leotychides, was banished from Sparta for allowing his military proceedings in Thessaly to be influenced by a bribe from his opponents. Archidamus reigned from B.C. 469 to 427; and his character, as drawn by Thucydides and Diodorus, exhibits all the peculiar features of the Doric race. Prudence and foresight, steadiness of purpose, and gravity of deportment, are the more prominent qualities which he displays. It was in the fourth year of his reign (B.C. 464) that Sparta was nearly annihilated by the violence of an earthquake, an opportunity which the Messenians did not fail joyfully to seize, with the hope of regaining their independence. The presence of mind displayed by Archidamus on this occasion saved what remained of the city from the hands of an exasperated foe; but it was not till ten years had elapsed, that this Third Messenian War, as it is called, was brought to a close, when the Messenians evacuated their citadel, Ithome. (Diod. Sic. xi. 64. Thucyd. i. 103.) On the part which Archidamus took in the affairs of his country, history is silent for a long succession of years; nor does his name again appear till we find him pleading the cause of peace in the important council held by the Lacedæmonians before they resolved on the Peloponnesian war. His voice was not listened to by his countrymen, and a declaration of war was the result of their deliberation (B.C. 431). So much confidence, however, had they that he would perform his duty, that they placed him at the head of the troops to be led against the Athenians. He was their general also in their second (B.C. 430) and third expeditions (B.C. 428); but it is unnecessary to notice his proceedings in the war, as they had little effect in deciding the contest. He was succeeded by his son Agis II., probably in B.C. 427. (Thucyd. i. 79, ii. 10-20, 71, iii. 1.)

ARCHIDAMUS III., the son of the celebrated Agesilaus, succeeded his father B.C. 361, and died B.C. 338. We find him in command of the Spartan troops during his father's lifetime, B.C. 367, and gaining a battle against the Arcadians and Argeians, which is known in history as *the tearless victory* (τὴν ἄδακρυν μάχην). Not one of the Spartans fell, while a very large number of the enemy were cut to pieces. (Xenoph. *Hell*. vii. 1. 28-32.) In the sacred war, which broke out B.C. 356, in consequence of the seizure of the temple of Delphi by the Phocians, it would appear that Archidamus gave at least secret support to Philomelus, the general of that people; but when the Lacedæmonians at last took an active part in the war, the name of Archidamus does not appear. There is, indeed, no other fact mentioned respecting him, except that he was sent (B.C. 338) to Italy to assist the inhabitants of Tarentum, then engaged in war with their neighbours the Lucanians. He fell fighting bravely at the head of his troops; and a statue was erected to his honour, at Olympia, by his countrymen. He was succeeded by his son Agis III. (Diod. Sic. xvi. 24, 63; Strabo, vi. 280; Paus. iii. 10.)

ARCHIDAMUS IV., the son of Eudamidas, is not mentioned, except by Plutarch, who states that he was defeated (B.C. 296) by Demetrius Poliorcetes; and Archidamus V., son of another Eudamidas, was put to death by his royal colleague, Cleomenes III., somewhere between B.C. 236-220. In him ended the line of the Proclidæ, for though he left five sons, they were passed over, and Lycurgus, not of the royal family, was raised to the throne. (Polyb. iv. 2, v. 37.)

ARCHI'GENES of Apamea, a medical author and practitioner, who enjoyed a great reputation at Rome in the commencement of the second century, during the reign of the Emperor Trajan. He must have held a very distinguished rank among his contemporaries, as appears from several passages in the *Satires of Juvenal* (vi. 236, xiii. 98, xiv. 259), in which his name is employed to denote a great physician generally. Archigenes followed the principles of the pneumatic sect, founded by Athenæus of Attalia, and is known to have written a considerable number of treatises on pathology, the practice of medicine and surgery. His works were thought very highly of in antiquity, although the author is accused of the same obscurity of style which the pneumatic physicians in general had adopted from the stoic philosophers, from whom they also derived some of their principal doctrines. The writings of Archigenes seem to have existed till the sixth century: but the only remains which we now possess are fragments contained in the works of Galen, Ætius, and Oribasius. Galen generally quotes Archigenes in order to criticise his opinions: Ætius and Oribasius give more copious extracts from him. Some of the surgical fragments have been collected by Cocchi, *Græcorum Chir. libr.* . . . . pp. 117, 118, 155. The passages contained in Oribasius have been published by De Matthiæ (xxi. *Med. Opusc. ex Oribasii Cod. Mosquæ*, 1808, 4to.)

ARCHIL (also called **ORCHIL**, in Chambers's *Dict. of Arts and Sciences*), *litmus*, or *tournsole*, is a blue dye procured from the *rocella tinctoria* and *ceanora tartarea*, which are lichens growing abundantly in the Canary and Cape Verde Islands. The colouring matter of these plants appears to be a peculiar vegetable principle which has been called *erythrine:* it may be extracted either by means of alcohol or ammonia, but the latter is employed by those who manufacture the colour, which is generally sold in small flat pieces, and known by the name of litmus.

The blue colour of litmus is soluble in water and in alcohol: a strong infusion, when looked at in mass, is purple, but a diluted one is of a pure blue colour by day-light, and red by candle-light. Acids redden the colour of litmus, and this effect is produced even by the weakest of them, as carbonic acid and sulphuretted hydrogen; when mixed with the latter, and kept for some days in a well-stopped bottle, the colour is destroyed, but by exposure to the air, or by boiling, the colour is restored. Sulphureous acid and the hyposulphites also bleach litmus. These effects appear to be the result of deoxidizement, for the blue colour is restored by the absorption of oxygen.

Archil is employed by chemists to ascertain the presence of acids in solution: for this purpose, the infusion or spirituous tincture is sometimes used; generally, however, paper which has been dyed and dried is preferred, and is well known by the name of *litmus paper*. This test is extremely sensible: according to Mr. Watt (*Phil. Trans.* 1784), it is capable of detecting one grain of sulphuric acid when mixed with 100,000 of water. It may also be used, when it has been reddened by a weak acid, as a test of the presence of the alkalis: these restore the blue colour of the litmus by saturating the acid which reddened it. Archil is never used alone as a dye, on account of its want of permanence. It is, however, employed for the purpose of deepening and improving the tints of other dyes, and it imparts a bloom which it is difficult to obtain from other substances.

ARCHI'LOCHUS, one of the most celebrated lyric poets of Greece, who lived at too remote an age to allow any very satisfactory account of his private history to reach us. Yet every traditionary fragment respecting him concurs to make us believe that he was one of the most extraordinary men of his time, whose hand was raised against every one, and whom all naturally feared and shunned. He was son of Telesicles by a slave Enipo, and he was born in Paros, an island of the Ægean Sea. The exact period at which he flourished does not appear to have been known to antient writers, if we may judge from the different epochs in which they place him. By Herodotus (i. 12) and Tatian he is made contemporary with Gyges, King of Lydia, Olympiad 23, or about B.C. 688; by Cicero he is said to have lived in the reign of Romulus; and by Corn. Nepos in the reign of Tullus Hostilius. It is most probable that he lived at the period assigned to him by the father of history; and it is not impossible that Cicero and Nepos intend to refer to the same epoch, though they denote it by two different Roman kings. He was more formidable with his pen than with his sword; like Alcæus and Horace, he thought life preferable to honour, and did not hesitate to turn his back on an enemy. This event in the life of Archilochus took place, according to the old scholiast on Aristophanes, in an expedition against a people called Sai (Σάοι), in Thrace. Archilochus, it would appear, defended himself by boldly declaring that it was better to lose one's shield than life; and Plutarch, in his account of the Spartan republic, states that Archilochus was banished from Sparta for such a remarkable opinion. Others tell us that his verses were of so impure a character, that the Spartans wisely interdicted the perusal of them by their youth. We have no difficulty in forming an opinion respecting his style of poetry, from the concurrent testimony of the antients; it was full of energy, terse in its language, and vivid in its images. Of his satirical powers no doubt can be entertained, if we credit the story of Lycambes. He had promised his daughter in marriage to Archilochus, but having changed his intention, the poet directed such a fearful satire against the offending Lycambes, that he found no other way of escape but by hanging himself, and some say his three daughters followed his example. On account of his powers of ridicule, over which he does not appear to have had sufficient control, he was driven from his country, and his character seems to have been so well known, that he was always an unwelcome visiter wherever he went. He died in a single combat with one Corax, whom he had probably provoked by his powers of satire, and the oracle of Delphi compelled the murderer to appease the manes of Archilochus by certain expiatory sacrifices. (Plut. *de Serâ; Num. Vind.* c. 17.) It was in Iambic verse that the poet chiefly excelled; he is said, indeed, to have been the inventor of it, and was one of the three poets whom Aristarchus esteemed most highly in this species of poetry (Vell. Paterc. i. 5; Quintil. x. 1). It is also remarked by Vell. Paterculus (i. 5), that Homer and Archilochus are the only poets who both invented a peculiar style of poetry and carried it to perfection. Some specimens of Archilochus, translated with much spirit, may be seen in Merivale's *Anthology*, London, 1832. Some fragments are found in the *Analecta Vet. Poet. Græc.* of Brunck, Argeut. 1785, and they are published separately by Liebel, *Reliquiæ Archilochi*, Vienna, 1819, 8vo.; also in Gaisford's *Minor Greek Poets*, vol. i.; and in Boissonnade's *Collection*, vol. xv. For his merits as a writer the reader may consult Huch, *Versuch über die Verdienste des Archilochus um die Satyre*, Wittenbach, 1767; *Memoires de l'Acad. des Inscript.*, tom. x.

ARCHIMANDRITE, the title of a dignitary in the monastic orders of the Greek church, answering to that of Father Provincial among the monks and friars of the Roman Catholic church. The archimandrite is a superior abbot, having under his jurisdiction several convents of the same district or province. The Russian church, which is a branch of the Greek, has its archimandrites, as well as the Greek church in Hungary and other parts of the Austrian empire.

ARCHIME'DES, the most celebrated of the Greek geometers, and one of the few men whose writings form a standard epoch in the history of the progress of knowledge, was born in Sicily, in the Corinthian colony of Syracuse, in the year 287 B.C.: he was killed when that town was taken by the Romans under Marcellus, B.C. 212, aged seventy-five years. Euclid died about the time of the birth of Archimedes, and Apollonius of Perga was about forty years his junior. Eratosthenes was born about ten years before him.

The life of Archimedes was written, according to Eutocius, his commentator, by Heraclides, but the work is not come down to us, and all that is known of him has been collected from various authors, of whom the principal are Polybius his contemporary, Livy, Plutarch, and Cicero. We, once for all, acknowledge our obligations to the life of Archimedes in Rivault's edition of his works, Paris, 1615; and also to that in M. Peyrard's translation, Paris, 1809.

Archimedes was related to Hieron, the second prince of that name, who came to the throne of Syracuse when Archimedes was a very young man. The reign of this prince, including the time that his son Gelon also bore the royal title, lasted about fifty-five years, during the greater part of which Archimedes remained at Syracuse under their patronage. All that we know of his life during this period, independently of the results of his studies, of which we shall presently speak, is contained in the following incidents. The well known story of Hieron's crown (or Gelon's crown, according to some) is as follows:—Hieron, or Gelon, had delivered a certain weight of gold to a workman, to be made into a votive crown. The latter brought back a crown of the proper weight, which was afterwards suspected to have been alloyed with silver. The king asked Archimedes how he might detect the cheat: the difficulty being to measure the bulk of the crown without melting it into a regular figure. For silver being, weight for weight, of greater bulk than gold, any alloy of the former, in place of an equal weight of the latter, would necessarily increase the bulk of the crown. While thinking on this matter, Archimedes went to bathe, and on stepping into the bath, which was full, observed the very simple fact, that a quantity of water, *of the same bulk as his body*, must flow over before he could immerse himself. It immediately struck him that by immersing a weight of real gold, equal to that which the crown ought to have contained, in a vessel full of water, and observing how much water was left when the weight was taken out again, and by afterwards doing the same thing with the crown itself, he could ascertain whether the latter exceeded the former in bulk. In the words of Vitruvius, 'As soon as he had hit upon this method of detection, he did not wait a moment, but jumped joyfully out of the bath, and running naked towards his own house, called out with a loud voice that he had found what he sought. For as he ran he called out in Greek, *εὕρηκα, εὕρηκα*,' (I have found it, I have found it). According to Proclus, Hieron declared that from that moment he could never refuse to believe anything that Archimedes told him. For the method of detecting the exact quantity of silver alloy, see GRAVITY, SPECIFIC.

The apophthegm attributed to him, that if he had a point to stand upon, he could move the world, arose from his knowledge of the possible effects of machinery, and, however it might astonish a Greek of his day, would now be readily admitted to be as theoretically possible as it is practically impossible. He is reported to have astonished the court of Hiero by moving a large ship, more than usually loaded, with a pulley, or collection of pulleys, and it is said that on this occasion the king pressed him to exert himself in contriving machines for the defence of the city.

He is said to have travelled into Egypt, and while there, observing the necessity of raising the water of the Nile to points which the river did not reach, to have invented the screw which bears his name (see SCREW OF ARCHIMEDES). Athenæus, in mentioning this screw, says it was employed to drain the holds of ships. Diodorus (i. 34) expressly asserts that this machine, which he calls *κοχλίας*, was his invention. It is certain, from the preface to the *Quadrature of the Parabola*, that Conon of Alexandria was well known to Archimedes, which is some presumption in favour of his having been in Egypt.

After the death of Hieron, the misconduct of his successor Hieronymus, the son of Gelon, provoked a rebellion, in which he was killed. The successful party sided with the Carthaginians, and the Romans accordingly dispatched a land and naval armament against Syracuse under Appius and Marcellus. Among all the extraordinary stories which have been told of the siege, so much seems clear:—that it lasted three years in spite of the utmost efforts of the besiegers—that this successful resistance was principally owing to the machines constructed by Archimedes—and that the city, after the siege had been some time converted into a blockade, was finally taken by surprise, owing to the carelessness of the besieged during the festival of Diana. Polybius states that catapults and balistæ of various sizes were successfully used against the enemy; that in their nearer approach they were galled by arrows shot not only from the top of the walls, but through port-holes constructed in numerous places; that machines, which threw masses of stone or lead of a weight not less than ten talents, discharged their contents upon the Roman engines, which had been previously caught by ropes; that iron *hands* (or hooks) attached to chains, were thrown so as to catch the prows of the vessels, which were then overturned by the besieged; and that the same machines were used to catch the assailants on the land side, and throw them to the ground. Livy and Plutarch give much the same account; but the curious story of setting the Roman ships on fire by mirrors is first mentioned by John Tzetzes and Zonaras, writers of the twelfth century, who cite Diodorus and others for the fact. But Galen, in the second century, though he mentions that Archimedes set the enemy's ships on fire, says it was done with *πύρια*, which may refer to any machine or contrivance throwing lighted materials. Lucian also, who lived in the second century, mentions the burning of the ships, but without saying how it was effected. Montucla is of opinion that this report arose from the joining together of two others, namely, that Archimedes wrote a treatise on burning mirrors, and that he did burn the Roman ships; both very credible stories. But their junction must, in our opinion, rank with the many curious things said of Archimedes in later ages. It is difficult to say at what period after his death discoveries respecting an illustrious man will stop: thus Rivault, in 1615, was informed by a very learned Greek, who had translated from that language the lives of the Sicilian martyrs, that one of them, a lady named Lucia, was a descendant of Archimedes, and an ancestress of the Bourbons.

After the storming of Syracuse, Archimedes was killed by a Roman soldier, who did not know who he was; Marcellus, it is said, had given strict orders to preserve him alive. According to Valerius Maximus, when the soldier asked who he was, Archimedes, being intent upon a problem, begged that his diagram might not be disturbed; upon which the soldier put him to death. According to another account, he was in the act of carrying his instruments to Marcellus, when he was killed by some soldiers who suspected he was concealing treasure. At his own request, expressed during his life, a sphere inscribed in a cylinder was engraved on his tomb, in memory of his discovery that the solid content of a sphere is exactly two-thirds of that of the circumscribing cylinder. By this mark it was afterwards found, covered with weeds, by Cicero, when he was residing in Sicily as quæstor.

The fame of Archimedes rests upon the extraordinary advances which he made, considering the time in which he lived, in pure geometry, in the theory of equilibrium, and in numerical approximation. In the first, by an axiom already mentioned [see ARC], and a similar one with respect to curved surfaces, and by the method of EXHAUSTIONS (which see), he made as near an approach to the fluxional or differential calculus as can possibly be done without the aid of algebraic transformations. In the theory of mechanics, he was not only the first but the last of the antients who reduced anything to demonstration from evident first principles; indeed, up to the time of Stevinus and Galileo, no further advance was made. We proceed to notice his writings, stating very briefly the most important of *his own discoveries only*. The works which have come down to us, of which the first seven are in Greek, are,—

1. *Two Books on the Sphere and Cylinder*.—Here he finds the surface of a right cylinder, a right cone, and a sphere—that a hemisphere is double of a cone of the same base and altitude, and two-thirds of the cylinder of the same base and altitude—that the surface of the circumscribing cylinder (the bases included) is half as great again as the surface of the sphere, and consequently that the surface of the cylinder (not including the bases) is exactly

equal to that of the sphere—he also finds the surface of any spherical segment, and the solidity of a spherical sector. In the second book, he shows how to find a sphere equal to a given cone or cylinder; to cut it into segments having a given ratio; to make a segment equal, either in surface or solidity, to one, and similar to another, segment. Also he shows how to cut off a segment which shall have a given ratio to its inscribed cone.

2. *On the Measurement of the Circle.*—It is here shown that the area of a circle is equal to that of a triangle which has the circumference for its base and the radius for its altitude, and also that the circumference of a circle exceeds three times the diameter by a line which is less than 10 parts out of 70, and greater than 10 parts out of 71, of the diameter. This is the celebrated approximation of Archimedes, and amounts to saying that the ratio of the circumference to the diameter lies between 3·1428 and 3·1408. It is now known to be 3·1416 very nearly.

3. *On Conoids and Spheroids.*—By a *conoid* is meant the solid formed by the revolution of a parabola or hyperbola about its axis. *Spheroid* has the usual meaning. Archimedes here shows that a segment (or part cut off by a plane) of a parabolic conoid is half as much again as its inscribed cone, whether the base be perpendicular to the axis or not, the axis of the conoid being the parallel to the principal axis which passes through the centre of the base; that all segments of the same conoid, having equal axes, are equal; or, more generally, that different segments of the same conoid are as the squares of their axes; how to find the ratio of the segment of an hyperbolic conoid to its inscribed cone; that any spheroidal segment, having the centre of the spheroid in its base, is double of its inscribed cone; and generally, how to compare any spheroidal segment with its inscribed cone. In this treatise is also shown, probably for the first time, how to find the area of an ellipse, by means of that of a circle.

4. *On Spirals.*—The spiral of Archimedes, the method of forming which appears to have been suggested by his friend Conon, is thus made:—a point moves uniformly along a straight line, which straight line itself revolves uniformly about a given point in it. Archimedes shows how to compare the areas described by the moving point in its various revolutions, and various other properties, which the little importance of the subject will excuse us from noticing. As an effort of geometry, it is, however, not inferior to the preceding, and it is one of the most difficult of his works.

5. *Two Books on the Equilibrium and Centre of Gravity of Plane Surfaces.*—The axiom on which Archimedes sets out is, that equal weights suspended at equal distances on opposite sides of a pivot are in equilibrium. He then shows the well-known property of the lever:—given the centre of gravity of a whole plane, and of one of its parts, how to find the centre of gravity of the remainder—how to find the centre of gravity of a parallelogram, triangle, and trapezium. In the second book he shows how to find the centre of gravity of a parabolic segment, or the difference between two segments of the same parabola, having different bases.

6. *Psammites*, better known by its Latin name *Arenarius.*—This is a mathematical toy, but abounds in curious information. It appears from it that Archimedes had written a system of numeration, in a work addressed to one Zeuxippus, resembling that of modern times in having units of different orders carried to a great extent—that he approved of the system which he attributes to Aristarchus, which places the sun immovably in the centre of the universe, instead of the earth—that he was aware of some attempts having been made to measure the earth, which, from their result, as stated by him, could hardly have been those of Eratosthenes—that no instrumental means then existed by which the apparent diameter of the sun could be measured within 4′—and that plane trigonometry was totally unknown at that time. The object of the work is to oppose those who held that the grains of sand on the sea-shore are either infinite in number, or at least cannot be reckoned. By approximately measuring the apparent diameter of the sun, and making arbitrary suppositions as to how many times the real diameter is contained in the earth's distance, and this again in the sphere of the fixed stars, he comes at last to the conclusion that no one will assert the diameter of the sphere of the fixed stars to be greater than 10,000,000,000 of stadia. Then supposing a stadium to be 10,000 finger-breadths, and a sphere, which is only the 40th part of a finger-breadth, to contain as many as 64,000 grains, Archimedes shows that the number of grains contained at the same rate in the whole sphere of the fixed stars can be expressed, in his system of numeration, by a number which in our system is less than 1 followed by 63 ciphers.

7. *On the Quadrature of the arabola.*—Archimedes here shows that any segment of a parabola is four-thirds of a triangle, having the same base and the same altitude.

8. *Two Books on Bodies floating in a Fluid.*—This work does not exist in Greek, but was translated by Tartaglia from a mutilated Greek manuscript: the first book was published in 1543, and both together in 1545. That Archimedes did write such a work is certain, from the testimony of Strabo (Casaubon, p. 54). These two books contain the conditions of equilibrium of a floating body in general, applied to determine the positions of a spherical segment and of a conoid. It is less necessary to describe this book particularly than any other, because, the use of algebra excepted, it contains all the conditions of a modern work on the same subject.

There is also a book of *Lemmas* attributed to Archimedes, translated from the Arabic in 1659, and republished by Borelli in 1661. Both Archimedes and his commentator Eutocius refer to some such work; but the very common character of the contents of the *Lemmas* has led some to doubt if this was the work in question.

The works of Archimedes are written in Doric Greek, the prevailing dialect in Sicily. The text is for the most part in tolerably good preservation; the style is clear, and has been considered better than that of any of the other Greek geometers. His books are mostly addressed to a friend named Dolitheus. The demonstrations are long, but rigorous; and M. Peyrard, in calling Archimedes the Homer of geometry, has made a simile which is perfectly admissible as to the strength of praise it conveys, if in no other point. The commentaries of Eutocius which have come down to us, are those on the *Sphere and Cylinder*, the *Measurement of the Circle*, and the *Equilibrium of Planes.*

We can only briefly touch upon several remaining points. It is known from Ptolemy that Archimedes observed or calculated several solstices, for the determination of the length of the year. He is said to have been the first who constructed a machine for representing the motions of the sun, moon, stars, and *perhaps* of the planets. The doubt is from Delambre, who does not, however, appear to have remembered that Cicero (*Tusc. Quæst.*) says that Archimedes '*lunæ, solis, quinque errantium, motus in sphæram illigavit.*' Pappus cites a treatise of Archimedes on the construction of this sphere, as also does Proclus. A large number of works which have not come down to us is attributed to him, a list of which may be found in Fabricius; particularly a treatise on *Burning Mirrors*, and a treatise on the *Parabola*, published at Louvain in 1548. There is no great evidence in favour of the genuineness of either. The antients attributed to him more than forty mechanical inventions; among which are the endless screw; the combination of pulleys; an hydraulic organ, according to Tertullian; a machine called the *helix*, or screw, for launching ships, according to Athenæus; and a machine called *loculus*, which appears to have consisted of forty pieces, by the putting together of which various objects could be framed, and which was used by boys as a sort of artificial memory. It is impossible to understand what is meant by such a description. This constant tendency to attribute inventions to Archimedes, sufficiently shows the impression which his name left on posterity.

Among the principal editions of the works of Archimedes we must notice the partial edition of Tartaglia, Venice, 1543; the first complete edition, reviewed by Regiomontanus, accompanied by the commentary of Eutocius; the whole Greek and Latin, Basle, 1544. This last edition does not contain the treatise on *Floating Bodies*, nor the *Lemmas*. Vossius states that the manuscript which had been brought from Constantinople at the fall of that place, was carried into Germany by Regiomontanus. There is also an edition by Commandine, Venice, 1558, containing only part of his works; by Rivault, Paris, 1615, containing the Greek of Archimedes in the preliminary addresses and enunciations only, the demonstrations being the Latin of Rivault, except in the *Arenarius*, which is complete; this edition has been much censured by several more modern editors but Mon tucla and Vossius unite in speaking well of it; by Torelli, Oxford, 1792, the best, perhaps, of all. The last mentioned edition was purchased by the University of Oxford after the death of the editor, and is the only one which contains the various readings. We have also the Latin translation of Borelli, 1661; the paraphrase of Maurolico, 1570, the whole edition of which was lost by shipwreck except one or two copies, and which was reprinted in 1681; the abridgment of Barrow, in 1675; and finally, the French translation of Peyrard, Paris, 1809, undertaken at the request of the Institute, and revised by Delambre, being, for public use, by much the most convenient version which has yet appeared. A German translation of all the works of Archimedes, by Ernst Nizze, appeared at Stralsund in 1824, in 4to.

Montucla cites the following lives of Archimedes: Mazuchelli, *Notizie Historiche alla Vita, &c., d'Archimede*, 4to., 1735; and an unfinished work of M. Melot, *Mém. de l'Acad. des Belles Lettres*, vol. xv.

ARCHIPE'LAGO is the common term given to many clusters of islands: the group generally known by this name, when not qualified by some word prefixed, contains those islands which lie between the shores of Greece and Asia Minor. There are, however, other groups so called in our charts, the principal of which are the Aleutian, Chagos, Sooloo, Dangerous, Queen Adelaide's, Corean, Louisiade and Solomon's, the two last forming part of Polynesia. The origin of the term Archipelago appears rather doubtful: the second part of the term certainly is *pelagus*, the *sea*, a Greek and Latin word; and the first part is possibly a corruption of Ægæum. [See ÆGEAN SEA.]

ARCHIPELAGO, ALEUTIAN, or Fox Islands, an extensive group on the N.W. coast of America. [See ALEUTIAN ISLANDS.]

ARCHIPELAGO, CHAGOS, in the Indian Ocean, extends from the south end of Diego Garcia (or Chagos) Island, in 7° 29′ S. lat., to the north end of Speaker's Bank, in 4° 40′ S. lat., and from the meridian of 71° to 77° E. It is composed entirely of coral islets, of which Diego Garcia is the largest: they have all very deep water close to them, and are covered with tall cocoa-nut trees. These islands abound in land-crabs, green turtle, and have a plentiful variety of fish; fresh-water may be had by digging eight or ten feet deep. There is a port in Diego Garcia, which, however, is difficult of access. The tide rises from six to seven feet, and the current generally sets through the group to the N.W.

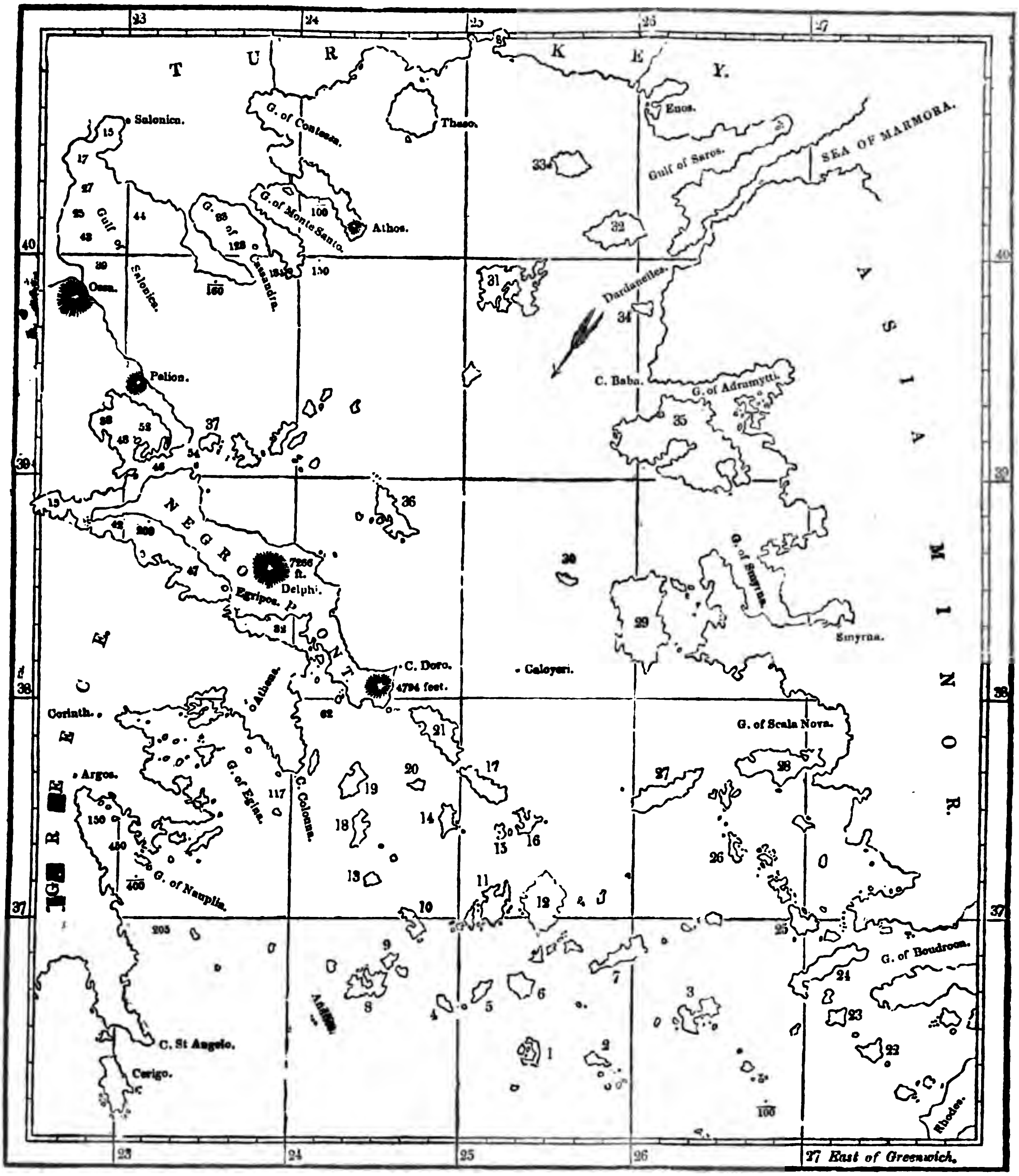
ARCHIPELAGO, DANGEROUS. This appellation has with good reason been given to a group of half-formed islets in the South Pacific Ocean, lying eastward of the Society Islands, and between the parallels of 14° and 26° south. They are exceedingly numerous, and probably many yet remain undiscovered; they are nearly all of coral formation, and consist of narrow ribands of coral rock, generally describing a circular figure, and inclosing a lagoon, in many instances of great depth. These ribands rarely exceed an elevation of ten feet above the sea, and half a mile in breadth; they all have the pandanus, and some the cocoa-nut tree on them. The eastern side is universally the better formed, and covered with vegetation: this is owing to the westerly current caused by the trade-wind, which deposits all floating substances, among which are the seeds of trees, on the eastern side of the island.

Salas Rock, Pitcairn Island, and Gambier's Group, are volcanic; and it may be presumed that the same convulsions of nature have given the little zoophyte a foundation on which to erect his stupendous structure. One island (Elizabeth) has attained a height of seventy or eighty feet, is formed of compact coral, and well covered with such stunted vegetation as may be expected from the absence of good soil. It has no lagoon; occasionally instances occurring of small islands without one, though rarely. The surf, which breaks violently over them on all sides, is the best safeguard for ships; in the night it may be heard from six to eight miles off, and is frequently seen by day before the island itself, unless the island is well covered with trees. Half a mile from the reef the sea is fathomless. The western sides are, as we have remarked, always less perfect, and some admit of a passage for ships into the lagoons, which become safe harbours. They all lie within the range of the S.E. trade-wind, which however prevails nearly east, but in the winter months there are frequent and heavy gales from the westward. Fresh-water may be obtained by digging in the sandy beach. Many are inhabited, though evidently not by the same race. Canoes driven off the Society Islands have been the means of peopling some. There is a tide-rise of from three to three and a half feet, but the surf prevents the direction of the tide from being ascertained. Plovers, ringdoves, curlews, and sandlings, terns, tropical birds, and gannets are found among them; and the specimens of shells are various and beautiful.

ARCHIPELAGO, GRECIAN, includes all the islands situated in the north-eastern quarter of the Mediterranean sea; they are bounded by the shores of Roumelia (a province of Turkey in Europe, partly corresponding to the antient Thrace) on the north, Asia Minor on the east, and the Negropont and Greece on the west, comprising a portion of sea which lies in the direction of N. by W. true, with a length of 380 (statute) miles from Candia to the coast of Roumelia, and a breadth, from the Negropont to the Asiatic shore, of 100 miles.

This sea was called by the Greeks and Romans the Ægean Sea, and the islands were distributed into two chief groups: those to the westward, now considered as part of Europe, were called Cyclades, from their being supposed to lie in a somewhat circular form; the smaller and more southern islands along the Asiatic coast obtained the name of Sporades, or 'scattered islands.' Of the Cyclades the principal are—Santorin (1), Anaphi (2), Stanpalia (3), Policandro (4), Sikino (5), Nio (6), Amorgo (7), Milo (8), Argentiera (9), Siphno (10), Paros (11) with the small island of Antiparos near it, Naxia (12), Serpho (13), Syra (14), Rhenea (15), Miconi (16), Tino (17), Thermia (18), Zea (19), Jura (20), and Andros (21). Of the Sporades the principal are—Piscopi (22), Nisari (23), Cos (24), Calymna (25), Patmo (26), Nicaria (27). There are also on the Asiatic coast the large islands of Samos (28), Scio (29), and Psara (30). Farther to the northward are Lemnos (31), Imbros (32), Samothraki (33), Tenedos (34), Mitilin (35), Skyro (36), and the Skiathos (37) group off the Trikiri Channel. Many of these islands are of volcanic formation; others are composed almost entirely of a pure white marble, of which the Parian, from Paros, where it was formerly most worked, is often mentioned by antient writers. They exist almost in countless numbers; some are beautifully fertile and picturesque, though all the smaller islands are mere masses of rock, almost entirely destitute of vegetation. The productions of the islands are wine, oil, gum-mastic, raisins, figs, silk, honey, wax, olives, and various fruits, especially the lemon and orange: cotton is grown in small quantities at Milo and other islands, and might be cultivated to a great extent. It is remarkable for its brilliant white hue. Some of the larger islands contain sulphur, alum, iron, and other minerals. An extensive sponge fishery has also long been established among the Sporades, which are noted for their fine sponges. The arts and manufactures are at so low an ebb, that commerce is confined chiefly to the interchange of articles of daily consumption, and is carried on principally in small kaïks, in which the inhabitants push across from one island to another, certain of always being able to reach a port in the event of being overtaken by bad weather. These kaïks are open boats, sharp at each end, and carrying one large spritsail, part of which is always dragging in the water.

All the islands are thinly peopled, and some indeed may scarcely be considered inhabited. As their religion imposes on the people four lents a year, when meat may not be eaten, fish becomes more a necessary than a luxury, in consequence of which a large portion of the men are employed as fishermen. There are, however, no regularly established fisheries; the supplies are obtained by any who think they can make a livelihood by fishing in their small boats; nets are most commonly used, and the fish caught are chiefly bream and mullet, both red and grey, which are large and well flavoured. The men are a fine, hardy, and athletic race, and as their insular position renders them necessarily habituated to the sea, they are justly considered good sailors. Their dress consists of a short jacket and waistcoat, without a collar, very full breeches, with a red sash round the waist, a small red cap fitting close to the crown of the head, and shoes resembling our slippers: the legs and throat are generally bare; they wear moustachios, but never beards, and though they do not shave the fore part of the head, like the Albanians, yet the hair is made to lie back, and falls down the neck to a great length. The women are generally considered beautiful; in no part of Greece does the character and expression observable in the face of the



[The figures attached to the islands refer to the list in p. 279: the numbers which stand alone denote depths in fathoms; and $\overline{400}$, for instance, denotes no bottom with 400 fathoms.]

antient statues so decidedly show itself, and especially among the Cyclades. The women's dress is very simple; the only peculiarity being a long jacket, generally trimmed with fur, and a red cap. When not employed in their household occupations, which are laborious, their time is taken up with spinning cotton, and knitting, or weaving.

Their religion, like that of their countrymen on the mainland, is of the established Greek church; and as they are very superstitious, almost every point of their islands has its little chapel dedicated to some saint, where the boatmen can offer up their prayers or thanksgivings. In many of the islands, however, Catholics are numerous. The difference of faith provokes much jealousy and hatred, and it is notorious that during the late war for independence, the Roman Catholic portion of the islanders inclined rather to the Turks, than to their own countrymen of the Greek church. This was more particularly the case at Tino and Miconi.

The mode of threshing is still that mentioned in Scripture —treading out the corn by oxen yoked together and driven round a circular enclosure.

All the islands are high: the mountains have an average elevation of 1500 to 1800 feet, but Mount Elias of Milo rises to the height of 2036 feet above the sea. Many of the islands exhibit, in the remains of antiquity yet visible, traces of their former prosperity and importance.

The climate is more equal and temperate than that of the surrounding continents, the heats of summer being tempered by cool refreshing sea-breezes and prevailing northerly winds; even in the more northern islands the winter is never felt with such severity as on the neighbouring mainland. The N.E. or Etesian winds, called by the fishermen 'Meltem,' a corruption probably of *mal tempo*, blow with great fury, especially about the equinoxes; the general period of their duration is three days. The true sirocco, with its oppressive state of atmosphere, does not blow in the Archipelago; and it is curious to observe the sea-breeze taking the direction of the various gulfs and inlets, though differing several points in bearing. In winter the navigation of these seas is, to say the least, an anxious task, on account of the numerous islands and rocks, which occasion sudden flaws and eddies of winds, and a short, ugly, confused sea. A remarkable feature is the very great depth of water: at the distance of less than a mile from the shore there is generally no bottom with 150 to 200 fathoms of line. The Ananes rocks, 10 miles south-west of Milo, and the Caloyeri, 30 miles west of the south point of Scio, rise up almost perpendicularly, like the coral reefs of the Southern Ocean. Throughout the Cyclades more especially, the Dardanelles current is felt, and sets strong through the narrow channels between them; but to the north, along the coast of Roumelia, a kind of back current sets to the eastward.

The rivers that empty themselves into the Archipelago are more deserving of notice from their classical associations than from their magnitude or commercial importance; indeed the south-western shores offer no river navigable even for small boats. On the coasts of Thessaly, Macedonia, and Thrace, however, the Peneus, the Axius, the Strymon, and the Hebrus, admit the larger class of kaïks, though in all of them the mouths are much obstructed by shoals and deltas of low islands. On the Asiatic shore, the Hermus and Mæander are the chief rivers. The coasts around the Ægean are deeply indented with gulfs of considerable length, the principal of which are Nauplia, Egina, Egripos, Trikiri Channel (leading to Zeitouni and Tallanda), Salonica, Cassandra, Monte Santo, Contessa, Saros, Adramytti, Smyrna, Scala Nova, Hassan Kalessi, and Boodroon (or Cos). Some of these are separated from each other by remarkable peninsulas, especially those of Pallene, Sithonia, and Athos, which last is perhaps the boldest promontory in the world: the steep and almost inaccessible sides of the mountain descend abruptly into an unfathomable sea. [See ATHOS.] Among the chief mountains in or near the Ægean may be noticed Delphi in Eubœa, the mountains bordering on the coast of Thessaly, Athos, and Elias in the island Milo.

On the division of the Roman empire the islands formed a portion of the eastern dominion, and continued so till the year 1185, when the Venetians captured Andros, Lesbos, Samos, and Scio, in revenge for an attempted aggression of the Emperor Alexius on the territories of the republic. In 1207 an edict was issued at Venice, authorizing the nobles to equip armaments for the reduction of portions of the empire. Several of the islands were thus taken possession of as private estates by the victorious adventurers; the most celebrated among whom was Marco Sanuto, who in the same year made himself master of the island of Naxos, with the title of Duke of Naxos. Having added to his conquest the islands of Paros, Antiparos, Santorin, Anaphi, Argentiera, Milo, Sipno, and Policandro, he asserted his independence of Venice, and assumed the more comprehensive title of Duke of the Archipelago.

Some of the other islands were occasionally recaptured by the Greeks, but this dynasty continued uninterruptedly in the same family for a period of nearly three centuries, till Naxos fell into the hands of Barbarossa, who, after sacking the island, allowed John Crispo, the then reigning duke, to retain his dominions on condition of becoming a vassal to the Porte. Barbarossa plundered the other islands which still remained appanages of Venetian noblemen. In 1566, James, the twenty-first and last duke, having become a prisoner in the Seven Towers, a governor was appointed by the sultan, and all the islands then became united under the dominion of Solyman. It is singular that no one institution worth recording, and no monument of art, remain to preserve the remembrance of the long period of the ducal government.

In 1686, Morosini again laid some of the islands under temporary contribution to Venice, though they were never again detached from the Ottoman dominions. The islands were, however, entirely freed from the Turkish presence by the expeditions of the Knights of Malta, who, making frequent descents, carried away into slavery all the Mussulman residents, so that the Porte withdrew its governor and officers, leaving them in a manner independent, and masters of the land, subject only to a tribute levied as land and capitation taxes. For this purpose the captain pasha, to whose pashalik most of the islands belonged, used to make an annual tour with the fleet in such force as to keep the knights in awe, and enforce the speedy collection of the taxes.

The government taxes of Candia, Cyprus, Cos, Imbros, Lemnos, Mitilin, Tenedos, and Thasos, were set apart for members of the imperial family; Nicaria and Samos, for the mufti; Andros, Tino, Scio, and Syra, for other officers of the divan. In 1770, the Russians became masters of some of the Cyclades, which they evacuated by treaty four years afterwards. They remained tributary to the Porte till the breaking out of the revolution in 1821, shortly after which most of them eagerly embraced the cause of liberty, and contributed as much as lay in their power, both by men and ships, to the squadrons fitted out at Hydra and Spezzia. Their intrepid behaviour in their small vessels against the Turkish fleet became the admiration of Europe, and contributed greatly towards the establishment of their national independence.

All the Cyclades are now a portion of the Greek kingdom, but most of the other islands still remain under the Turks. In many of the islands they build vessels, and in Syra, more particularly, there is a large establishment for ship-building; their fir plank is imported chiefly from Trieste. Their models are beautiful, but being hurriedly and slightly put together, often with unseasoned wood, their vessels do not last long. The polacca rig is universal.

ARCHIPE'LAGO CARIBBEAN. [See ANTILLES.]

ARCHIPE'LAGO, COREAN, an extensive cluster of islands on the western coast of Corea, discovered by the Alceste in 1816. They are all high, rising like mountains from the sea, and are well wooded to the summits. None of them appear to exceed three or four miles in length, but all are in some degree cultivated; the fields are divided by stone walls. From the tops of one of the highest 135 islands were counted, forming a chain of excellent harbours communicating with each other. They appeared to be all inhabited, and the natives resembled those of the mainland of Corea; they cultivate corn and feed cattle for their own consumption, but subsist chiefly on fish; no weapons were observed among them. The rise and fall of tide is considerable, but among so many islands the direction must of course be various. They extend from 34° to 36° 45′ N. lat., and from 125° to 127′ W. long. (Hall and M'Cleod.) [See COREA.]

Besides these there are many groups of islands to which the term Archipelago is applied by some geographers; thus all the islands to the north and east of Madagascar, from Bourbon to the Seychelles, and from Rodriguez to the main, have been classed under the denomination of the Ethiopian Archipelago. On the N.W. coast of America are small clusters, called George Third's, Prince of Wales's, and Pitt's Archipelagos [see COOK, VANCOUVER, PEROUSE], and on the western coast of the Birmese empire, near the Andamans, are two chains of small barren islands, called the Mergui and Tanasserim Archipelagos. The term has also been applied to the Philippines and many other groups. A list of twenty-six groups called Archipelagos is given in the *Encyclopédie Méthodique* (*Géographie Physique*), most of which, such as the Azores, Canaries, &c., are as properly called Archipelagos as those here noticed; but as they are generally known by other special names, and not by that of Archipelago, we prefer describing each group under its ordinary appellation.

ARCHIPE'LAGO, GREAT CYCLADES, a group of large islands in the south Pacific, so called by the French navigator Bougainville; they received from Cook the name of New Hebrides, by which they are now generally known. [See NEW HEBRIDES.]

ARCHIPE'LAGO, LACCADIVE, a group of low islands, opposite the Malabar coast, and separated from it by a channel 135 miles wide. They are surrounded by and interspersed with coral reefs, which are steep, with no soundings between them. Some of the islands are well inhabited and afford good fresh water; they abound in turtle, and are so low, that at a small distance the trees only appear visible above the water. There is a rise of tide of about six feet, but the tides are not regular, and the currents are very strong; the largest island is about six miles long and one broad. To the northward of the group is an extensive coral bank of twenty-five to thirty fathoms, also steep. It lies nearly N. and S., about sixty-five miles in length and very narrow. The extent of the chain is from 10° to 12° 20′ S. lat., and 72° 0′ to 74° 20′ E. long. (Horsburgh). [See LACCADIVES.]

ARCHIPE'LAGO, LOUISIADE, a range of islands to the S.E. of New Guinea, about 400 miles in length, and 160 at its greatest breadth. The largest islands do not exceed thirty miles in length; they are very high and are covered with wood from the summit to the shore. They are surrounded by and interspersed with coral reefs and islets, which are covered with cocoa-nut trees; these reefs are steep, like all others of the same formation. The current sets through the channels to the N.W. at the rate of about half a mile an bour. Some of the islands are populous and fertile, but the natives are warlike and treacherous, and are supposed to be cannibals: they are of middling stature, of a copper colour, with woolly hair: they tattoo, and go nearly naked, but are fond of personal ornaments. The islands appear to abound in aromatic plants, as most of the articles obtained from the natives were highly scented. Their canoes, some of which are fifty feet long, have their stems and sternposts prolonged to a great height; they carry outriggers and sails, and have two rudders. In battle the natives use slings chiefly, but also darts and tomahawks, and a wooden shield for defence. The group is contained between 9° 45′ and 12° south lat., and 148° 50′, and 154° 40′ east long. (Bougainville, Cook, &c.)

ARCHIPE'LAGO, MALDIVE, in the Indian ocean, to the S.W. of Ceylon, a chain of innumerable low islands and rocks, extending about 470 miles nearly on a meridian line. The large islands abound in cocoa-nut trees, and are generally inhabited by a race of Hindoos, but most of the other islands are mere barren rocks and sand banks. The greatest breadth of the range is about twenty leagues; it is formed of large groups or clusters, called by the natives Atolls. An Atoll is a bank rising from an unfathomable depth on which islands and rocks are situated; these prevail *generally* round the margin of the bank, though many exist within the area thus formed, that is, the islands themselves do not rise from the great depth, but are based on the sand-bank, which affords anchorage within the area. There are thirteen large Atolls from five to ten leagues in diameter, with several other detached islands and rocks in the channels that separate them: some of the channels are wide and safe, having no soundings till close to the reef, but within the reefs there is a moderate depth of water fit for anchorage. The currents set strong through the channels with the prevailing monsoon. The native boats, taking advantage of the monsoon, trade to Bengal in coir, cowries, &c., and return with rice, sugar, and piece goods. The geographical position is from lat. 7° 6′ N. to 0° 40′ S., long. 72° 48′ to 73° 48′ E. (Horsburgh). [See MALDIVES.]

ARCHIPE'LAGO, QUEEN ADELAIDE'S, on the S.W. coast of Patagonia, lies between Lord Nelson's Strait and the northern entrance to the Strait of Magalhaens on the western side. These islands are separated from the main land by an intricate channel, varying from two to five miles in breadth, called Smyth's Channel. They consist of numerous elevated islands with sharp rugged peaks and serrated ridges, separated by narrow and deep passages. Sir John Narborough touched here in 1670, and the S.W. island of the group still bears his name. This Archipelago is at present under examination; it is contained between 51° 50′ and 52° 42′ S. lat., and 74° 07′ and 75° 10′ W. long.

ARCHIPE'LAGO, RECHERCHE DE L', a very scattered and intricate labyrinth of reefs and islands on the south coast of New Holland. The largest island does not exceed four miles in length: they are all barren and arid, producing little vegetation, and nothing esculent. They have attained some elevation from the accumulation of sand, like the opposite coast, the approach to which is thus rendered dangerous. Wood and water, both in small quantities, may be procured on some of the islands; penguins, seals, and sharks are very numerous; the only quadruped seen by those who have visited the spot is the kangaroo. This group was so named by D'Entrecasteaux in 1792, when in search of La Perouse: the largest and the western portion of the islands lies off the bay of Espérance; the rest lie scattered to the eastward. The whole are included between the parallels of 33° 45′ to 34° 0′ south, and meridians of 121° 35′ to 124° 4′ E. (*Australian Memoir;* D'Entrecasteaux's *Voyage.*)

ARCHIPE'LAGO, SOLOMON'S, a chain of large islands, east of New Guinea, some of which are sixty miles in length; they are very high, and thickly wooded from the summit to the beach; they appear to be but thinly inhabited by different races, some very black and others copper-coloured; the former have soft woolly hair, the latter long and black; most of them cut it short round the crown. The men tattoo their bodies, and both sexes paint their faces; the ears are pierced and the orifices distended by rings of different kinds, and an ornament is also worn through the septum of the nose. Both sexes go entirely naked, except a scanty girdle round the waist. In war they use bows and arrows, spears and clubs; shields made of wicker-work are also used as a defence. Their canoes are skilfully constructed of pieces neatly joined together; the head and stern are high, and in general ornamented with mother-of-pearl; some of them are between fifty and sixty feet in length, and about four wide. The inhabitants are treacherous, and said to be constantly at war with the neighbouring islands; they are supposed to be cannibals.

The group was first discovered by Alvaro de Mendana in 1567, and was again visited by M. de Surville 200 years after, but, like the greater part of Polynesia, they have never undergone a survey, though frequently touched at by vessels during the last fifty years. Nothing is therefore known of their government, religion, or customs; the wild boar appears common, with loories, cockatoos, and aquatic birds: there are also large snakes and a peculiarly large ant. Their geographical position is from lat. 5° to 11′ S., long. 154° 40′ to 162° 20′ E. They lie parallel to the Louisiades in a N.N.W. direction, and are about 240 miles distant from that Archipelago. (D'Entrecasteaux.)

ARCHIPE'LAGO, SOOLOO, a group of islands, about sixty in number, lying between the S.W. point of Mindanao, and the N.E. point of Borneo, and consisting of some large islands, especially Sooloo, Beca, and Basseelan, with many smaller ones, and coral reefs so numerous as to render the navigation of the group very dangerous. All the islands are subject to a rajah, who resides at Sooloo town in the island of that name, which is thirty miles long, twelve broad, and contains about 60,000 inhabitants. The islands are generally high, and there are several good harbours; bullocks, poultry, and other live stock, with fruit and vegetables, may be had in abundance; but the natives are treacherous, and small vessels should be on their guard against attacks. The group is comprised between lat. 4° 30′, and 7° 0′ N., and long. 118° 30′, and 122° 30′ E. See Sooloo (Horsburgh).

ARCHITECTURE is sometimes defined to be 'the art of building.' We shall presently examine in what sense this definition ought to be explained, and how it ought to be limited.

The Greek term for architect is ἀρχιτέκτων (*architectōn*), which we find employed by Herodotus (iii. 60.) in the same sense as the word *architect* now is: he informs us, that Rhoecus, a Samian, was the *architectōn* or architect of the great temple of Samos. We thus learn from positive testimony, that before the great buildings of Athens were erected, the term architect and the profession of an architect were distinctly recognized among the Greeks. But Herodotus also uses the word *architectōn* in the passage just referred to in another sense: he applies it to a person who made a tunnel by which the city of Samos was supplied with water; and this is an instance in which *building*, or *construction*, properly speaking, can hardly be said to have been employed. The great increase in works of this class in modern times has led to new designations, such as that of civil engineer, which we apply to those who construct artificial ports, roads, railways, tunnels, &c.; and though the engineer may often have occasion to *build*, and may also with propriety *decorate*, common usage has placed a determinate boundary between civil engineering and architecture.

In ascertaining the present meaning of terms, it is sometimes useful and often necessary to ascend to their primary signification, and to trace their historical progress. The Greek word *archi-tectōn* signifies the chief *fabricator* or *maker;* and the word *tectōn* itself (τέκτων) appears to mean, originally, a *worker in wood*, a *carpenter*, a *house-builder*, a *ship-builder*, &c. (See *Iliad*, xv. 411; xxiii. 712; *Od.* xvii. 384.) It is not, however, limited to those who were skilful in the working of wooden materials, but when coupled with a qualifying term (as in *Il.* iv. 110; *Hymn to Venus*, l. 12) it had a more extensive signification. We believe that a fair examination of the earliest uses of this word will lead to an opinion that it signified *primarily* 'a worker in wood;' and consequently the Greek term *architectōn*, and the Roman *architectus* (which is a borrowed word with a Latin ending), would properly signify the *chief-carpenter*. It seems to be a fair inference, that this primary signification of the Greek word should have reference to the *materials* first employed in construction; and it appears to confirm the opinion, which is established by other independent considerations, that the *architecture* of the Greeks derived its origin from a construction in wood.

It is impossible to assign an exact meaning to the term architecture by any short definition. Architecture is not merely the 'art of building,' or of working materials of earth, timber, or stone, into the form of mounds, huts, caves, and walls. Thus we do not admit such mounds of earth as that of Alyattes [see ALYATTES], or of Silbury Hill near Marlborough, to possess an architectural character. Neither are the kraals of the Hottentot, nor the rude huts of other nations, entitled to this name, though such habitations undoubtedly have in each nation a particular and a tolerably uniform style of construction.

An excavation in a rock is not an architectural work, unless it possess a certain symmetry and certain ornaments which characterize other similar works, so as to enable us to refer it to some class or kind of construction. Where such instances of excavations occur, the ornamental or architectural part is obviously only the copy of models in wood or stone previously erected on the earth. Such is the character of the rock temples of Elephanta, and the rock-cut tombs or temples in Nubia. The rude Pelasgic or Cyclopian walls of Tiryns in the Peloponnesus, and other similar structures in Italy, possess a distinctive character, which is seen in a more advanced and improved state in the military fortifications of Mycenæ, where we find also the oldest instance, as far as we know, now existing in Europe, of a construction in stone combined with the sister art of sculpture. We refer to the sculptured figures in high relief, commonly called lions, which stand over the great gateway. But neither are these buildings included in the term architecture, as we shall proceed to show.

The existing monuments in Great Britain which are supposed to be anterior to the Roman invasion of this island, are classed, whether correctly or not we shall not here inquire, under the general term of Druidical or Celtic. The most remarkable of these monuments, both for preservation and arrangement, is Stonehenge on Salisbury Plain in Wiltshire. Here we find stones, some of very large dimensions, placed upright in the ground, and forming a series of concentric circles. They are not merely rude masses, like those of Avebury near Silbury Hill, but they have evidently undergone some shaping and rubbing down so as to form tolerably regular parallelopipedons. We here observe also two stones placed upright, like posts or pillars, and another large stone placed over them like an architrave or lintel: the lintel is also secured by means of mortises and tenons: all this indicates certainly a regular principle of construction. But, with the exception of a few inquirers who are, perhaps, disposed to over-value Celtic remains, can any careful antiquarian trace the forms of our oldest churches and other antient edifices, to the rude masses of the British monuments in this island? It is an historical fact, that the Romans introduced into England their own principles of building; and it is equally demonstrable that, with the exception, probably, of the arch, Roman architecture, as it is known to us, both from existing specimens and written books, is a modification and adaptation of Grecian architecture; it was probably introduced among the Romans by Greeks, and certainly generally practised by them even under the emperors. [See APOLLODORUS.] If we then trace the progress of architectural construction from the Greeks, through the Romans, to its introduction into western Europe, we may fairly assert that the term *architecture*, in its strictest sense, implies the adaptation of Grecian models to the buildings of our own times.

A building may be well arranged for all purposes of mere convenience, but in this case it is not an architectural construction. The progress which the arts have made in modern times has taught us to combine internal convenience and fitness with beauty of external form, and with durability. If the external arrangement of a building should be compounded of those of several nations, such as Hindoo, Egyptian, and Greek, we should not admit this to be an architectural construction, even if the external form gave pleasure, which, however, is hardly a possible result; for it is essential to the character of an architectural structure, that the general arrangement and ornaments should have a unity of character and be referable to some one model.

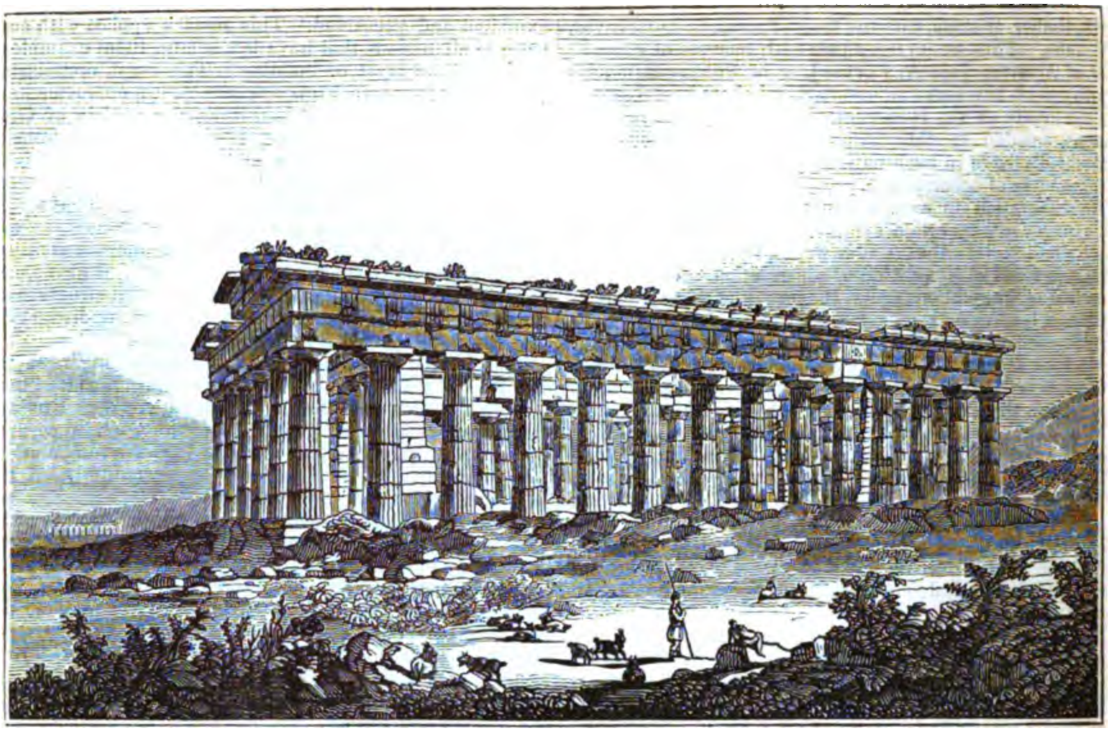
We have endeavoured briefly to show, what we believe to be strictly demonstrable, that the term architecture, *historically* explained, is the mode of constructing edifices which we have received from the Romans and the Greeks. But with the establishment of Christianity, and its diffusion over western Europe, a gradual modification was made in the forms of buildings devoted to religious worship: for it must be observed that it is principally in the religious edifices of a nation that we find the essential principles of its architecture exhibited and preserved. This remark applies with equal truth to all nations that have left behind them examples of some definite style of building. The great ecclesiastical structures of western Europe now exhibit a character in appearance very different indeed from the models of Greek and Roman buildings. They gradually deviated from the heavy and rounded Norman arch, the type of which is undoubtedly the Roman arch, to the pointed and light constructions generally denominated the Gothic. That foreign ornaments of a barbarous or at least incongruous style, were occasionally mingled with them by the numerous architects of the middle ages, cannot be denied; but still in the early ecclesiastical and also in many of the civil structures of Germany, France, Flanders, and England, a distinct and new character of architecture may be seen.

This distinction became again so marked in the several countries of Europe, that a very competent judge (Rickman) is of opinion that the Gothic or pointed styles of England, and various continental countries, have each a separate character, though they may all have had a common origin. The observation of Mr. Rickman has accordingly led him to assign to English architecture a distinct character and history. As England, then, possesses an architecture of her own in the numerous antient structures that adorn the country, and as the principles of Greek and Roman architecture have, especially within the last twenty years, been more carefully studied, and their general character and details more extensively diffused, we may reasonably expect that all our new public structures will not only be constructed with reference to their use, but that in their external design and the ornamental parts we shall adhere to some one of the great models.

The architecture of a people is an important part of their history. It is the external and enduring form of their public life, it is an index of the state of knowledge and social progress. Some speculators, indeed, would regard the noble monuments which decorate our own country, only as the marks of slavish submission to a hierarchy. But it may safely be asserted that the progress which man has made in the arts is mainly due to the influence of religious systems; and that the great improvements which have thus been gradually effected have at last descended to the humblest dwellings.

We have considered that the architecture of a country is inseparable from its history; and it is for this reason, among others, that we propose the subdivision, which the reader will see at the end of this article. A few remarks, however, may not be inappropriate on the supposed origin of the forms of architecture, and here we speak with reference to that of the Greeks. Whatever connexion, or rather resemblance, there may be between Greek and Egyptian, and between Egyptian and Hindoo architecture, will be most appropriately discussed under those separate heads. It is difficult to conceive that a Greek temple is any thing else than the improved and decorated form of a wooden construction. That wood would be used for the ordinary construction of dwellings, before baked clay or stone, seems natural, because it is more easily worked and more readily adapted to any required form. A rude cabin with its upright posts, its horizontal cross timbers, and its roof of wood, presents enough as a basis. A rectangular chamber for the inmates, a portico to screen them from the sun, posts to support it, with sloping roofs to carry off the rain, present all the essential elements of a Greek temple. Such an edifice, probably, was the antient wooden temple of Neptune, in Arcadia, which tradition attributed to Agamedes and Trophonius. This venerable monument of antiquity was preserved by the care of the emperor Hadrian, who ordered it to be cased with a new edifice. (Pausan. *Arcad.* 10, 2.) In the *agora* or public place of Elis, the same traveller saw a curious structure in the shape of a temple, but without walls; the roof was supported by columns of oak. An old man told Pausanias that it was the tomb of Oxylus. (6. 24.)

In opposition to this hypothesis, for it is not a matter which admits of proof, it is alleged, that we do not find barbarous nations, who use wood or sticks for their huts, adopting a construction such as we have described, and that in none of them do we trace these supposed elements of Greek architecture. The wonder would be if we did find a *barbarous* nation possessing these elements of knowledge, for a nation that had them would soon cease to be barbarous. But *all* nations have not an architecture of their own, nor have *all* nations a style of sculpture of their own, nor do *all*



[Temple of Neptune at Pæstum in Italy.

nations possess the power of forming geometrical figures and reasoning on their properties; and yet all these are the essential elements of architecture. For reasons which we cannot understand, the same faculties are not given to all the children of men: to some races is given the power to invent, to others a capacity to receive the inventions of others; but to some is denied the power of even receiving and adapting what others have invented.

Though we conceive, then, that Grecian architecture arose from the rude fabric of a wooden dwelling, we do not conceive that the edifice of stone attained either the beauty of proportion or the richness of ornament, till it called in the aid of sculpture. *Building*, that is, the putting together of timber frame-work, may be older than sculpture, but sculpture combined with building produced architecture. From the Homeric poems we deduce only very vague ideas as to the structure of temples and palaces; we find no distinct indication of the arrangement of columns, which are the very essence of Greek architecture. But the arts of design, and even the arts of working in metal, had attained some excellence. (See in the *Iliad*, book 18, the description of the shield of Achilles.) We find epithets derived from metal applied to the house of Alcinous and other buildings, from which we infer that they were structures of wood, and that the decorations were of metal; but we find no trace of columnar arrangement, or of an edifice of stone. (*Odyss.* vii. 84, &c.; iv. 45. &c.) Even in the time of Pausanias (x. 5. 11) there still existed at Lacedæmon the temple of Minerva, called the 'house of copper,' from which it would appear, that this and other antient temples were mainly of wood, and ornamented with metal.

That the oldest material of sculpture was wood, is a fact in itself probable enough, and attested by the authority of Pausanias (viii. 17). Many of these wooden statues of high antiquity remained after the wooden temple itself had been exchanged for a more substantial edifice of stone.

We believe, then, that Grecian architecture was only the improved and decorated wooden edifice, and that the ornamental parts of the stone structure, even in their simplest form, were derived from the art of the sculptor. The sculptor and the architect, in fact, were often united in the same person; and even when it became usual to separate these arts into two distinct branches, we can have no doubt that the skill of the architect, and the taste, at least, of the sculptor, were generally combined in the same individual. We believe this was the case also with the old cathedral architects of England, who frequently not only adapted the exterior forms of their edifices for the reception and display of sculpture, but had good taste enough to take care that these ornaments were in harmony with the whole design, and worthy of the edifice which was to receive them. Specimens of sculpture of great excellence may be observed on the exterior of many of our cathedrals: for instance, on the west end of Salisbury cathedral.

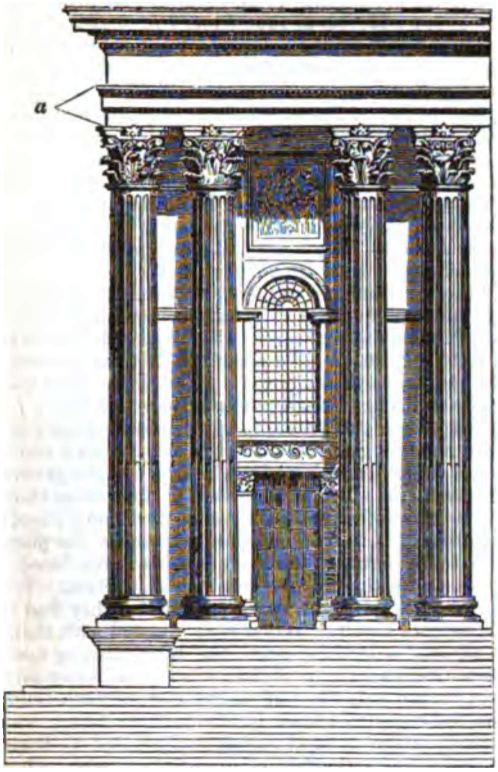
In attempting to discover what was the model of the wooden construction which we have assumed to be the parent of the architectural edifice, we meet with a variety of theories which are unsatisfactory. But it seems to have escaped the observation of many writers, that the nation to which Europe is indebted for the elements of its architecture is also the nation to which we are indebted for our knowledge of geometry. That law of the mind which gave birth to the simple forms of the triangle, the circle, and the square, gave to man the elements of all his works of art. We are not aware of any nation that has had a system of architecture which has not also had a style of sculpture; nor do we know of any nation that has carried architecture to perfection, or even to a degree of excellence in its kind, that has not also had a system of geometry and arithmetic.

Without such an extension of these general remarks as would interfere with the details belonging to the separate heads into which the various styles of architecture are divided, we could not attempt to bring down the history of the art to our own days, and trace its various stages of application in the public and private edifices of our own and other countries. We have therefore only to mention that the terms of architecture must be sought under their respective heads, as Arch, Architrave, &c.; that the general principles of construction will be found under Building, and of architecture, as a fine art, under Proportion; and that the more important styles and æras of architecture will be thus distributed:—

Babylonian Architecture
Celtic
Chinese
Egyptian
English
Etruscan
Gothic
Greek
Hindoo
Italian Architecture
Mexican
Moorish
Norman
Pelasgian
Persepolitan
Peruvian
Roman

The principles of military architecture will be treated of under Castle, and Fortification; those of naval architecture under Ship; and the most approved principles of domestic architecture under House.

ARCHITRAVE, from a Greek word and a Latin one meaning, when put together, *the principal beam*, is the lowest



[Part of the west front of St. Paul's Cathedral.]

part of any structure supported by pillars, or the lower beam which rests upon the columns and joins them together, on which the whole entablature (or ornamental part which comes immediately above the columns) rests. It was also called by the Greeks and Romans *epistylion*, or *that which is on the columns*. Thus, when pillars support an arch, the voussoirs (see ARCH) supply the place of an architrave, by which name they are sometimes called. In the same way the flat-beam, or row of stones coming immediately above a door or window, is called the architrave. The architrave may have only one face or two, that is, may appear as one beam, resting on and joining the contiguous columns (see the temple of Pæstum), or as two beams, the upper of which projects a little in front of the lower, as at *a* in the preceding cut. The proportions, &c., will be described under the heads of GRECIAN and ROMAN ARCHITECTURE.

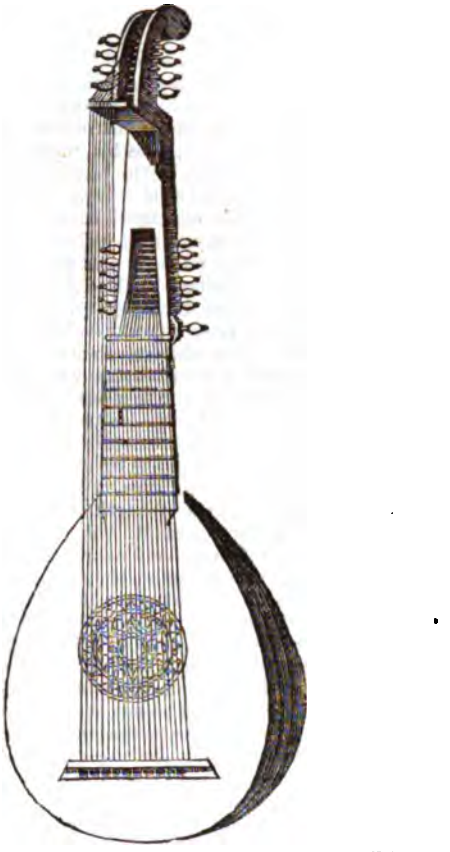
ARCHIVE, or ARCHIVES, a chamber or apartment where the public papers or records of a state or community are deposited: sometimes, by a common figure, applied to the papers themselves.

By some the word archive is supposed to have been derived from the Greek Ἀρχεῖα (*Archeia*), a term used by Josephus in the sense of public registers, and considered to have been transmitted to us through the Latin of the middle age. The Greek word *archeion* seems, in its primary signification, to mean 'a council-house or state house,' or 'a body of public functionaries,' as the Ephori at Sparta. (See Aristot. *Politic.* book ii.; and Pausan. iii. 11.) Others derive it from *arca*, 'a chest;' such being, in early times, a usual depository for records. So Isidorus, *Orig.* lib. xx. c. 9 —'Archa dicta, quod arceat visum atque prohibeat. Hinc et archivum, hinc et arcanum, id est secretum, unde cæteri arcentur.' 'It is called Archa, because it does not allow (*arc*-eat) us to see what is in it. Hence also Archivum and Arcanum, that is, a thing kept secret, from which people are excluded, (*arc*-entur.)'

The Temple of Saturn, built in the time of the Republic, was the chief repository of the archives as well as of the public treasure of antient Rome. In England the archives of the Court of Chancery are kept partly (*i. e.* to the year 1483) at the Tower of London, and partly in the Rolls Chapel, Chancery-lane. The national archives of France are preserved in the Hôtel Soubise at Paris; those of the Courts of Justice, in La Sainte Chapelle at the Palais de Justice.

ARCHIVOLT, or ARCHIVAULT, means, literally, the *principal turning*, or *arch*, and is applied to any ornamented band or moulding which runs round the lower part of all the voussoirs of an arch.

ARCH-LUTE, a large lute, or double-stringed theorbo (see THEORBO), formerly used by the Italians for the base parts, and for accompanying the voice, the form of which is given by Mersenne and Kircher in the next cut. In the early editions of Corelli's *Sonatas*, the principal base staff is assigned to the violone (double-base), or *arcileuto*. According to Kircher (*Musurgia*, lib. vi.), this instrument had fourteen notes, the highest whereof was A, the fifth line in the base, the lowest the double G below; and possessed considerable power. It was about five feet in extreme length, and proportionally large in the body. As Luscinius does not notice the arch-lute in his *Musurgia*, printed in 1536, it is to be inferred that it was invented subsequently to that time. At the commencement of the last century this instrument was much in use; Handel employed it in many of his early operas. The office of *Lutenist* still continues as part of the establishment of the Chapel-royal, though the place has been a sinecure for nearly a century.



A'RCHON, a Greek word written in Roman characters, signified originally one who had rule or command, either civil or military. In modern usage it is known only as the title of certain magistrates of the Athenians, of whom we propose to give some account in this article.

On the abolition of regal government at Athens (see CODRUS), the chief power was still intrusted to a single magistrate, or archon, without the title of king (βασιλεύς), which was more directly associated with the idea of arbitrary rule. The new office was hereditary; at least it is said to have been enjoyed successively by lineal descendants of Medon, the first archon, who was himself a son of Codrus, the last king. The Athenians were fond of attributing to Theseus the origin of their democracy; by which probably they meant, that many of his regulations had a popular tendency, and that his general reformation of the state, which was favourable to that part of the population which had possessed no political rights, was accompanied by a permanent relaxation of regal authority. (Plut. *Vit. Thes.* c. 25.) The prerogative of the archon was still further limited; for he was made responsible to his fellow citizens for the acts of his government. (Paus. iv. 5, 10.) Tradition told of thirteen hereditary archons, after whom the chief magistrate was appointed to his office for ten years, but was still taken from the Medontidæ, or descendants of Medon. We have the name of Charops and of five others after him as decennial archons. (Vell. Paterc. 1, 8.) Another revolution, which is placed by Newton B.C. 607, limited the duration of the office to a single year, at the same time dividing the charge of administration between the chief magistrate and eight others, thus forming a council of state, which consisted of nine magistrates or archons. Hence they are sometimes mentioned by the Greek writers under the general designation of The Nine. These officers had their distinguishing titles and duties, of which we shall presently speak, when we have carried a little farther the general history of this new constitution. We have seen that the first archon was, like his royal predecessor, the head of the government. The decennial archons had, doubtless, the same place and character, and the annual magistrates for a time exercised collectively the political power before vested in a single ruler. Their names and number, and in great measure the particular civil duties assigned to them, remained unaltered whilst Athens continued to possess an independent government; but the course of events wrought a most important change as to their position in the state. This change, to which in earlier times there was a gradual approximation, was effected mainly by the increased activity of the ecclesia, or popular assembly, which received its first impulse from the regulations of Solon, was urged on more effectually by the reformation of Cleisthenes, and was confirmed by the consequences of the Persian war, by which the *thetes*, or lowest class of citizens, which supplied the naval strength of Athens, were taught to know their power. (Aristot. *Polit.* 2, 9, 4.) From the time that the ecclesia interfered habitually and directly with the government of the republic, the actual minister of state was the person who enjoyed the confidence of the people, which neither the office of archon nor any other office could procure. The inevitable consequence was, that the archons sunk from ministers of state into municipal officers of high rank. We have thought it worth while to point attention to this fact, from having had occasion to observe that young students of Athenian history are sometimes perplexed by the apparent inconsistency of the accounts given them of the first appointment of archons with the little notice bestowed upon these magistrates in the general history of the republic. They read of important public measures, and of the persons who originated and executed them, whilst the name of archon seldom occurs in Grecian history, except as marking the year in which certain events took place. (See Thucyd. ii. 2.) Pericles, without the office of archon, to which it was not his chance ever to attain, enjoyed a degree of power which was not possessed during the freedom of the republic by any other citizen. Perhaps no one who read with the least attention would find the difficulty, if he were not in some measure led to it by popular works on Grecian antiquities, which too commonly present an accumulation of facts and authorities without sufficiently discriminating the times to which the different statements refer.

The annual archons, from their first appointment down to the time of Solon, were taken from the eupatridæ, or nobles, to which class all political power seems to have been confined. This is rather assumed from what we know of the progress of civil and political society at Athens, than asserted on any authority of much weight. The establishment by Solon of a timocracy, or government in which political power was distributed with reference to property, put an end to the claims of noble blood; but since the archons were by this regulation taken from the wealthiest class of citizens (*οἱ πεντακοσιομέδιμνοι*), the noblest families probably still continued chiefly to supply the archons for each year, till the celebrated law of Aristeides, enacted about B.C. 479, threw open the offices of state to the whole body of the people. (Plut. *Vit. Arist.* c. 1. and c. 22.) From this time no qualification was requisite in an Athenian citizen for the office of archon but fair fame and freedom from bodily defect.

The mode of appointment presents some difficulties, from the want of precise information. It appears that the archons were originally elected by suffrage, and the elective franchise was probably confined to the noble class from which they were taken. By Solon, eligibility to the office, and perhaps the right of suffrage, were enlarged, but the mode of appointment remained the same. In after times, and even as early as the first Persian invasion of Greece, the appointment was by lot. The case of Aristeides seems to have been an exception to the general rule, and may be attributed, perhaps, to his high character and eminent services. (Aristot. *Polit.* 2, 9, 2; Herod. 6, 109; Plut. *Vit. Arist.* c. i. p. 481, ed. Reisk, compared with p. 479.) We have no information which enables us to fix the time when the change was effected. It has been attributed, with some probability, to Cleisthenes, but we know only with certainty that they were at one time elected, and at some subsequent period appointed by lot. It must not be supposed that all the citizens were eager to avail themselves of the double opportunity offered by the new mode of appointment and the law of Aristeides. It seems that the poorest of them declined the hazard of the lot, which might throw upon them a burdensome honour. (Xen. *Rep. Athen.* 1, 3.)

Of the nine archons, one, usually termed *the* archon, was chief, and had the title of *epónymus* (ἐπώνυμος), or name-giver, because the year in which he served the office was called by his name, as among the Romans the year was distinguished by the names of their consuls. Thus his name appears at the head of all public decrees (see Dem. *De Cor.* Thucyd. 5. 19), and generally in all solemn records of state. Of the remaining eight, one was called the king (βασιλεύς), another the *polemarch*, and the last six had the general title of *thesmothetæ*. Before admission to their office they were subjected, like other public officers, to the examination, called *dokimasia* (that is, *trial* or *examination*), for the purpose of ascertaining that they were Athenians of pure blood, whole of limb, and without blemish in their characters. With reference to the last point, they were asked if they had treated their parents kindly. When once invested with their office and adorned with the chaplet, the distinguishing mark of it (Æsch. *contra Tim.* p. 3, 33), they were especially protected by the laws from all insult and outrage, and were exempted even from those public burdens which were not included in the general exemption granted to their most favoured citizens, the descendants of Harmodius and Aristogeiton. (Dem. *contra Lept.* p. 462, 20; and p. 465, 17.) There is reason to believe that they were members of the council of Areopagus by virtue of their office. (See AREOPAGUS.) It is certain that they passed from their annual magistracy to a permanent seat in that council.

Their public duties had reference for the most part to the administration of justice. In some courts, and in certain causes, they were the presiding judges. On some occasions they had the execution only of the sentence pronounced by other judges; but it seems to have formed a large if not the most considerable part of their legal duties to bring causes into court (εἰσάγειν, Dem. *contra Lacr.* p. 940, 5-20) to be tried before the proper tribunal, not in the character of public prosecutors, but on application from the plaintiff or accuser, in which case their province was somewhat similar to that of an English grand jury in finding and ignoring bills. Sometimes, perhaps, the application to the archon was a form of little more importance as to the responsibility of the archon, than that in English law of suing out a writ. To each of the first three archons, and collectively to the six thesmothetæ, a distinct province and peculiar duties were assigned. Incidental notices of these are to be found scattered over the Greek classics, especially in the Attic orators; more systematic accounts occur in the earlier lexicographers and antiquarians, among whom Julius Pollux may be particularly distinguished, whose authority would have more weight if we were better acquainted with the sources from which their information was derived and the times to which their accounts refer. Copious collections have been made from them by modern compilers, of whom, perhaps, the most popular in our language is that of Archbishop Potter. We shall present our readers with only a brief outline, sufficient to convey a general view of the separate jurisdiction of these magistrates in the later times of the Athenian republic.

It seems to have been the duty of the chief archon, or epónymus, to throw his official protection around those whose interests were most liable to be overlooked in the ordinary execution of the law. Hence he was the appointed guardian of orphans and minors. He was also charged with a more general superintendence in matters which concerned the safety and good order of the state than was committed to his colleagues.

The king archon was more especially concerned with religious matters. He was required to preside at the performance of the most solemn sacrifices. He had a certain control over the ministers of religion, and either himself tried offenders, or originated trials, in cases of impiety. It is hardly necessary to observe that in the early periods of regal government, kings were almost universally the chief ministers of religion. It is commonly supposed that the title of this archon was intended to denote the transfer of an important part of the king's prerogative to the magistrate who, in the department of religion, supplied his place.

The office of the polemarch was doubtless in its first institution that which the name implies, to command in war; and even as late as the battle of Marathon, we find the polemarch Callimachus acting an important part in the council of war which preceded it, and commanding in virtue of his office the right wing of the Athenians in the engagement: but, in later times, when the generals of the republic were immediately chosen by the people, the polemarch was confined to the discharge of civil duties, and particularly had cognizance of matters which concerned the strangers and *metics* (resident aliens) at Athens, exercising a jurisdiction, in this respect, not unlike that of the prætor peregrinus at Rome.

The thesmothetæ should, according to the meaning of their title, have been legislators, or propounders of laws. It was not, however, their office to introduce laws, but rather to watch over the conduct of those who put themselves forward as legislators, and also annually to examine the existing laws for the purpose of removing contradictory and superfluous enactments—to keep, as it were, the statute-book in a pure and consistent state. (Dem. *contra Lacr.* p. 940, 10, and 12; *contra Zenoth.* p. 890, 10; Lys. *contra Andoc.* p. 104, 15; Herod. 6, 109, 111; Lys. *contra Pancl.* p. 166, 32, and 40.) It appears that the whole college of archons was sometimes assembled in council (Dem. *contra Meid.* p. 542, 2); but we have no information respecting the authority which they collectively exercised.

For further information on the various and important duties assigned to the different archons, in addition to this brief and general notice, the reader is referred to the authorities mentioned above; but we would remind the young student, in his inquiries, that the reliance to be placed on the accuracy of even a credible and well-informed author must depend in some measure on the circumstances under which his information is given; and this should especially be kept in mind when, as in the subject of the present article, all our information, so far as it is supplied by the Greek classics, is obtained, not from regular essays, but from incidental notices. Our meaning in this caution will be best explained by an instance. The subject of inquiry may be the manner in which certain officers were appointed; and this, as in the case of the archons, may have varied at different times. The mode of appointment may, according to a common practice with the Athenians, be implied by an epithet familiarly joined with the title of the office. Now, it is possible that an author, who when writing professedly on the subject would have given minutely accurate information, may use this epithet, familiar to him, inaccurately with reference to the times of which he is speaking, if the circumstance indicated by it is of no importance to the subject immediately before him. Evidence drawn from a casual expression must often be taken into account, but then it should be carefully rated at its proper value.

ARCHY'TAS, a native of the Greek city Tarentum in Italy; of whose life we can give only a very unsatisfactory account. His father's name is variously given as Hestiæus, Mnesarchus, or Mnesagoras; but however that may be, all ancient accounts concur in considering him a man of extraordinary talents, uniting the merits of a philosopher, mathematician, statesman, and general. Even the period at which he lived is disputed; but if the *οἱ περὶ Ἀρχυταν Πυθαγορικοί* signify Archytas, he must have been contemporary with the younger Dionysius (Plut. *Dion.* 20.) and with Plato. Archytas belonged to the Pythagorean school, and was himself probably the founder of a sect. He is distinguished more particularly for his knowledge of mathematics,

> Te maris et terræ numeroque carentis arenæ
> Mensorem,—(*Horat.* i. 28.)
>
> The poor gift of a little dust confines,
> And near unto the Matine shore enshrines,
> Thee now (Archytas), who could'st measure well
> The sea, the earth, and sands which none can tell.
> *Odes of Horace*, by Hawkins, London, 1635.

and for his discoveries in practical mechanics. In what way he contrived to communicate the power of flying to his wooden pigeon, we are by no means able to state, but it seems to have been a great source of wonder to the ancients. (Aul. Gell. x. 12.) Probably this Archytas is the person recorded in Aristotle (*Politic.* book 8) as the inventor of that useful toy, a child's clappers or rattle (*πλαταγή*). Many works are ascribed to him, and we have still several small pieces under his name, but there seems good reason to doubt whether they are the genuine productions of Archytas. Archytas is said to have been drowned, as Horace intimates in the Ode quoted above. There is a *Treatise on the Ten Categories*, or *on the Nature of The All*, published in Greek by Camerarius (Lips. 1564. Venet. 1571), and a fragment on Mathematics, edited, with some other opuscula, by Stephens (Paris, 1557), reprinted at Copenhagen, 1707. The fragments of the works attributed to Archytas are chiefly known from the quotations of Stobæus. (See Schmidt, *Diss. de Archyta Tarentino*, Jena, 1683; Navarro, *Tentamen de Archytæ Tarentini Vita atque Operibus*, Hafn. (Copenhag.) 1819; Montucla, *Histoire des Mathém.* vol. i. p. 143; Bardili, *De Archyta Tar. in Nov. Act. Soc. Lat. Jenens.* vol. i. p. 1.)

ARCIS-SUR-AUBE, a town in France, in the department of Aube, and the capital of an arrondissement to which it gives name. It is ninety-three miles E.S.E. of Paris, and sixteen miles N. of Troyes, the capital of the department. It is on the S. or left bank of the Aube, which begins to be navigable here, and by means of this river it carries on a considerable trade with Paris in corn, wine, wood, iron, and mill-stones. There are manufactories of cotton hose here; and a tribunal *de première instance*, or subordinate court of justice, under the jurisdiction of the assize court of Paris. The population in 1826 was about 3000.

Arcis was injured by the allies in 1814, but has since been much enlarged and improved: 48° 32′ N. lat., 4° 9′ E. long. from Greenwich.

The arrondissement of Arcis comprehends ninety communes, and has a population of about 33,000 persons.

ARCKENHOLZ, JOHN, a Swede, was born in Finland in 1695. He studied at Upsal, after which he travelled over Europe, and resided at Paris a long time. There he wrote, in French, *Considerations Politiques sur la France par rapport à la Suede*, in which he spoke unfavourably of the former country, and censured the administration of Cardinal Fleury. Having communicated his MS. to several persons, he was arrested on his return to his own country and obliged to apologize to the cardinal minister. King Frederic I., of the house of Hesse Cassel, appointed him, in 1746, librarian and keeper of the cabinet of medals at Cassel, where he remained for twenty years. He wrote, in French, the *Mémoires de Christine, Reine de Suede*, 4 vols. quarto, Amsterdam, 1751, also *Lettres sur les Lapons et les Finnois*, 8vo. Frankfort, 1756, and *Recueil des Sentimens et des Propos de Gustave Adolphe*, Stockholm, 1769. From Arckenholz's MS. account of that prince, joined to other Memoirs, a history of Gustavus Adolphus was compiled by M. Mauvillon, and published in French at Amsterdam in 1764, and afterwards translated into German under the title of *Geschichte Gustav. Adolphs*, 2 vols. 8vo. Breslau, 1775. Arckenholz's manuscript on France and Sweden was published in Büsching's *Historical Magazine*. Arckenholz had been commissioned by the states of Sweden to write the history of Frederic I., but he never completed it, his mental faculties having grown weak; he died in 1777, at the age of eighty-two.

AR'COLE, a village in the Venetian States, about fifteen miles S.S.E. of Verona, lies in the midst of a low marshy country, through which the Alpone flows, a torrent which comes from the mountains near Vicenza, and empties itself into the Adige about three miles below Arcole. It is situated on the left or eastern bank of the Alpone, farthest from Verona. The ground between the left bank of the Adige and the right bank of the Alpone is one impervious marsh, intersected by two or three causeways, one of which leads to a narrow bridge over the Alpone, and to the village of Arcole beyond it. It was along this causeway that the French, under Bonaparte, having crossed the Adige at the village of Ronco, advanced on the morning of the 15th November, 1796, with the view of surprising the rear of the Austrian army under General Alvinzi, which was then posted on the heights of Caldiero near Verona. Two battalions of Croats and Hungarians were posted at Arcole, with some artillery, and they stoutly defended the bridge. Three times the French column attempted to storm it, amidst a shower of grape-shot and musketry, and three times it was repulsed with great loss. Bonaparte himself was thrown from the causeway into the marsh, and was near being taken. At last General Guyeux, with 2000 men, having crossed the Adige farther down, at the ferry of Albaredo, below the confluence of the Alpone, marched by the left bank of the latter stream, where the ground is firmer, and took possession of Arcole. General Alvinzi, however, having sent reinforcements in the evening, retook the village. Next day (16th) the battle became general between the two armies, and the village of Arcole was again the main point of the contest. The French attempted repeatedly to carry the fatal bridge, and were again repulsed with tremendous loss. Almost all their superior officers were killed or wounded. Thus passed the 16th, the Austrians retaining possession of Arcole for that night. On the 17th, Bonaparte, having thrown a bridge over the Alpone just above its confluence, directed Augereau to march with a column by the left bank, whilst another column advanced by the famous causeway. The latter was repulsed as before; but Augereau, after a sharp contest, succeeded in gaining possession of the village. General Alvinzi then made his retreat upon Montebello and Vicenza. This was the hardest fought battle in Bonaparte's first Italian campaigns, and one in which he showed great personal courage. The Austrians lost about 4000 killed, and as many were taken prisoners. The French loss in killed and wounded was not made known, but it must necessarily have been very great. Bonaparte's obstinacy in attempting so many times to carry the bridge in front, instead of turning it, as he was obliged to do at last, has been strongly censured. [See BONAPARTE, NAPOLEON.]

ARÇON, JEAN CLAUDE D', a native of Pontarlier in Franche Comté, in 1733, showed an early inclination for the military profession. He became an expert engineer, and wrote several treatises, among which may be enumerated, *Correspondance sur l'Art de la Guerre*, and *Réflexions d'un Ingénieur en réponse à un Tacticien*, duodecimo, Amsterdam, 1773. In 1780, the war of France and Spain against England gave him an opportunity of displaying his talents on a larger scale. The Spaniards were besieging Gibraltar without success, when D'Arçon devised a plan of attack, by means of floating batteries, which were to be incombustible and not liable to sink. His scheme being approved by the Spanish government, ten ships of from 600 to 1400 tons were cut down, each forming a battery of from nine to twenty-one guns, and manned by crews of from 250 to 760 men. The front of the batteries was covered with thick layers of squared timber, a sloping roof protected them from shells, and the exterior of the floating machine was lined with cordage and hides. In order to prevent combustion from red-hot balls, a reservoir was placed in each battery from which the water raised by pumps could be distributed by certain channels through every part of the fabric, so as to keep the wood constantly wet. Each floating battery was set in motion by a single sail. The ten batteries were to form a close line at 400 yards distance from the wall of the fortress, and the attack was to be supported by the land-batteries, by bomb-vessels and gun-boats, and by ten Spanish ships of the line. The equipment of this vast armament was made in the port of Algesiras, and 40,000 men, French and Spaniards, were assembled for the expedition, of which the Duke of Crillon, the conqueror of Minorca, had the chief command. The Spanish admiral, Moreno, commanded the fleet. The first nobility of Spain repaired to the spot to witness the attack, and the Count d'Artois (since Charles X.) and the Duke of Bourbon went from Paris for the same purpose. The attack was, however, precipitated through fear of the approaching stormy season, and the expected arrival of a British squadron. When the vast machinery was set in motion, it was found that the pumps occasioned such a flow of water into the interior of the vessels that the commanders became apprehensive lest their powder should be spoiled, and they therefore contented themselves with keeping the outer surface wet. On the morning of the 13th of September, 1782, the floating batteries moved forward, but were unable to gain the positions assigned to them; the wind, the roughness of the sea, and perhaps want of skill, entirely disconcerted the plan. The two largest, the Talla Piedra and the Pastora, anchored in advance, the rest some distance behind. The cannonade began soon after ten o'clock; and 400 pieces of heavy artillery were playing at once from both sides. General Elliot fired on the floating batteries with red-hot balls, which seemed to have no effect, till seven o'clock in the evening, when the Talla Piedra, in which D'Arçon was embarked, was discovered to be on fire. 'A red-hot ball,' says D'Arçon, 'had lodged in the side, and could not be extinguished. The fire of the enemy frustrated all our efforts to arrest the progress of the flames. An order was precipitately given to wet the powder, and this caused a total cessation of our cannonade. As we were no longer concealed by the clouds of smoke, we became too much exposed, and it was found impossible to extinguish the flames. The smoke proceeded at first from the outside, and afterwards through the interior joints of the machine. This hidden conflagration, which could easily have been stopped by moving to a distance from the constant fire of the garrison, continued in a smoking state for six hours, and did not become unmanageable till after midnight.' D'Arçon had proposed to send out a warp anchor, by which the vessel might be removed from its dangerous situation. 'The officer charged with this commission could not collect a sufficient number of sailors for the purpose.' In fact, panic and confusion had seized them when they found that the batteries *were not incombustible.* D'Arçon repaired at midnight to the admiral's ship, but he was referred to the general-in-chief, who was absent; he was, however, informed that orders had been given to abandon and destroy the whole of the batteries. Only the two foremost, the Talla Piedra and the Pastora, seem, at this time, to have caught fire, so that the other eight might probably have been saved. Such is D'Arçon's account in his *Mémoire pour servir à l'histoire du Siège de Gibraltar*, which he published at Cadiz, in 1783, and it explains pretty clearly how the catastrophe occurred, without attributing it, as some French biographers have done, to perfidy and jealousy on the part of the Spaniards. There was mismanagement, no doubt, both by the French and Spanish commanders, and D'Arçon himself was evidently mistaken with regard to the security of his batteries against red-hot balls. D'Arçon afterwards served in the French army at the time of the revolution, and assisted in the conquest of Holland. In 1795 he published *Considérations Militaires et Politiques sur les Fortifications*, in which he condensed all that he had previously written on the subject. He was made a senator in 1799, and died the following year at his estate near Auteuil. (See the account of the siege of Gibraltar in Coxe's *Memoirs of the Kings of Spain of the House of Bourbon;* and Captain Drinkwater's *Account of the late Siege of Gibraltar*, &c., Lond. 1785.)

ARCOT, a considerable district of Hindostan, forming part of the Carnatic (see CARNATIC). The territory thus named is subdivided into the two districts of northern and southern Arcot; both of which are under the government of the Madras presidency. They are situated between the 11th and 14th parallels of north lat., and the 78th and 80th degrees of east long. Northern Arcot is bounded on the north by Cuddapah and Nellore; on the east by the district of Chingleput and the sea; on the south by southern Arcot; and on the west by the Balaghaut, the high central tableland of Cuddapah. Southern Arcot is bounded on the north by the northern division of Arcot; on the east by the sea and the Chingleput district; on the south by Tanjore and Trichinopoly; and its western boundary is formed by the district of Salem and the Balaghaut region. This district comprehended Pondicherry, during the time in which that settlement was in the hands of the English. Chingleput, the Jaghire, or tract obtained by the East India Company in 1750 and 1763 by grants from the nabob of Arcot, in return for services rendered to his father and himself, was also formerly included within the limits of Arcot.

It was doubtless owing to the frequent wars of which these districts were the seat, and which raged for so long a time during the infancy of the British empire in the Carnatic, that the condition of the country and its inhabitants became so deplorable. The agriculture of Arcot depends for its prosperity upon irrigation; but it appeared, upon a survey made in 1810, that of 2698 large tanks 451 were then out of repair, and of 1322 smaller tanks the still greater proportion of 510 were useless, while the water-courses from rivers, springs, and wells, were scarcely in a better condition. The peace of the country being restored, and an improved system of management having been adopted by the Company's government about the time just mentioned, the prosperity of the district has been in a great degree restored. At that time (1810) the northern district contained 3599, and the southern district 3988 villages; the gross collection of the public revenue amounted, in 1817, to 1,382,279 pagodas, about 550,000*l.*

Five years after that time, in 1822, the total population was stated by the Company's collectors to be 1,347,312, nearly two-thirds of whom inhabited northern Arcot.

The lands throughout the districts are for the most part held by an industrious race of yeomanry or small proprietary cultivators, either in severalty, or in joint village communities. These cultivators pay their proportions of the revenue chargeable on the land which they occupy direct into the treasury of the state, without the intervention of any zemindars or great proprietors, as is the case in a large proportion of Hindostan.

The whole of these districts were, in 1801, formally ceded by treaty to the East India Company by the nabob of the Carnatic, Azim ul Omrah. On this occasion the British government undertook to adjust the claims made by the creditors of the nabob, for whose satisfaction an annual revenue of 340,000 pagodas was set apart. Commissioners were in consequence appointed both in India and in London for the investigation of the claims, and these boards have been in existence and in operation since 1805, endeavouring to unravel the intricacies in which the accounts were involved for fraudulent purposes. Out of a sum exceeding thirty millions sterling claimed against the estate of the nabob, the commissioners have set aside claims to the amount of upwards of twenty-seven millions on the grounds of fraud, and of that very common crime in India, forgery.

The northern and southern divisions of Arcot now form separate collectorates under the Company. The northern division includes Sativaid, Pulicat, Coongoody in the Barramahal, part of Balaghaut, and the western pollams or zemindaries. The southern division includes Cuddalore.

The chief rivers of the district are the Panaur or Punnair, which rises in the province of Mysore, from which it flows in a south-easterly direction till it falls into the sea at Cuddalore after a course of about 250 miles from its source. The Palaur or Milk river has its source very near that of the Panaur, but, taking a different course, flows first to the south, and then to the north-east, and after a winding course of about 220 miles falls into the Bay of Bengal near to Sadras. [For a description of soil, productions, and face of the country, see CARNATIC.] (Rennell's *Memoir of a Map of Hindostan*; Hamilton's *East India Gazetteer*; *Report of Committee of the House of Commons on the Affairs of India*, 1832.)

ARCOT (City). The Mussulman capital of the Carnatic is built on the south side of the Palaur, in 12° 54′ N. lat. and 79° 23′ E. long. It is a place of very great antiquity. For an Indian fortress, Arcot was a place of some strength, having been a regularly built citadel. Since the cession of the district of Arcot to the East India Company the principal defences of the place have been destroyed, part of the extensive area of the fort has been brought under cultivation, and the only use now made of the ramparts is to constitute a defence against the inundations of the Palaur, for which purpose alone they are kept in repair on that side of the city.

The town, which is inclosed by walls, is almost entirely of modern erection. It contains the palace of the former nabobs of Arcot; the principal gateway of the palace is entire, but the rest of the building is a heap of ruins.

The nabob, Anwar ed Deen, was killed in battle, and the place was taken in 1749 by Chunda Saheb, who favoured the French interests in the Carnatic. In two years, the city with its garrison of 1100 men surrendered to 200 Europeans and 300 Sepahis under the command of Captain (afterwards Lord) Clive, who had subsequently to defend his conquest, which he did successfully, against a very superior French force assisted by numerous allies, and whom he obliged to raise the siege at the end of fifty days. The fort subsequently fell into the possession of some natives who espoused the cause of the French, but it was again taken by the English under Colonel Coote, in the beginning of 1760, after the battle of Wandiwash. In 1780 it surrendered to Hyder Ali, and suffered greatly, both while it was in his hands and afterwards, through the mismanagement of the nabob's government. From the wretched state into which it then fell, the city has been recovering since it passed, in 1801, into the possession of the English. The principal inhabitants are Mohammedans, who speak the Hindostanee dialect. The bed of the Palaur, which is here half a mile wide, is sometimes nearly dry, and at other times is so swollen by the rains that its waters would inundate the streets but for the embankments already described.

Arcot is 73 British miles from Madras, 722 miles from Bombay, 1070 from Calcutta, and 1160 from Agra. (Mill's *History of British India*; Rennell's *Memoir of a Map of Hindostan*; *Report of a Committee of the House of Commons on the Affairs of India*, 1832.)

ARCTIC CIRCLE. The term *arctic* is derived from the Greek, and signifies literally *of* or *belonging to the bear*, meaning the constellation of that name. *Arctic circle* had formerly a different signification from that which it now has. Among the Greeks it meant the parallel to the equator which just touches the horizon, being entirely above it, and which therefore separates those parallels which are always above, from those which are partly above and partly below, the horizon. (See Strabo, Casaub. p. 95) Similarly the antarctic circle (if the phrase were used) would be a parallel to the equator which touches the horizon, being entirely below it, and which therefore separates those parallels which never rise above, from those which are partly below and partly above, the horizon. Thus every different latitude had a different arctic circle; and in the latitude in which astronomy was first cultivated, the great bear just swept the sea, and did not set, whence the boundary circle obtained its name.

In the modern sense of the term, it is one fixed circle, or very nearly so; and the first use of it as such is found in the celebrated treatise on the sphere, by Holywood, better known by the name of Sacrobosco, published in the twelfth century. For the complete meaning of the term, we refer to DAY. We can only here briefly remind the reader that at the equator all days are equal; that in going northwards from the equator, the day of the summer solstice lengthens as the latitude increases, until we reach the pole, where there is but one day and night in the year, of six months each. There must therefore be some circle of the globe, in the northern hemisphere, at which the longest or summer solstice day is just twenty-four hours; and an opposite circle in the southern hemisphere, at which the sun does not appear for twenty-four hours. The first is the *arctic*, the second the *antarctic*, circle of the *earth*. We need hardly say, that at the day of the *winter* solstice in the northern hemisphere, there is a day of twenty-four hours in length at the *antarctic* circle.

Fig. 1.

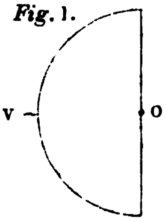
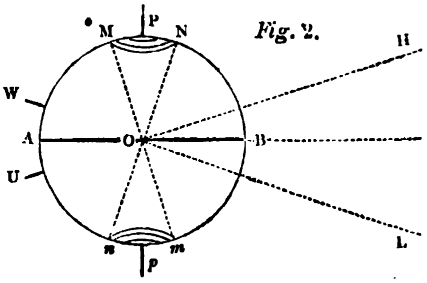


Fig. 2.



P and *p* (*fig.* 2.) are the north and south poles of the earth, the lines through which serve to remind us of the earth's axis. A B is the equator, and O H and O L are the directions in which the sun is seen at the northern summer and winter solstices, that is, the line which points to the sun rises and falls between H O and O L twice in a year. We do not consider the *apparent* motion of the sun *round* the earth, because, as the sun is always on the meridian of some place, and any conclusion respecting day and night drawn from one meridian holds good for any other, we may conceive the meridian P B *p* A to move round with the sun. Or, to consider it in another point of view, instead of supposing the sun to appear to move round, let it remain in the fixed meridian, P B *p* A, and increase the daily rotation of the earth by a quantity equal to the daily motion of the sun on the equator, which will preserve the *relative* rotations, leaving us only to take notice of the rise and fall of the sun in the ecliptic; which is the cause of the peculiar phenomena of the arctic circle. The semicircle O V, in the first figure, is supposed to be cut out and applied to the right hand figure, O to O, in such manner that the needle, V, shall always be directly opposite to the sun. In the figure (2.) are given the extreme positions of O V, namely, M U *m*, at the northern summer, N W *n* at the northern winter, solstice. The semicircle O V covers all those parts of the earth which do not see the sun, and the rotation round the axis, P p, brings every part of the earth under O V when its night begins. M N and $m\,n$ are the arctic and antarctic circles. By cutting out a semicircle equal to O V, and placing it in different positions on the second figure, the following will appear, on a little consideration:—

1. At the summer solstice (when V is at U) all circles above M N will be in light for twenty-four hours, and all below $m\,n$ in darkness: and *vice versâ* at the winter solstice.

2. At the equinoxes (V is at A) every circle will be in light for twelve hours, and the same time in darkness.

3. During the passage from the equinox to the summer solstice (V moves from A to U), at every moment some circle above MN emerges entirely into light, and an opposite circle below $m\,n$ begins to be entirely covered by darkness: and both states remain until the return of the circle O V in the next quarter of the year. And *vice versâ* for the passage from the equinox to the winter solstice (when V moves from A to W).

4. No circle lying between M N and $m\,n$ is ever entirely in light or entirely in darkness.

Hence, to find the duration of light at any place above the arctic circle, that is, to find during what part of the year the sun performs his daily rotation entirely above the horizon, look in an almanac for the times before and after the summer solstice, at which the *declination* of the sun is equal to the *polar distance* (or latitude subtracted from 90°) of the place. Between those two times there is perpetual light. For example, the north point of Nova Zembla (latitude 75°, polar distance 15°) has perpetual light between May 1 and August 12, 1834. For the time of perpetual darkness do the same with the winter solstice: thus there is perpetual darkness at the above-mentioned place from November 3, 1834, to February 9, 1835.

The north polar distance of the arctic circle is equal to the angle H O B, the greatest declination of the sun, or the OBLIQUITY of the ecliptic. The south polar distance of the antarctic circle is the same. This quantity changes very slightly from year to year. It is as follows:—

January 1, 1834, 23° 27′ 39″·26
January 1, 1835, 23° 27′ 38″·81

decreasing at present by about half a second yearly.

The arctic and antarctic circles are the boundaries which separate the frigid from the temperate zones, as they are called. The part of the earth included within each of the two is about 4$\frac{1}{10}$ per cent. of the whole surface of the globe. The best known points through or near which the arctic circle passes are Cape North in Iceland, the Maelstrom whirlpool, the mouth of the Oby, Behring's Straits, and the south of Melville Island. For discoveries of land within the antarctic circle, see ANTARCTIC OCEAN.

The arctic and antarctic circles of the heavens occupy positions with respect to the celestial poles similar to those occupied by the same circles on the earth. Thus a traveller going round the arctic circle would always have some point of the celestial arctic circle directly over head, or in his zenith. But the term is hardly ever employed by astronomers.

In all that precedes we have taken no notice of REFRACTION, the effect of which is to raise the sun a little towards the nearest pole at every point of the globe, thus lengthening the day and diminishing the night. In some latitudes the effect would be very considerable, and would increase the duration of light by as much as a day.

ARCTIC FOX, in zoology, a small species of fox (*Canis lagopus*), celebrated for the beauty and fineness of its fur, which has long been considered a valuable article of commerce. The colour of the fur, as is the case with all animals which inhabit very high latitudes, varies according to the season, being slaty blue in summer, and pure white in winter. It is in the latter state that the fur is most esteemed, not only on account of its colour, but likewise because it is of a closer and finer quality than at any other time. The soles of the feet also are at all seasons covered with a thick coat of fur, like those of the common hare, which defends them from the severity of the snow, and is a character likewise common to most other northern animals. For a more detailed account of the form, habits, and uses of the Arctic fox, see the articles FOX and FUR TRADE.

A′RCTOMYS. [See MARMOT.]

ARCTOSTA′PHYLOS, or bear-berry, is a genus of plants till lately considered the same as arbutus, from which it is essentially distinguished by its berries containing only from one to five, instead of a great many seeds. The common bear-berry, *A. uva ursi*, is found wild in the mountainous parts of England and Scotland, and generally over the whole of the north of Europe. It is a trailing shrubby plant, with leathery dark green entire leaves, which are broadest at their upper end. The flowers are white, tinged with pink, small, and in clusters. The berries are small, and red like those of the hawthorn. The whole plant is so astringent that it has been employed by the tanner with success, and also in dyeing a greyish black colour; it is no doubt the same property which has made it celebrated for its efficacy in gravelly complaints, and in diseases of the urinary organs. When cultivated it requires to be grown in peat earth.

ARCTU′RUS, or α Bootis, a star of the first magnitude in the constellation Bootes. It derives its name from two Greek words, signifying the tail of the bear, and, though not in the latter constellation, it is very nearly in a right line drawn through the two hinder stars of the tail (ζ and η). It rises N.E. by E. at Greenwich, and is on the meridian in about 7¾ hours after rising; which takes place at half past seven A.M., on the 1st of January, and about two hours later for the first of every succeeding month. Its mean places are as follows·

	Right Ascension. h. m. s.	Declination.
January 1, 1834,	14 8 5·6	20° 3′ 1″·5 N.
January 1, 1835,	14 8 8·3	20 2 42·57

Its annual increase of right ascension is 2ˢ·734; its annual decrease of declination 18″·96. This is not all owing to precession and nutation, as the star has a PROPER MOTION, (or change of place relatively to surrounding stars,) which (*Mem. Roy. Astron. Soc.*, vol. v., p. 165) caused a decrease both in right ascension and declination, as follows:

	Average yearly decrease of R. A.	Decl.
1755—1800	1″·21	1″·94
1800—1830	1″·14	1 ·99

Formerly the conclusion was sometimes drawn that Arcturus was the nearest star to our system, from its being a brilliant star with so decided a proper motion. This, which was but a faint presumption at the time, is now overturned by the known fact that there are much smaller stars (μ Cassiopeiæ, for example) which have much larger proper motions.

ARCY, GROTTO OF, a singular excavation in the mass of a hill which stretches into the valley of the little river Cure, a feeder of the Yonne in France. It is in the department of the Yonne, about a league south of the little town of Vermanton. A narrow path over a hill covered with wood conducts to the entrance of the grotto, which contains a number of apartments, some of which are more than 1500 or 1800 feet long; but they rarely rise to the height of 20 feet. In the first two apartments are found large blocks or masses of stone lying in greater or less profusion on the ground; and in the second apartment is also a small pool about 120 feet in diameter, the depth of which is not known. Its waters are clear and fit for drinking. The apartments farther in are distinguished by the number and variety of the crystallizations which either hang from the roof (stalactites), or rise column-like from the ground (stalagmites); they are formed by the water which filters through the over-arching rock, and forms a deposit about the orifice from which it issues, as well as on that part of the ground on which it drops. As the crystallizations rising from below are thus exactly under those depending from the roof, they frequently unite and form pillars which appear to support the roof of the vaults. Many of these crystallizations are capable of receiving a polish.

In the *Dictionnaire Universel de la France* (Paris, 1804-5), these caverns are described as abandoned stone-quarries, in which time has obliterated the traces of human labour; but the writer of the article in the *Encyc. Méthodique* ascribes them to the effect of the waters of the Cure, (one channel of which, entering the hill a little above the entrance of the grotto, undermines and traverses it, emerging on the other side, and having sufficient stream to turn a mill,) and to other subterraneous waters. It is acknowledged, however, that the stone with which the cathedral of Auxerre is built was taken from this place; and if so, the caves, to whatever their origin may be ascribed, have been at least enlarged in some parts by the hand of man. (*Encyc. Méthodique; Dict. Univ. de la France;* Malte Brun.)

ARD, LOCH. [See FORTH.]

ARDAGH, now a decayed village in the county of

Longford, in Ireland, about five miles S.E. of the town of that name, was once a place of considerable importance: as it gives name to a barony, one of the six into which the county is divided, and to a bishopric now united with the archbishopric of Tuam. The parish, a rectory in the diocese of Ardagh, had a population in 1821 of 4942 persons. There is a church, and some remains of the antient cathedral, which appears to have been a small building, though of very great antiquity, as it is supposed to have been erected not long after the conversion of the natives. There is also a free school for fifty children (thirty-two boys and eighteen girls), twenty of whom are educated at the expense of the dean of Ardagh. There are two fairs, viz., April 5, and August 26.

The see of Ardagh has undergone great changes. It was founded in the middle of the fifth century; united in 1658 to the see of Kilmore; separated in 1692, but reunited in the same year; again detached in 1741, and united with the see of Tuam, though it is in the ecclesiastical province of Armagh.

It is a small diocese, containing only twenty-five benefices, which comprehend thirty-seven parishes; but it extends into six counties. It is separated from the diocese of Tuam by that of Elphin. It has a dean and archdeacon, but no chapter. The temporalities are destined, upon the first vacancy of the see, to form part of the fund for defraying the expenses hitherto raised by the vestry cess. Ardagh is in 53° 38′ N. lat., 7° 39′ W. long.

ARDEA (*Vieillot*), the heron, a genus of birds under which Linnæus comprehended the cranes and several other divisions now formed into distinct genera by modern naturalists. M. Vieillot followed Buffon in making four divisions of the herons; but Temminck, who has paid peculiar attention to these birds, arranges them under one genus and two sections. We prefer, however, on account of its distinctness, the arrangement of M. Vieillot, which has been partly followed by Lesson, Drapiez, and Baron Cuvier. The genus *Ardea*, as limited by Vieillot, is thus characterised:

Bill strong, straight, or slightly curved, compressed, acuminated, sharp, in most species finely toothed; the upper mandible somewhat channelled, and usually notched towards the tip; nostrils on the side, almost at the base, slit lengthwise in the groove, and half shut by a membrane; eyes with a naked circle around them extending to the bill; legs long, slender, and either half-naked or feathered down to the shank (*tarsus*); the middle fore-toe united to the outer one by a short membrane; the back-toe articulated interiorly, and upon the same level as the others; the second and third quill feathers of the wings the longest.

Among the genera separated from *Ardea*, are Anthropoïdes, Balearica, Grus, Cariama, Nycticorax, and Ciconia; but considerable difference of opinion seems to exist with respect to these and a few other allied genera which have been proposed. The bitterns, however, though popularly distinguished from the herons, cannot, we think, with much propriety be separated from *Ardea*.

ARDEBIL, one of the principal towns of Azerbijan, is situated, according to Jaubert, in 38° 14′ N. lat., and about 48° 19′ E. lon. from Greenwich, in a fertile plain encompassed by hills, at a distance of thirty hours' march from Tauriz (or Tebriz), and about seven and a half from the western border of the Caspian Sea. Monteith gives the lat. at 38° 10′ 20″; Olearius at 38° 5′. A chain of hills, which separates Azerbijan from Ghilan, keeps off the noxious winds that prevail in the sultry lowland of the latter province: it is probably in allusion to this circumstance, and to its advantageous situation generally, that Ardebil has been surnamed Abadan-i-Firuz, 'the abode of happiness.' But still it is not a very healthy place, being exposed to great changes of temperature. The trees about Ardebil do not begin to bud before the end of April, which shows that the temperature of the place is much affected by its position near the mountains. The town is of importance as an emporium in the caravan trade of Tiflis, Derbend, and Baku, with Ispahan and Teheran. In history, Ardebil is remarkable as having given birth to the dynasty of the Sufi or Safawi rulers of Persia: two of the ancestors of this family of kings, Sheikh Safieddin and Sheikh Heider, are buried here; and their tombs are held in high veneration, as the sepulcares of saints, among the Mohammedans of the Shiite sect. Ardebil contained a fine library, which was sent to Russia when the place surrendered to Count Soukhtaline. This library is described by Olearius (ii. 638, Amsterdam ed.). A small river, the Balulukh, runs through the town, which is subject to inundations when the snow on the surrounding hills begins to melt. The great mountain of Sevelan, next to Ararat, perhaps the highest in this country, is about twenty-four miles west of Ardebil; its height is roughly computed at about 13,000 feet. In the neighbourhood of Ardebil, there are several hot and mineral springs.

ARDE'CHE, a department in France, including nearly the whole of the former district of Vivarais (so called from the town of Viviers); the remaining part of the Vivarais, which is of small extent, is included in the department of Haute Loire. Ardèche is bounded on the north and northwest by the departments of Loire and Haute Loire, from which it is separated by the range of the Cévennes. On the west it has the department of Lozère, and on the south that of Gard. The eastern boundary along the whole length of the department is formed by the Rhone, which separates it from the department of Drôme. Its greatest length is about 80 miles from N. by E. to S. by W., and its breadth about 42 or 43 miles. The superficial extent is about 2116 English square miles, and the population about 328,000, or about 155 to a square mile.

The geology of this district is of a very interesting character from the abundance of volcanic phenomena which it presents. (See Velay and Vivarais, and Ce'vennes.) The principal heights are along the western boundary of the department in the chain of the Cévennes. Mezen, which is just on the boundary, is 5820 feet in height, and Gerbier de Jones, from which the Loire rises, is 5125 feet. (See *Orographie de l'Europe*; and *Comp. to the Almanac for* 1833.) Indeed, the western part of the department is equal in elevation to almost any in central France. From these high lands descend the streams which by their union form the Cance, the Doux, the Erieux, and the Ardèche, which fall into the Rhone in the order (from north to south) in which their names occur. Of these the Ardèche alone appears to be navigable. The northern and western parts of the department abound in granite and sandstone, and yield rich iron ore, coal, clay for earthenware, and the finest kaolin for porcelain. Near Tournon, on the banks of the Rhone, are several lead-mines, and indications of copper have been observed near St. Laurent les Bains, in the western part of the department.

The lower grounds along the bank of the Rhone, and in the southern districts near Aubenas, produce the mulberry and the vine; the more mountainous parts yield the chestnut and the walnut, and afford pasturage to herds of cattle. The wines of St. Peray and Cornas are much esteemed. On the loftiest summits the snow lies eight months in the year: the department, from its unequal elevation, has a great variety of climate.

The capital of the department is Privas (population 4000), on the river Ouvese, an insignificant stream which flows into the Rhone. L'Argentière (population near 3000) and Tournon (population 3600) are sub-prefectures or capitals of arrondissemens. But these towns, which derive much of their importance from their political rank, are inferior in population to Annonay in the north, and Aubenas and Le Bourg St. Andeol in the south of the department. These have respectively 8000, 5000, and between 4000 and 5000 inhabitants. Aubenas is the great mart for the wine and chestnuts of Ardèche. It has two well-attended fairs in the year for the sale of silk, which their mulberry trees enable the inhabitants to produce. The cotton manufacture is carried on here; and in the neighbourhood are dye-houses, tan-yards, corn and oil mills, and silk manufactories. Near Le Bourg St. Andeol are the remains of an antient temple of the Gauls, among which are some nearly defaced bas-reliefs. For other of the places above-mentioned, see Privas, Argentiere L', Tournon, and Annonay. This department is in the bishopric of Viviers, a small town on the Rhone, a little north of the Bourg St. Andeol already noticed. It is within the jurisdiction of the *Cour Royale* (Assize Court) of Nismes; and sends three members to the Chamber of Deputies. The inhabitants are said to be ignorant and superstitious. (Malte Brun; Balbi; *Dict. Géog. de la France*; *Encyc. Méthodique*.)

ARDE'CHE, a river of France, which rises in the Cévennes, and flows first to the E. then to the S. or S. by W., and then turning S.E. empties itself into the Rhone a little above Pont St. Esprit (D. of Gard), forming, in the lower part of its course, the boundary of the department of Ardèche. This stream is perhaps about sixty miles long, but is not navigable for more than about ten miles. The river passes under the natural bridge of Arc, about eighteen or twenty miles above its outfal. This natural bridge consists of a very hard greyish limestone rock, forming an arch through which the river flows.

It has been used as a passage over the river ever since the Roman conquest. The road way is elevated nearly 200 French, or 212 English feet above the surface of the water. The arch has an elevation of ninety French, or between ninety-five and ninety-six English feet, and the breadth near the base is about 163 French, or 173 English feet. The length of this tunnel or arch is not given by our authorities.

Geographers have spoken of it as originally a work of nature, but perfected by the hand of man. The writer of the article *Ardèche* in the *Encyclopédie Méthodique (Géog. Physique)*, is of opinion that the river has worn this passage through the rocks round which it once took its course; having first effected a small opening, and gradually enlarged it. On the other hand, Malte Brun (*Géographie Universelle*) affirms that the arch does not exhibit any marks of the rock having been worn away by the stream; and denies, not only that the river originally formed, but even that it has at all enlarged the opening. He considers it a natural cavern formed by the decay of the rock on the bank of the river: and observes, that a tendency to decay is one of the characteristics of the kind of limestone which composes the mass. (*Encyc. Méthodique;* Malte Brun.)

ARDEE (or **ATHERDEE**), a market town, in the barony of Ardee, county of Louth, Ireland, forty-three miles N. by W. of Dublin, on the Lifford and Derry road. It is pleasantly situated on the river Dee, which is a small stream uniting its waters with those of the Lagan, and flowing into the Irish sea. The town had in 1821 a population of 3588 persons, and the rest of the parish contained 1773. The living is a vicarage, which has been united from time immemorial with those of Shenlis, Smermore, and Stackallen, and from a later period with the rectory and vicarage of Killdemock. The united parishes are in the diocese and province of Armagh. There are in the town two schools on Erasmus Smith's foundation, one containing eighty-four boys, and the other eighty girls, on the Lancasterian system; there is also a dispensary.

Ardee returned two members to the Irish Parliament, but lost its franchise with the Union; it has four fairs in the year. It gives the title of baron to the Brabazon family, earls of Meath.

Ardee was antiently a walled town, and defended also by a strong castle, erected by Roger de Pippard, lord of Atherdee, about the close of the twelfth or the beginning of the thirteenth century. There were two monastic establishments here; an hospital for Crouched Friars, following the rule of St. Augustin, founded in 1207 by the above-mentioned Roger de Pippard, and a Carmelite friary, the church of which, filled with men, women, and children, was burned by the Scots and Irish under Edward Bruce in 1313. Near the town is a remarkable mound called Castle Guard, of ninety feet perpendicular height, 600 feet in circuit at the base, and 140 feet at the summit. It is tastefully planted, and is surrounded by a deep and wide trench, or, according to other accounts, a double ditch and vallum (*i. e.* embankment). The remains of two structures, one seemingly a castle or tower, and the other a kind of parapet, are on the summit. These mounds, which the Irish call *raths*, and attribute to the Danes, are more numerous in the county of Louth than in any other county. (Carlisle's *Top. Dict. of Ireland; Traveller's New Guide through Ireland, &c.;* Beaufort's *Mem. of a Map of Ireland, &c.*) 53° 50′ N. lat., 6° 30′ W. long. from Greenwich.

ARDEN, the woodland district of the county of Warwick. This name, which, from its occurrence in the northern part of France and elsewhere [see ARDENNES], we may suppose was a common Celtic designation for a forest, was given to this most extensive of the antient British forests. It is said to have reached from the banks of the Avon to the Trent on the north, and to the Severn on the west; and to have been bounded on the east by an imaginary line from Burton upon Trent to High Cross, the point of intersection of Watling Street and the Foss-way on the border of Warwickshire and Leicestershire. Drayton, in his 'Poly-olbion,' (the 13th song,) says,

> That mighty Arden held, even in her height of pride;
> Her one hand touching Trent, the other Severn's side.

Upon the division of England into shires, this immense wild was divided between different counties, and only that part which was included in Warwickshire retained its name: though perhaps 'Dean,' the name of a forest on the borders of Gloucestershire and Monmouthshire, may be a relic of it.

Although there is no longer a continuous forest in this district, yet it is still the best wooded part of the county, affording plenty of timber, consisting of almost all kinds of forest trees, but especially oaks.

Several places preserve the name, as Henley in Arden Hampton in Arden, &c. (Drayton's *Poly-olbion*, with Selden's illustrations; *Beauties of England and Wales;* Marshal's *Review of the Agricultural Reports of the Midland Counties*.)

ARDENNES, a mountainous, or rather hilly region on the northern frontier of France, between the rivers Meuse and Moselle, situated partly in France, in the Grand Duchy of Luxembourg, in the Rhenish provinces of Prussia, and in Belgium. The name of the region is antient; the Arduenna Silva is mentioned by Julius Cæsar (*Bell. Gall.* l. v. vi.) by Strabo (*Geogr.* l. iv.), and by Tacitus (*Ann.* l. iii. 42) Ardennes is the name of one of the northern departments in the modern subdivision of France, and is a part of the antient provinces of Picardy and Champagne. The Ardennes, or, as the region is sometimes called, the Forest of Ardennes, extends from the hills of Thiérache in Picardy, on the left of the Meuse, to those of the Hautes Fagnes and the banks of the river Roer, in the form of a half moon; and the hilly parts of the Duchy of Luxembourg, as well as the mountainous district called the Eifel, which extends to the Rhine, and contains numerous extinct volcanos, belong to the same system. The mean elevation of the Ardennes, according to Dumont (*Mémoire sur la Constitution Physique de la Province de Liège*, Bruxelles, 1832), is about 470 metres, or 1540 English feet, above the level of the sea; its highest point, La Baraque Michel, is 680 metres, or 2230 feet. The mountain Schneifel, in the environs of Prum, according to Steininger, is 2132 feet. Omalius d'Halloy, in his *Mémoires Géologiques*, observes, that the Ardennes afford a proof that the direction of streams is not always a sure indication of the general slope of a country; that the table-land of Langres, in the department of the Haute Marne, which forms the water-shed of rivers which flow into the North Sea, the Atlantic, and the Mediterranean, has, on that account, been considered as one of the most elevated parts of France, and that it has been supposed that, from that point, there is a slope to the north, west, and south; that the table-land of Langres is only 1495 feet above the level of the sea, whereas the river Meuse, which rises at the foot of it, traverses, between Mezières and Givet, 136 miles to the north, a table-land which has an elevation of more than 1640 feet. The Ardennes, although a high region, cannot be called mountainous; there are extensive tracts where only very low hills or gentle undulations are observed. But in those parts which are traversed by the more considerable rivers, such as the Meuse, the Semoy, the Ourte, the Sure, the Warge, and the Roer, the surface is broken into a multitude of valleys, and extremely deep and often very narrow gorges, with steep sloping or precipitous sides, 650 feet high. These great water-courses form, as it were, principal trunks from which a number of secondary valleys branch off, furrowing the whole surface of the neighbouring country. Thus the Ardennes contain both hilly and flat districts; but these last are lofty table-lands, having the same general elevation above the sea, and being composed of the same materials.

The prevailing rocks of the Ardennes are clay-slate, grauwacke-slate, grauwacke, conglomerate, quartz-rock, and quartzose sandstones in various modifications of colour and internal structure, with now and then, but very rarely, some thin beds of limestone and of calcareous conglomerates. These rocks are in strata generally bearing N.E. and S. W., often highly inclined, sometimes vertical, but seldom, if ever, horizontal. They maintain a considerable uniformity both of composition and stratification throughout large tracts. The slaty rocks are abundant, and afford, in some places, excellent roofing slates; there are extensive quarries of these along the banks of the Meuse, and they are carried to great distances from the facility of the river-navigation. Excellent whetstones, both for coarse and fine cutlery, are largely exported. The Ardennes have hitherto proved but poor in metallic substances except iron; but the lead-mines of Longvilly and the antimony-mines of Goesdorf were productive. Near Lierneux, an oxide of manganese is worked in a mine open to the day. On the borders of the region towards the west there are some rich iron mines. The celebrated mineral waters of Spa issue from these slaty rocks.

The country of the Ardennes is in general sterile; and even in the best part of it, which constitutes the French department of Ardennes, there is only about a third of the land in cultivation. There are vast heaths and extensive marshes which can only be approached in the three driest months of the year. These heaths are called Fagnes, and the most elevated part of the region on the south-east is called Les Hautes Fagnes. There are extensive forests of oak and beech; more rarely, of alder, ash, and birch. Pines and firs occur but seldom. The people of Belgium, living on the borders of the Ardennes, call them the *Neur-Paï*, that is, *Noir-Pays*, 'black country,' because it contains no limestone, and because the only grains cultivated are rye and dwarf oats. Around the villages there are patches of land which have been brought into cultivation by means of a process of paring and burning, called *essartage:* it consists in taking off the turf and burning it on the ground, and by this process the soil is rendered capable of yielding three successive crops; the first year, rye, generally of a very good quality; the second year, oats; and the third year, potatoes; but after these crops have been got off the land, it must lie fallow for six, twelve, or even twenty years. Meadows and regularly cultivated lands occur only in the valleys. The rearing of cattle, sheep, and horses, is carried on to a great extent. The mutton is celebrated for its excellence, but the wool is not in such high repute. A great deal of ewe-milk cheese is made. The oxen, sheep, and horses are of a small breed. The hardy and valuable Ardennes ponies and little horses appear to be indigenous. They were as highly esteemed in antient times as they are in the present day; for at the time of the invasion of Gaul by the Romans, the cavalry of the Treviri, in which this particular breed was employed, was esteemed the best in Gaul.

ARDENNES, a department in the north of France, on the frontier. It is bounded on the N. and N.E. by the kingdom of Belgium, E. by the department of Meuse, W. by that of Aisne, and S. by that of Maine. Its length is about sixty-five miles N. and S., and its breadth sixty miles from E. to W. Its superficial extent is 1955 English square miles, and the population about 282,000, being about 144 to a square mile.

This department is traversed by ridges which may be regarded as remote branches of the Vosges, and which separate the waters of the basin of the Meuse from those of the Seine. The streams which flow from the N.E. slopes of these ridges fall into the Meuse; the Bar (which is navigable for several miles) just below Donchery, the Vence, and the Sormonne, near Mezieres, and the Faux and the Viroin, a considerable way farther down. The Meuse itself traverses the department in a direction S.E. and N.W, nearly parallel to and not very far from the Belgian frontier; it then turns more towards the N., and waters a portion of the French territory which projects into the kingdom of Belgium. It receives the abovementioned streams on its left bank: on the right it receives the Semoy, which has the greater part of its course in the Belgian territory. The Aisne forms an arc in the southern part of the department, flowing in a direction which may be described as, on the whole, E.S.E. and W.N.W.; it receives the Vaux on its left bank from the range of heights above alluded to; and falling into the Oise, far beyond the limits of the department, ultimately joins the Seine. Its navigation begins at Château Portien, a little before it leaves this department. Some of the other feeders of the Oise rise just on the eastern border of Ardennes.

The elevations in this department appear from their steep declivities and rugged summits to be more lofty than they really are. They afford excellent slates, equal in quality to those of Angers, though not so deep in colour. (*Encyc. Méthod.; Géog. Physique*, Art. ARDOISES.) Slate and stone are quarried to a considerable extent. Coal, iron, and some lead, are also worked: the great quantity of wood which the department produces, furnishes fuel for considerable iron works.

These heights were once covered with an immense forest. Cæsar (*Comment. de B. G.* lib. v.) describes it as spreading 'in vast extent through the middle of the country of the Treviri (people of the diocese of Trèves, now included in the Prussian Grand Duchy of the Lower Rhine), from the river Rhine to the beginning of the territory of the Remi' (the people about the present town of Rheims). In another place (*Comment. de B. G.* lib. vi.), he speaks of it as 'the largest forest in all Gallia,' and says, 'that it stretches from the banks of the Rhine and the country of the Treviri, to the lands of the Nervii' (who dwelt in the present country of Flanders), 'and extends above 500 miles in length[*].' But this measure is so great that some error in the text has been suspected. In some documents of the German empire of the dates 1001, 1003, A.D., the name Arduenna is applied to a canton of Westphalia bordering on the diocese of Paderborn. If the word signified a forest [see ARDEN], it accounts for the fact that the Roman goddess of forests, Diana, appears sometimes with the epithet Arduenna: and Montfaucon shows that a superstitious belief in this goddess existed in the Ardennes till the thirteenth century.

Strabo speaks of it as a large forest, consisting of not very lofty trees. (*Geog.* lib. iv.) Though now much reduced, it renders the department which bears its name one of the best wooded in France. It occupies a considerable extent on the banks of the Meuse below Charleville, and encompasses the plain in which the town of Rocroy stands. The timber which it furnishes, besides supplying the forges or manufactories, forms one of the chief articles of commerce. The agricultural produce of the department is not sufficient to supply the wants of the inhabitants. Their timber, slates, metals, and woven fabrics are exchanged for the corn and wine of more fertile districts. The southern parts contain the most pasturage and corn land.

The chief manufactures carried on in this department are of cloth and woollen stuffs, at Sedan and Rethel; cutlery, hardwares, nails, and fire-arms, at Charleville; leather, which is in good repute; hosiery, hats, serges, &c.

The chief towns are Mézières, the capital (population 4000), Rethel (population 6000), Rocroy (population 3500 or 4000), Sedan (population 13,000), and Vouziers (population under 2000); all which are seats of sub-prefects; Charleville (population 8000), which is separated from Mézières only by the Meuse; and Charlemont, with Givet, Notre Dame, and Givet St. Hilaire, which form one town with a population of about 4000. Several of these being on the frontier are fortified,—Mézières, Rocroy, Sedan, and Charlemont with the Givets. For a further account of these towns, see CHARLEVILLE, CHARLEMONT, MEZIÈRES, RETHEL, ROCROY, SEDAN.

This department is included in the archbishopric of Rheims, and is under the jurisdiction of the *Cour Royale* (Assize Court) of Metz. It sends three members to the Chamber of Deputies. (Malte Brun; Balbi; *Encyc. Méthodique; Diction. Géog. de la France*, &c.)

ARDESHIR. [See SASSANIDÆ.]

ARDFERT, called antiently ARDART, ARDFEART-BRENN, or ARDBREINN, a decayed city of Ireland, in the barony of Clanmaurice, county of Kerry; 184 English miles S.W. by W. from Dublin, and about four N.N.W. of Tralee. Although now much reduced, its former importance and its episcopal rank entitle it to notice. The see of Ardfert was erected in the fifth century, and was so early united with that of Aghadoe that they now form but one diocese, comprehending the county of Kerry and part of Cork, and containing eighty-eight parishes, and forty-nine benefices. In 1663, the united sees were added to that of Limerick, but without incorporation. The chapter of Ardfert consists of five dignitaries, viz., dean, precentor, chancellor, treasurer, and archdeacon, but no prebendaries; only the archdeacon of Aghadoe has a stall. The five dignitaries above-mentioned have the cure of souls in the parish of Ardfert, and contribute each one-fifth to the curate's salary. The parish church serves as the cathedral, and is the relic of a very extensive edifice, the rest of which was demolished in the wars of 1641.

The ruins of the nave and choir are twenty-six yards long and ten broad. There are the remains of an aisle on the south side, and there was probably one on the north side, which was rebuilt not long before the demolition of the church in 1641. Towards the west end of the cathedral, there are two detached chapels, said to have belonged to the dignitaries of the cathedral, one of them bearing marks of remote antiquity. Opposite the west door was formerly one of the an tient round towers (see Antrim *town*) nearly a hundred feet high, and built mostly of a dark kind of marble; but this fell in the year 1770 or 1771. The area of the cathedral is crowded with tombs, on one of which is the effigy of a bishop rudely sculptured in relief.

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[*] As the Roman mile was about 11-12ths of our mile, the distance will be about 458 English miles—which is impossible: for it is little more than 300 Roman miles from the Rhine at Strasburg to the coast of Flanders. And Strabo expressly says, the forest was not of the extent which some writers assign to it, mentioning 4000 stadia as the exaggerated dimensions, which are equal to Cæsar's measurement. Eight stadia are equivalent to one Roman mile.

Ardfert was once the capital of Kerry, and had a university of high repute. The bishops were antiently called bishops of Kerry. St. Brendan, or Brandon, to whom the cathedral was dedicated, erected a sumptuous abbey here in the sixth century, but it was burned, as well as the town, in 1089. The town suffered a similar fate again in 1151 and 1179, on which last occasion the abbey was entirely destroyed.

Within the demesne formerly belonging to the earls of Glandore and barons of Ardfert (titles now extinct) are the remains of an antient monastery, forming a most picturesque addition to the grounds. These remains, according to Sir R. C. Hoare, who visited them in July, 1806, consist of the tower, nave, and a great part of the cloisters, which are in tolerable preservation. The architecture of the building does not bespeak a very antient date. There is some difference of opinion as to its origin; Smith (*Nat. and Civ. Hist. of Kerry*) ascribes its foundation to Thomas, Lord of Kerry, in 1253, in which he is followed by Archdale (*Monast. Hibern.*); others ascribe it to a baron of Kerry, in 1389. It is thought to occupy the site of the former monastery founded by St. Brendan, and was destroyed when the town was burnt in the years 1089 and 1179.

There are three fairs in the year. The population amounted, in 1821, to 629 in the town, or 2481 in the whole parish. It was a parliamentary borough before the Union, and sent two members to the Irish House of Commons; it is still governed by a portreeve and twelve burgesses. In 1821, there was an Hibernian Society school of forty boys and twenty-one girls. 52° 19′ N. lat., long. 9° 39 W. from Greenwich.

Ardfert is so near the sea, that single trees, or even rows, are destroyed by the wind; yet there are fine plantations in the grounds of the late Earl of Glandore.

ARDGLASS, a town in Ireland, in the barony of Lecale, county of Down, a short distance E. by N. of the town of Killough, which is 100 miles N. by E. of Dublin. It lies upon the east side of the tongue of land which separates the bay of Killough from that of Ardglass; the road between the two towns leads round the head of the first-named of these bays, a distance of about five miles, but this may be very much shortened by crossing the sands when the tide permits.

Ardglass lies on a small rocky bay or creek about 150 fathoms wide, and extending, at high water, 500 fathoms inland, with three or four sandy coves along its shores, divided from each other by rocky ledges. The outer of these ledges on the west side has been built up so as to form a kind of pier, at the extremity of which is a light-house; and as there are always three or four fathoms water at the entrance, it may be run for at night, even at low water. The harbour is, however, far from secure when the southeast wind, the most violent on this coast, sets in. (*Report of the Commissioners of Irish Fisheries for* 1822.) It is inhabited chiefly by fishermen. The population of the whole parish was only 976 in the year 1821, the inhabitants of the town not being discriminated. It is the centre of one of the districts or stations into which the Irish fisheries are divided. In the year ending the 5th of April, 1830, there were employed within the district 208 sailing and 300 row-boats; 2441 fishermen, and probably about 300 other persons, as fish-curers, net-makers, coopers, sail-makers, and other artificers connected with the fisheries, and depending on them for support. In 1822 there were two packets to the Isle of Man. The harbour has been within a very few years substantially repaired by W. Ogilvy, Esq., and government have lately made a grant towards the erection of a pier. There is in the town a school on the foundation of Erasmus Smith, the school-house for which was built by Mr. Ogilvy: it contained in 1826 about 120 pupils, half of whom were boys and half girls.

Ardglass was once a corporate town of considerable importance, both as a seat of commerce and a military post. In the time of Queen Elizabeth it was, next to Newry and Down, the principal place in the county. Some authorities make it the second town for trade in all Ulster, Carrickfergus being the first. Several remains attest its former strength and greatness. A range of buildings 234 feet long and 20 broad in the clear—(250 feet long and 24 broad, according to Seward, *Topog. Hibern.*, which are probably the exterior dimensions,)—is situated close by the harbour, and washed by the sea on the north end and the east side. On that side there are only spike-holes; but on the west side, or front, are sixteen arched stone doors, alternating with fifteen square windows; there are also three towers, two connected with the building, the third, now a little detached, but which probably at first constituted one extremity, as the remaining two towers occupy the centre and the other end of the building. The whole building has been divided into small apartments in two ranges, one over the other, with a staircase in the centre. The lower rooms are about seven feet high; the upper, six and a half; there is a small water-closet in each of the latter, the drain running down through the wall into the sea. The towers have each three rooms, ten feet square, with broad-flagged floors supported without any timbers. The building is surmounted with a battlement, at least on the side next the sea.

This singular erection is termed by the inhabitants the 'new works,' although they have no tradition as to its use, which, however, its construction seems sufficiently to point out. It appears to have been intended for the secure deposit and sale of the goods of some merchants who came from beyond sea. About ten feet from the south tower of this building is a square tower, forty feet by thirty, (we know not whether these are the inside or the outside dimensions, but we believe them to be the latter,) consisting of two stories, and called Horn Tower, from the quantity of horns of oxen and deer found about it. It is thought to have been the merchants' dining-hall and kitchen, from the fire-places and other marks about it. There are at Ardglass three castles, called King's Castle, Cowed (or Coud) Castle, and Jordan's Castle. The last, though not so large as King's Castle, is a finer building than any of the rest. In the great rebellion of Tyrone (in the reign of Elizabeth) it was defended by Simon Jordan, the owner, for three years, until the garrison was relieved by the Lord Deputy, Mountjoy.

The parish of Ardglass is in the union (*i.e.* united parishes) of Ballyphilip, in the diocese of Down, and ecclesiastical province of Armagh; but it has been erected into a perpetual curacy, and a new church built. The old church of Ardholl was the parish church, but was desecrated by the dreadful massacre of the whole congregation at the Christmas midnight mass by the septs (clans) of the M'Cartanes. (*Antient and Present State of the County of Down; Seward's Topogr. Hibernica; Parliamentary Papers.*)

ARDNAMURCHAN. [See Argyleshire.]

ARDOCH, a village in Scotland, in the district of Strathallan, county of Perth, where there are the remains of a permanent Roman station, supposed to be in the most perfect preservation of any in the island, and the traces of three temporary Roman camps. The station is on the right of the great military road from Stirling through Crieff to the north Highlands, and close upon the little river Knaick or Knaig, a feeder of the Allan, which falls into the Forth.

This station is supposed, by General Roy, to be the Lindum of Richard of Cirencester[*]; and to have been founded by Agricola in one of his northern campaigns, perhaps in the fourth. It was on a road carried by the Romans from the wall erected by them between the Firths of Forth and Clyde into Strathmore beyond the Tay, and which crosses the river Knaig immediately below the station. The accompanying plan, from General Roy's *Military Antiquities of the Romans in Britain*, will show the great pains taken to strengthen it. Its form, according to the general practice of the Romans, is rectangular; its dimensions are about 500 feet by 430 within the entrenchments; and its four sides nearly face the four cardinal points. On the north and east sides, where the works are most perfect, there are five ditches and six ramparts. From the nature of the ground the direction of the outer rampart varies, but the aggregate breadth of the works on the east side, where intersected by the line A B, is about 180 feet, and that of the works on the north side, where intersected by the line C D, is more than 270 feet. The prætorium, or general's quarter, is near the centre, but not in it; it is a rectangle, and almost a square, having its greater side about 70 feet, but its sides are not parallel to those of the station. On the south side of the latter the works have been much defaced by the process of cultivation, and

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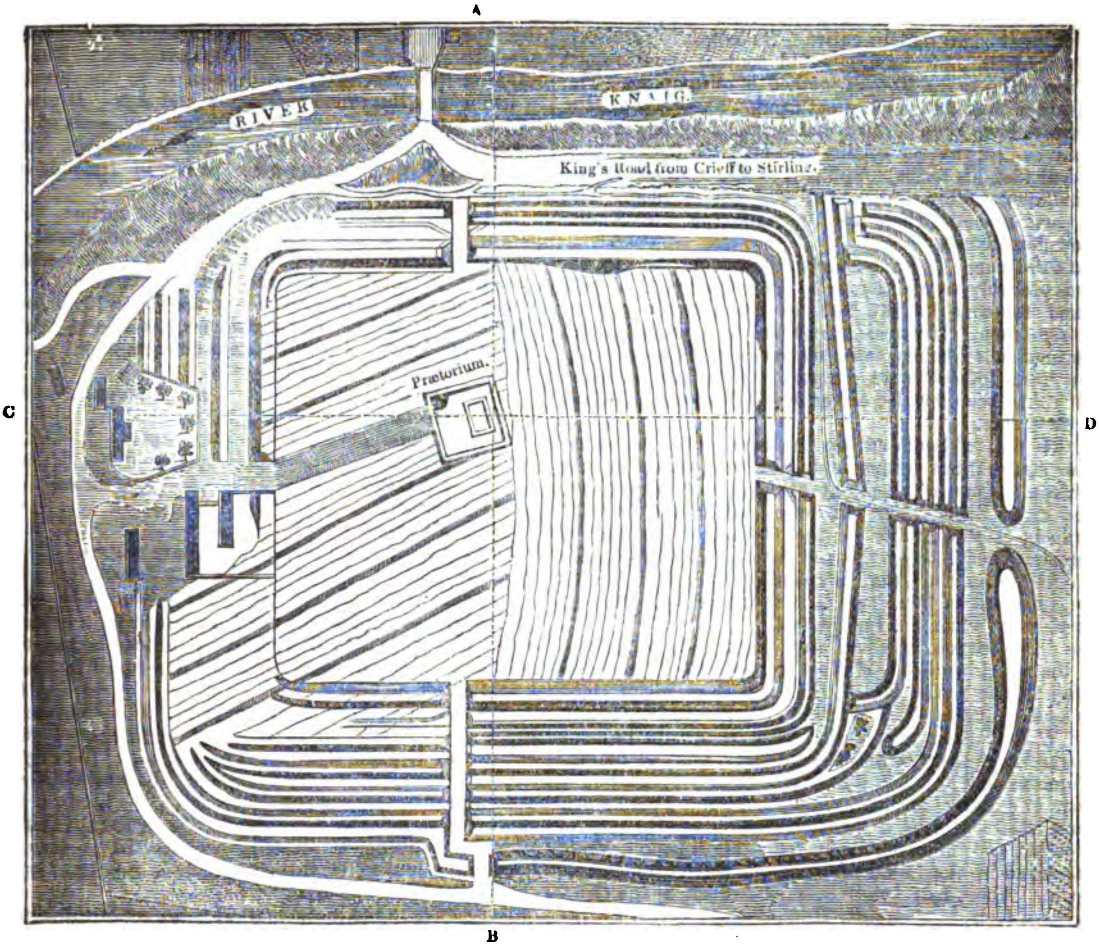
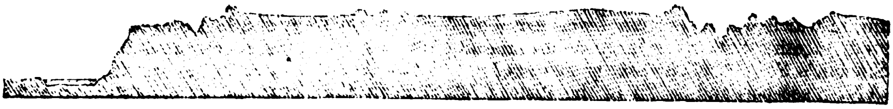
[*] A monk of Westminster, author of a History and Map of Roman Britain, written about A.D. 1338, the MS. of which was discovered in Denmark in 1757.

Plan and Sections of the Roman Station Lindum, at Ardoch, in Strathallan.

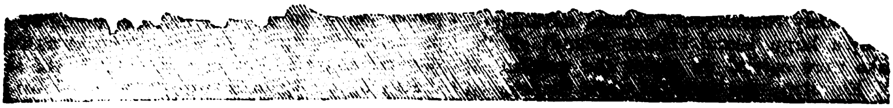


Scale of 600 Feet.

Section made in the direction of the line A B.



Section made in the direction of the line C D.



on the west by the modern military road from Stirling towards Inverness. Three of the gates remain. The entrance at the prætorian gate crosses the entrenchments, not at right angles, but obliquely. There is a road out of the camp on the south side; but whether it coincides with the remaining (*decuman*) gate is not clear from the plans. The Roman stations and camps had usually four gates: the Prætorian, in front of the prætorium or general's quarters; the Decuman, at the back of the same; and the right and left principal gates. From an inscription on a sepulchral stone dug up at this place, it appears that a body of Spanish auxiliary troops lay in garrison here.

The west side of the camp is protected by the river Knaig, the banks of which, as the section shows, are very steep. The level of the camp is sixty feet above the river. The prætorium, which has from time immemorial been called Chapel Hill, has been at some time enclosed with a stone wall, and has the foundations of a house ten yards by seven. The whole station has been of late years enclosed with a high stone wall in order to preserve it.

There is said to be on one side of the prætorium a subterraneous passage, supposed to extend under the bed of the river, but the entrance having been closed about 1720, to prevent hares, when pursued, from taking refuge there, it is not known where the passage is. Search has been made for it, but in vain. Previous to its being closed, a man who had been condemned in the baron court of some neighbouring lord, consented, upon condition of pardon, to explore it; but after bringing out some Roman spears, helmets, and bits of bridles and other things, he descended again and was killed by the foul air. The articles brought out were carried off by the duke of Argyle's soldiers after the battle of Shereffmuir in 1715, and were never recovered.

The camps are a little way north of the station on the way to Crieff, and are of different magnitudes. The largest of them has a mean length of 2800 feet, and a mean breadth of 1950, and was calculated to hold between 25,000 and 26,000 men. The military road enters the camp by the south gate, and has levelled half of the small work which covered it, leaving the other half of it standing. On the east rampart of this camp is a small redoubt, on a gentle eminence; the only thing of the kind in the temporary camps of Agricola in these parts. The area of this camp is marshy, and some parts of it appear to have been always so.

The second camp is smaller, and its ramparts obliquely intersect those of the last. The north end and part of the east and west sides remain entire. Its length is 1910 feet, and its breadth 1340, and it would contain about 14,000 men, according to the Roman method of encamping. The area is drier than that of the great camp. These camps Roy supposes to have been formed and occupied by Agricola in his sixth campaign; the smaller one after the larger, when he had divided his forces. The part of the rampart of the first included within the second was not levelled. The lower parts of both, where they approach the river Knaig, are now demolished.

The third camp is immediately adjacent to the station, and was probably an addition to it. Its mean length is 1060 feet, and its mean breadth 900, so that it would contain about 4000 men. It was stronger than the great camp, and was formed subsequently to it, the works of the great camp having been defaced by its rampart, and the part included within it has been levelled either by the Romans or others since their time.

In this part of Scotland are the remains of two other Roman stations, but neither of them are so perfect as that at Ardoch. One of them, at Strageath or Strathgeth, on the river Earn, about six miles and a half N.N.E. of Ardoch, is thought to be the Hierna of Richard of Cirencester; and between this and Ardoch, about two miles and a half from the latter, is a small post called Kaim's Castle, supposed to have been a look-out for both stations, the remains of which are very perfect.

The other station, of which only slight vestiges remain, is in the neighbourhood of West Dealgin Ross, near the junction of the rivers Ruagh Huil and Earn, about eight miles and a quarter N.N.W. from Ardoch, and eight and a half W.N.W. from Strageath. Near it are the remains of a small temporary camp, whereof great part of the intrenchments and the four gates (which are covered in a manner singularly curious) remain entire. This station General Roy supposes to be the Victoria of Richard of Cirencester, and the camp that of the ninth legion, which was attacked by the Caledonians in the sixth campaign of Agricola. About half a mile S.W. of Ardoch, at the Grinnan Hill of Keir, is a circular Roman work. (Roy's *Military Antiquities of the Romans in North Britain;* Sir John Sinclair's *Statistical Account of Scotland.*)

About a mile west of Ardoch was a cairn of extraordinary dimensions, viz., 182 feet in length, 30 feet in sloping height, and 45 feet in breadth at the base. (Gordon's *Itinerarium Septentrionale.*) The stones have been now mostly carried away to form enclosures for the neighbouring farms; but a large stone coffin, in which was a skeleton seven feet long, has been preserved, together with a few large stones around it. (Sir John Sinclair's *Statistical Account of Scotland.*)

ARDROSSAN, a sea-port and parish in the district of Cunningham, the most northern division of Ayrshire in Scotland. The harbour of Ardrossan was begun in 1806. The port had previously considerable natural advantages, being sheltered by a large island (Horse Island) off the coast. The works were carried on under the auspices of the late earl of Eglinton, who bestowed upon them much trouble and expense. The harbour was to form one outlet of a canal intended to connect the Clyde with this part of the coast, and the projectors seem to have hoped to render Ardrossan the port of Glasgow. The harbour has been for many years in a state to receive shipping, and is considered as one of the safest and most capacious and accessible on the west coast of Scotland. A circular pier of 900 yards* was finished in 1811; but the progress of the wet dock and other works was suspended by Lord Eglinton's death in 1820. The canal (begun in 1807) has never been finished. It has been carried from Glasgow past Paisley to the village of Johnston, a distance of eleven miles, at an expense of 90,000*l*. A rail-road has been commenced from Ardrossan to the canal, which will thus complete the communication, though not in the manner first designed. Baths have been constructed at Ardrossan, which render it somewhat attractive as a watering-place.

There are some ruins of an old castle, the remains of which indicate it to have been of considerable extent. It was in a great degree demolished by Cromwell, who used the stones of it for the erection of the fort of Ayr. The parish has a medium length of six miles. Its greatest breadth is about five miles, and its least not more than three. The kirk is close to the town of Saltcoats, part of which is in this parish. [See SALTCOATS.] The population in 1831 was 3494. Ardrossan is in the presbytery of Irvine, and the synod of Glasgow and Ayr. It gives the title of baron to the family of Montgomery, earls of Eglintoun. (Sinclair's *Statistical Account of Scotland,* &c.)

ARDSTRAW, an extensive parish in Ireland, in the county of Tyrone. [See NEWTON STEWART.]

ARE, the modern French measure of surface, forming part of the new decimal system adopted in that country after the revolution; it is obtained as follows:—the metre or measure of length, being the forty-millionth part of the whole meridian, as determined by the survey, is 3·2809167 English feet; and the *are* is a square, the side of which is 10 metres long. The following denominations are also used:—

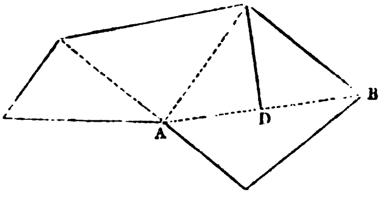
Decare . . .	is	10	ares.
Hectare . .	,,	100	,,
Chilare . . .	,,	1000	,,
Myriare . .	,,	10,000	,,
Deciare . . .	,,	$\frac{1}{10}$	of an are.
Centiare . .	,,	$\frac{1}{100}$	,,
Milliare . .	,,	$\frac{1}{1000}$	,,
The are is . .		100	square metres,
or . .		947·68175	French sq. feet,
or . .		1076·44144	English sq. feet.

The hectare is generally used in describing a quantity of land. It is 2·4711695 English acres, or $404\frac{2}{3}$ hectares make 1000 acres, which disagrees with the first result by less than 1 part out of 50,000.

A'REA. This term is a Latin word, and means the same thing as *superficies* or *quantity of surface*, but is applied exclusively to plane figures. Thus we say, 'the *surface* of a sphere, the *area* of a triangle,' and 'the *surface* of a cube is six times the *area* of one of its faces.' The word is also applied to signify any large open space, or the ground upon which a building is erected; whence, in modern built houses, the portion of the site which is not built upon is commonly called the *area*.

Returning to the mathematical meaning of the term, the measuring unit of every area is the square described upon the measuring unit of length: thus, we talk of the square inches, square feet, square yards, or square miles, which an area contains. And two figures which are *similar*, as it is called in geometry, that is, which are perfect copies one of the other on different scales, have their areas proportional to the *squares* of their linear dimensions. That is, suppose a plan of the front of a house to be drawn so that a length of 500 feet would be represented in the picture by one of 3 feet. Then the area in the real front is to the area of the front in the picture in the proportion of 500 times 500 to 3 times 3, or of 250,000 to 9. Similarly, if the real height were 20 times as great as the height in the picture, or in the proportion of 20 to 1, the real area would be to that of the picture as 20 times 20 to once one, or as 400 to 1, that is, the first would be 400 times as great as the second.

Any figure which is entirely bounded by straight lines may be divided into triangles, as in the adjoining diagram.



The area of every triangle may be measured separately by either of the following rules; in which the word in italics may mean inches, yards, miles, or any other unit, provided only that it stands for the same throughout. 1. Measure a side, A B, of the triangle A B C, and the perpendicular C D which is let fall upon it from the opposite vertex, both in *units*. Half the product of A B and C D is the number of square *units* in the triangle A B C. Thus, if A B be 30 yards, and C D 16 yards, the triangle contains 240 *square* yards. 2. Measure the three sides, A C, C B, B A, in *units;* take the half sum of the three, from it subtract each of the sides, multiply the four results together, and extract the square

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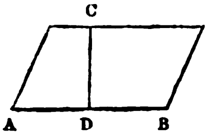
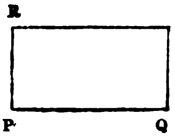
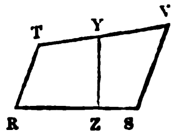
This is the statement in the *Ency. Britannica*, last edition; but we suspect some error. Two statements of the plans of Mr. Telford, the engineer, give 700 yards as the intended length of this pier.

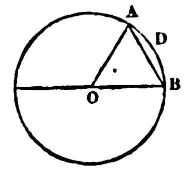
root of the product; this gives the number of square *units* in the triangle. For instance, let the three sides be 5, 6, and 7 inches; the half sum is 9: which, diminished by the three sides respectively, gives 4, 3, and 2: 9, 4, 3, 2, multiplied together, give 216, the square root of which is 14·7, $14\frac{7}{10}$ very nearly. The triangle, therefore, contains about $14\frac{7}{10}$ *square* inches.





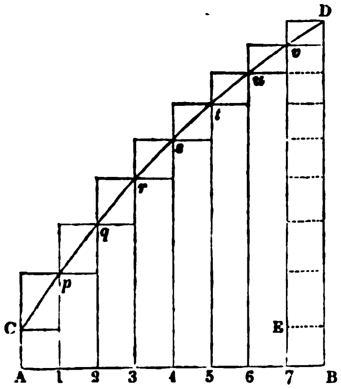


The following rules may be applied in the following cases —for a parallelogram, multiply A B, a side, by C D, its perpendicular distance from the opposite side—for a rectangle, multiply together adjoining sides, P Q and P R—for a four-sided figure, in which R T and S V are parallel, but T V and R S converge; multiply R S, one of the converging sides, by Y Z, its perpendicular distance from the middle point of the other. When R T and S V are perpendicular to R S, then Y Z is half the sum of R T and S V.



To find the area of a circle, multiply the radius O A by itself and the result by 355; then divide by 113. To find the area of the sector O A D B, see ANGLE. To find the area of the portion A B D, find those of the sector O A D B, and the triangle O A B separately, and subtract the second from the first. In all these cases, the result is in the *square* units corresponding to the *linear* units in which the measurements were made.

The area of a curvilinear figure can only be strictly found by mathematical processes too difficult to be here described, but the following method will give an idea of the principles employed. Let ACDB be a curvilinear figure bounded by the curve C D and the lines C A, A B, B D, of which the first and third are perpendicular to the second. Divide A B into any number of equal parts (eight is here supposed) by the points 1, 2, 3, &c. and construct the accompanying obvious figure by making A *p*, 1 *q*, &c. parallelograms. It is plain that the area sought, A C D B, is greater than the sum of the inscribed rectangles, denoted by the letters or numbers at opposite corners,



1 C, 2 *p*, 3 *q*, 4 *r*, 5 *s*, 6 *t*, 7 *u*, B *v*;

and that it is less than the sum of the circumscribing rectangles

A *p*, 1 *q*, 2 *r*, 3 *s*, 4 *t*, 5 *u*, 6 *v*, 7 D.

Therefore the area sought does not differ from either of these sums by so much as they differ from one another; but the sums differ from one another by the sum of the rectangles

C *p*, *p q*, *q r*, *r s*, *s t*, *t u*, *u v*, *v* D,

which, placed under one another, give the rectangle D E, which is less than D 7: consequently neither sum differs from the area sought by so much as D 7. But by carrying the division of A B, with which we set out, to a sufficient degree, the area of D 7 might have been reduced to any extent which might have been thought necessary; that is, name any fraction of a square inch, however small, and A B can be divided into such a number of equal parts that D 7 shall be smaller than that fraction of a square inch. Hence the sum of the inscribed or circumscribed parallelograms may, by dividing the line A B sufficiently, be made as nearly equal to the area as any practical purpose can require.

The accuracy of the preceding process will be increased by summing, not the parallelograms, but the figures

A C *p* 1, 1 *p q* 2, 2 *q r* 3, &c.

considering C *p*, *p q*, *q r*, &c. as straight lines. This will be equivalent to adding half the rectangle, D E, to the sum of the rectangles aforesaid. The practical rule is:—Add all the intermediate ordinates, 1 *p*, 2 *q*, &c. to the half sum of the extreme ordinates A C and B D: multiply the total by the common value of A 1, or 1 2, &c. This approximation is the first step of the method of QUADRATURES, which see.

The mathematical process of finding the area carries the preceding approximation one step further, and finds what is the limit to which the sum of the inscribed parallelograms approaches nearer and nearer, as the number of divisions of A B is increased. This limit, it is easy to show, is an exact expression for the area required. If x represent one of the lines A1, A 2, &c., and y the corresponding line 1 *p*, 2 *q*, &c., the area of the curve is found by the process of the integral calculus thus represented:

$$\int y\,d\,x$$

or, in the language of fluxions,

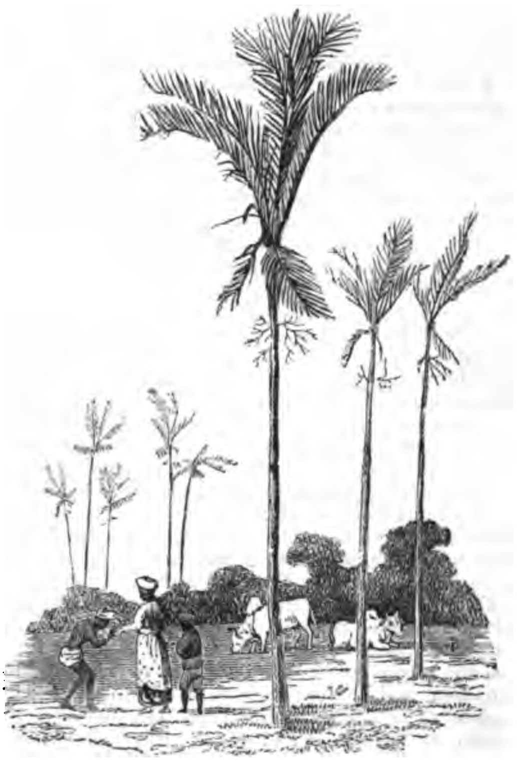
$$\text{fluent of } y\dot{x}$$

A process similar to the preceding is employed by surveyors in measuring a field whose boundaries are curvilinear. [See SURVEYING, OFFSET.]

The investigation of the area of a curve was formerly called the *quadrature* of the curve (*quadratum*, a square), because, before the application of arithmetic to geometry, the most convenient method of representing an area was by giving the square to which it is equal.

For some practical purposes the following experimental method of finding the above area might suffice. Cut out the figure A B C D in pasteboard (heavy wood or metal would be better). Out of the same pasteboard cut a square inch or other unit; and weigh both the pieces thus cut out accurately. Then the weight of the first piece divided by that of the second will give the number of square units in the area required, if the pasteboard, or other material, be of moderately uniform thickness. A method similar to that of Archimedes (see his Life) might easily be devised.

ARE'CA, a genus of palms containing two species, both remarkable for the purposes to which they are applied. Botanically, areca is distinguished by a double membranous sheath in which its bunches of flowers are contained, by its female corollas containing the rudiments of stamens, its calyx being divided into three parts or leaves, and its fruit



[Areca catechu.]

being a berry or drupe, with a fibrous rind inclosing one seed only. The leaves of all the species are pinnated, with their stalks rolled up cylindrically at the base.

Areca catechu is described by Dr. Roxburgh as being the most beautiful palm in India, with a remarkably straight trunk, often from forty to fifty feet high, and in general about twenty inches in circumference, equally thick in every part, and smooth. The leaflets are from three to three feet and a half long, and widest at the point, where they also are ragged. It is cultivated all over India for the sake of its nuts, which are about the size of a hen's egg, of a reddish-yellow when ripe, and with a firm fibrous rind about half an inch thick. It is this nut, which, under the name of pinang or betel nut, is so universally chewed in the East Indies. It has an austere and astringent flavour, and is not eatable alone; but mixed with lime, which no doubt destroys its acidity, and with the leaf of the betel pepper, it becomes milder and pleasant. The mixture is, however, after all, so hot and acrid as to be unfit for the use of any but persons accustomed to it; it is said to be aromatic and stomachic, and also to produce intoxication in beginners, but it is very doubtful whether all these qualities are not rather to be ascribed to the betel pepper leaf than to the nut of the palm. It, or rather the mixture of the three substances, stains the saliva and teeth of a deep red colour. It is to the stems of *Areca catechu* that the common black pepper vine is usually trained on the coast of Malabar. (Roxb.) The astringent substance called catechu was once supposed to be produced by it, but this was an error, as has been already explained. [See ACACIA CATECHU.]

Areca oleracea, or the *cabbage palm*, is the only other species that it is necessary for us to notice. This plant must be familiar to most persons in consequence of the allusions to it in the tale of *Paul and Virginia*, and from the often repeated fact that a tree of the growth of half a century is sometimes cut down for the sake of the single bud which terminates it, and which is called the cabbage.

The species is found in great abundance in the mountainous parts of Jamaica and other West India islands, growing to the height of from one to two hundred feet, with a trunk not more than six or seven inches in diameter. This gives it an extremely graceful appearance, especially as the leaves grow from the top only, in a kind of tuft or plume, to the length of fifteen feet; these leaves are divided in a pinnated manner, and their divisions are deep green, and several feet long. The unexpanded leaves are arranged so closely one over the other as to obstruct all access of light, which causes them to be of a very tender and delicate nature. It is this which forms the cabbage, which is considered a great delicacy, either raw or boiled. The nuts, which are about the size of a filbert and covered with a yellowish skin, are produced in great abundance upon a very long and branched spadix; the kernel is white and sweet.

Independently of the use of this palm as an article of food, its trunk when felled and exposed to the air quickly rots in the centre, and becomes a natural hollow cylinder, which, on account of the hardness of its outside, forms a very durable water-pipe, often as much as a hundred feet long, and is said to become, when buried, almost as hard as iron. (See Sloane's *Jamaica*, vol. ii. p. 116.)

AREMBERG is a considerable duchy close upon the Dutch frontier: it consists of the sovereignty of Meppen, which formerly belonged to the Westphalian bishopric of Münster, but is at present within the Hanoverian dominions; of Recklinghausen; of another sovereign domain in the circle of Münster, within the Westphalian dominions of Prussia; and of extensive possessions in the Netherlands. The ancestors of the present duke were created counts of the Roman empire in 1549; they were advanced to the rank of princes in 1576; and were ultimately created sovereign-dukes by the emperor Ferdinand III. in 1644. As a compensation for the loss of a considerable part of the duchy on the Upper Rhine and in the Netherlands under the stipulations of the treaty of Luneville, the then duke received Meppen and Recklinghausen, which are six times greater in extent, and produce double the revenue of the lost territory. The dukes of Aremberg, besides being grandees of Spain of the first class, are subject to the crown of Prussia as holding Recklinghausen, and to the Hanoverian crown as holders of Meppen. The late duke was created duke of Aremberg-Meppen by George IV. in 1826. His ancestor, Prince Leopold, who died in 1754, was a Field-Marshal in the Austrian service, and took a distinguished part in the Italian and German campaigns, which arose out of the contest for the succession to the empire, in the days of the empress Maria Theresa.

The present extent of this duchy, independently of the Belgian domains, is 920 geographical square miles; the amount of its German population above 85,000; and the yearly income from its possessions both in Germany and Belgium is estimated at nearly 70,000*l.* Meppen, which fell to the house of Aremberg in 1803, and became part of the French empire in 1810, being afterwards made over to Prussia, was relinquished by that power in favour of the king of Hanover in 1815, when it was erected into a duchy, with a seat in the Upper Chamber of the Hanoverian states. The 690 miles over which it spreads are the most cheerless, sterile tract in the whole kingdom; in fact, it is an extensive plain, in which heath alternates with morass; the inhabited parts exhibit the appearance of so many islands, and are almost as inaccessible as the Oases in the African desert. The heart of the land, which is denominated the 'Humling,' is an immense moor of sand, above twenty miles in circumference, the whole surface of which presents a wide covert of heath, interspersed with sandstones, and surrounded at every point by impenetrable morasses. This inhospitable region is traversed by the Ems in the west, and the Hase, which flows into the former, in the south; it is also watered by the north and south Ratte, the first running into the Ems, and the second into the Hase. Its climate is temperate, but moist, gloomy, and variable. The districts where rye and buckwheat are grown do not produce enough by one-half for the wants of the inhabitants; the growth of flax also is much less than adequate to their consumption; but the principal and the richest source of profit is the breeding of horned-cattle, sheep, and bees. Wood or orchard is unknown to them; but they have turf in sufficient quantity both for fuel and as an article of exportation. There is scarcely a mechanic among them, unless the domestic weaver and knitter deserve the name; for their shirts, stockings, and garments are all made at home. In short, Meppen is so poor that the greater part of the inhabitants make their way into Holland for the sake of finding better bread in the summer season, and returning home with the surplus produce of their labour before winter sets in. The present number of its inhabitants, who are wholly Catholics, is about 43,000; and its revenue amounts to between 26,000*l.* and 27,000*l.* a-year. The chief town, which lies at the confluence of the Hase and Ems, and 10 or 11 miles north of Lingen, in the bailiwick of Osnaburg, bears the same name as the duchy; it has a gymnasium or grammar-school, soap and succory manufactories, two churches, a hospital, bleaching-grounds, and some external trade. Its population is 2300: 52° 41′ N. lat., 7° 17′ E. long. Haselüne, on the Hase, is the seat of the ducal court of justice, and manufactures agricultural implements; it has a convent, and about 1700 inhabitants.

The earldom of Recklinghausen, which constitutes the remaining portion of the duchy of Aremberg, so far as respects Germany, belonged to the electorate of Cologne until the year 1803, formed part of the grand-duchy of Berg in 1811, and was transferred to the Prussian crown in 1815. It is situated in the circle of Münster, in the Prussian province of Westphalia, and is bounded on the south by the circle of Arnsberg and Düsseldorf, and on the west by Cleves. Its superficial extent is 294 square miles, and the number of its inhabitants at the close of the year 1831 was 42,214. The face of the country is a plain, intersected with gentle eminences; the Lippe traverses it, and its western districts are watered by the Emster. The soil is strong and fertile; the people depend chiefly upon agriculture and the breeding of cattle, though they are also employed very generally in making yarn and linen. It produces iron, freestone, turf, and coals. The inhabitants are all of the Catholic faith, and divided into seventeen parishes. The revenue which the duke of Aremberg derives from it is computed at nearly 16,000*l.* Recklinghausen, the chief town, which lies at the foot of the Hard, the highest spot in the earldom, is about 50 miles N.E. of Cologne, on the Lippe. It has a ducal residence, two churches, an asylum for females of noble birth, some linen manufactories, and a steel-work; and, in 1831, had a population of 2466 souls; 51° 37′ N. lat., 7° 12′ E. long. The other towns of note in this earldom are Dorsten, population 2295; and Boer, which, with its dependencies, contains above 4000 inhabitants. The latter includes the iron-works of St. Antonie, which are among the most considerable in Westphalia, and have sometimes produced 600 tons per annum.

ARENARIUS, literally, *relating to the sands*, a work of Archimedes. [See Archimedes.]

ARENG is the botanical name of one of the palms that produce sago, and from which palm-wine is obtained. The only species, *Areng saccharifera*, is described as a plant of an ugly appearance, having a trunk twenty or thirty feet high, covered almost entirely with coarse black fibres, resembling horse-hair. The leaves are from fifteen to twenty five feet long, and pinnated; their leaflets, which are from three to five feet long, widen gradually to the point, where they are ragged and prickly, in consequence of the projection of their hard veins beyond the margin; above they are of a deep shining green, but on their under surface they are firmly coated with ash-coloured mealy matter. The stalks of these leaves have intermixed with their coarse hair stiff bristles as thick as porcupine's quills. Each bunch of flowers is from six to ten feet long, and, when covered with fruit, is as much as a man can carry. The berries are of a yellowish brown colour, about the size of a medlar, and extremely acrid; each contains three seeds.

[Areng saccharifera.]

This palm is found in all the islands of the Indian Archipelago, in moist and shady ravines through which rivulets find a course; it is much used for the sake of its sap, which flows in great abundance from the wounded branches of the inflorescence about the time when the fruit is forming. A bamboo bottle is tied to the extremity of an amputated branch, and removed twice a day, morning and evening. A single tree will yield a large quantity of this fluid, which, when first drawn from the tree, is transparent, with the taste and colour of new wine: after a short time it becomes turbid and milky, and acquires a slight degree of acidity. When fit for drinking it is of a yellowish colour, with a powerful odour and a good deal of astringency; strangers do not, for some time, become accustomed to it. It is exceedingly intoxicating; but, if drunk in moderation, is said to be stomachic and wholesome.

Besides yielding wine, the coarse fibres of the stem and leaf-stalks are manufactured into powerful cables, and the trunk contains a great quantity of a nutritious meal like sago; Dr. Roxburgh mentions that 150 lbs. of that substance were obtained from one tree felled in the botanic garden at Calcutta. (See Roxburgh's *Flora Indica*, vol. iii. p. 627; and Rumphius' *Herbarium Amboinense*, vol. i. The former calls this palm *Saguerus Rumphii.)*

ARENSBURG, the capital of a circle in the large island of Oesel, or, as the natives call it, *Kure-Saar* or *Saare-Ma*, at the entrance of the Gulf of Riga, and within the limits of the Russian government of Livonia, is situated in about 51° 24′ N. lat., and 8° 1′ E. long. It lies on the Peddus, a small river on the S.E. side of the island, and has a harbour, too shallow for loaded vessels of any size, which are therefore compelled to anchor about five miles below the town. Its present site was formerly the abode of a colony of pagans from Esthonia. Valdemar, the Danish sovereign, built a fort of wood on the spot in 1205, but this fort having been destroyed by fire, another was rebuilt in 1221, at the time when Arensburg was erected into the seat of a bishopric; and it was converted into a regular and strongly-fortified castle by Hermann, bishop of Osnaburg, in 1334. Charles XII. afterwards added greatly to its strength and embellishment; but part of the works were destroyed in the course of the operations which preceded its capture by the Russians in September, 1710. It is a fine specimen of solid masonry, and constructed in a style of magnificence which reflects credit on the memory of its founder, and the talent of the age in which he lived. The town itself contains a Russian and a Lutheran church, a town-hall, public school, and hospital, and about 1400 inhabitants, nearly the whole of whom are Germans. They load twenty vessels a year with the produce of their industry and fisheries. Two fairs are annually held in the town.

AREO′PAGUS, or more correctly **AREIOPAGUS**, the Hill of Ares, is an eminence at a short distance west of the Athenian Acropolis. It was here that Xerxes posted his troops for the attack of that fortress (Herod. viii. 52). The circumstances which connected the place with the God are variously told. It was the hill of Ares, according to some, because the Amazons, who in their invasion of Attica pitched their camp on it, were descendants of Ares, or rather, according to Æschylus (*Eumen.* v. 692, ed. Stan.), because they performed sacrifice to the God in that place; according to others, because Ares himself was there tried for adultery; or lastly, to follow the more popular story (Paus. i. 2, 8), because it was on this hill that the God was brought to trial by Poseidon (Neptune) for the murder of his son Halirrothius. In short, the place was called Areopagus, and, in process of time, these legends were invented or employed to supply the want of further information.

AREOPAGUS, COUNCIL OF, a celebrated council, so called from the hill of that name, on which its sessions were held. It was also called the council above (ἡ ἄνω βουλή), to distinguish it from the council of five hundred, whose place of meeting was in a lower part of the city, known by the name of the Ceramicus (Paus. 1, 3, 4). Its high antiquity may be inferred from the well-known legends respecting the causes brought before it in the mythical age of Greece, among which that of Orestes, who was tried for the murder of his mother, has obtained especial celebrity (Æschyl. *Eumen.*); but its authentic history commences with the age of Solon. There is, indeed, as early as the first Messenian war, something like historical notice of its great fame, in the shape of a tradition preserved by Pausanias (iv. 51), that the Messenians were willing to commit the decision of a dispute between them and the Lacedæmonians, involving a case of murder, to this council of Areopagus. We are told that it was not mentioned by name in the laws of Dracon, though its existence in his time, as a court of justice, can be distinctly proved (Plut. *Vit. Sol.* c. 19). It seems that the name of the Areopagites was lost in that of the Ephetæ, who were then the appointed judges of all cases of homicide, as well in the court of Areopagus, as in the other criminal courts. (See Müller, *History of the Dorians*, vol. i. p. 352, English translation.) Solon, however, so completely reformed its constitution, that he received from many, or, as Plutarch says, from most authors, the title of its founder. It is, therefore, of the council of Areopagus, as constituted by Solon, that we shall first speak; and the subject possesses some interest from the light which it throws on the views and character of Solon as a legislator. It was composed of the archons of the year (see Archon), and of those who had borne the office of archon. The latter became members for life; but before their admission, they were subjected, at the expiration of their annual magistracy, to a rigid scrutiny (*dokimasia*) into their conduct in office, and their morals in private life. Proof of criminal or unbecoming conduct was sufficient to exclude them in the first instance, and to expel them after admission. Various accounts are given of the number to which the Areopagites were limited. If there was any fixed number, it is plain that admission to the council was not a necessary consequence of honourable discharge from the dokimasia. But it is more probable that the accounts which limit the number are applicable only to an earlier period of its existence. (See the anonymous argument to the oration of Demosthenes against Androtion.) It may be proper to observe, that modern histories of this council do not commonly give the actual archons a seat in it. They are, however, placed there by Lysias the orator (*Areop.* p. 110, 16-20), and there is no reason to think that in this respect any change had been made in its constitution after the time of Solon. To the council thus constituted Solon entrusted a mixed jurisdiction and authority of great extent, judicial, political, and censorial. As a court of justice, it had direct cognizance of the more serious crimes, such as murder and arson. It exercised a certain control over the ordinary courts, and was the guardian generally of the laws and religion. It interfered, at least on some occasions, with the immediate administration of the government, and at all times inspected the conduct of the public functionaries. But, in the exercise of its duties as public censor for the preservation of order and decency, it was armed with inquisitorial powers to an almost unlimited extent.

It should be observed, that in the time of Solon, and by his regulations, the archons were chosen from the highest of the four classes into which he had divided the citizens. Of the archons so chosen, the council of Areopagus was formed. Here, then, was a permanent body, which possessed a great and general control over the state, composed necessarily of men of the highest rank, and doubtless in considerable proportion of eupatridæ, or nobles by blood. The strength of the democracy lay in the *ecclesia* or popular assembly, and in the ordinary courts of justice, of which the *dikasts*, or jurors, were taken indiscriminately from the general body of the citizens; and the council of Areopagus exercised authority directly or indirectly over both. The tendency of this institution to be a check on the popular part of that mixed government given by Solon to the Athenians, is noticed by Aristotle (*Polit.* ii. 9, and v. 3, ed. Schneid.) He speaks, indeed, of the council as being one of those institutions which Solon found and suffered to remain; but he can hardly mean to deny what all authority proves, that in the shape in which it existed from the time of the legislator, it was his institution.

The council, from its restoration by Solon to the time of Pericles, seems to have remained untouched by any direct interference with its constitution. But during that interval two important changes were introduced in the general constitution of the state, which must have had some influence on the composition of the council, though we may not be able to trace their effects. The election of the chief magistrates by suffrage was exchanged for appointment by lot, and the highest offices of state were thrown open to the whole body of the people (see ARCHON). But about the year B.C. 459, Pericles attacked the council itself, which never recovered from the blow which he inflicted upon it. All antient authors agree in saying that a man called Ephialtes was his instrument in proposing the law by which his purpose was effected, but unfortunately we have no detailed account of his proceedings. Aristotle and Diodorus state generally that he abridged the authority of the council, and broke its power (Aristot. *Polit.* ii. 9; Diodor. Sic. xi. 77). Plutarch, who has told us more than others (*Vit. Cim.* c. 15; *Vit. Pericl.* c. 7), says only that he removed from its cognizance the greater part of those causes which had previously come before it in its judicial character, and that, by transferring the control over the ordinary courts of law immediately to the people, he subjected the state to an unmixed democracy. Little more than this can now be told, save from conjecture, in which modern compilers have rather liberally indulged. Among the causes withdrawn from its cognizance, those of murder (*φονικαὶ δίκαι*) were not included; for Demosthenes has assured us (*Contr. Aristocr.* p. 641-2), that none of the many revolutions which had occurred before his day had ventured to touch this part of its criminal jurisdiction. There is no reason to believe that it ever possessed, in matters of religion, such extensive authority as some have attributed to it, and there is at least no evidence that it lost at this time any portion of that which it had previously exercised. Lysias observes (*Areop.* p. 110, 46), that it was in his time charged especially with the preservation of the sacred olive-trees; and we are told elsewhere that it was the scourge of impiety. It possessed, also, long after the time of Pericles, in some measure at least, the powers of the censorship. (Athenæus 4, 64, ed. Dindorf.)

Pericles was struggling for power by the favour of the people, and it was his policy to relieve the democracy from the pressure of an adverse influence. By increasing the business of the popular courts, he at once conciliated his friends, and strengthened their hands. The council possessed originally some authority in matters of finance, and the appropriation of the revenue; though Mr. Mitford and others, in saying that it controlled all issues from the public treasury, say perhaps more than they can prove. In later times, the popular assembly reserved the full control of the revenue exclusively to itself, and the administration of it was committed to the popular council, the senate of five hundred. It seems that, at first, the Areopagites were invested with an irresponsible authority. Afterwards they were obliged, with all other public functionaries, to render an account of their administration to the people (*Æsch. Contr. Ctes.* p. 56, 30). Both these changes may, with some probability, be attributed to Pericles. After all, the council was allowed to retain a large portion of its former dignity and very extensive powers. The change operated by Pericles seems to have consisted principally in this: that, from having exercised independent and paramount authority, it was made subordinate to the ecclesia. The power which it continued to possess was delegated by the people, but it was bestowed in ample measure. Whatever may have been the effect of this change on the fortunes of the republic, it is probable that too much importance has been commonly attached to the agency of Pericles. He seems only to have accelerated what the irresistible course of things must soon have accomplished. It may be true that the unsteady course of the popular assembly required some check, which the democracy in its unmitigated form could not supply, but the existence of an independent body in the state, such as the council of Areopagus as constituted by Solon, seems hardly to be consistent with the secure enjoyment of popular rights and public liberty; which the Athenian people, by their naval services in the Persian war, and the consequences of their success, had earned the right to possess, and the power to obtain. It ought not, however, to be concluded, that institutions unsuitable to an altered state of things were unskilfully framed by Solon, or that he surrounded the infancy of a free constitution with more restrictions than were necessary for its security. He may still deserve the reputation which he has gained of having laid the foundation of popular government at Athens.

With respect to the censorship, we can show, by a few instances of the mode in which it acted, that it could have been effectually operative only in a state of society from which the Athenians were fast emerging before the time of Pericles. The Areopagites paid domiciliary visits, for the purpose of checking extravagant housekeeping (Athenæus 6, 46). They called on any citizen at their discretion to account for the employment of his time (Plut. *Vit. Sol.* c. 23). They summoned before their awful tribunal a little boy for the offence of poking out the eyes of a quail (Quinctil. 5, 9. 13). They fixed a mark of disgrace on a man who had dined in a tavern (Athenæ. 13, 21). Athens, in the prosperity which she enjoyed during the last fifty years before the Peloponnesian war, might have tolerated the existence, but certainly not the general activity, of such an inquisition.

It appears from the language of contemporary writers, that, while there were any remains of public spirit and virtue in Athens, the council was regarded with respect, appealed to with deference, and employed on the most important occasions (Lys. *Contr. Theomnest.*, p. 117, 12; *De Evandr.*, p. 176, 17; *Andoc.*, p. 11, 32; Dem. *Contr. Aristocr.*, p. 641-2). In the time of Isocrates, when the dokimasia had ceased, or become a dead letter, and profligacy of life was no bar to admission into the council, its moral influence was still such as to be an effectual restraint on the conduct of its own members (Isocr. *Areop.*, p. 147). In the corruption of manners and utter degradation of character which prevailed at Athens, after it fell under the domination of Macedonia, we are not surprised to find that the council partook of the character of the times, and that an Areopagite might be a mark for the finger of scorn (Athenæus 4, 64). Under the Romans it retained at least some formal authority, and Cicero applied for and obtained a decree of the council, requesting Cratippus, the philosopher, to sojourn at Athens, and instruct the youth (Plut. *Vit.*

Cic., c. 24). It long after remained in existence, somewhat superior in dignity, and perhaps equal in power, to a modern court of aldermen in a municipal corporation. The old qualifications for admission were neglected in the days of its degeneracy, nor is it easy to say what were substituted for them. Later times saw even a stranger to Athens among the Areopagites.

We shall conclude this article with a few words on the forms observed by the council in its proceedings as a court of justice in criminal cases. The court was held in an uninclosed space on the Areopagus, and in the open air; which custom, indeed, it had in common with all other courts in cases of murder, if we may trust the oration (*De Cæde Herodis*, p. 130) attributed to Antiphon. The Areopagites were in later times, according to Vitruvius, accommodated with the shelter of a roof. The prosecutor and defendant stood on two separate rude blocks of stone (Paus. 1, 28), and, before the pleadings commenced, were required each to take an oath with circumstances of peculiar solemnity; the former, that he charged the accused party justly; the defendant, that he was innocent of the charge. At a certain stage of the proceedings, the latter was allowed to withdraw his plea, with the penalty of banishment from his country (Dem. *Contr. Aristocr.*, p. 642-3). In their speeches both parties were restricted to a simple statement, and dry argument on the merits of the case, to the exclusion of all irrelevant matter, and of those various contrivances known under the general name of *paraskeue* (παρασκευή), to affect the passions of the judges, so shamelessly allowed and practised in the other courts (Or. Lycurg., p. 149, 12-25; Lucian. *Gymn.*, c. 19). Of the existence of the rule in question in this court, we have a remarkable proof in an apology of Lysias for an artful violation of it in his Areopagitic oration (p. 112, 5). Advocates were allowed, at least in later times, to both parties. Many commentators on the New Testament have placed St. Paul as a defendant at the bar of the Areopagus, on the strength of a passage in the Acts of the Apostles (xvii. 19). The apostle was indeed taken by the inquisitive Athenians to the hill, and there required to expound and defend his new doctrines for the entertainment of his auditors; but, in the narrative of Luke, there is no hint of an arraignment and trial.

Some of our readers may perhaps be surprised that we have made no mention of a practice so often quoted as peculiar to the Areopagites, that of holding their sessions in the darkness of night. The truth is, that we are not persuaded of the fact. It is, indeed, noticed more than once by Lucian, and perhaps by some other of the later writers; but it is not supported, we believe, by any sufficient authority, whilst there is strong presumptive evidence against the common opinion. It was, as it should seem, no unusual pastime with the Athenians to attend the trials on the Areopagus as spectators (Lys. *Contr. Theomn.*, p. 117, 10). We suspect that few of this light-hearted people would have gone at an unseasonable hour in the dark to hear such speeches as were there delivered, and see nothing. Perhaps there may be no better foundation for the story, than there is for the notion, till lately so generally entertained, that the same gloomy custom was in favour with the celebrated Vehmic tribunal of Westphalia.

AREQUIPA, a department of the republic of Peru, bordered to the north by that of Lima. It is 185 leagues long, and 30 wide; the temperature is mild, and the soil fertile; the aspect of the country is that of a perpetual spring. It is watered by the Lona, the Arequipa, the Tambo, and the Chile, and has a considerable commerce in wine with the adjacent provinces; cochineal is also produced, and there are gold and silver mines, particularly those of Calloma. It has excellent pastures for vast herds of cattle, and produces wheat, maize, and sugar. It is backed by the Andes, offsets from which come down to the sea coast, and form a succession of delightful valleys.

AREQUIPA, one of the largest and finest cities of Peru, second only to Lima, is situated in the beautiful valley of Quilca, about thirty-five miles from the coast. It was originally founded by Francisco Pizarro in 1539, but not on its present site; its inland situation having secured it from the attacks of pirates who infested the coast, it has continued in a flourishing condition, though repeatedly desolated by earthquakes. The inhabitants have acted altogether on a different system from the people in most other parts of this country, who build slightly, that there may be the less danger in the overthrow of their edifices, and less expense in restoring them. On the other hand, the houses of Arequipa are built of stone, very substantial, low, and vaulted, with the view of their being able to withstand the shock. The town is populous, the inhabitants being estimated at 40,000; it is a bishop's see, with a cathedral, under the archbishopric of Lima, is divided into three parishes, has two Franciscan convents, one Dominican, and one Augustine, a college of Jesuits, and a hospital of S. Juan de Dios. A handsome bridge is thrown over the Chile, which runs through the city, and, being let off in sluices, irrigates the country; it is also conducted through the streets by canals, which contribute to cleanliness, and to the health of the inhabitants. An elegant bronze fountain adorns the Plaza, or great square. The climate is delightful; in winter a slight frost is perceptible, and the summer heats are not excessive. Gold and silver, cloths, woollens, and cottons, are manufactured at Arequipa, which carries on a great trade with Buenos Ayres, exporting brandies, wines, flour, cotton, and sugar; and importing cattle, dried flesh, tallow, cocoa, &c. The great commercial road passes through the city from Lima to the southern provinces. (Ulloa).

Mollendo, the port of Arequipa, consists of about fifty huts built of reed-mats, and covered with flat cane roofs, without windows and chimneys. the whole has the appearance of a wicker-work cage. The anchorage is open, but, like other ports on the coast, is safe, from the general absence of storms. The site of this village was chosen for the advantage of a sandy beach to land on in the balsa. (Hall.)

ARES (Ἄρης), the God of War among the Greeks, generally considered as corresponding to the Roman Mars. Homer makes him a native of Thrace, and others consider him the father of several Thracian rivers and races. It is therefore highly probable that he was the god particularly worshipped by some northern people, though nearly all other traces of this circumstance have disappeared. The Scythian deity known to Herodotus as the God of War, whom he calls by the Greek term *Ares* (iv. 62), was worshipped under the form of an iron scimitar, to which horses and other quadrupeds were annually offered; and also every hundredth man of captives taken in war. In the later genealogy of the gods he was considered the son of Jupiter and Juno, and, as such, took part in the war against the giants, and slew Mimas and Pelorus. In the contest with Typhon he fled with the other gods into Egypt, and was changed into a fish. He was not more successful in his engagement with Otus and Ephialtes, the children of Aloüs, by whom he was imprisoned for thirteen months. To a still later period we must refer the murder of Halirrhotius, and his trial before the court of Areopagus, as well as his combat with Hercules.

It is a curious circumstance that the Greeks, though constantly engaged in war, should have paid little attention to the worship of Ares. There were few temples erected to his honour in Greece. Geronthræ, a village of Laconia, had a temple and grove where a yearly festival was celebrated, to which no female was admitted (Paus. iii. 22): there was another on the road from Amyclæ to Therapne in Laconia (iii. 19), and a third at Athens (i. 8). Though, as we have remarked, Ares seems to be a Thracian god, yet the element of the word Ares is an integral part of the Greek language, and the word which denoted best and bravest, *aristos* (ἄριστος), is the superlative of *ares*. The Sanscrit *ari*, nom. *aris*, signifies an enemy. In early times human sacrifices were offered to him by the Lacedæmonians, dogs by the Carians, and asses by the Scythians (Apollod. *Fragm.* p. 394, ed. Heyne).

It is difficult to say what distinctive character antient artists wished to give to this god, because no Greek state honoured him as their principal deity. We have no distinct account of his statues by Alcamenes and Scopas in the temple at Athens, but we can collect, from some that have been preserved, and also from heads of the god on gems, that the following is the general character under which he is represented. The expression is stern and thoughtful; firm nervous muscles, a strong fleshy neck, and short bristly hair; the mouth is small, the lips full, and the eyes deep-set. It is only in later times that he appears with a strong beard as the Roman Marspiter. When not naked, his dress is a chlamys (*sagum*). See a beautiful head on a gem (Millin, P. Gr. 20); a standing figure on a basso-rilievo (Pio Clem. iv. 7); head on the coins of the Mamertini (Magnani, iv. 31, 32); on the Denarii of Fonteius Capito

(Patin. p. 114). See this subject fully treated by Hirt, *Bildende Kunst*, 1833; Müller, *Archæologie der Kunst*, p. 492. (For the Italian God of War, see MARS.)

ARETÆUS, surnamed **CAPPADOX**, or the **CAPPADOCIAN**, one of the most valuable medical writers of antiquity, is supposed to have lived in the latter part of the first and the beginning of the second century after Christ. There are no positive accounts as to the time and circumstances of his life: the above supposition, therefore, rests solely on the fact of the medicinal preparations of Andromachus, physician to the Emperor Nero, and the medical dignity of the Archiatri, being mentioned in his works; whilst, on the other hand, the name of Aretæus occurs in the *Euporista* of Dioscorides, which appears to have been written during the reign of Vespasian. Hence it is concluded, that Aretæus wrote shortly after the time of Nero. He takes notice of the wine of Falernum, and other Italian wines, which has led critics to believe that his residence must have been in Italy. The learned have found some difficulty in fixing upon the sect, or school of medicine, to which Aretæus belonged. P. Petit considered him as a follower of the dogmatic sect, who founded their explanations of life and disease on the four elementary qualities. But his frequent allusions to the *pneuma*, or spirit, have led others to regard him as one of the pneumatic school founded by Athenæus, which embraced a considerable proportion of the medical men of eminence at the period when Aretæus is supposed to have lived. It seems to be a peculiar merit of this physician, however, to have remained free from the predominant influence of any one of the prevailing theoretical schools, and to have preserved a praiseworthy independence in the observation and treatment of diseases. Aretæus was an original observer; his writings bear no traces of compilation; and if a part of the information which he affords belongs to the age in which he lived, there is another very considerable part for which we seem to be indebted to his own personal experience.

Aretæus regarded a knowledge of the structure and functions of the body as a necessary step towards the study of disease; his anatomical remarks, however, betray sufficiently the imperfect state of this science in his time. He concurred with the pneumatic physicians and the Stoic philosophers, in believing the heart to be 'the principle of life and strength,' and the seat of the soul. He gave a full account of the distribution of the *vena portarum*, and regarded all veins as having their origin in the liver; he also was aware of the numerous communications which exist in various parts of the venous system, which led him to refute the notion that particular veins in the arm are connected with particular internal organs, and the consequences which were drawn from this notion as to bloodletting. Aretæus looked upon the liver as the organ destined to prepare the blood, and the spleen as fitted to purify that fluid. He regarded both the stomach and colon as organs of digestion, and bestowed much attention on the morbid affections of the latter organ. He knew that the kidneys had a glandular structure. He stated the nerves to be the organs of sensation and motion. The fact that injuries of the head are apt to produce paralytic affections on the opposite side did not escape his observation, and, in order to account for it, he stated that the nervous fibres in the brain form a decussation in the shape of the Greek letter X, whilst the nerves arising from the spinal marrow proceed directly to the organ for which they are designed. Notwithstanding these curious remarks on the functions of the nervous system, Aretæus evidently did not make any clear distinction between the nervous and tendinous parts; the latter are undoubtedly alluded to, when he says that, besides the nerves proceeding from the brain, there are others which pass from one bone to another, and are the principal sources of motion.

The descriptions which Aretæus has given of the diseases to which the human economy is subject are accurate delineations, evidently taken from nature, and distinguished by a peculiar liveliness, elegance, and conciseness of diction. He is thought to have excelled all antient authors, not even excepting Hippocrates, in the art of describing diseases, and may still be regarded as a model in this species of literature. His account of epilepsy, tetanus, acute and chronic headaches, hæmoptysis and *causus*, or burning fever, are peculiarly happy specimens of his manner of writing.

In the treatment of diseases, Aretæus regarded experience as the best guide (*ἀγαθὴ διδάσκαλος ἡ πείρη*), and he repeatedly refers to the necessity of following the hints which nature gives to the physician. His methods of treatment seem to have been energetic where it appeared necessary, but always simple; and he was averse to that farrago of medicines to the use of which some of his contemporaries were addicted.

He frequently employed emetics, purgatives, and clysters; and he was aware that emetics not only evacuate the contents of the stomach and intestines, but derive a great part of their efficacy from the shock which the act of vomiting produces in those parts. He was fond of bloodletting in chronic as well as acute diseases, but cautious with regard to the quantity of blood which he took away: he advises the blood to be stopped before fainting supervenes, and recommends not to take away too much blood at one bleeding in apoplexy. He also mentions the practice of opening a vein on the back of the hand, and he practised the operation of arteriotomy. He employed cupping-glasses and leeches, and he is the first author who mentions blistering with cantharides: as he recommends this practice as preferable to other rubefacients, without mentioning it as having been formerly in use, it appears probable that we are indebted to him for this most important remedy; nor had the tendency which it sometimes has to injure the functions of the urinary organs escaped his observation; he enjoins, therefore, milk to be drank in large quantities before the blister is applied.

Scarcely any internal medicines were employed by Aretæus in the treatment of acute diseases; but he paid strict attention to diet and regimen: among his dietetical prescriptions, those on the use of the different kinds of milk deserve to be mentioned. In treating chronic diseases he more frequently had recourse to the aid of medicines; we find him prescribing diuretics, sudorifics, and several of the compound stimulating preparations which were in vogue in his time. One of the substances he most frequently resorted to is castoreum, which he regarded as very efficacious in various affections of the nervous system.

Of the writings of Aretæus, only four books on the causes and symptoms, and as many on the treatment, of acute and chronic diseases are extant; nor have they been preserved in a perfect form: chap. i—iv. and part of chap. v. of the first book on the causes, and several passages in the books on the treatment, of diseases are lost. In this work the author alludes to his treatises on surgery, on pharmacy, on fevers, and on the diseases of women, of all which works not a single fragment now remains. Had they been handed down to our times, they would have formed most important additions to medical literature. Aretæus wrote in the Ionic dialect of the Greek language, which at his period had nearly ceased to be employed in writing; but he was, probably, induced to adopt it by the example of the older medical authors, Hippocrates and his contemporaries and successors, who wrote in this dialect, which was also used in the antient sentences of the school of Cos.

The eight books of Aretæus were first edited from the Parisian MSS. by J. Goupyl, and published at Paris, 1554, 8vo. The standard edition is that of Mr. John Wigan, student of Christ Church, Oxford: it was undertaken by the advice and with the assistance of Dr. Freind, and printed at the Clarendon Press, 1723, folio. Wigan gave a very good Latin translation, notes, and a valuable dissertation *de Aretæi ætate, secta, in rebus anatomicis scientia, et curandi ratione*. This edition is scarce, only 300 copies having been struck off. Another edition was published under the superintendence of Boerhaave, Leid. 1731, folio the greater part of it had been printed as early as 1719, before the publication of the Oxford edition; and the text, as well as the Latin translation, are such as they had been before Wigan's labours. Boerhaave added, however, the valuable critical commentaries of Peter Petit, a Parisian physician, which had remained in MS. for nearly seventy years. Aretæus also forms the 24th volume of Kühn's edition of the Greek medical authors. This volume (Lips. 1828, 8vo.) contains the Greek text and Latin translation, Wigan's preface, notes, and dissertation, Boerhaave's preface, Petit's commentaries, Triller's conjectures and emendations, and a copious Greek index by Michael Mattaire. An English translation of Aretæus, by John Moffat, was published at London, 1785, 8vo.

ARETHU'SA, a celebrated fountain in the island Ortygia, one of the five divisions of antient and the site of modern Syracuse. For the story of the nymph Arethusa, the manner of her change into a fountain, and the pursuit of her by the river-god Alpheius from Eleia below the sea to Sicily, see ALPHEIUS, and Ovid, *Met.* v. 572. Pausanias tells rather a different story; he says that Arethusa passed over into Ortygia, and there was changed into a fountain (v. 7). Diodorus says, that the nymphs produced the fountain Arethusa to gratify Diana, after one of whose names the island was called Ortygia, and to whom it was consecrated. He calls it 'a very large fountain,' and adds, that it abounded in large fish, which were held sacred, and never caught; and that if any persons were impious enough to eat them (as had been done in time of siege), they incurred the anger of the deity and fell into great misfortunes (v. 3). Cicero speaks of it as a 'fountain of sweet water of incredible size and abounding in fish, which would be covered by the sea but for a stone bulwark.' (*Verr. Act.* ii. iv. 53.) That beauty and abundance of water which attracted the admiration of the poets, has disappeared. Swinburne speaks of the rock as riven by earthquakes, and of the spring as sometimes failing in the volcanic convulsions which from time to time desolate that region. Wilkins thus describes its appearance at the beginning of this century: 'The fountain now springs from the earth under a natural arch in the rock, within a few paces of the sea, and is only separated from it by the city wall, through an aperture in which it is discharged into the harbour. It is a considerable spring of brackish water, although of little depth; and is resorted to by the poor female inhabitants of Syracuse, who, after the Sicilian manner of washing, perform the operation standing up to their knees in the stream. Over the arch is a rude image of the Madonna, which the Syracusans pretend to be a statue of the nymph Arethusa.' (*Magna Græcia.*)

It was commonly said that things thrown into the Alpheius would reappear in this fountain. Strabo asserts that a cup did so. Seneca quotes it as an article of popular belief, that when the Olympian festival was celebrated on the banks of the Alpheius, the sweepings of the temple reappeared in the Sicilian fountain. (*Nat. Quæst.* iii. 26.) Moschus intimates a similar belief in his seventh Idyll. In the middle ages the story reappeared with a change of form adapted to the change in religion, and the fountain was said to cast up leaves not known to grow except on the river Jordan. (Marifiotti, *Cron. Antiche di Calabria*, ap. Wilkins.) A strong spring bubbles up under water near the place where the stream from the fountain runs into the sea; and this has been said to come from the waters of the Alpheius. It is now called *L'Occhio della Zilica.* The Syracusan poets, Theocritus and Moschus, make frequent mention of this favourite stream. There was another Arethusa in Samos, and another in Eubœa. (*Schol. in* Theoc. i. 117.)

ARET'INO, PIETRO, an Italian writer of the sixteenth century. He was born at Arezzo in 1492, and was the natural son of Antonio Bacci, a patrician of that city. He left his native place very young, and went to Perugia, where he found employment as a bookbinder. Here he had an opportunity of reading the books which were entrusted to him, and of thus acquiring some information. His regular education had been very limited, and indeed he remained all his life ignorant of Latin and Greek; but he had much quickness of parts, a fervid imagination, and great fluency of expression. After some years he set off from Perugia on foot; and with nothing but the clothes he had on, went to Rome in quest of better fortune. He first met with a patron in a wealthy merchant, Agostino Chigi, the same for whom Raphael painted the palace called La Farnesina, who lodged him in his house. His next step was an introduction to Pope Leo X., and to Cardinal Giulio de' Medici, afterwards Clement VII., in whose service it appears that he remained seven years, but in what capacity is not known. A circumstance which strongly shows the profligacy of those times drove him away from Rome about 1524. The celebrated painter, Giulio Romano, sketched a series of most obscene drawings, Marco Antonio Raimondi engraved them, and Aretino illustrated them by sonnets. The court of Rome, being informed of this scandal, ordered the arrest of the offenders. Giulio Romano escaped to Mantua, Aretino also ran away, but Raimondi was seized, and would have been severely punished, had he not succeeded in escaping from prison. Aretino now found a friend in Giovanni de' Medici, the famous captain of the Florentine republic, and in Francis I. of France. Giovanni took a particular liking to him, and introduced him to the king, who made him presents in return for the praises which Aretino lavished on him. The death of Giovanni de' Medici having deprived Aretino of a generous patron, he went to live at Venice, where he depended on his writings for subsistence. He wrote both prose and verse, obscene dialogues, satirical *capitoli* in *terza rima*, heroic cantos, sonnets, and comedies, besides a multitude of letters which he addressed to all the princes and great men and ladies of his time, sometimes flattering them, sometimes praising himself, and generally asking money or some other favour in exchange for his praise, or for the dedication of some of his works; and sometimes threatening them with the lash of his satire if his demands were not complied with. It is a curious fact, that by these means he received considerable sums of money, which enabled him to lead a dissolute life, and also to satisfy his taste for prodigality, which he mistook for generosity. His house was open indiscriminately to the destitute poor, the adventurer, and the profligate of either sex. He dressed in costly garments; and spent nearly a thousand scudi, or crowns, a year, a large sum in his time. He was often embarrassed, and ever craving for money, though he received presents from most Italian princes, as well as from Francis I., Charles V., Henry VIII. of England, and even, it is said, from Solyman, Sultan of the Turks.

Owing to the virulence both of his speech and pen, he narrowly escaped from several attempts to assassinate him. Twice at Rome, in the time of Leo X., he nearly lost his life, but was saved by a friend. Piero Strozzi, a celebrated captain of his time, who was serving in the French armies in Italy, being incensed at some satire of Aretino, sent him a message, that if he continued to slander him, he would have him killed in his bed; the threat so frightened the poet, that he shut himself up in his house, and would not trust any one within as long as Strozzi remained in the Venetian territory.

Aretino still cast a longing eye towards Rome, in expectation of dignities and emoluments. For this purpose he wrote several compositions on sacred subjects, such as the *Lives of Christ*, the *Virgin Mary*, *St. Catherine*, *Thomas Aquinas*, *A Commentary on the Book of Genesis*, and *A Paraphrase of the Seven Penitential Psalms.* These works met with no success, being, with the exception perhaps of the last, utterly contemptible both in their conception and style. The language of Aretino is generally turgid, affected, full of metaphors and hyperbole, resembling that which became prevalent in Italy a century later, and which is known by the name of *del seicento.* He wrote with great facility, but at the same time with carelessness, and his taste was coarse and trivial. The Duke of Urbino applied in his favour to Pope Paul III., and even proposed that Aretino should be made a cardinal. Luckily for the credit of the Roman hierarchy, the pope would not listen to such a suggestion; and it was perhaps in resentment of this, that Aretino unmercifully lashed the pope's grandson, Pier Luigi Farnese, Duke of Parma. After Paul's death, Julius III., who was a native of Arezzo, was addressed by Aretino in a letter of congratulation, accompanied by a sonnet characterized by the most fulsome praise of the new pontiff. Julius, being at the same time importuned by several persons around him in favour of Aretino, made the poet a present of 1000 scudi, and sent him the bull or diploma of Knight of St. Peter, an inferior order, to which a small income was attached. Aretino still expecting more, went to Rome with the Duke of Urbino in 1553, was kindly received by the pope, but meeting with no further encouragement, he again left that city in disappointment a few months after, and returned to Venice, where he remained till his death in 1557. He was buried in the church of S. Luca, at Venice, where a monument was raised to him, which Sansovino mentions in his *Venezia Illustrata;* it was afterwards removed in the reparations which that church underwent. The witty epitaph which has been reported by many biographers and travellers, and by Misson among the rest, was never placed on his tomb. Pietro Aretino must not be confounded with the historian Leonardo Bruni, also called 'L'Aretino;' nor with the poet Bernardo Accolti, who was styled 'L'Unico Aretino.' Some travellers, seeing the monument of Leonardo Bruni in the celebrated church of Santa Croce, at Florence, by the side of the tombs of Galileo, Michel Angelo, and Machiavelli, have mistaken it for that of Pietro, and have indulged in uncalled-for moral reflections on the subject. Pietro Aretino was never married, but he left several natural daughters. His works, and the most obnoxious of them in particular, have been re-published separately at different times, notwithstanding the censure of the Inquisition, and have been translated into several languages. His *Capitoli* are the best specimens of his poetry: they are partly satirical and partly laudatory of several conspicuous characters of his age—Charles V., Catherine of Medici, Pope Julius, and the Duke of Urbino. He wrote *L'Orazia*, an historical tragedy in blank verse, one of the earliest Italian tragedies. His five comedies in prose,—*Il Filosofo, La Cortigiana, Il Mariscalco, L'Ipocrito*, and *La Talanta*,—are not without some merit in the invention, but, like most of the old Italian comedies, they are deficient in dramatic plot, and objectionable in their language. His *Letters* were published at Venice at different epochs during his lifetime, and form six volumes, octavo, besides two volumes of letters written to Aretino by his numerous correspondents. Amidst a multitude of unmeaning or egotistical phrases, much of the life and character of Aretino, as well as of the character of his times, may be gathered from these letters. He was either the flatterer or the enemy of almost every Italian writer of his age; and it was one that abounded in writers. He bestowed freely the epithet of 'divine' on Cardinal Bembo, Fracastoro, Giovio, Alamanni, Tolommei, Lollio, and even upon Molza and Dolce, and they in gratitude returned the compliment with interest. Ariosto has not disdained to call himself 'Il divin Pietro Aretino.' Berni, on the contrary, was never his friend, and wrote a most bitter invective against him. Franco, another poet, nearly as immoral as Aretino himself, bandied satire with him. Aretino directed his enmity chiefly against the prelates of Rome: Clemens VII., Cardinal Caraffa, afterwards Paul IV., and the estimable and learned Cardinal Sadoleto, were all the objects of his low and vulgar abuse. At last they paid so little attention to it at Rome, that it was considered rather an honour to be satirized by the cynic poet. Aretino boasted of his impudence, styling himself 'by divine grace a free man,' and 'the scourge of princes.' He is indeed one of those instances of successful shamelessness which occasionally appear to astonish the world, and make us wonder that such nuisances are so long endured. But the heaviest guilt of Aretino lies in his licentious writings. He was the most offensive writer of a most immoral age, an age abounding in impure works, which might rival in obscenity those of antient Rome, and are only surpassed in infamy by some of the worst productions of the French erotic press of the eighteenth century. (Count Mazzuchelli's *Vita di Pietro Aretino*.)

ARETINUS (Musician). [See Guido.]

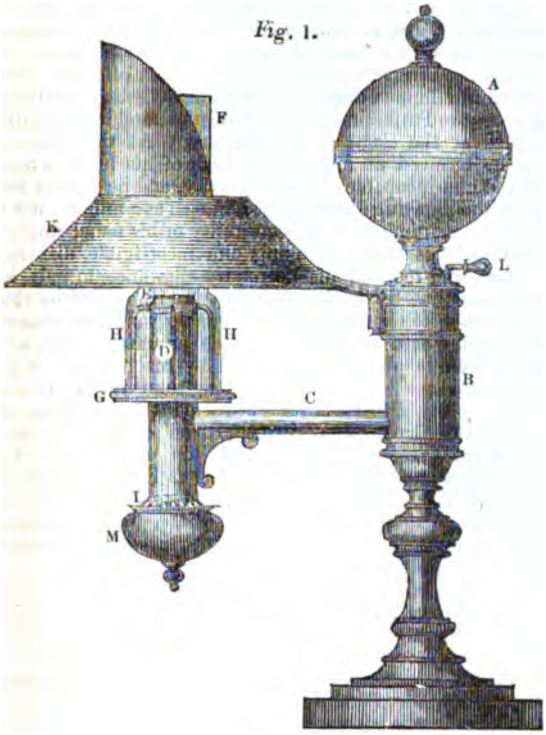
AREZZO, a very antient and still considerable town of Tuscany, thirty-four miles S.E. of Florence. The citadel of Arezzo is in 43° 27′ 52″ N. lat. and 11° 52′ 35″ E. long. Arretium was one of the wealthiest and most populous among the twelve cities of antient Etruria, was repeatedly at war with Rome, and afterwards became its ally, and supplied money and arms towards Scipio's expedition to Africa about the end of the second Punic war. Its government was then partly popular and similar to that of Rome, having its senate, and its patricians and plebeians. Arretium, having joined the Marsi and other Italian nations in the social war against Rome, was devastated by Sylla, its inhabitants were dispersed, and a Roman colony was sent into the country. It is a matter of doubt whether the colony did settle at old Arretium, as we find in the Roman geographers two colonies mentioned, one about eight miles to the north of it, called Arretium Julium, and another the same distance to the south, called Arretium Fidens, both distinguished from Arretium Vetus, which last, however, survived them both, having been restored by the care and liberality of Mæcenas, who was said to be descended from the old kings or rather nobles of that part of Etruria. The pottery of Arretium was in great repute. After the fall of Rome, Arretium, or Aritium, as it is sometimes called, was ravaged by the Goths under Totila, but was restored under Justinian. It then passed under the dominion of the Longobards, and afterwards of Charlemagne and his successors. The bishops of Arezzo were made feudal counts, and as such governed the town and its county or district, in the name of the Emperor and King of Italy. In the eleventh century, however, Arezzo, like most Italian cities, threw off its allegiance to the empire, and adopted a republican form of government. It was subsequently distracted by the factions of Guelphs and Guibelines. The Guibelines at last prevailed in the time of Frederic II.; and having at their head the Bishop Guglielmo Ubertini, drove the Guelphs out of the city. They next made war against Florence, and were defeated at the battle of Campaldino, in 1289, when the bishop was killed. In the following century, another bishop, Guido Tarlati of Pietramala, also a Guibeline, became Lord of Arezzo. He was a warrior and a statesman. He enlarged and fortified the city, made roads, conquered several neighbouring towns, fought against Florence, and maintained himself in his see although deposed by the pope, from whom he took Citta di Castello, and other places. Under him Arezzo attained a high degree of power and splendour. He died in 1327, and his monument is in the cathedral of Arezzo. After his death there came fresh dissensions among the citizens, and new wars with the Florentines, until 1384, when the city was taken and plundered by Ingelram of Coucy, a famous Condottiere of the times, who sold Arezzo to the Florentines for 40,000 golden florins. After more than a century Arezzo revolted against Florence in 1502, was again taken, and treated with great severity. In 1529 it opened its gates to the army of Charles V., which was then besieging Florence. Arezzo was obliged, in 1531, to submit, as well as Florence, to the Medici, and has ever since made part of the duchy of Tuscany. But its inhabitants have always retained something of their former independent and warlike spirit. In 1799, they rose against the French who had occupied Tuscany: the following year, after the battle of Marengo, being attacked by a French division, they resolutely defended themselves; but the town being stormed on the 19th of October, 1800, a dreadful scene of violence and slaughter ensued.

Arezzo is situated on two hills, and in the middle of a fine plain, watered by the Arno and the Chiana, and surrounded by an amphitheatre of mountains. The citadel is on the summit of one of the hills. It lies on the high road from Florence to Perugia and Rome, and three miles from the left bank of the Arno. The walls of Arezzo are about three miles in circuit, and have four gates: the streets are tolerably wide and well paved. The only remains of antiquity are the ruins of an amphitheatre. The cathedral is a large Gothic building, besides which there are several other remarkable churches with fine paintings, and various handsome palaces belonging to the nobility. But the handsomest structure in Arezzo is that called *Le Logge*, by the side of the town-house on the principal square, which has a fine portico nearly 400 feet long. It contains a theatre and the custom-house. It was built by Vasari, who was a native of this place. Arezzo has produced many other distinguished men—the monk Guido, the first restorer of modern music; Guittone, one of the earliest writers in Italian; the celebrated Petrarch, who was born here, though of Florentine parents; the historian Leonardi Bruni, Pietro Aretino, Pope Julius III., the naturalist and physician Cesalpini, the learned Redi, &c. Arezzo has about 10,000 inhabitants, and its comunita, or territory, 17,000 more in 1825, according to Professor Giuli's *Statistica della Val di Chiana*. But Arezzo is also the chief town of one of the five compartimenti, or provinces, into which Tuscany is now divided, which includes the large district called Val di Chiana, once a marsh, but now drained, and the towns of Cortona, Montepulciano, and others. The territory of Arezzo is fertile in corn, oil, wine, and fruits. The celebrated wine called *Alleatico*, the finest in Tuscany, is made here. There are also manufactories of woollens and of pins. Arezzo is a bishop's see, which has an income of 3,000 scudi, or crowns, per annum.

ARGALI, in zoology, the name of a species of wild sheep (*Ovis ammon*) found on the mountains of Siberia and Kamtschatka. [See Sheep.]

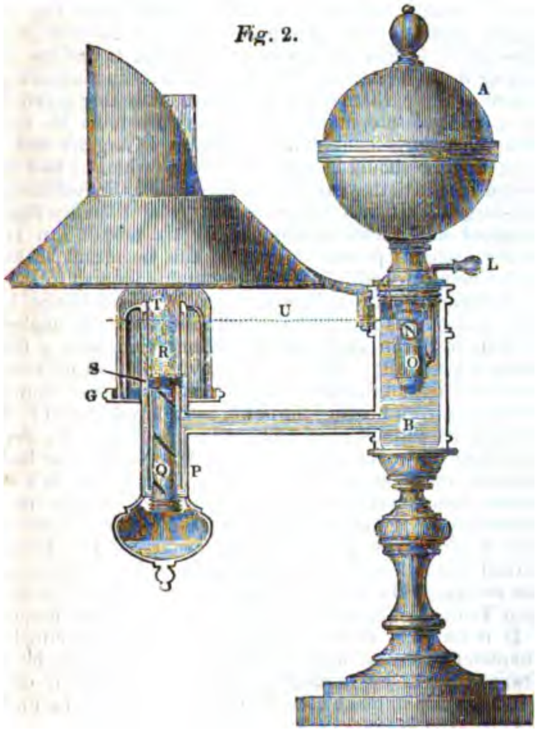
ARGAND LAMP, so called from the name of its inventor, who was a native of France. This lamp has been made of various forms, for the different purposes of reading and of diffusing general light. *Fig.* 1. exhibits the external appearance of the reading-lamp; A is the reservoir of oil, from which it descends gradually to the cistern B, and is thence conveyed through by the pipe C to the burner D, containing the wick, placed between two tubes and immersed in oil. The wick rises a little above the upper surface of D, at E; F is the glass-chimney, the lower part of which is enlarged, in order to increase the current of air upwards; the chimney rests in the gallery G, and is kept in its place by four wires, two of which are marked H, H. By turning the gallery G, the wick is either raised or low

Fig. 1.



ered. The wick is hollow and cylindrical, and receives a current of air both internally and externally; the former enters through the open work at I, and the latter at the gallery G: this indeed constitutes the peculiar principle and merit of the lamp. K is a shade surrounding the light, so as to prevent its acting too powerfully on the eyes. L is a handle, which, when the lamp is burning, is depressed, to allow of a supply of oil to descend into B, and which is raised to cut it off when the lamp is not in use; M is a small cup screwed on to receive any drops of oil which may fall. The internal construction of the lamp may be seen by *fig.* 2.

Fig. 2.

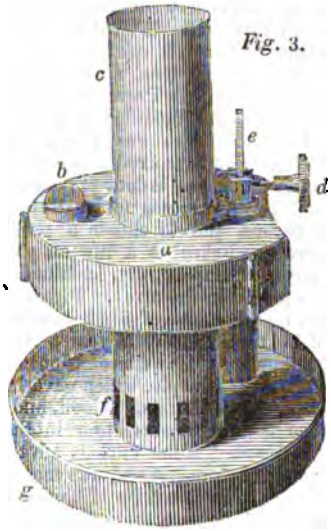


The reservoir A terminates in a neck, which screws into the upper part of the oil cistern B; when it is unscrewed and inverted, the oil is poured into the reservoir at the hole N; by moving the handle L, the short tube O is made to cover this hole and prevent the oil from running out, and the reservoir is then screwed into its place, and the handle depressed so as to uncover the hole and to allow the passage of the oil into the cistern B. Within the perpendicular tube P there is placed a smaller tube Q, and both are closed at bottom and open at the top; the space between these contains oil and the wick R, stretched over the short tube S, rising a little above the tubes at T. The outer surface of the tube Q has a spiral groove formed round it, and a tooth in the ring or gallery G entering this groove, when it is turned round, causes the tube and wick attached to it to ascend or descend, so as to regulate the flame. On account of the nature of the reservoir which contains the oil, a constant supply will be kept up at the level marked by the dotted line U, both in the cistern B and in the wick-tubes P and Q.

It has been mentioned that various forms are given to the Argand lamps. In those employed for the purpose of giving a general and diffused light, the reservoir of oil is circular, and surrounds the cistern and wick, and is nearly on a level with the latter; a ground-glass shade, which in the smaller lamps is frequently globular, and in larger ones rather flat, rests upon a groove.

The chemical Argand lamp is a very useful instrument, and is represented by *fig.* 3.: *a* is the reservoir of oil; *b* the opening at which the oil is poured into it; *c* is a short copper chimney; *d* is a pinion by which motion is given to the rack *e*, so as to raise or depress the wick; the apertures at *f* supply air; and the dish *g*, in which the lamp stands, serves to retain any oil which drops from the reservoir.

Fig. 3.



ARGEII, a name sometimes applied by Homer to the whole body of Greeks assembled at Troy; it is derived, probably, from the inhabitants of Argos, who had even in those early times raised their city to considerable celebrity. Homer, indeed, employs the word Argos not only to designate the name of a town, but also the whole Peloponnesus: Agamemnon is styled the sovereign of all Argos and the islands. (See Strabo, viii. 369.) The capital of Agamemnon's *kingdom* of Argos, which certainly did not comprise all the Peloponnesus, was Mycenæ. Homer often qualifies it with some epithet, as Achaiicum (*Iliad*, ix. 141), when Argos of the Peloponnesus is meant, and Pelasgicum when the Thessalian city or district of that name is intended. Strabo (viii. 372) tells us that in later times the word Argos in the Thessalian and Macedonian dialects signified a plain or field, and we may therefore perhaps consider it as having the same root with *ager* in the Latin language. What connexion this has with the several cities named Argos, the geographer does not think proper to inform us, though he may perhaps intend us to infer that they were so called from being situated in a plain. Pausanias (viii. 7) mentions a plain (called the πεδίον ἀργὸν) close to the mountain Artemisium, but we doubt if this has any reference to the use of the word Argos, of which we are here speaking The early inhabitants of the Peloponnesian Argos and of the district around it were, we have good reason to believe, Pelasgi. (Strabo, viii. 371; Eurip. *Orest.*, 931; Æschyl.

Suppl., 268.) The arrival of Danaüs from Egypt, according to tradition, caused their name to be changed to Danaï, a term that occurs in the *Iliad*, but the mass of the population no doubt still remained the same. Eighty years after the Trojan war, or B. C. 1104, the invasion of the Peloponnesus by the Heraclidæ took place, and Argos, like most of the other cities of southern Greece, was obliged to submit to the Dorians. Still this was only a change of dynasty, and all the older Achæan inhabitants were not compelled to leave their country. From this time the names Argos and Argeii lost their more extensive signification; but the city Argos itself continued an important place under this new race. [See ARGOLIS, ARGOS, and ACHÆI.]

ARGEMO'NE, the name of a small genus of the poppy tribe, of which three species are cultivated in this country as ornamental plants. They are all natives of Mexico, and are characterised by having six petals and three sepals, a very unusual number of parts in the natural order to which this genus belongs. Their leaves are prickly, and generally marked with whitish or pale bluish-green veins; the flowers are white or yellow. The commonest species is *A. Mexicana*, from the seeds of which the Mexicans obtain an oil very useful to painters; the handsomest is *A. grandiflora*, the flowers of which are pure white, and as much as three inches in diameter. They are all hardy, and will thrive in almost any soil or situation. Their seeds should be sown in a hot-bed, and the young plants treated as half-tender annuals.

ARGENS, MARQUIS D', JEAN BAPTISTE BOYER, a writer of the last century, more remarkable than illustrious for his opinions, adventures, and literary reputation, was born at Aix in Provence, on the 24th June 1704, and, as he says, was destined to the bar from his birth, because his father, who was Procurator-General of the parliament of Aix, had resolved if possible to keep that office in his family. But the ardour of youth, and a restless disposition, led the marquis to frustrate the prudent designs of his parent, and to choose a profession which he thought more conducive to a life of pleasure. He therefore, by force of importunity, obtained his father's consent, and was placed in the army. Pleasure became his principal pursuit, and a course of illicit amours occupied a great portion of his time for several years. At last, interest was made to get him into the suite of Monsieur Andresel, in an embassy to Constantinople, which gave him an opportunity of visiting Algiers, Tunis, Tripoli, and some other places, and also of making a short tour in the Black Sea. In these voyages he had some curious adventures in the pursuit of his favourite pleasure, and was more than once in danger of experiencing the severity of Turkish retribution. He did not, however, neglect the opportunity of making many useful observations, and as he always attached himself as much as possible to the best informed and most respectable persons of the embassy, he was introduced by them into the best society. The remarks which he made upon the manners and customs of the people he conversed with, and his sketches of the characters and qualifications of those who were employed in the embassy, evince considerable ability for so young a man. Upon his return to France, he took seriously to the study of the law; and so far qualified himself as to be able to plead two remarkable causes, both of which he gained. Flattered by this success, and complimented upon the progress he had made and the fair prospect of future eminence thus opened to him, he began to think better of the bar. But, unfortunately relapsing into his former habits, his disgust for all professional studies returned. His intrigues becoming troublesome, and the state of his finances more so, he left home, and found his way to Paris, where accidentally gaining a sum of money in his first and only adventure at a public gaming-table, he had the good sense to keep it and retire to Rome, to study music, for which he had great taste, and to perfect himself in the art of painting, in which he became very skilful. The same propensities that drove him from home compelled him to return, by exhausting his funds, and subjecting him to the danger of assassination. On his return to Aix, where he was received with more kindness than he had a right to expect, he again applied to the law, but only for the purpose of employing himself till he could find some other occupation more suitable to his inclinations. An event soon occurred that he contrived to turn to his own purposes. This was the famous trial of the Jesuit Girard before the Parliament of Aix, for seducing Mademoiselle La Cadière, his penitent The decision of this case was unsatisfactory to the people of Aix and its neighbourhood: a riot ensued, and the military were called in to protect the magistrates. The marquis made this a pretext for again quitting the legal profession, his dislike for which seems to have been confirmed by a consideration of its being so often involved in religious disputes in Roman Catholic countries.

He went to Paris, obtained a commission, and was slightly wounded at the siege of Philipsbourg. At the siege of Kehl he received an injury by the fall of his horse, which rendered him incapable of further service, and he quitted the army without having distinguished himself as a military man.

In the meantime he had been guilty of his usual imprudences, and his father, thinking him incorrigible, disinherited him, and reduced his pecuniary allowance to half its former amount. Being in some measure compelled by this circumstance to abandon the fashionable world, he retired to Holland, where he lived under an assumed name, and endeavoured to obtain a livelihood by his pen, which he could there use with more freedom than in his native country. His *Lettres Juives* attracted the attention of Frederic the Great, then Prince Royal of Prussia, who commenced a correspondence with him, offered him his friendship, and invited him to Berlin, 'to live and philosophize with him.' The marquis declined this invitation, for good reasons: the king, Frederic William, was not partial to literary men; he had interfered with Frederic's studies, and had hanged one of his best friends before his face.

When Frederic came to the throne, in 1740, the invitation was renewed, and accepted. The marquis was soon appointed one of his chamberlains, with a pension of 6000 francs; made a member of the Royal Academy of Belles Lettres, and Director of the Philological Class, with a salary of 800 francs, and other marks of royal favour. He had apartments in the palace, and the king built and furnished a country retreat for him. D'Argens was so disinterested as to refuse an addition to his emoluments, telling his majesty that he had many officers who had served him faithfully in his wars, who stood in greater need of his bounty.

There is evidence that his good sense influenced the king's conduct on some important occasions, which also show the extent of the confidence placed in him. His amours ended in a marriage with Mademoiselle Cochois, a dancer. When it took place is not known. His biographers choose to call it a sexagenarian adventure, but it is certain that this lady accompanied him to France in 1747. In the latter part of the marquis's life, his health and spirits appear to have failed together; he became unwilling to exert himself, and was too often absent from the royal supper parties under pretence of illness. He felt it was time to retire, and had reasons for wishing to end his days among his own relations. His brother, who had become president of the parliament of Aix, had honourably given him up a family estate, and built a house upon it for his reception. An agreement existed between D'Argens and the king that he should be allowed to retire when he had completed his sixtieth year, and he demanded the fulfilment of the bargain. It was, however, with great difficulty that he obtained only a leave of absence for six months, in 1769, under a solemn promise to return; this he meant to keep, and, though in bad health, he began his journey to Berlin, and reached Bourg en Bresse, where he was detained by a long and serious illness. Unfortunately, his wife neglected to write to Berlin, and a letter of admonition from a friend there missed him. The king, thinking he had broken his word and did not intend to return, hastily cashiered him, and the marquis, on hearing the news, as hastily returned to Aix, though not without grief and vexation. Before his departure from Berlin, he returned all the letters which he had at various times received from the king, telling him, in a well-written letter, that he thought it might not be right in the present state of his health to carry these marks of his majesty's confidence into a foreign country. The king returned the letters, with a reassurance of his confidence in the marquis. He died in 1771, while on a visit to his sister, near Toulon, leaving a daughter, who inherited his property.

It is stated by all his biographers that he maintained the character of a good husband and master, and that he was always firm in his friendship. The natural ardour of his mind led him to make considerable acquisitions; he understood several languages, knew something of chemistry and anatomy, was a great reader of the fathers and doctors of the church, and of all sorts of polite literature. His works are:—

1. Mémoires de Monsieur le Marquis d'Argens, avec quelques Lettres sur divers sujets (fourteen not in the collections of his works); Londres, 1736, 12mo. (certainly a foreign print—Hague); 1737, Londres, 12mo.—1807, Paris, 8vo.

2. Mémoires du Marquis de Miremon, ou Le Philosophe Solitaire; 1736, 12mo. An interesting work.

3. Mentor Cavalier; 1736, 12mo.

4. Nouveaux Mémoires du Comte de Bonneval, publiés sous le nom de Mirone (perhaps the name he took in Holland); 1737, 4 vols. 12mo. The Mémoires de Bonneval is an inferior work by another writer.

5. Mémoires du Comte de Vaxère, ou Le Faux Rabbin; 1737, 12mo.

6. La Philosophie du Bon Sens; 1737, 12mo.—1768, with Nos. 8, 15, and 16; called his works in 24 vols. 12mo.

7. Triomphe de la Vertu, ou Voyages sur Mer, et Aventures de la Comtesse de Bressol; 1741, 3 vols. 12mo.

8. Lettres Juives; 1742, 6 vols. 8vo.—1754, 8 vols. 12mo.

9. Lettres Philosophiques et Critiques, par Mad. Cochois; avec les Réponses de M. d'Argens; 1744, 12mo.

10. Mémoires Secrets de la République des Lettres; 1744, 7 vols. 12mo. These Mémoires contain notices of the lives, acts, and peculiarities of numerous writers that can only be found elsewhere by consulting a great variety of authors. The Lettres Juives et Chinoises contain similar notices.

11. Mémoires du Chevalier de * * *; 1745, 2 vols. 8vo.

12. Songes Philosophiques; 1746, 12mo.

13. Nonnes Galantes, ou l'Amour Embéguiné; 1749, 12mo.

14. Réflexions Critiques sur les différentes Ecoles de Peinture; 1750, 12mo. Much has been written upon this subject with great pretensions; but nobody has said so much as the marquis, so well, and in so few words, nor indeed anything more to the purpose. See also Letters in No. 1.

15. Lettres Cabalistiques; 1754, 7 vols. 12mo.—1769, 7 vols. 12mo.

16. Lettres Chinoises; 1755, 6 vols. 12mo.

17. Ocellus Lucanus, Gr. et Fr.; 1762, 8vo.

18. Timée de Locres, Gr. et Fr.; 1763, 8vo.

19. Défense du Paganisme, par l'Empereur Julien, Gr. et Fr.; 1764, 8vo.—1768, avec des Notes de M. de Voltaire. Ces trois traductions ont des Dissertations et Notes sur les principales Questions de la Métaphysique, de la Physique, et de la Morale, qui peuvent servir de suite à la Philosophie du Bon Sens. These translations are very good.

20. Certain pieces in the Mémoires de l'Esprit et du Cœur that bear his name; he had no part in the rest.

21. Letters printed in the Works of Frederic the Great. The editor of his Mémoires (Paris, 1807) has collected what was necessary to complete his life, and has reviewed some of his works with considerable tact and delicacy, and not without censure where it is due. But where he accuses the marquis of making insidious attacks on religion through its priests, he expressly alludes to the religion of the church of Rome, to which the word is exclusively applied by all its writers. Writers of other sects, and their errors, are also remarked upon with great levity by the marquis; but many ecclesiastics have attacked each other with infinitely more virulence, and without a due regard to the decency which their order should never lose sight of.

The marquis's name was again brought forward when, we are told, it was nearly forgotten in France, by the well meant zeal of certain declaimers against the licentious opinions which were promulgated during the revolution in the reign of Louis XVI. As all ranks and establishments were then thrown into confusion, so all names were confounded in searching for the authors of those calamities, and the Marquis d'Argens was associated with 'atheists and desolators of religion, morals, and government.' These words have been repeated by some who must be supposed to feel the very existence of the desolation they describe in the destruction of the old French government. More impartial writers have traced the causes of the French revolution to the accumulated grievances of many ages, and shown that it was not caused, though it may have been quickened, by the writers alluded to; if so, they may be classed together as instigators, but if their names are worth preserving, they are entitled to their just distinctions in biography. 'The marquis was not an atheist,' he says; 'he always thought it would be opposing his clearest notions not to believe in the existence of God;' he never abjured religion. After his return to France, 'he manifested sentiments and exhibited acts of devotion that were not expected from him, considering his life and writings.' This only proves that those who did not expect such things were not acquainted with his habits—perhaps not with his writings, for he frequently asks, whether certain opinions and practices 'are consistent with *true* religion?' his objection to them being that he thinks they are not. The last of the sweeping accusations against him clearly indicates the temper of the person who first brought it forward, and of those who have copied it, whose thorough detestation of the Philosophy of Common Sense seems to have induced them to abandon the small portion of that valuable commodity which may have naturally fallen to their share. From their own biographical works it can be quoted that 'Frederic the Great was the best legislator of his day in Europe; that his people were the best governed; and that the Marquis d'Argens, a desolator of government, according to their ideas, was his confidential friend and adviser during the whole term of his literary life, lived under his special protection, died most sincerely regretted by him, and was, by his command, characterized on his monument as a lover of truth and an enemy of error.'

ARGE′NSOLA, BARTOLOME′ LEONARDO DE, was a native of Barbastro in Aragon, and descended from a noble family, originally from Ravenna in Italy. He was born in 1566. He studied at the university of Huesca, and entered the ecclesiastical profession. Through the influence of his brother he was made a chaplain to the princess Maria of Austria, and rector of Villahermosa. He followed his brother to Naples, and remained in Italy three years after his death. In 1616, having first visited the principal cities in Italy, he returned to Spain, and was made a canon of Zaragoza, in which town he died, according to some authorities in 1633, and according to others in 1631.

Argensola left behind him a continuation of the Annals of Aragon by Zurita, a History of the Conquest of the Molucca Islands, some letters, satires, and other poetical effusions. The continuation of the history of Zurita, in point of style, exceeds the original, and the events are related with no less accuracy than freedom. The history of the Molucca islands, though it was written in his youth, is not inferior either in judgment or elegance to his later performances. As poets, both the brothers are, if not in point of originality, at least for their correctness and purity, among the first that Spain has produced. Their poetry is vigorous, abounds in wit and classic dignity of style, and above all, is marked by singular correctness of taste, on which account they have been styled the Horaces of Spain.

ARGENSOLA, LUPERCIO LEONARDO DE, brother of Bartolomé, was born in 1565, and began his studies at the university of Huesca. He afterwards went to Zaragoza, where he studied Greek, history, and rhetoric. Before he had attained his twenty-fifth year he went to Madrid, where his patroness, the princess Maria of Austria, had fixed her residence, and he was made her secretary. The archduke Albert of Austria made him his chamberlain, and Philip III. honoured his talents by appointing him historiographer of Aragon. The count of Lemos, having been appointed viceroy of Naples, took Argensola with him and made him his secretary of state, and also secretary for war. In 1613, he died at Naples. He left behind him three tragedies, some poems, and other works which are still unpublished.

(See Nicolao Antonio, *Bibliotheca Nova;* Fernandez, *Rimas de Lupercio y Bartolomé de Argensola;* Bouterwek, *History of Spanish Literature,* pp. 392-405.)

ARGENTAN, a town in France, in the department of Orne, 115 miles W. of Paris, twenty-five N. of Alençon, and thirty-four S. by E. of Caen: 48° 44′ N. lat., 0° 1′ E. long.

It is on the river Orne (which falls into the sea below Caen), and on an eminence in a very fertile plain. It is tolerably well built, with good broad streets, and its fortifications have been converted into a pleasant promenade. Near it are the ruins of a strong castle. The trade of Argentan is considerable. Lace similar to that of Alençon is made here; and also leather, the waters of the Orne being considered excellent for tanning. The cottons manufactured in the town and in its vicinity are carried to Caen and sold there, where they bear a good price. A considerable quantity of poultry is reared about the town; and there is an iron mine at no great distance. The village of Rye, in the neighbourhood, was the birth-place of the historian Mezeray. The population of Argentan is about 6000.

Before the revolution, Argentan possessed a priory and three other convents.

It is the capital of an arrondissement, or sub-prefecture, containing 248 communes and above 115,000 inhabitants.

The form of this word and of the next (Argenteuil) may be compared with some Celtic names which occur in the map of Gallia: Argentomagus (Argenton), between Poitiers and Bruges, Argentoratum (Strasburg), &c.

ARGENTEUIL, a town in France, in the department of Seine and Oise, on the right bank of the Seine below Paris, just where the river serves as boundary between the department above-mentioned and that of Seine: 48° 56′ N. lat., 2° 14′ E. long.

It stands in the middle of a district abounding in vineyards and gardens, the produce of which forms the chief trade of the town. There are also in the neighbourhood quarries of gypsum, which furnish an abundant supply. Some ruins still indicate the site of a monastery, founded in the seventh century, which has acquired celebrity as the retreat of Heloise. [See ABELARD.] The lordship of the town was in the prior of the Benedictine monks, who appear to have occupied the monastery which once sheltered Heloise. Two other religious houses existed before the revolution. Population 4700. (Reichard's *Guide des Voyageurs.*)

ARGE'NTEUS CODEX, or Silver Book, the name given to a very curious manuscript, or rather fragment of a manuscript, containing the greater part of the Four Gospels in the Mœso-Gothic language, preserved in the library at Upsala, in Sweden. It is believed to be a relic of the Gothic Bible, all or the greater part of which was translated by Ulphilas, bishop of those Goths who were settled in Mœsia and Thrace, and who lived under the emperor Valens about A. D. 360. This curious fragment was discovered in the library of the abbey of Werden in Westphalia. The leaves are of vellum, some purple, but the greater part of a violet colour; all the letters being of silver, except the initials, which are of gold. These letters, which are all capitals, appear not to have been written with the pen, but stamped or imprinted on the vellum with hot metal types, in the same manner as book-binders at present letter the backs of books. This copy is judged to be nearly as antient as the time of Ulphilas, or at least not later than a century or two after.

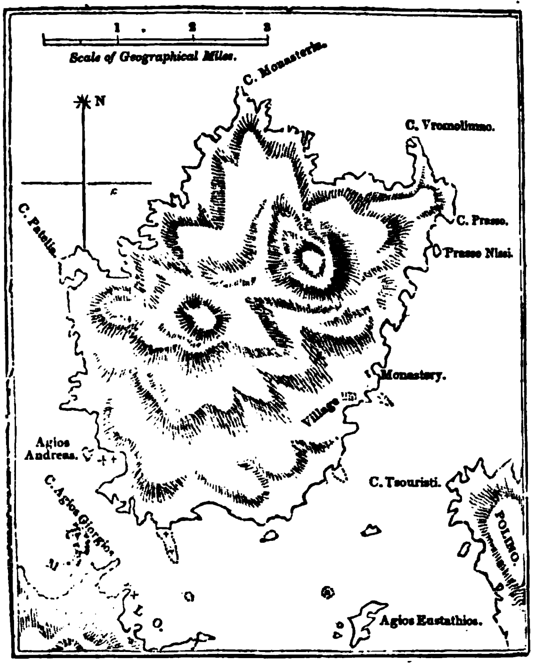
Michaelis and one or two other learned men have opposed the current opinion, that the Silver Book contains part of Ulphilas's Gothic version, and have offered arguments to prove, that it is rather a venerable fragment of some very antient Francic Bible: but they have been confuted by Knittel and others. The letters used in the Gothic Gospels, being twenty-five in number, are formed, with slight variations, from the capitals of the Greek and Latin alphabets, and are believed to have been really the invention or application of Ulphilas. See the notes to Bishop Percy's *Translation of Mallet's Northern Antiquities*, vol. i. p. 366.

The Gothic Gospels of the Silver Book were first printed in types approaching to a fac-simile, by Junius, in 1665; again in common type at Stockholm, in 1671; by Mr. Lye at Oxford, in 4to, 1750, with a Gothic Grammar prefixed; and lastly, by Zahn, 4to, Weissenfels, 1805.

Palimpsest fragments of this Gothic version of the Scriptures, though not in the silver character, have been since found in other places. Knittel printed a fragment, containing part of the Epistle to the Romans, which was discovered in the library at Wolfenbuttel: it was reprinted in 1763, by Professor Ihre; and again in the Appendix to Lye's Saxon Dictionary. In 1819, some further fragments were published by Angelo Mai, and Car. Oct. Castillonei, in 4to., at Milan, containing small portions of Esdras and Nehemiah, parts of the 25th, 26th, and 27th chapters of St. Matthew, of St. Paul's Epistles to the Philippians, Titus, and Philemon, and of a homily and calendar; these were discovered in separate leaves in the Ambrosian library at Milan.

A *Dissertation on the Argenteus Codex*, by Ericus Sotberg, printed at Stockholm, in 1752, contains two of its pages in fac-simile. Knittel and Mai have also engraved some of the palimpsest fragments which they respectively published.

ARGENTIE'RA, an island of the Grecian Archipelago, so called from its having been supposed to contain a vein of silver. It lies to the N.E. of Melos or Milo, from which it is separated by a narrow strait, only half a mile in breadth, which, though not free from dangers, may be passed through by ships of large size, the connecting ridge of the two islands having five fathoms water over it. The extreme length of the island is five miles, and breadth three miles and a half; it has no port, and but one small village, standing on an eminence at the S.E. side of the island, in 36° 48′ N. lat., and 24° 35′ E. long. It consists of only a few miserable huts; the whole population of the island does not exceed 800 souls. There are some hot springs in this island, like those in Milo, and the soil is also of the same volcanic nature, dry and barren, but producing in the valleys, with much care, a little cotton, corn, and fruit (chiefly figs and grapes). The only trade is the supply of a few kaïk-loads of wine; for other articles the inhabitants visit Milo. The island generally is high; the hills rise to an elevation of 800 to 1000 feet. The antient name was Kimolos, which is still always used by its present Greek inhabitants.



[Argentiera.]

This island was noted in antient times for an earth used in dyeing and bleaching cloths. (See Strabo, p. 484, and Plin. xxxv. 17, on the *Creta Cimolia.*)

ARGENTIE'RE, L', the capital of an arrondissement, in the department of Ardèche, in France. It is in the south of the department, in a deep valley, on the banks of the little river Ligne, one of the streams which run into the Ardèche: 44° 32′ N. lat., 4° 17′ E. long.

L'Argentière derives its name from the mines of argentiferous lead (*i. e.* lead combined with silver), which were formerly worked in its neighbourhood, but are now exhausted or neglected, as being of little value. Its chief trade is in silk, of which there are several manufactories. The population is nearly 3000.

The air of the town is pure, though it is situated in so deep a hollow that its eastern part does not enjoy the sun's rays till the afternoon. The western part, being more elevated, fares better in this respect. A public library of 4000 volumes was established in the town as far back as 1784.

The arrondissement of L'Argentière contains 104 communes and 85,000 inhabitants. (*Dictionnaire Géograph. de la France;* Malte Brun, *Géographie de la France.*)

ARGENTINE REPUBLIC. [See LA PLATA.]

ARGENTON SUR CREUSE, a small town in the department of Indre, in France. [See INDRE.]

ARGIL. [See ALUMINA.]

ARGO, the ship, a southern constellation, the greater part of which, containing all the more important stars, is not visible in this country. It has one star of the first magnitude, CANOPUS (which see). The part of it which is visible in our latitude may be found in and above a line drawn through Orion's belt, and continued beyond Sirius. The star Cor Hydræ is just above the end of the mast, and the direction of the mast is that of a line passing through Regulus and Cor Hydræ. The latter comes on the meridian at six in the evening in the middle of May. For the mythological story connected with Argo, see ARGONAUTS.

The stars in Argo are as follows, in which, as before, the simple number in the column marked Flamsteed, &c. is that of Flamsteed; ( ) denotes Piazzi; C, Lacaille; and Fa. Fallows.

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi, Bradley.	Astron. Society.			Flamsteed, Piazzi, Bradley	Astron. Society.			Flamsteed, Piazzi, Bradley.	Astron. Society.	
	1	950	6	α	519 C	807	1	I	936 C	1247	5
τ(?)	3	954	5	τ(?)	579 C	852	4	p	943 C	1258	4
	4	955	5·6	χ	721 C	982	3	u	979 C	1294	5
	6	959	5·6	γ^2	737 C	1003	2	...	.....	....	...
ξ	7	961	4	ε	761 C	1032	2	r	(31)	1007	5
	9	964	5	ο	786 C	1067	4	q	(47)	1015	4·5
	10	966	6	δ	796 C	1077	3	L^1	(54)	897	5
e	11	974	5·6	β	848 C	1133	2	n^1	(147)	935	6
	12	980	6	ι	849 C	1137	2	n^2	(149)	936	6
	13(?)	985	5	κ	851 C	1144	3	p	(163)	937	5·6
	15	995	3·4	υ	894 C	1186	3·4	m	(173)	942	6
	16	996	5·6	φ	901 C	1196	4	c	(214)	957	4
	18	1000	6	ω	920 C	1225	4 5	o	(220)	958	5·6
	19	1001	6	θ^2	964 C	1276	2·3	P	(244)	965	4·5
	20	1005	5	η	968 C	1281	2	x	(253)	845	5
	21	1010	6	μ	970 C	1283	3	b	(254)	969	5
	22	1018	6	γ^1	81 Fa.	1002	5	I	615 C	895	5
λ	(1)	1114	3·4	θ^1	124 Fa.	1273	5	R	713 C	971	5
	(22)	1006	5	...	......	....	...	...	......	....	...
	(60)	1019	6	d	791C	1071	5	q	(29)	1223	4
π	(68)	903	3·4	b^1	821 C	1101	5	l	(40)	1129	5
	(72)	1029	6	b^2	823 C	1102	5	r	(61)	1235	4·5
ψ	(116)	1159	4·5	G	834 C	1120	6	e_1	(139)	1056	5
	(122)	924	6	a	835 C	1123	5	b	(155)	1065	5
σ	(135)	928	4	i	838 C	1124	5	a	(176)	1078	5
	(200)	952	5·6	n	865 C	1156	5	c	827 C	1105	5
ν	(205)	829	3	h	873 C	1167	5	N	868 C	1160	5
	(277)	977	6	l	890 C	1182	5	T	926 C	1234	5
ζ	(306)	990	3	q	922 C	1229	5	p	949 C	1264	5

Owing to the extent of this constellation, it is usual to subdivide it into four, between the stars of which dotted lines are drawn in the preceding table. They are named as follows: Argo, Argo in Carina (in the keel), Argo in Puppi (in the stern), Argo in Velis (in the sails).

The stars to which a note of interrogation has been placed are those about which some mistake has arisen in the catalogues. Thus the star which, according to Flamsteed, is 13 Argus, is really in Canis Minor: and 3 Argus, to which Flamsteed has affixed the letter τ, Lacaille has affixed *l*; while τ Argus, according to Lacaille, is No. 579 of his own catalogue. (See *Memoirs of the Astronomical Society*, vol. iv. p. 291.)

ARGOL is an acidulous concrete salt which is deposited by wine, and forms a crust on the sides of vessels in which that liquid is kept. This crust becomes hard, brilliant, and brittle; it is easily reduced to powder. The colour of argol depends upon that of the wine from which it is separated. That which is deposited by white wine contains fewer impurities than the other, but when refined, the produce of both is identical. Argol brought from Germany is the most esteemed, and it is understood that the excellence of its quality is owing to the successive additions of new wine which are made from time to time during a series of years to the contents of the same casks or vats, which are commonly of large dimensions.

Argol is largely used by dyers as a mordant, that is, as an intermediate substance, which, having a stronger affinity for both the cloth and the colouring matter employed than exists between the cloth and the colouring matter, becomes, as it were, a bond of union between the two. It is employed also by dyers with another object, in combination with alum, the sulphuric acid of which would injure the texture of cloth, if it were not neutralized by the potass which argol contains. At the same time the tartareous acid, which is the other component of argol, combines with the alumina of alum and forms tartrate of alumina, which is decomposed by the cloth more easily than alum.

A further use is made of argol in the same art, by combining it with nitro-muriate of tin dissolved in water. A double decomposition is thus effected. The nitro-muriatic acid combines with the potass of the argol, while the tartareous acid of this substance dissolves the oxide of tin. The mordant thus produced is therefore a tartrate of tin. These few explanations will perhaps suffice to indicate the purposes to which this substance is applied in the important art of dyeing. The chemical properties and further uses of argol will be described under the head of TARTAR.

About 3000 casks and cases (nearly 1000 tons) of argol are annually imported into this kingdom. It comes to us from almost all wine-producing countries. It is admitted at the trifling duty of two shillings per hundred weight from foreign countries, and half that rate from British possessions. The best, after that from Germany, comes from Bologna and the Cape of Good Hope; that shipped from Florence and Leghorn ranks next. Its present price varies, according to quality, from 42*s.* to 58*s.* per hundred weight, including the duty.

A'RGOLIS, one of the antient divisions in the north-eastern part of the Peloponnesus: it is of a peninsular shape, being bounded on the south and north-east respectively by the Argolic and Saronic gulfs. On the west, it was separated from Arcadia by a range of mountains, which, shooting off from Cyllene, now Zyria, the highest mountain of the peninsula, not far from the frontiers of Achæa, run southwards, and were known by the appellations of Artemisium and Parthenium. Pausanias (viii. 6) mentions several passes from the plain of Argolis into Arcadia, two of which were respectively over the ranges of Parthenium and Artemisium. The territory of Corinth bounded it on the north. Argolis lies between 37° 12′ and 37° 46′ N. lat., and extended from 22° 32′ to 23° 33′ E. long. Its greatest length, measured in a straight line along its western frontier from Laconia to Corinthia, was nearly thirty-eight miles, and the peninsular part of it varied from twenty-five to eleven miles in breadth. Mr. Clinton calculates (*Fasti Hell.* i. 385) its area in English square miles at 1059.

Argolis is traversed by a ridge of mountains which run nearly in a continued line through the peninsula, from Cyllene on its western frontier eastward to Cape Scyllæum, now Skyllo; these mountains are intersected by deep valleys, through which flow rivulets, generally dry during summer. Arachnæum is the antient name of part of this range, which was crossed on the road from Argos to Epidaurus. The valleys are most numerous and of greatest breadth on the southern side of the ridge, but none of them are of any great extent. That in which Argos and Mycenæ were situated is the largest; and through it flowed the ancient Inachus, now Bánitza. The coast is of an irregular shape, with numerous indentations, and it is generally low. The only good harbour is Nauplia, now Napoli di Romania, at the head of the gulf of Napoli; which, however, is exposed to a southerly wind.

Argos, with a territory around it of about 524 English square miles, was situated in the south-west part of the province near Mycenæ. On the eastern coast were the three independent republics, Epidaurus, now Pidhavro; Trœzen, now Damala, and Hermione. In the mountains to the west was situated Phlius. The only other city of any importance in Argolis was Tiryns, the mythological birth-place of Hercules, and known for its Cyclopian walls. [See TIRYNS.] The district of Cynuria, which was long a subject of contention between Argos and Sparta, lay on the west side of the Argolic gulf, on the borders. (Thucyd. ii. 26. iv. 56, &c.) It was finally adjudged to the Argeii by the Romans. [See ARGEII and ARGOS: and Gell's *Argolis*.]

ARGONAUTA. [See NAUTILUS.]

ARGONAUTS, a term signifying the crew of the Argo, or members of the Argonautic expedition. This is one of the most remarkable of those mythological tales in which, as in the legends of the Trojan war, and the war of the Seven against Thebes, there is reason to believe that a substratum of truth exists, though overlaid by a mass of fiction. Anterior to these events (it is placed by Newton B.C. 937, by Blair B.C. 1263), the Argonautic expedition has a larger share of what is purely fabulous; the license of the poet being of course curtailed in proportion as the events which he related came nearer to his own times. No story has been more frequently treated by Grecian writers. We shall give a brief outline, and then offer a few remarks upon it.

Jason, the son of Æson, king of Iolcos in Thessaly, having been defrauded of his father's kingdom by his father's brother Pelias, in hope of recovering his paternal inheritance, undertook to bring from Colchis the golden fleece of the ram which carried Phrixus thither. Argus, the son of Phrixus, by the help of Athene (Minerva), built the ship Argo, of fifty oars, at Pagasæ, and it was manned by the most celebrated heroes of Greece, in number fifty. The lists differ, for every state in later times wished to include its own national hero among them; but by general consent the most distinguished warriors, as Heracles (Hercules), the Æacidæ, the Dioscuri, Orpheus, Theseus, &c., were on board the vessel, which was steered by Tiphys, the son of Agnius. Embarking from Iolcos (or, some say, Aphetæ, *departure*), they steered first to Lemnos; thence to Mysia, where Hercules remained behind, seeking his favourite Hylas, who had been carried off by the Naiades, and drowned. (See Theocr. *Idyll.* 13.) They touched next at Bebrycia, where Amycus, king of the country, was slain by Polydeukes (Pollux), in boxing with the *cestus*, or weighted glove. (Theocr. *Idyll.* 22.) Apollonius next conducts them to the coast of Bithynia, where Zetes and Calais, the winged sons of Boreas, delivered the seer Phineus from certain winged monsters called Harpies, and in return he gave the Argonauts instructions for the conduct of their voyage. (Apoll. Rhod. ii. v. 178-425.) The entrance to the Euxine sea was fabled to be closed up by certain rocks, called *Symplegades*, *clashers*, or *Planktai* (Od. xii. 61), or *Cyanean*, which floated on the water, and when any thing attempted to pass through, came together with such velocity that not even the birds could escape. Phineas advised them to let fly a pigeon, and to venture the passage if the bird got through safe. It passed, with only the loss of its tail; and the Argo, favoured by Juno, and impelled by the utmost efforts of its heroic crew, passed also, though so narrowly that the meeting rocks carried away part of her stern-works. Thenceforward they remained fixed. The expedition reached the river Phasis without any more adventures worthy of notice. Æetes, king of Colchis, hearing from the strangers the cause of their arrival, promised to give Jason the golden fleece, which was suspended on a tree in the sacred grove of Ares, on condition of his yoking two bulls with brazen feet, which breathed flames, ploughing a piece of land with them, and sowing part of the teeth of the serpent slain by Cadmus, which had the peculiar property of producing a crop of armed men. These difficult tasks he performed by the help of the celebrated sorceress Medea, daughter of Æetes, who fell in love with him, placed the fleece, which Æetes ultimately refused to surrender, in his possession, and became his partner in flight.

How the Argo got back to Greece, it is not easy to say; but somehow or other she found her way from Colchis, at the eastern end of the Euxine, to the western extremity of the Mediterranean. Here the Argonauts touched at Æea, the island of Circe (see Od. xii. 69), which by Homer is placed in the westernmost part of the Mediterranean, and by some later writers has been said to be the promontory of Circeum, on the Latian coast. Hence they passed all the wonders of the western world described by Homer: the Sirens; Scylla and Charybdis; Thrinakia (Sicilia), the isle of the sun; and Phæacia, or Corcyra. Near Anaphe, one of the Sporades, they narrowly escaped shipwreck, but were saved by Phœbus. They touched at Crete, proceeded to Ægina, thence to Iolcos, where Jason delivered up the fleece to Pelias; after which he sailed to the Isthmus, and dedicated the Argo to Poseidon, or Neptune.

For a full account of the adventures of the Argonauts, see, besides the passages referred to, Pindar. *Pyth.* IV.; Apollonius Rhodius; the Orphic Argonautica; Diodorus, book iv. c. 40; see also Hesiod. *Theog.* 992; Ovid, and the Latin poem of Valerius Flaccus, entitled *Argonautica*.

The reader will readily understand that it was a difficult matter to get the Argo home from Colchis to Greece, by way of the Mediterranean. Besides numerous large streams, two very great rivers, the Ister and Tanais (Danube and Don), flowed into the Euxine sea, from the west and north-east respectively, in addition to the Phasis (Faz), which entered it on the east side, within the limits of Colchis. Of none of these did the early Greeks know either the rise or course; and this was convenient, for they could do as they liked with them. Pindar (Pyth. iv. 44 and 448) conducts the Argonauts into the 'Red Sea' (probably the Indian Ocean), and by the ocean to the coast of Libya, where they carried their ship over land for twelve days, and launching her into Lake Tritonis, entered the Mediterranean. According to the tradition preserved by Herodotus (iv. 179), Jason was driven off the south coast of the Peloponnesus into the shallows of the Lake Tritonis, while he was on his voyage (apparently before the commencement of the great expedition) to carry a hecatomb and a brazen tripod to the god of Delphi. He only got out of the difficulty by surrendering the tripod to Triton, the god of the lake, who on no other terms would consent to pilot him out. Hecatæus of Miletus improved the story, by making them sail from the ocean down the Nile, into the Mediterranean. Pisander and Timagetes, followed by Apollonius Rhodius, carried them up the Ister, and down one of its branches, by which they perhaps meant the Rhone, into the Keltic or Tyrrhene sea. Timæus and others took them up the Tanais to its source, from which they dragged the Argo to an unnamed stream, which carried them to the ocean, and they sailed home by Gades (Cadiz), that is, the straits of Gibraltar. The poet who writes under the name of Orpheus took them up the Phasis, down another branch of it to the Palus Mæotis, at the head of which they entered a river, probably the Tanais, and crossed the Rhipæan mountains to the Cronian or Baltic sea. They passed by the land of the Cimmerians, and the isle Iernis (Ireland ?), and home by the strait of Tartessus (Gibraltar) into the Mediterranean.

The gross geographical ignorance involved in each of these routes need not be pointed out. Why later writers should have laboured to solve such an impossible problem, it is hard to say, except that Homer brings the Argonauts into the Mediterranean (Od. xii. 70), and they may have thought themselves bound to follow him. Diodorus, however, takes them quickly home by the Euxine Sea.

The name of Minyans, which was given to the Argonauts, according to the mythologists, because most of them were descended from Minyas, son of Poseidon on the maternal side, has led Mr. Keightley (*Mythology*) to suggest that the expedition may have been in fact undertaken by the Minyans, an early race in Greece, probably a branch of the Æolian tribe, who inhabited the southern part of Thessaly, and whose port was Iolcos, and their dockyard Pagasæ, and who are conjectured to have been a wealthy and commercial race. (Müller's *Orchomenos;* and Buttmann's *Mythologus*, ap. Keightley.)

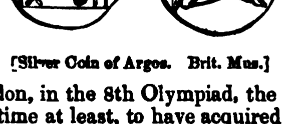
Mr. Keightley further suggests, that the voyage may in fact have been to the west, for the wool and gold of Spain, and that this explains the universal agreement of all writers in bringing the Argonauts home by the Mediterranean; while at the same time the commodities for which the voyage was undertaken might readily be mythologized into the legend of the golden fleece. We prefer, however, the simpler belief of Mitford and others, that the expedition was of a piratical nature, on a large scale; in which, according to the notions of honour of the age, a number of young men of the highest rank and spirit engaged under one celebrated leader. The notion of the expedition being a western one seems to be untenable: the bold attempt of exploring the Black Sea, with the mingled objects of plunder, curiosity, and traffic, appears to be a more natural story. (See Herod. i. 2.) As to the Argonauts being found in the western part of the Mediterranean on their return, this notion arose, as we have already intimated, from the ignorance of the later Greeks as to the true course and character of the great streams which enter the Euxine or Black Sea on the north. When the geographers of Strabo's time (Strabo, Casaub. p. 121.) could believe, in opposition to the earlier statement of Herodotus, that the Caspian lake was an inlet or bay of the ocean running southward into the land, we may easily conceive how the ignorance of a previous age connected the Euxine with the waters of the ocean. When the Euxine was explored, so as to leave no doubt of its true character, ignorance and credulity merely transferred the same hypothesis to the Caspian. The wanderings of Io, as given in the *Prometheus* of Æschylus, are a good sample of poetical geography, which may be compared with that of the Argonautic voyage.

Bryant, in his learned work on antient mythology, considers this expedition of the Argonauts as one of those corrupt traditions in which the recollection of the Deluge, and the preservation of mankind in the ark, was long maintained. Jason, therefore, he believes to be the arkite deity, and the name of Argo to be connected with and derived from the ark itself. The reader will find this question discussed with great research and ingenuity in his *Ancient Mythology;* but the author's prejudices in behalf of one favourite theory are so strong, that his arguments require to be examined with more than usual care.

ARGONNE, a woody district in France, on the frontier of the antient provinces of Lorraine and Champagne, and extending into each of them. It is now included in the departments of Meuse, Marne, and Ardennes. It is about sixty miles in length, with a very unequal breadth. It may be described as a vast forest, in the intervals and void spaces of which, towns and villages have been built. The inhabitants of these cultivate the lands in their neighbourhood; but the badness of the soil, and the quantity of deer, and animals of that kind (*bêtes fauves*), render tillage an unprofitable pursuit, and lead the inhabitants to attend rather to rearing stock. The cattle and the wood, which is so abundant, furnish the chief articles of trade. St. Menehould was the capital of this country, and among the other towns which are situated in it, are Clermont, Varennes, Beaumont, and Grandpré. Some of these take from the district a distinctive addition to their name, as Clermont-en-Argonne, Beaumont-en-Argonne, &c.; just as in England we have Henley-in-Arden, &c. [See Arden.]

Argonne was the great scene of operations in the Duke of Brunswick's invasion in 1792, when the enthusiasm of republican France enabled her new levies to triumph over the disciplined forces of Prussia and Austria, and expel them from her territory. (*Encyc. Méthod. Dictionnaire de la France.*)

ARGOS, called also Argi by Latin writers, the most antient city of the Peloponnesus, the chief city of Argolis, is situated on a level plain at the foot of a hill called Larissa, on which was its citadel and a temple of Jupiter, and on the banks of the rivulet Inachus, now Banitza. We admit the fact of its high antiquity, but we do not venture to decide whether its foundation took place B.C. 1857, as Eusebius affirms, or B.C. 1986, which is the opinion of Larcher. Its earliest known inhabitants were Pelasgi. In the remains of the Acropolis on the hill Larissa, we see traces of walls approaching to the massive Tirynthian style (see Tiryns), and others of the later polygonal kind, which is characterized by the absence of regular horizontal courses, and by the accurate fitting together of the stones. In the mythic age it was governed by kings, of whom Inachus was the first; or, according to other accounts, he was the river-god, and his son Phoroneus was the first king. (Paus. ii. 16.) Danaüs, from Egypt, afterwards founded a new dynasty by wresting the sovereign power from Gelanor, a descendant of Phoroneus. Herodotus, in his story of Io, whom he calls the daughter of Inachus (i. 1.), a story in itself of no historical value, states the general belief as to the importance of Argos at this remote period, and indicates that it was known to the enterprising merchants of Phœnicia. According to Homer, the city Argos belonged to the kingdom of Diomedes, and not to that of Agamemnon, who however seems to have enjoyed a kind of sovereign power over the whole peninsula.



[Silver Coin of Argos. Brit. Mus.]

Under Pheidon, in the 8th Olympiad, the power of Argos appears, for a time at least, to have acquired a considerable extension. [See Pheidon.]

In the more certain historical age, Argos appears under a republican form of government, and becomes first known to us when engaged in war with the Spartans respecting the territory of Thyrea. This war was contemporaneous with the capture of Sardes by Cyrus. (Herod. i. 82.) Before this epoch, the possessions of Argos had extended to Cape Malea, and included Cythera and other islands. At a later period, B.C. 493, there was another contest between Argos and Sparta, in which Argos was unsuccessful, and so many of the citizens fell in battle, that the slaves, or more probably the Periœci, found no difficulty in seizing the government, and are said to have retained it till the sons of their masters had grown up, when they were again expelled from the city. (Herodot. vi. 83.) It was probably on this account that the Argeians took no part in the Persian war B.C. 480, though many much less creditable reasons for their conduct were afloat in Greece at the time. It was, in fact, believed that they had been bribed by Xerxes; but Herodotus is evidently unwilling to credit the story. (vii. 148—152.) A few years afterwards, B.C. 468, we find them at war with the inhabitants of Mycenæ, who had refused to acknowledge the supremacy of Argos, and had been supported for many years in their independence by the Spartans. Mycenæ fell, and it never again rose from its ruins. (Diod. Sic. xi. 65.) [See Mycenæ.]

Though Argos remained neutral during the earlier part of the Peloponnesian war, her feelings were at all times opposed to the Spartans, and she at last took an active part with the Athenians. The defeat, however, of the Argeians at Mantinea, B.C. 418, dissolved the confederacy, of which she was the head, and Argos was compelled to accept an aristocratical constitution. (Thucyd. v. 65-81.) She subsequently shook off the yoke, and we find her assisting the Thebans at the battle of Mantinea, B.C. 362; but her history becomes gradually less important; nor is there any fact worthy of being noticed, till the unsuccessful attempt made by Pyrrhus, B.C. 272, to take the city. It joined the Achæan league, and continued to form a part of this confederacy till its final dissolution by the Romans. (Strabo, viii. 377.) The great deity of Argos was Hera (Juno), and it seems probable that a great catalogue of the priestesses had been preserved, which may have served as the basis of the work ascribed to Hellanicus on the succession of the priestesses. (See Herod. i. 31. Thucyd. ii. 2.)

Argos is still known by its antient name, and at the beginning of this century contained 1200 families. Part of the plain around is cultivated, and where the moisture is sufficient, cotton and vines are grown: in the marshy parts towards the sea, some rice. The plain of Argos does not abound in water, for which Pausanias assigns a mythological reason (ii. 15: but compare Strabo, p. 371.) A ruined castle, of lower Greek construction, which now occupies the summit of Larissa, still preserves some remains of the famed Acropolis of Argos. For a detailed account of its antient remains, see Leake's *Travels in the Morea*, London, 1830; and for its antient history, Mannert's *Geographie des Griechenlandes*, Leips. 1822. Pausan. ii. 19, &c.; Strabo, p. 368, &c.; Müller's *Dorians*.

ARGOS, in Amphilochia, a town near the S. E. angle of the gulf of Arta. Its ruins are supposed by some to be those at the bottom of the gulf of Karavasara. (See *Lond. Geog. Journal*, vol. iii. p. 85, and the article Arta.) This Argos was founded, according to tradition, by Amphilochus of the Peloponnesian Argos, after his return from the war of Troy. (Thucyd. ii. 68.)

ARGOSIE, a ship of great burthen, whether for merchandise or war. Shakspeare, in his *Merchant of Venice* (Act i. Scene 1) says—

> Your mind is tossing on the ocean,
> There where your *Argosies* with portly sail,
> Like signiors and rich burghers on the flood,
> Or as it were the pageants of the sea,
> Do over-peer the petty traffickers.'

It is mentioned in the same sense by Chapman, Drayton, Beaumont and Fletcher, and other writers. In Rycaut's *Maxims of Turkish Polity*, chap. xiv. it is said, 'Those vast carracks called *Argosies*, which are so famed for the vastness of their burthen and bulk, were corruptly so denominated from Ragosies,' *i. e.*, ships of Ragusa, a city and territory on the Gulf of Venice, then tributary to the Porte. We have no proof, however, that the Ragusan vessels were particularly large; and it seems more likely that the Argosie derived its name from the classical ship Argo. Indeed Shakspeare himself has hinted as much in the play just quoted, when he makes Gratiano, in allusion to Antonio's argosie, say (Act iii. Scene 2)—

> 'We are the Jasons; we have won the fleece.'

Sandys, in his Travels, p. 2, applies the term argosie to a ship of force. Describing the boldness of pirates in the Adriatic, he observes, that from the timorousness of others they 'gather such courage that a little frigot will often not fear to venture on an argosie.'

ARGO'STOLI. [See Cephalonia.]

ARGUIN, or ARGUIM, one of a cluster of small islands in a bay of the same name, about fifty miles to the S.E. of Cape Blanco, on the western coast of Africa. It is only about two miles long, and would be unworthy of notice were it not for the variety of masters to whom it has been subject, and the loss of life incurred there. It was discovered in 1444, by Nunez Tristaõ, and in 1461 a fort was erected for the protection of commerce, then consisting of gold and negroes, which were received in exchange for cloths, knives, glass-beads, bells, &c. The Portuguese remained in quiet possession till 1638, when they were driven out by the Dutch, who established a traffic with the Moors in gum Arabic, and claim the merit of being the first to introduce that article into Europe. The bay also abounded in stock-fish, which they cured with salt, obtained from the opposite shore and exported to Holland. In 1665, the fort was destroyed by an English squadron; but the Dutch, recapturing the island in the following year, strengthened it very much, entered into an alliance with the Moorish chiefs, and by giving a high price for the gums greatly injured the trade of the French Senegal Company. In consequence an expedition was sent, which drove the Dutch out, and the island was ceded to the French by the treaty of Nimeguen. It appears that in 1690 the French exported hence a thousand tons of gum Arabic, with many chests of ostrich and herons' feathers, and a quantity of ambergris. The Dutch, however, still carried on their trade in spite of the French company; but in 1725 they were finally driven away, and the gum trade gradually merging into the establishments on the Senegal, Arguin has been abandoned, and subsequently to the treaty of Versailles in 1763 the forts have been demolished.

The opposite coast of the main land is only a barren tract of sand; but the country inland is described as being fertile, yielding corn and fruit in abundance. The country of the gold-mines, called Darha, is fifty leagues in the interior. The anchorage was good, and the bay afforded plenty of turtle and fish.

Arguin has been supposed by Major Rennell to be the Cerne of Hanno; and Bougainville asserts that the cisterns found there are of Carthaginian construction. The largest of these cisterns (evidently an artificial work) is 96 feet long, 60 wide, and of considerable depth: it is situated about 400 yards from the ruins of the fort. There is plenty of fresh water on the island.

An extensive and dangerous shoal, called the Arguin Bank, stretches thirty leagues along the land in a S.S.E. direction, from off Cape Blanco to Cape Mirik; it is composed of hard sand with broken shells; a strong current sets along its edge to the southward. This was the scene of the melancholy wreck of the French frigate La Méduse. Arguin is in 20° 24′ N. lat., 16° 14′ W. long.

ARGUMENT, in astronomical tables, is the angle on which the tabulated quantity depends, and with which, therefore, in technical language, the table must be *entered*. If, for example, a table of the sun's declination were formed, corresponding to every degree, &c. of longitude, so that the longitude being known, the declination might be found opposite to it in the table, then the longitude would be made the *argument* of the declination.

ARGYLE, or ARGYLL, a shire in the west of Scotland, comprehending an extensive district on the main land, and several of the Hebrides, or Western Isles. The name is said to be derived from *Earra Ghaidheal*, the West Gaël's country. It is bounded on the N. by Inverness-shire; on the E. by Perth, Dumbarton, and Renfrew shires; from the last two it is separated by Loch* Long and the Firth of Clyde. On other sides it is washed by the sea; but the islands of Bute and Arran, which form the shire of Bute, lie close to it to the S.E. The line of the coast is very irregular. Deep indentations of the sea penetrate far inland. The principal of these, beginning from the N., are Loch Moidart and Loch Shiel (communicating with Loch Moidart by a narrow passage), which separate Argyleshire from Inverness-shire; Loch Sunart, which runs into the land in an eastern direction; Linnhe Loch, which runs nearly N.E., and the extremities of which are Loch Eil (which runs first N.E., and then W. by N. till it approaches Loch Sheil), and Loch Levin; Loch Creran and Loch Etive are inlets of Linnhe Loch, on the right as you enter. From Linnhe Loch, the coast runs in a direction about S. by W. for a distance of between 80 and 90 miles (broken successively by the Lochs Feochan, Melfort, Craignish, Crinan, Swin, Killisport, and West Tarbet), to the Moyle or Mull of Cantire. From this headland, the coast, after running eastward a short distance, returns N. by E. for about 35 miles to Skipnish Point, forming the long narrow peninsula of Cantire. From Skipnish, Loch Fine runs inland first N. by W., then N.E., and has a subordinate inlet; Loch Gilp, Lochs Riden and Straven also run N. by W., or N.; and the Firth of Clyde, with its terminating lochs, Long and Goyle, completes the circuit of the Argyleshire coast, the extent of which is estimated at more than 600 miles.

Authorities differ considerably as to the dimensions of Argyleshire: we give the following from measurement on the Map of Scotland published by the Society for diffusing Useful Knowledge.

Length from the northern extremity of the county in the territory of Locheil to the Mull of Cantire, 115 miles.

Length from the point of Airdnamurchan to the Mull of Cantire, 101 miles.

[Statement in Dr. Smith's Survey of the Agriculture, &c., of the County (1798), 115 miles.]

Breadth from the point of Airdnamurchan to the border of Perthshire, near the source of the river Urchay, 66 miles.

[The breadth is given by Dr. Smith at 68 miles.]

There is equal diversity of statement as to the superficial contents; Dr. Smith's calculation is as follows:—

	Sq. miles.
Mainland, exclusive of Cantire .	2475
Peninsula of Cantire . .	260
Islands	1063
	3798

But the Doctor gives this statement as conjectural, in the absence of good authority; and as he appears to have over-estimated the length and breadth of the county, it seems better to take the statement in the *Gen. Report of Scotland*, drawn up under the direction of Sir John Sinclair, Appendix, vol. i. pp. 49, 58 (1814):—

	Sq. miles.		Eng. acres.
Land on the main .	2200	or	1,408,000
Lakes . . .	60		——
Islands . . .	929	or	594,560
	3189	or	2,002,560,

more than one-tenth of the whole surface of Scotland and its islands.

Of the land, the quantity in cultivation is —

	Eng. acres,
On the main land . . .	163,970
Islands	107,020
	270,990,

about 13.5 parts in 100, or between one-seventh and one-eighth of the surface of the county; and between one-eighteenth and one-nineteenth of the cultivated land in Scotland.

The islands attached to Argyleshire are as follows. The length and breadth are given from measurement on the Society's map; the proportion of land in cultivation is from the *General Report of Scotland*; the population from the census of 1831:—

Canna: greatest length, 4½ miles, E.N.E. to W.S.W.; greatest breadth, 1 mile; proportion of land cultivated in Canna and its dependency, Sandy Island, 45 parts in 100; population, 264.

Rum: greatest length, 8 miles, N. to S.; greatest breadth, 7½ miles; proportion of land cultivated, 6 parts in 100; population, 134.

Rum is the most mountainous and rugged of all the Hebrides.

Muck, Muick, or Monk: greatest length, 2 miles, E. to W.; greatest breadth, 1½ mile; population, 155.

Muck contains good pasturage and excellent corn land. The above islands, with the isle of Eig or Egg, lying between Rum and Muck, but included in Inverness-shire, make up the parish of Small Isles, one of the most laborious ministerial charges in Scotland. The population here has been rapidly decreasing, as appears by the statement below:

	Population in		Diminution.
	1821.	1831.	
Canna . .	436	264	172
Rum . .	394	134	260
Muck . . .	321	155	166
	1151	553	598

Coll: greatest length, 12 miles N.E. to S.W.; greatest breadth, 3½ miles; proportion of land cultivated, about one-third; population, 1316.

Tirree, or Tir-y, or Tyree: greatest length, 13 miles N.E. to S.W.; greatest breadth, 6½ or 7 miles; proportion of land cultivated, 30 parts in 100; population, 4453. The dimensions of this island, which is not included in the So ciety's Map, are given from Langlands and Son's Map of Argyleshire, 1801.

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* Loch is a lake, and also an inlet of the sea.

Mull: greatest length, 29 miles, from Duart Castle, N.E., to the point opposite to Holmin Island, S.W.; greatest breadth, 28 miles; proportion of land cultivated, 8 parts in 100. The following islands are dependencies of Mull:—Gometray: greatest length, 2 miles, E. to W.; greatest breadth, 1½ mile. Ulva: greatest length, 5 miles, E. to W.; greatest breadth, 1½ mile. Staffa: dimensions under a mile. I-colm-kill, or Iona, antiently called Sodor: greatest length, 3½ miles, N.E. to S.W.; greatest breadth, 1 mile; all arable or good pasturage: and several smaller islands. Population of Mull and its dependencies 10,538.

Lismore: greatest length, 10½ miles, N.E. to S.W.; greatest breadth, 1½ mile; one-half cultivated, very fertile; population, 1790.

The Islands of Lorn: 35 parts in 100 cultivated; the population cannot be given, as it is included in that of the parishes on the main land to which they belong.

Kerrera, or Kervera: greatest length, 4½ miles, N. by E. to S. by W.; greatest breadth, 2 miles.

Seil: greatest length, 4 miles, N. by E. to S. by W.; greatest breadth, 2 miles.

Easdale, or Eysdill: dimensions under a mile: famous for its slate quarries.

Luing: greatest length, 7 miles, N. to S.; greatest breadth, 1½ mile.

Shuna: greatest length, 2½ miles, N. to S.; greatest breadth, 1 mile *.

Lunga: dimensions about or under a mile.

Scarba: greatest length, 3 miles, N.E. to S.W.; greatest breadth, 2½ miles.

Jura: greatest length, 25 miles, N.N.E. to S.S.W.; greatest breadth, 8 miles; proportion of land cultivated, 7 parts in 100; population, 1312.

Colonsa and Oronsa: greatest length, 10 miles, N.N.E. to S.S.W.; greatest breadth, 3 miles; proportion of land cultivated, two-fifths; population, 893.

These are counted as one island, and their united dimensions given, as the channel between them is dry at low water.

Isla or Ilay: greatest length, 26 miles, N. by E. to S. by W.; greatest breadth, 21 miles; one-fourth cultivated or in woods or pastures; population, 14,992.

Gigha: greatest length, 5 miles, N.E. to S.W.; greatest breadth, 2 miles; proportion of land in cultivation, 30 parts in 100; population, 534

Sanda (a small island near the southern point, or Mull of Cantire): greatest length, nearly 2 miles N.E. to S.W.; greatest breadth, about a mile.

Several of these islands deserve further notice for their magnitude, productions, or other circumstances. [See IONA, ISLA, JURA, MULL, and STAFFA.]

The population of the islands, as given above, amounts to 35,065: that of the whole shire, at the same period, amounted to 101,400, leaving 66,335 for the main land.

Argyle is mountainous; and presents an appearance more pleasing to the lover of the picturesque than to the agriculturist. The barrenness of the soil and the want of cultivation are shown by the scanty population, which amounts only to about 32 for every square mile of land in the shire, or 1 for every 2½ acres under cultivation.

The northern and eastern parts, where it borders on the Grampians, are the most rugged: along the coast the ground is in general lower and more level, yet particular mountains near the sea rise to a great height, and are indeed among the loftiest in the shire. We subjoin a table of the principal:—

		Feet.
Cruachan Ben, between Loch Etive and Loch Awe		3669
Benmore, in the Isle of Mull		3168
Cruach Lussa, to the E. of Loch Swin	(S)	3000
Beden na bean, or Bedan ambran, N. of the termination of Lake Etive	(L)	2720
Paps of Jura, on the Isle of Jura		2580
Buchael Etive, or Buachaille, N.E. of the extremity of Loch Etive	(L)	2537
Ben na hua, on the N. side of Linnhe Loch		2515
Ben Ima, Ben Arthur, or the Cobler, at the extremity of Loch Long	(S)	2389
Ben More, in Rum		2310
Ben ea Tan, S. of Loch Sunart		2306
Slia Gaoil, between Loch Killisport and Loch Fyne	(S)	2228
Crock Moy, in Cantire	(L)	2036
Oreval, in the Isle of Rum		1800
Ben Tuirck, in Cantire		1515
Ben Varn, in Isla		1500
Isle of Scarba		1500
Ben Ronastill, in Isla		1050
Isle of Canna		810
Ben Tartevil, in Isla		762
Cliffs near the Mull of Oe, in Isla		750
Isle of Muck		600
Ben Oe, in Isla		546
Isle of Sanda, near Mull of Cantire		300

The above, where they have no distinctive mark, are from the *Map of Scotland* published by the Society for diffusing Useful Knowledge: those marked (S) are from the Appendix to the *General Report of Scotland*, drawn up under the direction of Sir John Sinclair (1814); and those marked (L) from a table of heights given with Langlands' *Map of Argyleshire* (1801).

The chief rivers in the county are, the Urchay, which rises in the Grampians and flows into Loch Awe, an inland lake lying in a direction nearly parallel to Loch Fyne; and the Awe, which serves to connect Loch Awe with Loch Etive, and through it with the sea. The basin of these streams is estimated at 250 square miles. Streams of smaller importance are numerous, as the nature of the country would lead us to expect. There are no large inland lakes except Loch Awe just mentioned, which is about 24 miles long from N.E. to S.W., and from half a mile to two miles and a half broad. It is thickly studded with small green islets, and surrounded with picturesque scenery of woods and mountains.

Argyleshire is divided into six districts: 1. Mull, including the island of that name, and its dependent isles, with Canna, Rum, Muck, Coll, Tiree, and Airdnamurchan, Sunart, Ardgower and Morvern, N.W. of the Linnhe Loch, which separates these divisions from the rest of Argyleshire: 2. Lorn, a large division, comprehending the subordinate districts of Appin, Benederaloch, and Muchairn; with Glen Urchay or Glenorchy, Glen Etive, and Glen Co; the island of Lismore and those grouped together, as the islands of Lorn: 3. Argyle proper, or Inverary; separated from Lorn by Loch Melfort, Loch Avich (which is united by a channel with Loch Awe), and Loch Awe, and by a line drawn S.E. from the last mentioned lake to the eastern frontier of the county: 4. Cowal, including the district S.E. of Loch Fyne: 5. Cantire or Kintyre (including Killislate), a long peninsula, formed by Loch Killisport, the ocean, the Sound of Kilbrannan (which is the strait between the Isle of Arran and the mainland), and Loch Fyne; the Island of Gigha is joined to and forms part of Cantire: 6. Isla or Ilay, including the islands of Isla, Jura, Colonsa, and Oronsa, with a small part of the continent between Argyle and Cantire. Knapdale is divided between districts 5 and 6.

With respect to the geology of Argyleshire, granite forms the principal constituent of the mountain masses which stretch from the river Awe, N.E. into Perth and Inverness shires; it also extends along the N.W. shore of the Linnhe Loch in the districts of Morvern and Sunart. Mica-slate predominates in nearly every other part of the mainland, together with the islands of Isla, Jura, Colonsa, Oronsa, Coll, Tiree, and the south part of Mull. It constitutes the mass of the Grampians (which form the E. border of the county) and of the mountains of Cantire. Floetz trap prevails in Canna, Rum, and the north side of Mull; in some districts, of no great extent, along the coast of Airdnamurchan and Morvern; and in the neighbourhood of Campbeltown in Cantire. A small extent in the last mentioned neighbourhood is occupied by the coal formation and the rocks connected with it, being perhaps part of the great coal-field of Scotland, and serving as a link between that and the coal formation of the North of Ireland. The columnar basalt will be noticed under the head of STAFFA.

The minerals which are turned to economical purposes are numerous. There are lead-mines in several places, as at Strontian near the extremity of Loch Sunart; at Tyndrum on the border of Argyle and Perth shires, and in the islands Isla and Coll. Copper was obtained from a mine in Kilmartin in the district of Argyle, but the mine is no longer worked. A vein is, however, worked in the island of Isla. Coal is obtained in the neighbourhood of Campbeltown. There are seams of coal also in Mull, but not sufficient to defray the expense of working them: peat is the common fuel, except at Inverary and Campbeltown, and at gentlemen's houses on the coast. The slate-quarries of Easdale island have been among the most considerable in Britain; and there are quarries at Balaclulish or Balahulish in Appin in Lorn. In the Appendix to the *General Report of Scotland* (1814), the yearly produce of the quarries in Easdale and the other islands of Argyleshire is stated at 5,000,000 slates; and the produce of those at Balaclulish and other parts of the mainland of the same county, at 3,000,000. Marble is procured in several places, of various quality and colour: among the most beautiful specimens is that of the island of Tirree, which is very hard, and takes a good polish. Limestone is abundant in most parts of the county. The granite quarried near Inverary takes as fine a polish as marble; and the *lapis ollaris* (a kind of micaceous slate), with which the Duke of Argyle's castle at that place is built, is one of the handsomest of the building-stones found within the borders. The earth strontian takes its name from the place so called near Loch Sunart, where it was found and first analysed. In Glenorchy in Lorn, specimens of cobalt are found; and the coasts of Cantire towards the south end, and of the isle of Colonsa, abound with coral.

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* There is another Shuna off this coast, N.E. of Lismore, and a Shona in Loch Moidart, between Argyle and Inverness shires.

Argyleshire has a very variable and moist climate, but from its situation on the coast, and from the numerous inlets of the sea by which it is so deeply indented, the temperature is mild. Frost seldom continues long on the sea-coast, and snow rarely lies more than two or three days at a time. Mildew, blight, and hoar-frost seldom do much injury to the husbandman. The north-eastern parts, bordering on the Grampians, have a colder climate; though even there the valleys, sheltered by the surrounding heights, are neither so cold nor so uncomfortable as might be expected.

The farmers of this county direct their attention chiefly to the breeding of stock and the feeding of sheep, for which the rough and mountainous character of the surface is better adapted than for tillage. There is, indeed, a considerable quantity of arable and improveable ground in the vales interspersed among the mountains, and along the margin of the streams which wind through them, but the chief proportion of arable land is on the coast. The soil varies materially: by the rivers and by the sea there is a light loam, mixed with sand or gravel, on a clay or gravelly bottom, while on the sides of the hills there is a light gravelly soil. Sometimes the soil of the lower grounds has a mixture of clay, and sometimes of moss. The pasture grounds differ much, and the difference is manifested by the produce; in one place there is sweet fine grass; in another, coarse grass and rushes. Moss and marshes occupy a part of the flat grounds; and heath covers a large portion both of the hills and flats. The tops of the highest hills are usually quite barren.

The farmers (with the exception of the tacksmen, a kind of intermediate class between the land-owners and the great body of the farmers), owing to the small size of their farms, the short terms of their leases, and their want of capital, are in a dependent and even depressed state. They excel in rearing live stock, and in the knowledge of the diseases of their cattle; but are regarded as deficient in general industry and skill, wedded to old customs, and unwilling and unable to promote improvements. The principal kinds of grain raised are oats, and bear or big, a species of barley much used in distilling. Wheat and rye are cultivated in Cantire, though to a small extent. Peas and beans are grown, but not to any large amount; and flax is raised for family use. Potatoes are cultivated extensively, and serve as a staple article of food for a considerable part of the population. Turnips, cabbages, kail, and the artificial grasses, are little attended to, except in Cantire, and there not to any considerable extent. As late as the commencement of the present century, the old custom of ploughing with four horses abreast, the driver walking before them backwards, was kept up in many parts; but as it was then yielding to improved methods, it is probably now nearly or quite done away. The rotation of crops is not well understood; grain crops are raised with little interruption, on the same ground, till it is exhausted. (Smith's *General View of the Agriculture of Argyle*, 1798.) Although there is a considerable extent of meadow-land, the quantity of hay made is not great. It is usually cut in August; the artificial grasses in July. The bear harvest begins in general in the middle of August, and is followed by the harvests of oats (middle of September), beans, peas, and potatoes, in succession. The inhabitants, even the poorest, have usually gardens attached to their houses, but they are neither well cultivated, nor is their produce much varied. The general food of the people is oatmeal and potatoes. Of oatmeal a considerable quantity is imported.

The extent of wood land in Argyleshire has been very differently estimated. Dr. Smith (*General View of the Agriculture of Argyle*) gives 30,000 acres for the natural woods: and the plantations of the Duke of Argyle and others are estimated at about 4000 more; to which 2000 acres may be added for the wood of the islands. The scarcity of wood is severely felt in many places. In former ages a great part of the country was covered with it.

The cattle of this district constitute one of the chief articles of export. They are of the west Highland breed, and are reared for the southern market, where they are preferred to almost any others. Being of small size, and of hardy constitution, they can bear to be driven to distant markets, which is an important consideration. Their milk is rich, but small in quantity. In Cantire, the dairy is the chief object of attention; and both butter and cheese are made beyond the wants of the district. The sheep occupy, in many places, the high grounds, where they have been substituted with great advantage for black cattle. They are chiefly of the Linton or black-faced kind, having in a great measure driven out the small white-faced breed, which is supposed to have been the earliest introduced into Scotland, and which many have thought capable of being so far improved as to become a very suitable stock. The horses are of various, but on the whole of inferior, breeds. Since the introduction of sheep, less attention has been paid to rearing them. Swine were formerly few in number, the Highlanders having a prejudice against them; but they are increasing. Goats are few; poultry and pigeons not numerous. In the islands, black cattle are reared more than sheep. From Isla horses are exported to Ireland.

Wild animals are numerous in the rugged districts to the N.E. Roes and red deer are abundant in several parts; also grouse, ptarmagans, and black cocks. The eagle occupies the bare rugged summit of the rocks. Rabbits and a few hares are found in some of the islands.

The manufactures of this county are unimportant. The woollen manufacture was established at Inverary, and carried on for many years under the patronage of the Duke of Argyle, but it does not seem to have flourished, and has been given up for some time. The cotton manufacture has gained but little ground; whatever is carried on is about Campbeltown. A more important branch of industry is the herring, cod, and ling fishery, though these might be prosecuted with greater diligence and spirit. In the years 1829-30, at the two stations, Inverary and Campbeltown, 266 vessels and 798 men were engaged in this branch of industry, besides various workmen as curers, coopers, labourers, &c., who made up the total number of 1220. The quantity of fish on the coast and around the islands is very great, and the herrings of Loch Fyne are well known. The salmon of Loch Awe are remarkably good, and the trout perhaps unrivalled, being of all sizes, up to 20 lbs. weight. The quantity of kelp made on the coast and on the islands was considerable; but the reduction of the duty on foreign barilla has much diminished the demand for it.

Large sums of public money have been applied to making roads in this county, together with other sums raised by county assessments. The main road from the Lowlands enters the county by Glencro and Cairndhu, at the head of Loch Fyne; that from Perthshire, by Dalmally, near the N.E. end of Loch Awe; and that from the north Highlands crosses Loch Leven at Balaclulish, or Balahulish ferry, and Loch Eil at Carron ferry. Two canals, the Caledonian Canal (running through the great valley of Scotland from Murray Frith to Linnhe Loch), and the Crinan Canal (from Loch Crinan to Loch Fyne), belong to Argyleshire; the former partially and in a small degree, the latter entirely; but the traffic on these canals, though much increased by the introduction of steam-navigation, is not commensurate with the outlay. Nothing, however, has given a greater impulse to agriculture and industry in Argyleshire than the extension of steam-navigation of late years. By means of it, the most distant parts of the county are brought into communication with one another, and with Glasgow, to which they can now send their stock and produce, with the certainty of finding a good market.

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Argyleshire contains few towns. Inverary, on Loch Fyne, in Argyle proper (population in 1831, 1117), is the county town, and a royal burgh; Campbeltown, in Cantire (population 4869), is also a royal burgh. [See INVERARY and CAMPBELTOWN.] Oban, perhaps the next place in importance, is on the coast of Lorn, nearly opposite the island of Kerrera. There are no weekly markets in the shire; but eighteen fairs for the sale of horses, cows, coarse cloths, yarn, &c. are held during the year at various places (Smith's *Survey*, &c.) The population of the whole county was, in 1831, 101,400, as already stated. It has increased in the last twenty years, notwithstanding the partial depopulation from the consolidation of smaller holdings into large sheep farms.

The county returns one member to the House of Commons; and the burghs of Inverary, Oban, and Campbeltown, unite with Ayr and Irvine (Ayrshire) to return another.

The chief landed proprietor is the Duke of Argyle, whose domains and influence were formerly such that he could bring 3000 to 4000 men into the field; and the name of Campbell, that of the ducal family, is by far the most prevalent. The marquises of Tweeddale and Breadalbane have also property in the county. The latter is a branch of the Campbell family.

The population returns of 1831 contain the names of fifty parishes in the mainland and isles, but we have no information of the number of benefices. The great extent of some of the parishes has led to the erection of new churches and manses (parsonage houses) by the 'commissioners for building churches in the Highlands of Scotland.' Eleven churches have been built, all except one, with a manse; and three manses erected where churches were previously in existence, or have been built by private individuals. Of these eleven churches, six are in the islands of Mull, Isla, Ulva, and Iona. Argyle gives name to a synod, which has jurisdiction over all the parishes of the county, except one, and over the shire of Bute. In the territory thus subject to the synod there were, in 1811, five presbyteries, and thirty-nine ecclesiastical parishes, with forty-one clergymen: but the number of the latter is now of course much increased. There are some catholics in the islands.

Argyleshire contains many antiquities. The ecclesiastical ruins in Iona will be mentioned in our notice of that island. There are in Oronsa the remains of a Cistertian priory, one of the finest religious antiquities of the Hebrides, after those of Iona. Of antient castles, may be mentioned Dunstaffnage, at the entrance of Loch Etive, a square building in a ruinous state, with round towers at three of the corners, having an old chapel of elegant workmanship near it; Ardterinish or Ardtornish, on the sound of Mull; Skipnish in Cantire, Kilchurn at the east end of Loch Awe, and others; Inverary castle will be mentioned in the article INVERARY. There are in different places of the coast old 'Duns' or Danish forts. Druidical circles, more or less complete, and cairns, are to be seen in different parts. Of natural curiosities, besides Staffa with its basaltic columns and cave [see STAFFA], may be noticed some singular caverns in the parishes of Loch-Goyle-head and Strachur, both in Cowal.

After undergoing a variety of political changes, we find, in the middle ages, the territory of Argyle subject to thanes, powerful and in fact independent. The lordship of Argyle, with Mull and the islands north of it, were subject to the M'Dougals of Lorn; Isla, Cantire, and the southern islands to the M'Donalds, known by the style of 'Lords of the Isles,' or 'Earls of Ross.' The nominal allegiance of these last to the kings of Scotland was unsteady; but their power was broken in the reign of James III., towards the latter part of the fifteenth century. The acquisition of Lorn by the Stuart family, by marriage, and the erection of the earldom of Argyle in favour of the Campbells of Loch Awe, weakened their sway still further, and produced the diminution, and at last the annihilation of it. In 1614 the M'Donalds rose in insurrection to oppose the grant of Cantire to the Earl of Argyle and his relations, but the power of the Campbells prevailed. In 1748 all heritable jurisdictions were abolished by act of parliament, and civilization has subsequently made great advances.

The Gaelic language still predominates in Argyle; but in Inverary, though in the Highlands, English is as much spoken as Gaelic. (Smith's *General View of the Agriculture of Argyle*, 1798; *General Report of Scotland*, drawn up under the direction of Sir John Sinclair, 1814; *Parliamentary Papers*; Pennant's *Tour in Scotland*, 1774; and *Voyage to the Hebrides*.)

ARGYLE, a subdivision of the county so called. [See ARGYLE, SHIRE OF.]

ARGYLE, DUKES AND MARQUIS OF. [See CAMPBELL.]

ARGYRO (or **ARGHIRO**) **CASTRO**, an important town in the inland part of Albania, in European Turkey. It is in the fertile valley or district of Deropul, a name which appears to be sometimes applied to the town itself, and to the river which waters the valley.

Argyro Castro is built upon the declivity of the mountains which enclose the valley on the south-west side, and is not far from the river already mentioned, to which it gives name, and which is a branch of the Vouissa, or Bojiessa. [See ALBANIA.] Several deep ravines approach each other at this spot, and the houses crown the summits of the steep and narrow ridges which separate them. Upon three of these ridges the greatest part of the town is placed. The central ridge is surmounted by the castle built by Ali Pasha, which is of great extent, and, with reference to Turkish warfare, strong. The included area of the castle, owing to the form of the ridge on which it stands, is very long and narrow, and the walls, though thick, were built in too great haste. The ground on which it stands is high and steep, but appears to be commanded by some of the neighbouring heights on which parts of the town are situated. Ali erected a seraglio, or palace, within this castle, and there are also a mosque, barracks for 5000 troops, and subterranean magazines of ammunition and provisions. Water is brought to the town generally, and also to the castle, a distance of six miles, by an aqueduct.

The situation of the town renders the streets so steep, that horsemen must dismount in order to proceed with safety, but it gives an air of magnificence to the place, which is increased by the size of some of the Turkish houses. The sides of the chasms, or ravines, are lined with houses intermingled with trees, shrubs, and gardens; but the mountain torrents, which, after the melting of the snows, sweep through these ravines, sometimes occasion fearful devastation.

The houses were estimated, when Dr. Holland visited the town in 1813, at 4000, and the inhabitants at 20,000; which agrees with the estimate of Sir John Hobhouse, who travelled in the country, though he did not visit the town itself, about three years and a half before. Mr. Hughes, who visited Argyro Castro about the same time as Dr. Holland, says, the inhabitants were computed at about 15,000. The trade of the town, which, before its reduction by Ali Pasha, was the principal depôt for the internal commerce of the district, appears to have been considerable. M. Balbi states the population very vaguely at 4000 to 9000

The distance of this town from Joannina is computed at fifty miles by Dr. Holland, and by Mr. Hughes at twenty hours' journey N. W. Mr. Hughes states, that it is not on the site of the antient town, which had successively the names of Phanote, Hadrianopolis *, or Justinianopolis.

Previous to the winter of 1811-1812, Argyro Castro appears to have enjoyed a considerable degree of independence. The chief power had been divided, as in many towns in Albania, among the principal families. Ali Pasha attacked it in vain, till the time above mentioned. About that period, he contrived to inveigle away the bravest and most warlike of the inhabitants, and seized many of the merchants who were scattered about the country. The chiefs of this and some neighbouring parts assembled their forces to oppose him, but were defeated near Delvino, another Albanian town some miles to the south. Argyro Castro soon afterwards surrendered, and Ali built the fortress noticed above. When he was attacked by the forces of the Grand Seignior, this strong hold was given up to the Turks by his son Mouctar, who deserted him in his hour of need.

Most of the people of Argyro Castro are Turks or Albanians, who profess the Mohammedan religion. The number of Greek families is very small: they have a bishop, and are remarkable for their courtesy and agreeable manner to strangers. (Hobhouse's, Holland's, and Hughes's *Travels*; Leake's *Researches in Greece*.)

A'RIA, the name of a province of the antient Persian empire. It formed part of the country of Ariana, or Iran, and bordered in the north upon the Tapuri, Margiana, and Bactriana, in the east upon the Paropamisadæ, and in the south and west upon Drangiana, Karmania, and Parthia. Its situation corresponds to that of the modern Sejestan and the southern part of Khorasan. Strabo (xi. c. 10) calls Aria and Margiana the best provinces of this part of the earth. They are, he says, watered by the rivers Arios and Margos. The former of these, called also Arias, Areios, or Arrianos, is described by Arrian (iv. c. 6) as a river not less than the Peneios of Thessalia, yet losing itself in the ground. This account answers to the present Heri-Rud. The Margos is supposed to be the modern Murgh-ab.

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* From this name Derópul seems to be a derivation. See Leake's *Researches*.

The remark of Strabo, that Aria is 2000 stadia in length and 300 in breadth, can be understood only as applying to the principal part of the province, probably the valley of the river Arius, which seems to have been early celebrated for its fertility.

Herodotus does not mention the country of Aria, but he enumerates the Arii (Ἄρειοι) as constituting, together with the Parthi, the Chorasmii, and the Sogdi, the sixteenth of the twenty satrapies into which Darius divided the Persian empire. (Herod. iii. c. 93.) The antient name of the Medi was Arii (Ἄριοι). (Herod. vii. 62.) Lassen (*Indische Bibliothek*, vol. iii. p. 71) supposes the name of the Arii to be etymologically identical with the word *Ârya*, by which the followers of the Brahmanic religion are designated in Sanscrit.

The importance of Aria, and the advantages which its situation affords to commerce, could not be attested by higher authority than that of Alexander the Great, who here founded a town, named Alexandria Ariôn (Alexandria of the Arii). The situation of this town it is difficult to determine, in consequence of the discrepant statements concerning it found in antient authors. Ptolemy (*Geogr.* vi. 17) places Alexandria near the lake Arius, and conformably to this information D'Anville fixed its position at a place now named Corra, on the western side of the lake Zerrah. Pliny (*Hist. Nat.* vi. 23) says, that Alexandria Ariôn was washed by the river Arius; and if we take this Arius to be the present Heri-Rud, the position of Alexandria will answer that of the present Herat. Besides the popular belief now prevalent in the East, which is in favour of this opinion, it is also supported by Eratosthenes' statement of the distance of Alexandria Ariôn from Baktra = 3870 stadia, and from the Caspiæ Pylæ = 6400 stadia (Strabo, xi. c. 8), which it would be impossible to reconcile with the assumption that Alexandria was near the lake Zerrah. (See St. Croix, *Examen Critique des Historiens d'Alexandre*, p. 822, &c.) Mannert, who takes the river Arius to be the present Ferrah-Rud, supposes the present village of Pulki, at the south-eastern turn of the river Hirmend, to answer the situation of Alexandria.

The capital of the Arii, at the time of the Macedonian conquest, was Arctoana: thus the name is written in the best (the Florentine) MS. of Arrian; others have Artacoana; Mannert prefers Artacauan, or Artacabane, from Pliny and Isidor. It must have been situated considerably to the north, as Alexander was able to reach it within two days from his march against Baktra (Arrian, iii. 25). Ptolemy places it at no great distance from Alexandria; and Mannert, assuming the southern position of the latter town, seems inclined to think that the extensive ruins of an antient town, discovered by Christie, at Dushak, near the river Hirmend, are those of Arctoana. [See ARIANA.]

A'RIA, in music (Ital. *air*). [See AIR.]

ARIA'NA is the general appellation given by antient authors, subsequent to the age of Alexander the Great, to the eastern portion of those countries which form the highland of Persia. According to Eratosthenes (quoted by Strabo, p. 723, Casaub.: tom. iii. p. 310, edit. Tauchn.), Ariana was bounded on the north by the Paropamisus mountains and their western continuation as far as the Caspiæ Pylæ; on the south by the Great Sea (the Indian Ocean); on the east by the river Indus, and on the west by the chain of hills which separate Parthyene from Media, and Karmania from Paraitakene and Persis. Its shape is by Strabo (l. c., p. 304, 305) compared to that of a parallelogram, the dimensions of which, reckoned from the mouths of the Indus to the Paropamisus, he estimates at 12,000 or 13,000 stadia; and in a straight line from the upper Indus to the Caspiæ Pylæ, on the authority of Erastosthenes, at 14,000 stadia (Strabo, i. c. 4, tom. i. p. 101, edit. Tauchn.); the length of the southern sea-coast from the mouths of the Indus to the entrance of the Persian Gulf is stated at 12,900 stadia (Strabo, xv. c. 2, tom. iii. p. 305). The total of the distances on a road from the Caspiæ Pylæ by way of Hekatompylos, Alexandria in Aria, Prophthasia, Arachoti (the town), and Ortospana, to the confines of India, is in one passage of Strabo (xi. c. 8, tom. ii. p. 434, 435) reported, on the authority of Eratosthenes, to be 15,500 stadia, in another passage (xv. c. 2, tom. iii. p. 310), on the same authority, only 15,300: the latter appears more correct, as it approaches nearer to the sum of the single distances enumerated which amounts to no more than 15,210 stadia.

Strabo observes (p. 724: t. iii. p. 311), that the name Ariana is sometimes used so as to extend beyond the limits above assigned to it, and to comprehend part of the Persæ and Medi, and, towards the north, part of the Bactrii and Sogdiani; 'for these,' says he, 'have very nearly the same language (as that spoken in Ariana.)'

The countries properly belonging to Ariana are, according to Strabo, in the east, the Paropamisadæ, the Arachoti, and Gedroseni along the Indus, proceeding from north to south; the Drangæ towards the west of the Arachoti and Gedroseni; the Arii towards the west of the Paropamisadæ, but extending considerably to the west and south, so as nearly to encompass the Drangæ; the Parthyæi west of the Arii, towards the Caspiæ Pylæ; and Karmania to the south of the Parthyæi. It is observed by Mannert, *Geographie der Griechen und Römer*, vol. v. part ii. p. 3, 4, that antient authors sometimes confound Ariana with Aria, saying of the province what can only be understood as applying to the entire country.

The original form of the name Ariana in the Zend or antient Persian language is *Airyâne*. From this seems to be derived the modern Persian name Iran, by which oriental writers designate the country between the Tigris, the Persian Gulf, the Oxus or Gihon, and the Indus. M. Eugène Burnouf (*Commentaire sur le Yaçna*, vol. i. notes, p. 62) thinks that, in some passages of the Zend-Avesta, the word *Airya*, properly the name of the province Aria, must be taken as synonymous with *Airyâne* or Ariana. He observes that the countries not belonging to Airyâne are, in the Zend-Avesta, called *Anairyâo Danhâvô* (pronounce Danghâvô) *i.e.* Non-Arian provinces: a name regularly formed from *Airya* by means of the prefixed negative *a* (*an*), which is also used in Greek and Sanscrit. An expression of analogous form and import had long since been read by De Sacy (*Mémoires sur diverses Antiquités de la Perse*, p. 54, &c.) in one of the Greek inscriptions of Nakshi Rustam copied by Niebuhr, where the Sassanide king, Sapor, son of Ardeshir, is called the king of the Arians and Non-Arians (ΑΡΙΑΝΩΝ ΚΑΙ ΑΝΑΡΙΑΝΩΝ).

ARIA'NO, a town in the province of Principato Ultra in the kingdom of Naples, and a bishop's see. It is situated on a very steep hill on the main road from Naples to Puglia, and in the highest point of the pass leading over the Apennine ridge into the plains of the latter country. From Ariano the road descends rapidly, following the course of the Cervaro, here a mountain stream, which flows eastwards, and enters the flats of Puglia a little beyond Ponte di Bovino. Ariano is forty-four miles E.N.E. of Naples, and thirty-two miles S.W. of the town of Foggia, in 41° 8′ N. lat. and 15° 1′ E. long. The road distance from Naples to Foggia, through Ariano, is about ninety English miles. It was built by the Greek governors of Apulia under the lower empire, as well as the neighbouring town of Troja, and was reckoned important during the subsequent vicissitudes of the country on account of its situation, which enabled it to command the pass from the eastern into the western provinces. It was made a feudal county by the Normans. Ruggiero I., king of Sicily and Duke of Apulia, held at Ariano a parliament of the barons of the kingdom in 1140, in which he fixed the new coin of the realm. Ariano had a castle, which was considered strong in those times, and was repeatedly taken and retaken during the wars of the Norman, Suabian, Angevin, and Aragonese dynasties. In the reign of Joanna II. the famous Sforza Attendolo bore the title of Count of Ariano. The fief subsequently reverted to the crown, and Ariano became a royal town. It has long since declined from its former importance. It has suffered greatly from earthquakes, especially from that of 1732. Its population in the last century amounted to 14,000, but is now under 10,000. A recent visiter informs us that the population now can hardly exceed 7000.

Close to Ariano, and between that town and the head of the valley of Bovino, there is a village occupied by an Albanian colony, a remarkably handsome race. They retain the use of their own language among themselves, but they can also speak that of the country. (Vitale, *Storia della Città d'Ariano.*)

ARIANS, a name applied in common to all who entertain opinions concerning the relation between Jesus Christ and the Father similar to those entertained by Arius, although they have not always derived their notions from him. According to the second oration of Athanasius against the Arians (§ 24), Eusebius of Nicomedia, Asterius, and Arius, agreed in the following opinion: God being willing to create the universe, and seeing that it could not be subject to the working of his almighty hand, made first a single being whom he called Son, or Logos, to be a link between God and the world, by whom the whole universe was created. (Compare Athanas. *c. Arian.* i. § 5.) The Arians formed a more exalted idea of Christ than the Socinians and the modern Neologians, or Rationalists, in Germany. According to the Rationalists, Jesus was a sort of Socrates among the Jews, and Socrates was a Grecian Jesus. But the Arians did not deny that Christ, in the New Testament, was called God, and they ascribed to him a sort of divine dignity; but asserted that he had this dignity, not by his own essence, but merely by the grace of God the Father. (Athanas. *Orat. c. Arian.* i. § 6.) The Arians fully admitted the incomprehensibility of God, and that Christians ought to pay divine worship to Jesus Christ. This they proved from Christ's saying, 'That all men should honour the Son, even as they honour the Father. He that honoureth not the Son, honoureth not the Father who hath sent him.' (St. John, v. 23.) Hence the Arians were accused by Athanasius of idolatry, because, according to their own notions, they offered to a creature that tribute which belonged to the Creator alone. The Arians distinguished the Logos in God from the Logos improperly so called.

These were the characteristic doctrines of the strict Arians. But in the western part of the Roman empire, all adversaries of the doctrine of Athanasius, that the Son was *homoousios*, or of the *same* essence with the Father, were called Arians; although some of these opponents taught a doctrine which had already been propagated in the school of Origen, namely, that the Son was *homoiousios*, or of *similar* essence. These, afterwards called semi-Arians, were first compelled, by the opposition of the Homoousiasts, to join the Arians, but, owing to the persecutions which they suffered from the strict Arians (who asserted the Son to be *ἀνόμοιος κατ' οὐσίαν, dissimilar in essence*), they were driven back into the orthodox church. The party of Aëtius, and of his pupil, Eunomius, went a step farther than Arius, by asserting the comprehensibility of the divine essence, and by considering the *precision of doctrine* (*δογμάτων ἀκρίβεια*) of chief importance in Christianity. The Antiochene church, under the Arian bishop Eudoxius, afforded an asylum to the ultra-Arian followers of Eunomius. The difference between Arians and semi-Arians became more evident from these extreme opinions, and contributed to the gradual assimilation of the latter to the orthodox church. This assimilation was easily effected, because the semi-Arians had constantly used an orthodox phraseology, which was taken by the people in an orthodox sense.. According to Hilarius Pictaviensis *contra Aurentium* (§ 6), the ears of the people were holier than the hearts of their priests. At Constantinople, however, a dogmatizing spirit pervaded all ranks of society. Of this we have a graphic description in the *Oratio de Deitate Filii et Spiritus Sancti*, by Gregorius of Nyssa (Opp. t. iii. p. 466). 'The town is full of those who dogmatize concerning incomprehensible matters,—they are in the streets and markets, among the clothiers, money-changers, and victuallers. If you ask any one how much you have to pay, they dogmatize about being begotten and not being begotten. If you ask the price of bread, the reply is, "The Father is greater than the Son, and the Son is subordinate to the Father." If you ask, "Is the bath ready?" the answer is, "The Son is created from nothing." (Compare Neander's *Kirchengeschichte*, b. ii. pp. 767-904.) [See ARIUS, ATHANASIUS, EUNOMIUS, GREGORIUS of Nazianzus, GREGORIUS of Nyssa, BASILIUS.]

ARIARA'THES. [See CAPPADOCIA.]

A'RIAS MONTA'NUS (BENEDICTUS), in Spanish BENITO ARIAS MONTANO, was a celebrated catholic divine and orientalist, who possessed vast erudition in Jewish antiquities, and chiefly distinguished himself as editor and interpreter of the sacred Scriptures. He was born, in 1527, of noble, but poor parents, in a village called Frexenal de la Sierra; which is situated in the province of Estremadura, near the Andalusian border, in a mountainous district; and hence his surname Montano. He also used to style himself Hispalensis, because at Sevilla (Hispalis) he laid the foundation of his future eminence as a scholar. During his stay at Sevilla he was supported by the magistrates of the city and other kind patrons: subsequently he took up his residence at Alcala de Henares (Complutum), and there obtained the degree of Doctor of Divinity. He specially devoted himself to the study of Scripture in the original languages, and in general to that circle of philosophy which is connected with these tongues. He acquired a knowledge of the Arabic, the Syriac, and the Chaldaic, which, for that age, was truly surprising: at a later period, while journeying through France, England, Italy, Germany, and the Netherlands, he acquired the knowledge of several modern tongues. He himself, as well as several of his contemporaries, seems to have considered it a wonderful accomplishment, as no doubt it was in that age, to know ten languages. On account of his great scholarship, the bishop of Segovia, Martin Perez Ayala, took him for his companion to the Council of Trent, where he had his share in some of the most important transactions. After his return to his own country he determined to live in seclusion and devote his time to literature, and for this purpose chose a small place in the mountains of Andalusia, near Aracena, as his residence. But he made no long stay in this retreat, being invited by Philip II. to superintend the splendid and expensive edition of the *Polyglott Bible*, which, at the suggestion of a most diligent and enlightened printer, Christopher Plantin, was to be executed at Antwerp. Arias accordingly set out for Antwerp, in 1568, provided with the most honourable recommendations to the governor of the Netherlands, the Duke Ferdinand of Alba, so disadvantageously known for his cruelty and tyrannical administration. Arias devoted four years to this undertaking, and had the pleasure of presenting the finished work to Pope Gregory XIII. in 1572. During his sojourn in the Netherlands, he was also president of the committee, which, by the Duke of Alba's order, prepared the *Index Expurgatorius*. The edition of the Polyglott Bible which Arias gave to the world, in every respect justified the high expectation which had been formed of it; but in an unfortunate voyage from the Netherlands to Spain nearly all the copies were lost. The king, however, remunerated Arias's labours very splendidly, giving him a yearly pension of two thousand ducats, besides other honorary rewards and lucrative offices. Arias was an upright, sincerely orthodox catholic, but he was a declared enemy of the Jesuits, and that ambitious order omitted no opportunity to take revenge on so dangerous a foe—the more powerful, because his orthodoxy had never been questioned, and was supported by uncommon erudition. His *Antwerp Polyglott* had received the approbation and praise of the pope, and even that of the most eminent catholic universities; yet because he had edited the Chaldaic paraphrase in the Polyglott, and expressed certain opinions in his commentaries, he was accused of a leaning towards Judaism, and, in fact, of heresy in general. He was even in danger of falling into the hands of the Inquisition, and was obliged several times to go to Rome in order to defend himself. Having cleared himself of these accusations, he devoted the remaining years of his life to literature, sometimes residing at Sevilla, sometimes at Aracena; he died at Sevilla, in the year 1598, as prior of the convent of St. Iago, being then seventy-one years of age. His library, which was extensive, was incorporated in that of the Escurial, where, Schröckh says, some of his MSS. are still to be found. In respect to moral character, he enjoyed a high reputation for candour and blameless integrity.

Among Arias's numerous and extensive literary works, which chiefly belong to theological, but partly also to classical literature, his Polyglott certainly holds the principal place: it is generally called the *Antwerp Polyglott*, or, from the patronage bestowed on it by Philip II., *Biblia Regia* (the Royal Bible), and sometimes also after the printer, *Biblia Plantiniana:* a fuller notice respecting this great work, in eight folio volumes, will be found in the articles BIBLE and POLYGLOTTS.

Of Arias's other works the following are the most remarkable:

1. *Antiquitates Judaicæ.* Lugd. Batav., 1593, quarto.
2. *Liber Generationis et Regenerationis Adam, s. de His-*

toria Generis Humani, operis magni pars prima, i.e. *Anima*. Antv., 1573, quarto. This is only a part of a Biblical Encyclopædia which Arias intended to write: another part of this work appeared after his death under the following title: 3. *Naturæ Historia, prima in magni operis corpore pars, Benedicto Aria Montano Descriptore*. Antv., 1601, quarto. 4. *Hymni et Sæcula*. Antv., 1593, 16mo. (being a translation of the Psalms of David and the Ecclesiastes). 5. *Monumenta Humanæ Salutis*. Antv., 1571, quarto. 6. *Speculum Vitæ et Passionis Christi*. Antv., 1573, octavo. 7. *David, Virtutis Exercitatissimæ probatum a Deo Spectaculum*. Francof., 1597, quarto. 8. *Dictatum Christianum, sive Aureus de Christi Vita et Doctrina Libellus*. Antv., 1775, octavo. 9. *Aforismos sacados de la Historia de P. Cornelio Tacito*, i. e. *Aphorisms collected from Tacitus's History*. Barcelona, 1614, octavo.

He wrote, about the year 1569, an hexameter poem on rhetoric in four books; and he also edited the *Tour of the Jew Benjamin of Tudela*.

Sources for the biography of Arias Montanus are:

Nicolas Antonio, *Bibliotheca Hispana*, tom. i. p. 162—164. Niceron, *Mémoires*, &c., *à l'Histoire des Hommes illustres*, tom. xxviii., p. 104—118. J. Matth. Schröckh's *Lebensbeschreibungen berühmter Gelehrten*, one volume, p. 291—304 in the Leips. edit. of 1790;—and Moreri's *Dictionary*, article *Arias*, where the Spanish translation of this great work is, as might be expected in the biography of a Spaniard, preferable to the French original.

ARI'CA, a district in the department of Arequipa, and the republic of Peru. The valley, which extends about eighteen miles from the coast into the lower chain of the Andes, is irrigated by a small stream of good clear water, about half a mile on each side of which the soil is fertile and the aspect verdant, but beyond this, as far as the eye can reach, is a complete desert of sand to the foot of the mountains, except a small space around the town. The valley is famous for Guinea pepper, which is principally cultivated with manure of 'guano,' or cormorants' dung, a singular but considerable branch of commerce, ten or twelve small vessels being employed in collecting it from the small islands along the coast. Cotton, olives, and castor-oil are produced; fruit and vegetables are plentiful, and oxen and sheep may be procured; *aguardiente* (spirits) and a small white wine are manufactured, and rock salt is dug out of the adjacent mountains. The people of the valley are subject to a sort of ague called *terteaga*, and the district is generally unhealthy; the heat is excessive by day, but the nights are very chilly.

Close to the beach, in a small bay formed by a projecting bluff, stands the town of Arica, once flourishing and populous; it was sacked by Sir Francis Drake in 1579, and, in common with other places in Peru, has suffered much from earthquakes, more particularly in November, 1608. It appears, however, successfully to have resisted the attacks of the Buccaneers, who twice attempted to reduce it. During the war of independence it was entirely desolated. It now consists of a few huts, the better sort built of sun-dried bricks, and plastered with mud, but mostly formed of canes or reeds set upright and bound together; these being only covered in with matting, the place appears at a little distance to be a heap of ruins. There is a custom-house, a convent of Franciscan friars, also one of the order of San Juan de Dios, and a parish church dedicated to St. Mark. The population does not exceed 400, the greater part of whom are Indians. The town is defended by two small forts of six guns each, and garrisoned by about fifty soldiers; it belongs to the see of Arequipa.

The bay is small, and safe, principally from the rare occurrence of storms; ships lie close to the shore in deep water; it is exposed to southerly and westerly winds, which seldom blow strong; but in winter time the north winds are violent. In the summer time the land and sea-breezes are very regular. There are no regular tides, but a rise and fall of about three feet, occasioned by the winds. The surf rolls so heavy on the beach, that ships' boats cannot land, and the only means of shipping or landing cargoes is on a *balsa*, a float formed of two inflated seals' skins fastened together, and in this manner bars of silver, bags of gold and silver, and all goods, are conveyed to vessels in the bay.

Arica is the sea-port of Tacna, distant thirty miles to the N.N.E.; most of the silver from the mines of Potosi was formerly shipped off hence to Lima, and much bullion is still exported.

Near the small bay of Chacota, south of Arica, a number of sepulchres of the antient Peruvian inhabitants have been discovered, whence the bodies have been dug in a very perfect state, but almost reduced to skeletons, covered with a tough, dark, brown skin. Latitude of the town 18° 28¼′ S., longitude 70° 13¼′ W. Distant 185 leagues S.E. of Lima. (Basil Hall; *Orig. MS.* of Captain Bauza, Spanish navy.)

ARIES (constellation), the Ram, is the first constellation of the antient zodiac. The sign of the zodiac, so called, including the first thirty degrees of the ecliptic, reckoning from the vernal equinox, owing to the precession of the equinoxes, now begins in the constellation Pisces.

The Greek mythology makes Aries to be the commemoration of the golden fleece, in quest of which the Argonautic expedition was undertaken. [See ARGONAUTS.] Owing to the difficulty of separating any account of discussions relating to the origin of this constellation in particular, from the general description of the ZODIAC, we refer to the latter term for further mythological elucidation.

This constellation is surrounded by Cetus, Taurus, Perseus, Andromeda, and Pisces, the first of which is directly below it. In the horns are two stars, α and β, the only two of any note, which are near together, and may be found by continuing the line drawn from Procyon through Aldebaran; or, by continuing the line drawn through the pole star, and ι Cassiopeiæ, the nearest to the Great Bear of the five. These stars (α and β Arietis) are on the meridian at midnight in the middle of October.

The principal stars are as follows. As before, a number without brackets is that of Flamsteed; in ( ) that of Piazzi; in [ ] that of Bradley.

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi, Bradley.	Astron. Society.			Flamsteed, Piazzi, Bradley.	Astron. Society.			Flamsteed, Piazzi, Bradley.	Astron. Society.	
	4	192	6·7	α	35	287	4	τ¹	61	362	6
γ	5	199	4·5		36	290	7		62	364	6
β	6	201	3	o	37	291	6·7	τ²	63	367	7
	7	202	6		38	292	5·6	g	64	369	5·6
ι	8	205	6	b	39	298	4		65	370	6
λ	9	207	5·6		40	301	6		66	376	6·7
κ	12	225	6	c	41	304	3		(85)	251	6
α	13	227	3	π	42	302	5		(96)	257	6·7
	14	229	5·6	σ	43	307	6		(112)	264	6·7
	15	231	6	ρ²	45	313	6		(128)	271	6·7
η	17	235	6	ρ³	46	314	6		(155)	284	7
	19	236	7		47	317	6		(179)	193	6
θ¹	22	239	6	ε	48	319	5		(203)	312	7
ξ¹	24	249	6		49	326	6		(215)	315	6·7
	26	258	6·7		51	328	7		(222)	211	6
ψ	27	259	6	h	52	338	6·7		(240)	221	7
ω	29	262	6·7		53	342	6	A	(243)	222	6
	30	270	6		54	344	6·7		(261)	345	7
υ	31	272	6	i	56	351	6		[284]	226	6
ν	32	276	5·6	δ	57	348	4		[414]	318	7
	33	277	6	ζ	58	354	5		[444]	346	6·7
μ	34	283	6		59	358	6·7				

ARIES, in antient military science, is the Latin name for the BATTERING RAM.

ARIET'TA, in music (the diminutive of the Italian word *aria*), a short air.

ARILLUS, in botany, is a fleshy expansion either of the umbilical cord by which seeds are attached to the placenta, or of the placenta itself. It is never formed till after the fertilization of the seed, and is only met with in a few plants; its use is entirely unknown. The most remarkable instance of the arillus among species of common occurrence is in the spindle tree, *Euonymus Europæus*, in which it is the fleshy red covering of the seed that renders that plant so ornamental in the autumn and beginning of winter. Another familiar case is the *mace* of the nutmeg; this substance is, when fresh, a crimson lacerated covering of the nut, which acquires its pale brown colour in consequence of the preparation it undergoes in being dried and prepared for market. Before the term was thus accurately defined, it was applied to a variety of parts of exceedingly different natures.

ARIMA'NES and AREIMA'NIOS are Greek corruptions of the Persian name Ahriman or Aheriman, which, according to the antient doctrine of Zoroaster, is the appellation of the author of evil, and the opponent of Ormuzd, who is the author of good. The genuine form of the word, as it occurs in the original text of the Zend-Avesta, is Anro-Mainyus (pronounce Angro-Mainyus), a compound term, the meaning of which might be expressed by perhaps an etymological equivalent in the Greek *ἀγριομενής*, 'hostile, of evil disposition.' The Zend original of the word Ormuzd is Ahuro-Mazdâo, coming near the forms Oromazes and Oromasdes, under which the name occurs in Greek authors (*e.g.*, Plutarch, *de Iside et Osir.* p. 660. ed. Steph.) In the Sanscrit paraphrase of a portion of the Zend-Avesta by Neriosengh, the name Ahuro-Mazdâo is interpreted 'the king of great wisdom.' This interpretation is adopted by M. Eugène Burnouf, *Commentaire sur le Yaçna*, vol. i. p. 72, &c.

The two individual beings Ormuzd and Ahriman were, according to the Zend-Avesta, the offspring of Zeruane-Akerene, the indefinite and impersonal divine substance and cause of all existence. Both were primarily equal in intellect and power; but Ormuzd was, from the beginning, pure, good, and luminous; while Ahriman was dark and wicked, and bent on destruction and mischief. Ormuzd is represented as the creator of the world: Ahriman constantly counteracts the designs of his goodness. Ormuzd created the six Amshaspands, or ministering angels of good: Ahriman, in opposition, created the six Darujs to be subservient to his evil purposes. 'I produced,' says Ormuzd, 'a place of delight, Airyâne-Vaejo, fairer than the entire existing world. I acted first; then this evil one acted, whose soul is not mortal. The first place similar to paradise which I made, I who am Ormuzd, was Airyâne-Vaejo, created pure. Then this Paityare-Ahriman, full of death, produced in the river (which watered that country) the great snake of winter,' &c. (Anquetil du Perron's *Zend-Avesta*, vol. i. part 2, page 263, &c.) Thus Ormuzd is always taking the lead by pure and good productions, and Ahriman follows, sowing the seeds of natural and moral evil in the new creations. The struggle of the two deities will, according to the doctrine of Zoroaster, continue during 12,000 years, after the lapse of which Ormuzd will defeat his opponent. Ahriman himself will then become a convert to truth and goodness, and a new world, happier and better than the present, will be created.

We abstain from entering into further detail concerning the dogma of the contest between Ormuzd and Ahriman, as the original documents in the Zend language, from which alone authentic information on the subject can be derived, have but just begun to be critically examined, and much is still wanted to a full understanding of them. The translation by Anquetil du Perron, though of invaluable service to those who wish to follow up the inquiry, has been found too loose, and in some instances too incorrect to allow inferences on many subtle points of the antient Persian faith to be drawn from it.

The Persian doctrine of the two opposite principles was known to Aristotle, who, according to Diogenes Laertius (*De Vit. Philos. Procem.* 2), distinguished them as *ἀγαθὸς δαίμων* and *κακὸς δαίμων*.

The most antient foreign authors that have given some interesting details regarding the doctrine of Zoroaster are the Armenian chroniclers of the fifth century, especially Elisæus and Esnac. See Elisæus's *History of Vartan*, &c., translated by C. F. Neumann, London, 1830, 4to., and an extract from the Chronicle of Esnac, in the appendix to P. Aucher's *Grammar, Armenian and English*, Venice, 1819, 8vo. p. 198, &c.

ARINS (or **ARINNES**), are the remains of a Siberian people who inhabit the banks of the Yenïsei. They have been reduced to their present limited numbers by the successive cruelties of the Tartars, by consequent emigration to the regions inhabited by the Kirgishes, and by intermarriage with the Catchin-Tartars and Otiaks. They reside in an *aimak* or single district, under the superintendence of a *bachlik* or elder, by whom the tribute, fixed by the Russian government in 1733, is regularly paid. When Müller, the traveller, visited the spot, he found but one single individual amongst them who was capable of speaking the native dialect, which has some affinity to the Otiak; the rest of his brethren had adopted the Catchin-Tartar tongue.

ARIOBARZA'NES. [See CAPPADOCIA.]

ARI'ON, a native of Lesbos, the inventor of the dithyrambus, and a great musician, was contemporary with Periander of Corinth, and with Alyattes, king of Lydia (B.C. 628—571). He travelled as far as Taras (Taranto) in Southern Italy, and acquired considerable wealth by his professional skill. (See his history, Herod. i. 23; and also Ælian. *Hist. Anim.* xii. 45.)

ARIO'SO, in music (an Italian adjective, *airy*), used adverbially—*in the manner of an air*, as contradistinguished from recitative. When applied to instrumental music, it denotes a sustained, a vocal style. It is sometimes most improperly used substantively, and may be mentioned among the numerous instances of the misapplication of Italian words by English and German musicians.

ARIOSTO, LODOVICO, was born at Reggio, near Modena, September 8, 1474. He was the son of Nicolò Ariosto of Ferrara, a military officer in the service of Duke Hercules I. d'Este, and governor of the citadel of Reggio; his mother, Daria Malaguzzi, was of a noble family of Reggio. Lodovico was the eldest born of a family of five brothers and five sisters. He early showed a disposition for poetry, and wrote in his boyhood a drama on the subject of Pyramus and Thisbe, which he and his brothers rehearsed before their parents. Lodovico, being designed for the profession of the law, was sent to Padua, where he spent five years, much against his will, in the study of that science; and his father, at last convinced of his distaste for this pursuit, recalled him home and allowed him to follow his own inclination. Lodovico was then past twenty, and being yet but little acquainted with the antient writers, he put himself under the tuition of Gregorio da Spoleti, a learned scholar of the time, by whose assistance he made great progress in Latin. He was proceeding to study Greek when his teacher was called away to Milan to be preceptor to the young Duke Sforza. Ariosto, however, studied Greek later in life. On the death of his father, about the year 1500, he found himself charged with the guardianship of his younger brothers and sisters, and the management of a very moderate patrimony—a task which he entered on with brotherly affection, and which he fulfilled with integrity. In the midst of these cares he found time to write several lyric compositions, both in Italian and in Latin, by which he attracted the notice of Cardinal Ippolito d'Este, younger son of Hercules I., and brother to Alfonso, the heir to the ducal crown. The cardinal, in 1503, appointed Ariosto one of the gentlemen of his retinue, and soon discovering that his abilities were not confined to poetry, he employed him in important affairs and missions both for himself and for his brother Alfonso, after the latter became Duke of Ferrara, by the death of his father in 1505. Alfonso having joined, in 1509, the famous league of Cambray against the Venetian republic, Cardinal Ippolito took the command of his brother's troops, and Ariosto was present at the campaign of that year on the banks of the lower Po, the atrocities of which, perpetrated chiefly by the Sclavonian mercenaries in the service of Venice, he feelingly describes at the beginning of the thirty-sixth canto of his great poem. In December of the same year, he was sent by the duke on a mission to Rome to request the assistance of Julius II. against the Venetians, but the pope, who had been the first mover in the league, had already changed his mind and become jealous of his French and German allies. Cardinal Ippolito, however, in the meantime defeated the Venetians and destroyed their flotilla on the Po, and the object of Ariosto's mission of course ceased.

[From a bronze Italian medal in the British Museum.]

The following year, 1510, Pope Julius, having openly joined the Venetians against his former allies, excommunicated the Duke of Ferrara for refusing to follow his example, and assembled an army in the Romagna to attack Alfonso's territories. Ariosto was now sent again to deprecate the wrath of the pontiff; but not succeeding, he was obliged to make a hasty escape from Rome, as the pope had threatened to have him thrown into the Tiber, a threat which he was not unlikely to have carried into effect. The war continued, between the Duke of Ferrara and the French on one side, and the Venetians, the pope, and the Swiss on the other, till the death of Julius, in the beginning of 1513, delivered Alfonso from his bitterest enemy. Cardinal Giovanni de' Medici being raised to the pontifical throne, by the name of Leo X., Ariosto went to Rome, to congratulate the new pope, whom he had familiarly known at Florence and at Urbino. Leo received him most graciously. 'He stooped from his pontifical chair, took him by the hand, and saluted him on both cheeks' (Ariosto, *Satira* iv). Ariosto thought his fortune made; but he had not enough of courtly patience and perseverance. He soon grew tired of waiting for more substantial demonstrations of favour, left Rome in disgust, and returned to Ferrara to resume his studies. He had long before this begun a poem, in *ottava rima*, on the fabulous adventures of the knights and paladins, Moors and Christians, of Charlemagne's age, an inexhaustible theme, which had occupied the pens of many Spanish, French, and Italian ballad and romance writers.

In Italy, Pulci, Bojardo, and Bello had each written a poem on the wars between Charlemagne and the Saracens, which tradition had confounded with the previous wars of Charles Martel and Pepin, and in which Orlando, or Roland, appeared as a prominent character, and the champion of the Christians. Bojardo took Orlando for the hero of his poem, and made him fall in love with Angelica, an infidel princess, of exquisite beauty and of consummate coquetry, who had come all the way from Asia for the purpose of sowing dissension among the Christian knights. Bojardo introduced numerous episodes into his narrative, in the midst of which he broke off the story of Angelica, in the fiftieth canto of his *Orlando Innamorato*, and never resumed it, although he had carried his poem to the sixty-ninth canto at the time of his death. Ariosto took up the thread of Angelica's story where Bojardo had left it, and making the jilt fall in love herself with Medoro, an obscure youthful squire, he represents Orlando as driven mad by jealousy and indignation: he continues in this state during the greater part of the poem, committing a thousand absurdities, until he is restored to reason by Astolfo, who brings back his wits in a phial from the moon. Orlando's madness, however, is rather terrific and lamentable than ludicrous; for the poet, often jovial and humorous in his episodes, never loses sight of the dignity of his narrative, nor descends to the low burlesque. But the madness of Orlando is not the principal subject of the poem, although it has furnished the name for it; the war between Charlemagne and the Saracens is continued throughout the narrative, of which it forms a most important and consecutive action, ending with the expulsion of the Moors from France, and the subsequent death of their king Agramante and their other chiefs. The poet has interwoven with these a third subject, which some critics, who are determined to find a unity of action in a poem which is not an epic, have assumed to be the principal one, namely, the loves of Ruggiero, a young Saracen knight born of Christian parents, and Bradamante, a Christian amazon, and Rinaldo's sister. These two characters had been already introduced by Bojardo in his *Innamorato*, and Ariosto followed up the story of their mutual attachment; after numerous adventures, crosses, and narrow escapes, he makes them marry in the last or forty-sixth canto of the poem, and from their union he derives the genealogy of the house of Este.

Intermixed with these three subjects or tales are numerous and some long episodes of knights and damsels, of their fights and loves, of their strange adventures, some heroic, some ludicrous, and others pathetic; there are magicians and giants, enchanted palaces and gardens, flying horses and harpies, and other monsters; and the reader finds himself in the midst of a new world, created as it were by the wand of an enchanter. The poet has the art of sketching and particularizing every creature of his fancy with features and attributes so apparently appropriate and consistent with their supposed nature as to remove the feeling of their improbability. He appears himself deeply interested in his fantastic creation, and at times so entangled in his own labyrinth, that he loses himself, as he ingenuously confesses, and is obliged to break off in the midst of a most interesting story, to run after some other personages, whom he left in a desert island, or on a dangerous voyage, or on the eve of a mortal combat, and to bring them again to the view of his readers. Yet he contrives to wind off all his threads at last with admirable skill. It is not always an easy thing to follow such a guide; but we wander along from tale to tale, from description to description, delighted with the present, and unconscious of the ultimate object of our journey. Such is the *Orlando Furioso* (as far as an idea of it can be given in a few words), the first of all the poems of chivalry and romance. A knowledge of Bojardo's *Innamorato* is, however, required for the proper understanding of the *Furioso*. In both poems there are licentious passages, which render them unfit for the perusal of youth.

Ariosto, after spending ten years in writing his poem, published it in one volume quarto, at Ferrara, in April, 1516, in forty cantos, which he afterwards increased to forty-six. He sold 100 copies of it to the bookseller Gigli of Ferrara, for 28 scudi; about 15 pence per copy. He dedicated it to Cardinal Ippolito, who, after perusing it, is said to have asked 'where he had picked up so many absurdities?' Whether this be true or not, it is certain that Ariosto gained no favour with his patron by his work, in which he had introduced his praises and those of his family in so many places. But the Cardinal had no taste for poetry; he was a busy man of the world, and he told Ariosto that 'he would have felt better satisfied if, instead of praising him in idle verse, he had been more assiduous in his service.' (Ariosto, *Satira* ii.)

In 1517, the Cardinal, being about to set off for Gran in Hungary, of which he was archbishop, asked Ariosto to follow him there, but the poet excused himself on the plea of his health, which was very delicate. His brother Alessandro, however, accompanied the Cardinal. The consequence of Ariosto's refusal was, that his patron was offended, and some time after his departure a small pension which he had allowed him was stopped. After the Cardinal's death, in 1520, Ariosto was called by the Duke Alfonso to his own service, in which he always experienced the kindest treatment. It ought to be observed, in justice to Cardinal d'Este, that, although he showed no sympathy for the poetical merits of Ariosto, it was he, nevertheless, who first patronised and brought him into notice, and introduced him to his brother, to the Medici, and other great men of his time; and that, had it not been for Cardinal Ippolito, Ariosto probably would not have had the leisure, the spirit, or the means of writing and printing his poem, at a time when the patronage of the great was a necessary encouragement to an author. The trifling pension of twenty-five scudi every four months, which Ariosto mentions as being stopped, was not the only remuneration which he had from the Cardinal: through his interest he enjoyed certain ecclesiastical perquisites, such as one-third of the profits of the archiepiscopal chancelry of Milan (about 100 scudi yearly), although he was not ordained priest nor even subdeacon, but had only taken the minor orders which are not attended by binding vows, and wore the clerical dress. (Ariosto, *Satira* ii. and iii., and also Mazzuchelli, *Scrittori d'Italia*, Biography of Ariosto.) Ariosto had also the reversion of the rectorship of Sant' Agata, in Romagna, the incumbent, an old maternal relative, having made it over to him. We ought not to judge of Ariosto's permanent feelings towards his patrons from the fits of poetical querulousness in which he occasionally indulges in his satires, for in the very midst of them we can perceive much grateful regard and affection for both the Cardinal and the Duke. The Duke indeed, by Ariosto's own acknowledgment, behaved liberally to him. Through his munificence the poet was enabled to build himself a house surrounded by a pleasant garden, opposite the church of S. Benedetto, at Ferrara. In February, 1521, Ariosto published a second edition of his poems with many corrections, but still in forty cantos only; this edition is now extremely rare, even more so than the first.

In 1522, having applied to the Duke for some more active and lucrative employment, he was sent as governor to the mountain district of Garfagnana, a dependency of Modena, situated on the western slope of the Apennines, and bordering upon Lucca. This country had just returned to the allegiance of the House of Este, after having been occupied by the Pope and the Florentines. The people were restless and quarrelsome, and the mountains were infested with outlaws. Ariosto humorously describes the troubles of his government in his fifth Satire. He remained nearly three years at Castelnuovo, the chief town of the district, during which he seems to have conciliated the minds of that rude population, and to have restored order among them. Being once stopped in the mountains by a band of robbers, his name and reputation proved his protection; the outlaws, on learning who he was, showed him much respect, and offered to escort him wherever he chose. In 1523 the Duke proposed to send him as ambassador to Clement VII., who had just been elected Pope; but Ariosto declined the mission, having been disappointed with Rome and the Medici once before (*Satira* vii). In 1524, he returned from his government to Ferrara, where it appears he remained ever after, nominally in the Duke's service, but enjoying leisure for his studies. He now wrote his comedies, which were performed with great splendour before the court, in a theatre which the Duke built for the purpose. In October, 1532, Ariosto, after correcting and revising his poem for sixteen years, published the third edition in forty-six cantos, which, in spite of some misprints of which Ariosto bitterly complains, remains the legitimate text of the Orlando Furioso. The six entire cantos which he added, are the 33rd, 37th, 39th, 42nd, 44th, and 45th, besides several stanzas here and there added to the other cantos. Some stanzas he wrote in twenty different ways before he fixed upon the present text. The apparent ease of Ariosto's verse is the result of much labour. Scarcely had Ariosto completed his third edition, when he found himself grievously ill with a painful internal complaint, which brought on a decline, and at last, death. It was remarked, that on the night preceding the last day of the year, on which his illness first assumed a serious character, a fire broke out in a wing of the ducal palace, and burnt the great hall and the theatre which had been constructed for the performance of his plays. After lingering several months, Ariosto died on the 6th of June, 1533, in his 59th year. He was buried without any pomp in the old church of San Benedetto, attended by the monks, who volunteered to do honour to his remains. Forty years later, after the church had been rebuilt, Agostino Mosti, of Ferrara, who had studied in his youth under Ariosto, raised a handsome monument to him in the chapel, which is to the right of the great altar, to which spot the poet's bones were transferred with great solemnity. In 1612, Lodovico Ariosto, grand nephew of the poet, raised another monument to his memory more magnificent than the first, in the other chapel to the left of the great altar, to which place Ariosto's remains were finally removed.

Besides the three Ferrara editions above-mentioned, printed under Ariosto's superintendence, several reprints of his poem were published in various parts of Italy in his lifetime. Numerous editions followed after his death; all, however, more or less incorrect, and some of them purposely altered and mutilated. The Aldine edition, of 1545, is one of the best of that age; it is also the first that contains five additional cantos, which are the beginning of a new poem, and were left in MSS. by the author, and delivered by his son Virginio to Antonio Manuzio. G. A. Barotti edited all Ariosto's works, Venice, 1766, six volumes, duodecimo, with many corrections and illustrations, and a life of the poet. Baskerville's edition, 1773, four volumes, octavo, with plates by Bartolozzi, is also much esteemed. The edition of the *Classici Italiani*, five volumes octavo, Milano, 1812-14, is valuable for the *varianti* added to every canto, which the editor Reina has taken from the first two editions of 1516 and 1521. But the best modern edition of the Orlando Furioso is that of Milan, 1818, in quarto, in which the learned editor Morali has faithfully restored the original text of 1532. The Orlando Furioso has been translated into most European languages, though seldom successfully. Of the English translations, that by Harrington is spirited and much superior to Hoole's, but the recent one by Mr. S. Rose is considered the best, and is generally faithful.

Ariosto is considered one of the best Italian satirists. The tone of his satires resembles that of Horace rather than that of Juvenal. He introduces several of the principal occurrences of his life, and exhibits the manners and vices of his time and country. He speaks of popes, princes, and cardinals, with great freedom, but in language generally, though not always, decorous. His satires, seven in number, and addressed to his brothers and other friends, were first published in 1534, after his death, and have been often reprinted, both separately and with the rest of his works. He wrote five comedies in blank verse, *La Cassaria*, *I Suppositi*, *La Lena*, *Il Negromante*, and *La Scolastica*. Cardinal Bibbiena, Ariosto, and Machiavelli, all three contemporaries, were the first writers of regular comedy in Italy. They adopted the manner of Plautus and Terence; they preserved the unities, and made their plots turn chiefly upon the intrigues and stratagems practised by dissipated and needy young men, assisted by worthless domestics, to deceive an old miser, a jealous husband or father, or a watchful guardian of some good-natured beauty. The language is often grossly indecent, and yet these plays were performed before the court and chivalry of those times. There are some other minor works of Ariosto, consisting of *canzoni*, *capitoli in terza rima*, sonnets, and a curious eclogue which has long remained inedited: it was composed in 1506, on the occasion of a conspiracy being discovered against the life of Duke Alfonso by his two brothers Ferrante and Giulio. There are also some short Latin poems on various subjects, and an epithalamium on Alfonso's marriage with the famous Lucrezia Borgia. They are all found in the Venice editions of Ariosto's works of 1741 and 1766, edited by Barotti.

Ariosto left two natural sons, Virginio, whom he had legitimated by public act in 1530, and who afterwards became a canon of the cathedral of Ferrara; and Giovanbattista, who was made a captain in the Duke's service. The number of commentators, critics, and biographers of Ariosto, is very great; some of the best have been mentioned in the course of this article. Baruffaldi junior has also written a life of Ariosto; Ferrara, 1807.

ARISH, or EL ARISH, a small town on a slight eminence about half a mile from the shore of the Mediterranean, and on the usual road from Egypt to Syria, 31° 5′ N. lat.; 33° 48′ E. long. There are some wells near it, and some clumps of palm-trees between the town and the sea. Thevenot (*Voyage de Levant*, p. 360) describes the castle, in his time, as being well built of small stones; and he says there were so many fine antient columns at Arish, that the inhabitants made their coffee-houses and their wells of them, and the cemeteries also were filled with such remains. There are still some Roman ruins, and several marble columns at Arish. (Mangles and Irby.) Arish is the site of the antient Rhinocolura, which was often considered a kind of frontier town between Egypt and Syria; and, in connexion with Petra in the interior, was an entrepôt of some importance (Strabo, 781). It stands on a small inlet of the sea, and near a scanty stream of water. The French took possession of it in February, 1799, in their expedition to Egypt, and kept it for some time.

It was at Arish that Sir Sydney Smith concluded a convention with the French army, allowing them to return to France with their baggage and arms, which was subsequently disavowed by the British government.

ARISTÆNETUS, a Greek writer, a native of Nicæa, whose epoch is not capable of being accurately determined. It has been conjectured that the Aristænetus to whom are attributed the Erotic or Love Letters (Ἐπιστολαὶ ἐρωτικαὶ) is the person to whom several of the letters of Libanius are addressed, and who lost his life in the earthquake at Nicomelia, A.D. 358: some are inclined to place him at a later epoch.

These Letters, of which there are two books, are a species of rhetorical exercise, and not real letters; they often exhibit very bad taste, but are of some value as presenting a picture of the manners, or at least of the literature, of the age. The latest and best edition is by Boissonade, Paris, 1822, 8vo. There is a German translation of Aristænetus by Herel, Altenburg, 1778, 8vo.: there are also several French translations.

ARISTEAS. [See SEPTUAGINT.]

ARISTARCHUS of Samos, an astronomer, lived about the same time as Archimedes, and some say survived him, though this is not likely. Archimedes died B.C. 212, but there is an observation of the solstices made by Aristarchus, and preserved by Ptolemy, of the date B.C. 280. (See Ptol. *Syntax*, iii. c. 2, tom. i. p. 163, ed. Halma.) Some accounts (in modern books) place him much earlier, but these are necessarily incorrect. In Plutarch's treatise *On the Appearances in the Moon's Disc*, it is said that Cleanthes, the successor of Zeno in the Stoic school, asserted that Aristarchus deserved punishment for his opinions about the earth's motion. This treatise of Cleanthes is cited by Diogenes Laertius. Whether the charge was ironical or not (Montucla conjectures the former), it serves to corroborate the preceding date, since Cleanthes succeeded Zeno about B.C. 264. We know nothing further of the life or death of Aristarchus.

Archimedes (in the *Arenarius*) attributes to Aristarchus the opinion that the earth moves round the sun, which is supposed to have been previously held by Pythagoras and Philolaus. His words are, ‘He (Aristarchus) says, that the fixed stars and sun remain without motion, but that the earth is carried round the sun in the circumference of a circle, the sun being in the centre. and that the sphere of the fixed stars, which has the same centre as the sun, is so great that the circle described by the earth bears no more proportion to the distance of the fixed stars, *than the centre of a sphere does to its surface*.’ Archimedes then proceeds to combat the singular notion contained in the last words. The passage from Plutarch's treatise on the moon, above referred to, states that Aristarchus supposed the heavens to be fixed, and that the earth moved in an oblique circle (λοξοῦ κύκλον), at the same time revolving round her own axis. We learn also from Archimedes, that Aristarchus supposed the apparent diameter of the sun to be the 720th part of the zodiac, that is, half a degree. This is about 2′ too little.

One small work of Aristarchus has come down to us, ‘On the Magnitudes and Distances of the Sun and Moon,’ which makes no mention of the preceding hypothesis with regard to the earth's motion. The scope of it will be shown in the following translation of the introduction (from Wallis's edition). The brackets contain remarks, mostly from Delambre.

‘1. The moon receives light from the sun. [This was asserted before Aristarchus.]

‘2. The earth is a mere point or centre when compared with the sphere of the moon. [This is wrong, since the moon would then appear at the same point of the heavens from different parts of the earth, which is not the case.]

‘3. When the moon appears halved, the great circle separating the light and dark part of the moon passes through the eye of the spectator. [A very simple truth, but a great step in astronomy, as giving rise to the first determination of the relative distances of the sun and moon, the principle of which was correct.]

‘4. In the preceding case, the angle between the sun and moon is less than a quadrant by its thirtieth part. [That is, the angle is 87°; whereas 89° 50′ is nearer the truth.]

‘5. The apparent diameter of the earth's shadow [that is, the section through which the moon passes in an eclipse] is twice that of the moon. [This would give it 64′; it is nearer to 82′.]

‘6 The moon subtends the fifteenth part of a sign. [This would make the apparent diameter 2°, which is four times too great.]

‘Hence the distance of the sun from the earth is more than 18 times the distance of the moon, and less than 20 times; that is, when the moon appears halved. And the [real] diameter of the sun bears the same proportion to the [real] diameter of the moon. The diameter of the sun bears to that of the moon a greater proportion than 19 to 3, but a less proportion than 43 to 6, as appears from what has been found of the ratio of the distances, the shadow of the earth, and the moon's subtending the 15th part of a sign.’

The preceding deductions follow correctly from the principles laid down, and of course partake of their numerical inaccuracy. The manner in which they are proved shows that the Greeks of this period had no trigonometry whatever; not even a table of chords, and the limits given are not so close as those which might have been obtained from the same data by a ruler and compasses. There are several propositions on the relative bulks of the three bodies, deduced by common methods.

There is a commentary of Pappus upon the work of Aristarchus, which has been given (in part at least) by Wallis in his edition.

From an obscure passage in Plutarch (Πλατωνικὰ ζητήματα. 8), in which the report of Archimedes is corroborated, Delambre infers that Aristarchus attributed day and night to the rotation of the earth. It is hard to see how he could do otherwise, if he supposed the sun fixed.

There is another work attributed to Aristarchus, published by Roberval at Paris, in 1543, on the System of the World. But this appears to have been probably one of the *restorations* of which we have spoken in APOLLONIUS, as Des cartes and several others affirm that it was written by Roberval himself, and Wallis asserts that this fact was perfectly well understood by the French, both at the time of publication and in his time.

Vitruvius speaks highly of Aristarchus, as the inventor of many useful machines, and, in particular, of a dial which he terms *scaphe*. This dial is decribed by Martianus Capella (cited by Weidler), from which, and partly from the name, we should infer that it was a part of a concave hemisphere, with a style ending in the centre, so that by drawing the equator, &c. inside the hemisphere, the sun's position might be found by marking the extremity of the shadow. Montucla describes one, dug out at Tusculum in 1741, which, since Cicero describes such an instrument, is conjectured to have belonged to him. (Mont. *Hist. Math.* i. 721; a drawing is given.)

The principal editions of Aristarchus are the Latin translation of Valla, Venice, 1498, containing the commentary of Pappus; and of Commandine, Pesaro, 1572; the Greek text of Wallis, Oxford, 1688, with a commentary and Commandine's version, which edition was also reprinted in the second volume of Wallis's works, Oxford, 1699. A new edition of the Greek text, with a Latin translation, appeared at Paris in 1810, 8vo. There is also a French translation by M. de Fortia D'Urban; Paris, Didot, 1823.

ARISTARCHUS, the critic, the son of Aristarchus, was born in the island of Samothrace; but he abandoned the narrow limits of his own country, in order to settle in the wealthy and populous city of Alexandria. The time of his birth is not exactly known; but he is stated to have flourished about B.C. 158. Ptolemy Philometor, king of Egypt, reigned from B.C. 181 to 145, and Aristarchus was the preceptor of his son, who was killed by his uncle Ptolemy Euergetes II. at the accession of the latter in 145 B.C. (Justin, xxxviii. 8.) Aristarchus was the disciple of Aristophanes of Byzantium, the celebrated grammarian, who flourished about 200 B.C., and was the first Grecian who laid the principles of philological criticism upon a sound and accurate basis; thus he was the first to inquire with precision into the genuineness of the early Greek writings, and into the grammatical analogy of the Greek language; he likewise introduced the use of the Greek accents, as they may now be seen in manuscripts and printed books (Wolf, *Proleg. ad Homer.* s. 44). Aristarchus succeeded his master Aristophanes (for whose opinions he is stated to have entertained great respect), as head of the grammatical and critical school of Alexandria; and obtained in that capacity, by his eminence as a teacher and by his various writings, a reputation greater than any other critic of antiquity. Forty grammarians are stated to have proceeded from his school (Suidas in Ἀρίσταρχος), who doubtless contributed to spread his fame over Greece and the neighbouring countries. His name was highly celebrated among his contemporaries; thus Panætius the philosopher called him a *diviner*, from his facility in conjecturing the meaning of poets (μάντις, Athenæus xiv. p. 634. C.); and after his death, his authority was so much esteemed, that Horace and Cicero used Aristarchus as a general name for a great critic (*De Arte Poet.* 450. *Epist. ad Att.* l. 14), and Sextus Empiricus mentions him with Plato and other such eminent names (*Adv. Mathem.* ix. s. 110); one of the scholiasts to Homer likewise expresses an opinion (which a modern critic has applied to other persons), that it is better to err with Aristarchus than to be right with Hermapias, a grammarian of little note (*ad Il.* 235).

The critical works of Aristarchus appear to have been very voluminous, but they are now all lost, and are only known from extracts and citations preserved in other writers. His chief work was his edition of the *Iliad* and *Odyssey*, in which, 1. he revised the text, partly by means of the comparison of MSS., and partly by conjecture; 2. he divided the two poems into twenty-four parts or books, each distinguished by a letter of the Greek alphabet, which in the Alexandrine age contained twenty-four letters (*Incertus de Hom. Poesi, in* Ernesti's *Homer*, vol. v. p. 152); and 3. he placed certain critical marks before certain lines, some denoting that the verses so marked contained something worthy of notice, and others that they were spurious; the last were merely straight lines thus ———, in the form of a spit or ὀβελός whence ὀβελίζειν in Greek and *obelo notare* in Latin, ‘to mark with an obelus,’ meant to mark as spurious. The reasons for the changes which he made in the text, and for the marks which he prefixed to the verses, and his explanations of doubtful passages, he appears to have given separately in some of his commentaries or ὑπομνήματα, of which he is stated to have written more than 800 books. (Suidas in v.) Probably these *books* were not longer than such divisions as we should now call chapters; these commentaries, however, included not only his labours on Homer, but also illustrations of Hesiod, Archilochus, Alcæus, Anacreon, Æschylus, Sophocles, Pindar, Aristophanes, Aratus, and other poets. Of these latter productions of Aristarchus few remnants have been preserved; of his Homeric criticisms, however, a large part is extant in the Scholia to Homer, from which a tolerably complete notion of his mode of treating ancient Greek poets may be formed. One of the most remarkable features of his criticism is the boldness with which he condemned numerous verses as unworthy of Homer, and as manifest interpolations of a later age. Various opinions have been formed on these judgments of Aristarchus; some moderns having thought that his method was in the highest degree arbitrary and uncritical, while others have thought that he exercised a sound and modest discretion. There can be no doubt that Aristarchus in rejecting verses of Homer for the most part did not rely on the faith of ancient copies, but trusted merely to his own sagacity in discovering the traces of interpolation; 'as Aristarchus (says Cicero, to his correspondent) denies that Homer wrote the verses of which he does not approve, so do you suppose that whatever part of my letters may be wanting in clearness is not written by me.' (*Epist. ad Fam.* iii. 11, and see Clinton, *Fast. Hellen.* part iii. pp. 492-5.) Whatever theory may be adopted with regard to the composition of the Homeric poems, whether we suppose that the *Iliad* and *Odyssey* were both entirely written by one poet, or that each was the work of a separate poet; or that they were a series of rhapsodies composed by a number of early bards, whose scattered songs, being originally like the old Spanish and Scotch ballads, were afterwards collected and joined together; it is equally certain that every part must have received its proper form from its original author; and that verses and passages might have been improperly introduced at a later date by the reciters of these poems. Now these interpolations, if any such existed, were doubtless made before the age when the *Iliad* and *Odyssey* were first reduced to writing; and therefore they could not be detected by the mere comparison of manuscripts. Consequently, Aristarchus ought not to be taxed with rashness for condemning verses of Homer which might be found in all the MSS., nor should it be said with Cicero that he rejected those verses of which he did not approve, simply *because* he did not approve of them; he rejected them because he thought them unworthy of Homer, and inconsistent wtth the general character of his poetry and language. If the existence of any additions to the Homeric poems, of considerably later date than the body of the poem (as the last book of the *Odyssey*), is ever susceptible of proof, it can only be established by such probable and indirect arguments as those employed by Aristarchus in justification of his obeli.

The division of Homer into books was doubtless made by Aristarchus for the purposes of reference, which were important to critics such as himself; and it has been retained on that account ever since his time. The earlier Greek writers, as Herodotus, Plato, Aristotle, &c., in citing Homer, refer by description to the part of the poem which they mean, as the exploits of Diomedes, the descent into hell, the battle of the gods, &c.

Aristarchus did not confine his criticism to grammatical and metrical questions, but he also gave historical and geographical illustrations of the author's text. Thus we are told that he considered Homer to have been a native of Athens, and placed him at the time of the Ionic migration, sixty years after the return of the Heraclidæ, or one hundred and forty years after the fall of Troy. (*Incertus de Hom. Poesi, in* Ernesti's *Homer*, vol. v. p. 151, comp. Wolf, *Prol. Hom.* p. cclvi.) His notes on the mythology and geography of Homer, preserved in the scholia, are very numerous. (See Lehrs. *de Aristarchi Studiis Homericis*, pp. 167-256.)

Aristarchus published two editions of his recension of Homer, as appears from numerous passages in the scholia to Homer, where the differences between the readings of the first and second editions are noticed. (Lehrs. *ib.* p. 27). His recension became the established text of the *Iliad* and *Odyssey*, not only among the grammarians of Alexandria, and their disciples; but among the copyists from whose transcripts the modern versions of Homer have been derived since the invention of printing. In the scholia to the *Iliad*, moreover, a constant reference is made to the explanations and obeli of Aristarchus, whose opinion is often stated without the addition of his name, as if he was pre-eminently *the* commentator of Homer. (Wolf, *Prol. ad Hom.* s. 47.)

Besides his edition of Homer and his Commentaries, he wrote some short works addressed to individuals, as to Philetas and to Comanus, the chief cup-bearer of the king (*Proclus ad Hesiod. Op. et Di.* 97); a treatise on the Paradox of Zeno, and another on the Iliad and Odyssey, are also mentioned. (Lehrs. p. 25.) These writings, which probably were occasional productions, were considered less accurate and elaborate than his Commentaries (see Schol. *Il.* ii. 111; Lehrs. pp. 20-6). He wrote also in defence of analogy in matters of criticism, against Crates the grammarian, who defended the principle of anomaly. (Wolf, *ib.* p. ccxxx.) He is likewise stated to have contended at Pergamus with Crates, who was a native of that town; and Zenodotus of Mallus (a different person from his more celebrated namesake of Ephesus), a disciple of Crates, wrote a book in defence of the verses in Homer rejected by Aristarchus. (Suidas in Ζηνόδοτος, comp. Clinton, *F. H.*, part iii. p. 491.) Late in his life he appears to have retired from Alexandria to Cyprus, where, being afflicted with a dropsy, he died of voluntary starvation at the age of 72; leaving as his successor in the Alexandrine school his disciple Ammonius. (Suidas in Ἀμμώνιος.) He had two sons, named Aristarchus and Aristagoras, who were both idiots; the former was sold as a slave (probably because he was a burden to his family), but having been brought by his master to Athens, he was redeemed by the Athenians, out of respect (as it appears) for his illustrious father. (Suidas in v.)

ARISTI'DES (Ἀριστείδης), son of Lysimachus, a great Athenian statesman and general, who took a leading part in the delivery of Greece from the Persian invasion. He was of the tribe Antiochis, and born in Alopece, a demos of Attica. Some doubt exists concerning his endowments of wealth and birth—a question of so little importance that we shall not stop to discuss it. It is to be regretted that Plutarch, from whom our knowledge of his personal history is almost exclusively derived, has given us little information as to the steps by which he rose to eminence in the state. Several anecdotes illustrative of his probity are told by that amusing, but not very accurate author, which, according to this arrangement of his life, ought to have occurred before the Persian war; but the date of their occurrence is not fixed, and they contain no distinct mention of Aristides's public employments, except that he was twice chosen treasurer of the public revenue of Athens. Plutarch further states, that Themistocles and others, whose malpractices he had exposed, had influence enough to procure his condemnation on a charge of malversation; but that, by the exertions of the more virtuous citizens, the fine imposed on him was remitted, and he was again elected to the office of chief treasurer. It appears that he was early opposed in politics to Themistocles, whose ambitious and unscrupulous temper led him to promote both his own and his country's benefit by measures quite at variance with the integrity and straightforward temper of Aristides. But the first distinct notice which we possess of his public life is, that he was one of the ten commanders who directed the Athenian army, B. C. 490, upon the occasion of the Persian invasion under Datis and Artaphernes. This rests on the authority of Plutarch, who ascribes to Aristides the honour of having first yielded his turn of command to Miltiades, and by his example and authority having carried the dissentients with him. (For a fuller account of these circumstances, and the battle of Marathon, see MILTIADES, and *Historical Parallels*, vol. i. p. 267.) Plutarch adds, that when the Athenians marched back to their capital in haste, to prevent the flying Persians from making any attempt on it by sea, Aristides was left with the men of his own tribe to guard the valuable spoil of the Persian camp; being selected for that duty on account of his incorruptible honesty. But Herodotus, in his account of the battle (vi. 109), never even mentions Aristides's name. This proceeded from no unfriendly feeling; for the historian (viii. 79) bears testimony to him as the 'justest and best man in Athens.' This silence would lead us to doubt whether Aristides did really act so important a part in the action as his biographer would have us believe. That he did distinguish himself is, however, rendered probable by his having been elected archon *epónymos* in the following year. (Plut. Arist. c. 5.)

Of the transactions of his magistracy we have no account. In the sixth year after it (B.C. 483), he was banished by the process called *ostracism.* A person less obnoxious to the spirit of jealousy which dictated that singular expedient, whether of jealousy or precaution, could hardly have been found; but the practices of Themistocles prevailed with the suspicious temper of the Athenians against the approved integrity of his rival, though so well recognized, according to a story told by Plutarch, as to have already acquired for him the appellation of 'the Just.' In the third year afterwards (B.C. 480), the eventful transactions of the Persian invasion under Xerxes took place. At the battle of Artemisium, Aristides was still in exile; but before the battle of Salamis he was recalled, with other exiles. In the night preceding that memorable battle, he passed from the island of Ægina through the Persian fleet, bearing intelligence to his countrymen that they were surrounded, and that flight, which they were then meditating, was no longer possible. (Herod. viii. 79.) The details of the action do not belong to this place. (See *Historical Parallels*, p. 360, and SALAMIS.) We have only to state that Aristides, at the head of a body of Athenians, landed on the small island of Psyttaleia, near Salamis, and put to the sword the Persian troops stationed on that island. (Herod. viii. 95; Plut. c. 9.) With respect to the prosecution of the war, he combated Themistocles's advice to sail for the Hellespont, and destroy the bridge built by Xerxes; and recommended, on the contrary, that every facility for evacuating Greece should be given to the Persians.

Before the battle of Platæa, fought in September, B.C. 479, he was reinstated in all and more than his former favour with his countrymen. The answer returned to Mardonius's offer of peace and alliance with the Athenians is said by Plutarch to have been dictated by him: 'Tell Mardonius that the Athenians say, while the sun goes in the same course as he is now going, we will never make peace with Xerxes; but we will fight him, trusting in the gods, who fight with us, and the heroes, whose temples and statues he, making no account of them, has burnt.' (Herod viii. 143.) Aristides was one of the ambassadors sent to remonstrate with the Spartans for their tardiness in sending succours to resist the threatened second invasion of Attica by Mardonius; and at the battle of Platæa, contrary to the general usage, he was appointed sole general (στρατηγὸς αὐτοκράτωρ) of the Athenian troops, and signalized his moderation in a dispute with the Tegeatæ concerning the right of occupying the left wing of the allied army, the second post in point of honour, the right wing being always held by the Lacedæmonians. 'We came here,' he said, 'not to talk, but to fight. Since, however, the Tegeatæ have advanced their claims to renown, both in old times and of late, it is necessary that we also should explain to you our claims to priority over the Arcadians.' Then, after enumerating the warlike glories of his countrymen, he added, 'But this is no time to wrangle about place. We are ready to obey you, Lacedæmonians, wherever, and against whomsoever, you choose to station us; and wherever we are, we will do our best. Command us, therefore, as men who will obey.' The Lacedæmonians answered by acclamation, that the Athenians were more worthy than the Tegeatæ to lead the left wing. (Herod. ix. 27.) It is to be observed here (as of the answer returned to Mardonius), that what Plutarch says of Aristides, Herodotus says of the Athenians generally. It may be presumed, however, that on both occasions the people acted under the guidance of their leader; and that the words so full of wisdom, spirit, and moderation, agreeing so well with the character of Aristides, were really prompted or delivered by him.

Not long after the restoration of Athens, which had been destroyed by Xerxes and Mardonius, an important change took place in the constitution: though opposed to the principles of those with whom Aristides generally acted, it was supported at least, if not brought forward by him. By Solon's laws, noble descent and a definite amount of property were required as qualifications in candidates for the higher offices. It was now thought, either that in the great exertions made for the existence of the state, all had merited alike, and all were therefore entitled to an equal share in the direction of public affairs; or that the more numerous class who were excluded by law from the administration, having arms in their hands, and proud of their recent exertions and success, would scarcely be brought to acquiesce in their former political inferiority. Aristides, therefore, proposed an alteration in the law, by which all were rendered eligible to the archonship, without regard either to birth or wealth. [See ARCHON.]

Aristides was the colleague of Thucydides in an embassy to Sparta, when the Spartan government interfered to prevent the rebuilding of the walls of Athens, destroyed by the Persians. (Thucyd. i. 91.) Cicero relates a story (*Off.* iii. 11), told in a slightly different manner by Plutarch, that Themistocles, after the end of the war, announced to the assembly of the people, that he had a scheme to propose greatly advantageous to the state, but of such a nature that it could not safely be made public. Upon this he was desired to communicate it to Aristides, who reported that nothing could be more advantageous, or less honourable; and the proposal was dropped without further inquiry. The measure proposed, according to Cicero and Valerius Maximus (vi.), was to burn the Lacedæmonian fleet at Gythium; according to Plutarch, to burn the dock-yard of the Grecians (ναύσταθμον τῶν Ἑλλήνων), by which we suppose the confederate fleet was meant. It is difficult to conceive how either measure could be reconciled with sound policy, any more than with justice. Diodorus (xi. 42) has a different version still of the same story, agreeing in the one point of the proposal of Themistocles being referred to Aristides.

B.C. 477, the unpopularity of the Lacedæmonians, especially of the commander-in-chief Pausanias, induced the Ionian Greeks to decline serving under him. They offered the command of the confederacy to Athens, whose ships at that time were under the command of Aristides; and to his moderation and probity, and to the favourable opinion entertained of the Athenian character, mainly through his virtues, that transfer of the command is chiefly to be ascribed, and the consequent establishment of what is called by historians the Athenian rule in Greece, which was overthrown seventy-two years afterwards, at the end of the Peloponnesian war. Under this new arrangement the Greeks of the west coast of Asia Minor, the islands, and Thrace, in conjunction with the Athenians, engaged to maintain a fleet sufficient to prosecute the war with Persia. Each state was assessed to furnish a certain sum of money, amounting in the aggregate to 460 talents; and the difficult task of making the assessment was executed by Aristides with such fairness, that, according to Diodorus (xi. 47), he obtained the highest praise for justice. Deputies from the states met in the sacred island of Delos, where the temple of Apollo was appointed for the common treasury, and officers called Hellenotamiæ, 'treasurers of the Grecians,' of whom the chief was Aristides, were appointed to regulate the distribution of the common fund.

This is the last public office in which we know Aristides to have been engaged. The precise time of his death is not mentioned by the early Greek historians, or by Plutarch. Nepos says that it occurred in the fourth year after the ostracism of Themistocles, which fixes it to 467. Plutarch quotes a story from Craterus of his having been accused of taking bribes from the Ionians to reduce their annual contribution to the common fund, and being fined five minæ, which being unable to pay, he retired to Ionia, where he died. But the story is in itself highly improbable, and the silence of certain writers seems conclusive against it; and Plutarch himself argues against its credibility. He says also that the tomb of Aristides was in his own time to be seen at Phalerum, erected at the charge of the state, because the patriot died so poor that nothing was found in his house to pay for his burial. He left children—a son, Lysimachus, who is one of the speakers in Plato's dialogue of *Laches*, and two daughters (Plut. 27); all of whom were provided for by the state. Lysimachus had a pension and a grant of lands at Estiæa in Eubœa. (Demos. *Leptin.* cap. 24.) Aristides lived and died in poverty, after having borne the highest offices of Athens, and possessed the most tempting opportunities for peculation of any man in Greece; a voluntary poverty, for he is said to have refused large sums offered to him by private liberality, saying that 'he could better boast of his poverty than others of their riches, which many did use ill, and few well: and that it was a hard thing to find one man of a noble mind that could away with poverty, and that such only might be ashamed of poverty as were poor against their wills.' (North's *Plutarch.*)

The character of Aristides (so far as we can trust our chief authority, Plutarch, who is supported by the more scanty testimony of Herodotus and Thucydides) is one of the finest in antiquity. To him belongs the rarest of all praises, that of observing justice, not only between man and man, but between nation and nation. He was truly a patriot, for he preferred the good of his country to the gratification of his own ambition. A candid enemy, an impartial friend, a just administrator of other men's money, an observer of national faith, it seems hardly worth while to add to this catalogue of virtues the more common merit of being a brave and successful general, except that this latter quality completed his character, and fitted it to the stormy times in which he lived, giving to it a lustre and importance in the eyes of the many, which his peaceful virtues unassisted might have failed to command.

In the Elgin collection of the British Museum, there is a sepulchral stele, which bears the name of 'Aristides, the son of Lysimachus, of Estiæa.' It is conjectured that this Aristides was the grandson of Aristides the Just. (See *Elgin Marbles*, vol. ii., 149; Herod.; Plutarch, Cornelius Nepos, *Lives of Aristides*; Mitford, &c.)

ARISTI'DES, a native of Thebes, and one of the great Greek painters, is said by Pliny (xxxv. 10) to have been the contemporary of Apelles. His excellence consisted in giving character and expression to his figures, and in the strong delineation of the passions: his colouring was hard. One of his great pictures represented the capture of a city. Among the most striking figures was that of a mother just expiring from a wound; her infant still clings to her breast, and the dying mother seems only anxious that her child should not suck the blood that is streaming from her body. Alexander the Great had this picture removed to Pella in Macedonia. He also painted an engagement with the Persians: this picture contained one hundred figures, and was liberally paid for by Mnason, tyrant of Elatea. The works of Aristides were numerous, and many of them were transferred to Rome with the rest of the plunder of Greece. At the capture of Corinth by L. Mummius, Polybius, the Greek historian, who was present on the occasion, saw with indignation the barbarians of Italy playing at games of chance on the most costly pictures which they had spread on the ground. (Strabo, p. 381.) A Dionysus (Bacchus) by Aristides, and a Hercules struggling with the poisoned shirt of Deianira, by the same artist, were treated in this shameful way. Strabo himself saw the Bacchus, which, by chance, had been safely transferred to Rome, in the temple of Ceres, and he pronounces it a most beautiful work of art. Unfortunately the picture was shortly after destroyed, when the temple of Ceres was accidentally burnt: Pliny also mentions this picture. Another fine painting of Aristides in the temple of Apollo at Rome was spoiled by an artist, whom M. Junius the Prætor had commissioned to clean it preparatory to its exhibition at the Ludi Apollinares.

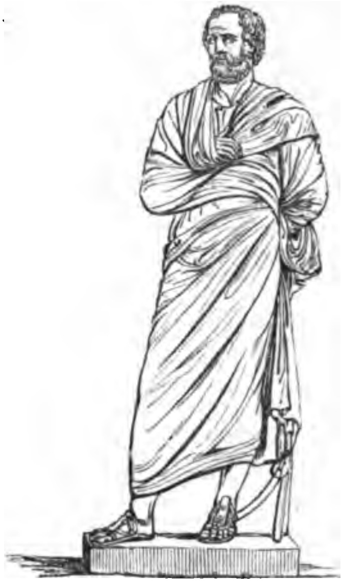
See a passage in Athenæus (xiii. 567) on other subjects painted by Aristides.

ARISTI'DES, Æ'LIUS, a distinguished rhetorician of the second century, was born at Hadriani in Bithynia, probably about A.D. 117; but, according to other opinions, A.D. 129. He studied at Smyrna under Polemo, and at Athens under Herodes Atticus, after which he travelled extensively in Asia and in Egypt; finally, he settled at Smyrna, where he obtained the priesthood of Æsculapius. He also opened a lecture-room and gained such reputation by his rhetorical prelections, that by his contemporaries he was placed on a level with Demosthenes, the great Athenian orator. In A.D. 178, Smyrna was destroyed by an earthquake, and Aristides, by addressing a letter on the subject, which is still extant, to M. Aurelius, induced the emperor to restore the city. Owing to his services on this occasion, and the high reputation which he enjoyed as a rhetorician, statues were erected to his honour; one, now in the Vatican (see Winckelmann, ii. 475, French ed.), bears his name, and it is by no means improbable that the statue supposed by some to represent Aristides of Athens, really belongs to this Aristides, who affected to rival Isocrates and Demosthenes.

Of his fifty-five declamations, one entitled *Against Leptines*, is an imitation of the great oration of Demosthenes, which bears the same name; and another, the *Panathenaikos*, was intended to show that he could write in the style of Isocrates, and rival one of the most famous specimens of that master. Aristides wrote also panegyrics on many distinguished cities, such as Smyrna, Rome, &c.

It was the practice of Aristides and other rhetoricians of his age, often to choose their topics from the republican times of Greece, and particularly from the most striking events of Athenian history. But instead of throwing any light on the historical events which they made their text, it is more frequently the case that in the effort after rhetorical effect, the truth of history is sacrificed to what were then considered the graces of style. The poverty of ideas in their declamations, and the total absence of the old Attic vigour of language, render them of less value in the judgment of the present age, than in that of the contemporaries of Aristides.

The latest edition of the Declamations of Aristides, together with his two books on Rhetoric, is by W. Dindorf, Leipzig, 1829, 3 vols. 8vo.



The statue which we have here assigned to Ælius Aristides was found in the ruins of Herculaneum, and is now in the Museo Borbonico at Naples. The height is about 6½ feet. It is called the statue of Aristides the Just by G. Finati, in the work entitled *Museo Borbonico*; but from comparing the head with that of Ælius Aristides in the Vatican, and from the somewhat affected attitude, and the general character of the figure, we are convinced it is not the old Aristides. It may be objected by some that this statue is superior, as a work of art, to the age to which we have assigned it. The objection may be a good one; and the only conclusion then must be, that we do not know whom it was intended to represent. A cast of this figure may be seen at Sarti's, Dean Street, London.

ARISTI'DES QUINTILIA'NUS, a Greek writer on music, whose age is uncertain, as he is not mentioned by any other antient author. Some critics are of opinion that he was contemporary with Plutarch. His work on Music (Περὶ Μουσικῆς), in three books, is printed in the Collection of Meibomius, and is considered one of the most valuable musical works of antiquity. For further remarks, see GREEK MUSICAL WRITERS.

ARISTIPPUS, the son of Aritades, was born at Cyrene, a Greek colony on the north coast of Africa, and came to Athens when a young man in order to profit by the lessons of Socrates; his curiosity to hear this philosopher having been excited by some accounts of his doctrines which he had received from Ischomachus of Athens, whom he met at Olympia, during the celebration of the Olympic games. (Plutarch, *de Curiosit.* c. 2; on Ischomachus, see Xenophon's *Œconomic.*) Aristippus was a hearer of Socrates for some time; and as he could not have been very young when he went from Cyrene to the Olympic festival, and was attracted from thence to Athens by a philosopher's fame, we may suppose that he was at least twenty-five years old at the death of Socrates, B.C. 399; which would make his birth as early as B.C. 424 or 425. Lais, the courtezan, with whom he was in habits of intimacy, was born B.C. 421. (Clinton, *Fast. Hellen.*, part ii. introd. p. lv.); which agrees with this determination. We know further, from explicit testimony, that he was celebrated in B.C. 366 (Olymp. ciii. 3; Diodorus, xv. 76); so that if he lived to the natural age of man, he probably died between B.C. 360 and 350.

Although Aristippus was a disciple of Socrates, his mode of life and his opinions were very different from those of his master. Instead of imitating the chaste, frugal, and temperate habits which distinguished Socrates, he was a lover of sensual pleasure; and we learn from a conversation between Aristippus and his master, reported in Xenophon's *Memorabilia*, that the former deliberately maintained in argument the superiority of his own habits of life and principles of conduct. In this discussion, being pressed by the interrogations of Socrates, he asserts that he does not wish to take any share in public affairs, that his object is to be neither a governor nor a slave, but a private citizen; and that he lives out of his own country in order to escape from all political duties. (Xen. *Mem.*, ii. 1. 1-18.) He appears to have prided himself on his knowledge of the world, on the popularity and versatility of his manners, and the ease with which he could adapt himself to the company of all persons, and to all varieties of fortune: hence Plato is reported to have said of him, that he was the only man who could wear with equal grace both fine clothes and rags. He recommended to others, as he practised himself, the pursuit of sensual pleasure, saying that the disgrace consisted not in enjoying it, but in being overcome by it He attempted to profit by circumstances in order to adapt them to his own wants, and to be the arbiter rather than the slave of fortune; whence Horace says:—

'Nunc in Aristippi furtim præcepta relabor,'
Et mihi res, non me rebus, subjungere conor.

His principles and conduct made him obnoxious to Xenophon, with whom he is stated to have been on bad terms, and to Antisthenes, the head of the Cynic school, whom he is reported to have constantly ridiculed for the austerity of his manners. (Diog. Laert. ii. 65; Suidas in Ἀρίστιππος.) Plato likewise aims a blow at him in the *Phædo*, for passing his time in luxurious enjoyment at Ægina, while his master Socrates was under sentence of death at Athens, at a distance of a few hours' sail. (Plato, *Phædon*, p. 59, ed. Steph.; Demetrius Phalereus *de Elocut.* § 288. ed. Schneider; see also Aristot. *Rhet.* ii. 23, for a saying of Aristippus against Plato.) But Aristippus, although on bad terms with Xenophon, Antisthenes, and Plato, entertained friendly relations with Æschines, another disciple of Socrates, and recommended him as a teacher of philosophy to Dionysius, the tyrant of Syracuse. (Diog. Laert. ii. 60, 82; Plutarch *De cohibenda Ira*, i. p. 462.) He seems to have remained true to the principle expressed by him in his conversation with Socrates, of avoiding his native country, and to have travelled to various Greek states; thus he passed much time at the court of Dionysius of Syracuse, and he is stated to have been taken prisoner by a satrap of the Persian king in Asia Minor. (Diog. Laert. ii. 79.) He probably retired late in his life to Cyrene, where we find his family and his school after his death. (Diog. Laert. ii. 86.)

Aristippus differed from Socrates and the genuine Socratic philosophers, not only in his mode of life, but also in taking money for his instructions (Diog. Laert. ii. 65. comp. Xen. *Mem.* i. 2. 60.): hence he is called by Aristotle a *sophist* (*Metaph.* ii. 2); a name which Aristotle never would have given to any person whom he considered a genuine philosopher. Aristippus, when blamed for teaching for money, defended himself (and it must be confessed with some reason), by saying that Socrates was provided for by the richest and greatest of the Athenians, whereas he had to provide for himself. (Diog. Laert. ii. 74.) Aristippus is reported once to have sent five minas to Socrates, who refused them, saying that his genius did not permit him to receive such a gift. (Diog. Laert. ii. 65.)

There can be no doubt that Aristippus was the founder of a philosophical school; but it is doubtful whether he inculcated his opinions in writing, or whether, like Socrates, he only imparted them orally to his disciples. A list of his works, chiefly dialogues, is given by Diogenes Laertius (ii. 85), on the authority of Panætius and Sotion; the latter of whom lived in B.C. 205, and wrote on the history and lives of the Greek philosophers. (Clinton, *Fast. Hellen.* part. iii. p. 526.) Sosicrates of Rhodes, however, who lived somewhat later, and wrote on the same subject, stated that Aristippus left nothing in writing. (Diog. Laert. ii. 84; Clinton, *ibid.* p. 565.) However this may be, it is certain that his doctrines were perpetuated after his death by his daughter Arete, and by another disciple named Antipater of Cyrene. Arete was the teacher of her son Aristippus, who, to distinguish him from his grandfather, was called *metrodidactos* (taught by his mother): and Theodorus the atheist, a philosopher of some note, is stated to have been a disciple of this Aristippus. Antipater, the other immediate successor of the elder Aristippus, is stated to have had disciples; but Hegesias and Anniceris, who were about contemporary with Theodorus, are the only philosophers in his branch of the Cyrenaic school of whose opinions anything is known.

As no precise or detailed account of the doctrines of Aristippus has been preserved, it is difficult to avoid confounding his opinions with those of his successors in the Cyrenaic school. The later Cyrenaics appear to have approached nearly to the doctrines of Epicurus: Aristippus, however, though agreeing in substance with the moral system of Epicurus, yet differed from it in many important particulars. Aristippus is stated to have considered ethics as the only subject which deserved the attention of a philosopher; and to have especially despised mathematical and physical science, as not being concerned about the happiness of mankind. (Aristot. *Metaph.* ii. 2; Diog. Laert. ii. 92.) The antient Cyrenaics, however, though they confined themselves to ethical philosophy, yet adhered to it only in name; for they divided ethics into five parts, *viz.* 1. on those things which ought to be pursued or avoided: 2. on the affections of the mind: 3. on moral actions: 4. on causes: and 5. on proofs: of which heads the first three alone belong to moral philosophy, while the fourth refers to physical, and the last to logical inquiries. Aristippus held that the happiness of man consists in pleasure, and his misery in pain: happiness being merely an aggregate of pleasures, and misery an aggregate of pains. That pleasure is the greatest good, he conceived to be proved by the fact, that the youngest children, and even brute animals, seek it, and avoid its contrary, pain. He did not, like Epicurus, consider the absence of pain to be pleasure, or the absence of pleasure to be pain: for he thought that pleasure and pain are accompanied with motion, whereas the absence of pain and pleasure is not accompanied with motion; the former of these two states being like sleep. He compared the three states of which the mind is susceptible, *viz.*, pain, pleasure, or the absence of both, to the sea during a storm, during a gentle breeze, and during a perfect calm; but this analogy is not quite perfect, for the sea agitated by a gentle breeze is in a middle state between the storm and the calm; whereas the absence both of pleasure and pain, which is the middle state of the mind, is made to correspond to the calm, which is not the middle state of the sea. He further held, that all pleasures, whether sensual or intellectual, are equally good: one account even states that he considered the pleasures of the body as superior to those of the mind. Hence he taught, that however immoral an action might be, still the pleasure which it causes is a good, and desirable for its own sake. He did not, however, recommend an unrestrained pursuit of pleasure; true wisdom (he thought) consisted, not in abstaining from pleasure, but in seeking it without being carried away b the love of it. Thus when reproached with his visits t Laïs, he replied that there was nothing disgraceful in going to her; the disgrace consisted in not being able to leave her. He condemned all care for the past or the future, all regret and all forethought, as equally useless; and said that a person ought to think only of the passing day, and, if possible, only of the passing minute. He recommended calmness of mind and moderation of desires: and he particularly cautioned his daughter Arete against covetousness and love of money. He also thought that the wise man should be free from the passions of envy and love, from superstition, and from the fear of death. Such is a brief summary of the principal moral doctrines of Aristippus which have been recorded by antient writers; in which there is less acuteness than is usually perceptible even in the most mistaken systems of the Greek philosophers. They do not indeed appear to have attracted much attention in his own time: for Aristotle, in his *Nicomachean Ethics*, when examining the different opinions of philosophers on the subject of pleasure, takes no notice of Aristippus. (See the *Life of Aristippus* by Diogenes Laertius, ii. 65-104, with Menage's notes; Suidas in Ἀρίστιππος; and Ritter's *Geschichte der Philosophie*, vol. ii. pp. 87-103.)

ARISTOBU'LUS accompanied Alexander the Great in his campaigns, of which he wrote an account after the king's death. This work, now lost, is one of the chief authorities for Arrian's history of Alexander. (See Arrian's *Preface to his Anabasis.*)

ARISTOBULUS: several of this name belonged to the Asmonæan dynasty. [See ASMONÆANS.]

ARISTO'CRACY, according to its etymology, means a government of the *best* or *most excellent* (ἄριστοι). This name, which, like *optimates* in Latin, was applied to the educated and wealthy class in the state, soon lost its moral and obtained a purely political sense: so that aristocracy came to mean merely a government of a *few*, the rich being always the minority of a nation. When the sovereign power does not belong to one person, it is shared by a number of persons either greater or less than half the community: if this number is less than half, the government is called an *aristocracy*, if it is greater than half, the government is called a *democracy*. Since, however, women and children have in all ages and countries (except in cases of hereditary succession) been excluded from the exercise of the sovereign power, the number of persons enumerated in estimating the form of the government is confined to the adult males, and does not comprehend every individual of the society, like a census of population. Thus, if a nation contains 2,000,000 souls, of which 500,000 are adult males, if the sovereign power is lodged in a body consisting of 500 or 600 persons, the government is an aristocracy: if it is lodged in a body consisting of 400,000 persons, the government is a democracy, though this number is considerably less than half the entire population. It is also to be remarked, that where there is a class of subjects or slaves who are excluded from all political rights and all share in the sovereignty, the numbers of the dominant community are alone taken into the account in determining the name we are to give to the form of the government. Thus, Athens at the time of the Peloponnesian war had conquered a number of independent communities in the islands of the Ægean Sea and on the coasts of Asia Minor and Thrace, which were reduced to different degrees of subjection, but were all substantially dependent on the Athenians. Nevertheless, as every adult male Athenian citizen had a share in the sovereign power, the government of Athens was called, not an aristocracy, but a democracy. Again, the Athenians had a class of slaves, four or five times more numerous than the whole body of citizens of all ages and sexes: yet as a majority of the citizens possessed the sovereign power, the government was called a democracy. In like manner, the government of South Carolina in the United States of America is called a democracy, because every adult freeman, who is a native or has obtained the rights of citizenship by residence, has a vote in the election of members of the legislative assembly, although the number of the slaves in that state exceeds that of the free population.

An aristocracy, therefore, may be defined to be a form of government in which the sovereign power is divided among a number of persons less than half the adult males of the *entire* community where there is not a class of subjects or slaves, or the *dominant* community where there is a class of subjects or slaves.

Sometimes the word aristocracy is used to signify, not a form of government, but a class of persons in a state. In this sense it is applied not merely to the persons composing the sovereign body in a state of which the government is aristocratical, but to a class or political party in any state, whatever be the form of its government. When there is a privileged order of persons in a community having a title or civil dignity, and when no person, not belonging to this body, is admitted to share in the sovereign power, this class is often called the aristocracy, and the aristocratic party or class; and all persons not belonging to it are called the popular party, or, for shortness, the people. Under these circumstances many rich persons would not belong to the aristocratic class; but if a change takes place in the constitution of the state, by which the disabilities of the popular order are removed, and the rich obtain a large share of the sovereign power, then the rich become the aristocratic class, as opposed to the middle ranks and the poor. This may be illustrated by the history of Florence, in which state the *nobili popolani*, or popular nobles (as they were called), at one time were opposed to the aristocratic party, but by a change in the constitution became themselves the chiefs of the aristocratic, and the enemies of the popular party. In England, at the present time, aristocracy, as the name of a class, is generally applied to the *rich*, as opposed to the rest of the community: sometimes, however, it is used in a narrower sense, and is restricted to the *nobility*, or members of the peerage.

The word *aristocracy*, when used in this last sense, may be applied to an order of persons in states of any form of government. Thus, the privileged orders in France from the reign of Louis XIV. to the revolution of 1789, have often been called the aristocracy, although the government was during that time purely monarchical; so a class of persons has by many historians been termed the aristocracy in aristocratical republics, as Venice, and Rome before the admission of the plebeians to equal political rights: and in democratical republics, as Athens, Rome in later times, and France during a part of her revolution. It would therefore be an error if any person were to infer from the existence of an aristocracy (that is, an aristocratical class) in a state, that the form of government is therefore aristocratical, though in fact that might happen to be the case.

The use of the word *aristocracy* to signify a *class of persons* never occurs in the Greek writers, with whom it originated, nor (as far as we are aware) is it ever employed by Machiavelli and the revivers of political science since the middle ages: among modern writers of all parts of Europe this acceptation has, however, now become frequent and established.

The word *oligarchy* is likewise of Greek origin, and it means, according to its etymology, a government of *a few*. By the Greek historians it is used as synonymous with aristocracy, nor did it convey any offensive meaning; among modern nations, however, it generally has an opprobrious force, and when used, it commonly implies that the writer or speaker disapproves of the government or dislikes the class of persons to which he applies that name.

There is scarcely any political term which has a more vague and fluctuating sense than *aristocracy*; and the historical or political student should be careful to watch with attention the variations in its meaning: observing, first whether it means a form of government or a class of persons: if it means a form of government, whether the whole community is included, or whether there is also a class of subjects or slaves: if it means a class of persons, what is the principle which makes them a political party, or on what ground they are jointly opposed to other orders in the state. If attention is not paid to these points, there is great danger, in political or historical discussions, of confounding things essentially different, and of drawing parallels between governments, parties, and states of society, which resemble each other only in being called by the same name.

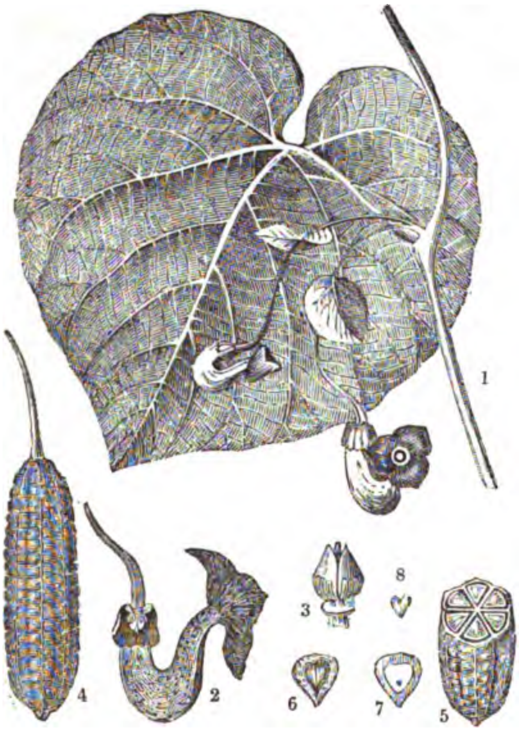
It has been lately proposed by Mr. Austin, in his work on *The Province of Jurisprudence*, to use the term *aristocracy* as a general name for governments in which the sovereignty belongs to several persons, that is, to all governments which are not monarchies. There would, however, be much inconvenience in deviating so widely from the established usage of words, as to make democracy a kind of aristocracy; and it appears that the word republic has properly the sense required, being a general term including both aristocracy and democracy, and signifying all governments which are not monarchies or despotisms. (See *Journal of Education*, Part viii. p. 299, and the words REPUBLIC and DEMOCRACY.)

ARISTOGI'TON, an Athenian closely connected with an important event in Athenian history, which will be more particularly treated under the head of HIPPIAS. We shall only state here, that having conceived a mortal hatred against Hipparchus, son of Pisistratus and brother of Hippias, who held the tyranny of Athens (Thucyd. i. 20), he plotted, in conjunction with another Athenian named Harmodius, the death of the brothers, and succeeded in effecting the murder of Hipparchus at the Panathenaic festival, B.C. 514. Harmodius was slain on the spot; Aristogiton fled, but was subsequently taken and put to death by Hippias. After the expulsion of Hippias, when the constitution of Athens was brought nearer to a democracy, the memory of Harmodius and Aristogiton was honoured as that of martyrs in the cause of liberty. Bronze statues were erected to them in different parts of Athens; among others, by the celebrated Praxiteles. (Plin. xxxiv. 8.) Xerxes, when he took possession of Athens, B.C. 480, carried off the statues of Harmodius and Aristogiton, which he sent to Susa. They were afterwards restored to the Athenians, when Susa fell into the hands of Alexander, and in the time of Arrian they stood in the Ceramicus at Athens. (Arrian, iii. 16.) Various privileges and immunities were conferred on their descendants; and their exploit was regularly celebrated in song at the Panathenaic festival (Philostratus, *De Vit. Apollonii* vii. 2; ap. Meursius, Pisist. c. xiv.), and became (we might instance a similar feeling in the frequent introduction of the names of Hampden and Sidney in patriotic toasts) a very favourite subject for the songs, called *scolia* (σκόλια), with which the Athenians enlivened their festive parties. One of these, composed by Callistratus, is commonly printed among the fragments of various authors at the end of the editions of Anacreon (see also Athenæus, xv. p. 695); and will be found translated in Bland and Merivale's *Anthology*, beginning

'I'll wreath my sword in myrtle bough.'

The first stanza of this is ascribed by Meursius, *Pisist.* c. xiv., to Carcinus. With reference to the custom, and other proofs of the affection with which the memory of Harmodius and Aristogiton was regarded, see Aristophanes, *Eq.* 786; *Ach.* 980, &c. We have, however, the testimony of Thucydides, (an early and dispassionate, though from his political opinions perhaps not a favourable, witness,) that the act of Harmodius and Aristogiton arose entirely out of a private quarrel; and that, far from effecting the immediate delivery of Athens, it made the sway of Hippias jealous and severe, instead of mild and beneficent; and Herodotus speaks to the same effect (vi. 123). That this mistake, as to the motives and merit of their action, was of early date, we may infer from Thucyd. vi. 54. Mitford (ch. vii. § 5) expresses an opinion that it was sedulously inculcated and fostered by the party of the Alcmæonidæ, the true expellers of Hippias, with a view to the firmer establishment of their own power; a supposition not in itself improbable, but unsupported on the part of the author by any references to authorities. (Thucyd. vi. 54, 9; Mitford, ch. v. 5, ch. vii. 5.)

ARISTOLO'CHIÆ, or the birth-wort tribe of plants, consists of a small number of genera which principally inhabit the hotter parts of the world. They are in many cases used medicinally on account of their tonic and stimulating properties; and some of them are reputed remedies for the bite of venomous serpents. The distinguishing characters of the order reside in the flowers, which have no corolla, and are constantly divided into three segments; the number of the cells of the fruit is also three or six, and the stamens agree in the same ternary character; the fruit is always adherent to the calyx, or, as botanists say, inferior. Notwithstanding the accordance which thus exists between aristolochiæ and monocotyledonous plants in the ternary number of the parts of their flowers their structure is otherwise truly dicotyledonous. The arrangement of the woody matter of which their stem is composed is in longitudinal plates, surrounding a central pith, and surrounded by bark; but what is very curious, these plates are not placed in concentric circles like most other exogenous plants, but continue to increase uniformly and uninterruptedly as long as the plant grows. (See Lindley's *Introduction to Botany*, p. 66.) The leaves are veined like those of dicotyledonous plants, and the embryo of the seed has two lobes.



Aristolochiæ.

1. A branch of Aristolochia sipho; 2. one of its flowers cut lengthwise, showing the stamens lying in its bottom; 3. a cluster of stamens; 4. a seed-vessel; 5. the same cut across to show its six cells; 6. a seed; 7. a seed cut through to show the minute embryo lying in the albumen; 8. an embryo much nified.

The most common plants of this singular order are the different species of asarum, or, as the gardeners call them, asarabacca; little stemless plants with dingy-brown flowers hidden among the leaves. This colour, which is far from common in plants, appears characteristic of the whole order, for even in those species which have yellow flowers, a brown stain seems to be mixed with the colour so as to change it, or brown spots are scattered over the surface. The most remarkable species of the genus Aristolochiæ are those which, in many of the tropical parts of America, excite the wonder of travellers by the gigantic size or grotesque appearance of the flowers, such as *A. cymbifera*, the border of whose calyx resembles one of the lappets of a Norman woman's cap, and measures seven or eight inches in length (see *Botanical Register*, vol. xviii. t. 1543), and *A. cordiflora* and *gigantea*, the flowers of which are from fifteen to sixteen inches across, and are large enough to form bonnets for Indian children.

ARISTOLOCHIA, MEDICAL USES OF. The most valuable of the species is the *A. Serpentaria*, which grows in North America,' chiefly in Virginia, and hence is called Virginian snake-root. Though the whole root is used, the rootlets are more powerful than the solid root. These consist of a large portion of woody fibre and gummy matter, which have no virtues, along with some resin, bitter extractive, and a little essential or volatile oil, on which principles its virtues depend. It communicates its properties to water and to alcohol, which are employed as the means of extracting them, by forming an infusion or a tincture. Decoction should never be employed, as the heat drives off the volatile oil.

Its odour and taste resemble valerian, angelica, and camphor. In its action on the human system it most nearly approaches to camphor, but its effects are more permanent. It chiefly influences the nervous system, and seems to act most beneficially in those cases where the capillaries, either from not receiving an adequate supply of blood, or of nervous energy, are incapable of producing upon the blood those changes, which form secretions in the glands, the skin, and other secreting surfaces, or which are essential for the maintenance of a sufficient degree of vital action in every part of the body. The diseases or disordered states of the system in which it may be advantageously employed can, therefore, be easily inferred.

In protracted fevers, whether of a continued or intermittent kind, it is often eminently serviceable. In those cases of continued fever, which do not assume a very active character, but run on to a lengthened period, commonly called *low* nervous fever, it is preferable to every other agent, and may either be used alone, or in conjunction with cinchona bark, or some of its preparations. Hence, under the title of Huxham's tincture of bark, it is very much used: but a safer mode of administration is that of an infusion of the serpentaria, to which sulphate of quinine, and orange-peel, or other aromatic, may be added; as recommended under AGUE (Vol. I., p. 227,.

In eruptive or exanthematous fevers, such as small-pox and measles, when the eruption is imperfectly formed or threatens to recede, an occurrence always betokening great danger, and indicating much feebleness in the powers of the system, serpentaria is an invaluable agent.

In the sore throat of scarlet fever, or in other affections of the throat, where gangrene is to be apprehended, from the depression of the vital powers, serpentaria, given internally, and used as a gargle, alone, or with tincture of capsicum, is more likely to prevent so serious a termination than any other medicine. In none of these diseases should it be exhibited till after the bowels have been thoroughly cleared out by proper purgative medicines. But there are other diseases, not attended with fever, in which serpentaria is extremely useful. In that form of indigestion where no inflammatory state of the mucous membrane of the stomach exists, and where the skin is harsh and dry, serpentaria alone, or better with sulphate of quinine, is eminently serviceable. On the same principle, in the state of torpor or exhaustion to which literary persons are subject, from long-continued or intense mental exertion, this combination is highly useful.

In America, the infusion or tincture of serpentaria is sometimes taken every morning in damp aguish situations, to prevent intermittents. It is likewise said to prove useful in the treatment of a kind of pleurisy accompanied with great derangement of the biliary system, of frequent occurrence in autumn, among persons exposed to the exhalations of the marshes in America.

This species, and several others, both in America, and the East and West Indies, are much employed as antidotes against the bite of serpents; and hence the name snake-root. Dr. Hancock states, that the quaco, used by the South Americans in such cases, belongs to this tribe.

ARISTO'MENES, a remarkable personage of antient Greece, who holds a middle place between the mythic age and the commencement of history. As of the Spanish national hero, the Cid, or our own Richard the Lion-hearted, so we have an outline, probably a correct one, of his life, but filled up with exaggerated facts and fictitious adventures, which the minstrels of a rude age never fail to attribute to those whom popularity or notoriety renders fitting subjects for popular songs.

Of the early history of Messenia we know little. A race of kings descended from Cresphontes, the Heracleid leader to whom that district of Peloponnesus was allotted, governed the country, until, not very long after the legislation of Lycurgus, a series of disputes and skirmishes arose on the borders of Messenia and Laconia, which gave rise to a confirmed hatred. Prompted by this feeling, without declaring war, and indeed with studied secrecy, the men of Sparta bound themselves by oath never to return home until Messenia was subdued; and they commenced the contest by a midnight attack on Ampheia, a frontier town, which they took, and put the inhabitants to the sword. This was the commencement of what is called the first Messenian war. The chronology of these events, which in themselves are half fabulous, must of course be uncertain, and we can only give the dates of the conflicting systems of Newton and Blair, without pronouncing any judgment upon them. The former places the capture of Ampheia B.C. 652; the latter, B.C. 743. Under two able princes, Euphaes and Aristodemus, the Messenians continued the war for twenty years with various success; but in the end they were overpowered, and treated with great rigour. They bore the yoke for twenty-five years (Newton, thirty-nine Blair); at the end of which a new generation had grown up, high-spirited, impatient of their national humiliation, and of the tyranny of their Spartan masters. In Aristomenes, a young man of the royal blood, a leader was found qualified to command both their affection and respect. Endowed with prudence as well as courage, he refused to move until assured of external support, of which the antient jealousy of Arcadia and Argos towards their formidable neighbour, Sparta, gave good hope; and those states proved hearty in the cause. The revolt is dated by Pausanias (iv. 15) thirty-nine years after the end of the first war (*Ol.* xxiii. 4), B.C. 685 (Newton places it in 607), and the first battle was fought at a place called Deræ. It was obstinately contested, and each party claimed the victory; but even this doubtful issue was encouragement to the Messenians. Aristomenes performed more than one man seemed able to do, and his countrymen offered to him the regal dignity. This he declined; accepting however (under the title of *στρατηγὸς αὐτοκράτωρ*) the sole direction of military affairs. Upon this he undertook a singular enterprise, 'thinking it important above all things, by scaring the Lacedæmonians in the outset, to become more terrible in their eyes for the future.' He entered Sparta (an unwalled town, and therefore of easy access) by night, and suspended a shield upon the temple of Athena of the Brazen House, inscribed, 'Aristomenes to the goddess, from the spoil of the Spartans.'

The year after the battle of Deræ a second engagement took place at a village called the Boar's Tomb. The Messenians were supported by auxiliaries from Elis, Argos, Sicyon, and Arcadia; the Lacedæmonians by Corinth and two minor cities. There was a chosen band of eighty Messenians who formed a sort of body-guard to Aristomenes, and fought around him; and to their exertions principally the Messenian legends ascribe the victory gained on this occasion. At their head Aristomenes attacked and routed, after a hard fight, the flower of the Spartan troops ranged round their king, Anaxander. Leaving it to others to improve this success, he led his companions from point to point, wherever the enemy seemed most inclined to make head; and finally achieved so complete a victory, that the Lacedæmonians 'fled without shame, no longer waiting for one another.' Aristomenes lost his shield in a very odd way in the pursuit (see Paus. iv. 16, or *Historical Parallels*, i. p. 41), and we might conjecture from the story, that the Messenians, pressing too eagerly, received a check.

The war was continued in a series of predatory incursions, in the course of which some romantic adventures are told of Aristomenes, B.C. 604. (Blair, 682.) A third pitched battle was fought at Megaletaphrus (the Great Ditch), in which the treachery of Aristocrates, prince of Orchomenus in Arcadia, and commander of the Arcadian auxiliaries, who was bribed by the Lacedæmonians, led to the entire defeat of the Messenians. So great a number were slain, that 'having before expected to become masters instead of slaves of the Lacedæmonians, they now gave up even the hope of safety.' Aristomenes found himself too weak to maintain his ground in the open field, or even to defend the inland forts; and he withdrew with his followers to the strong hold of Eira near the sea, abandoning to the Lacedæmonians all the country except a strip of land along the coast, held by the Pylians and Methonæans. From Eira he kept up a war of constant incursion along the Laconian border, carrying off agricultural produce and prisoners both from Laconia itself, and from Messenia, now occupied by the Lacedæmonians. At last the Lacedæmonians were obliged to prohibit the cultivation not only of Messenia, but of the borders of Laconia, 'as tilling the land rather for those who were in Eira than for themselves.'

This compelled the Messenians to seek their spoil in more distant excursions, in one of which Aristomenes was taken prisoner, and cast, with several of his companions, into a pit called Ceadas; such was the name of a place into which criminals at a later period were thrown at Sparta. All but Aristomenes were killed by the fall. For three days he lay waiting the slow approach of death; at the end of that time, his eyes being accustomed to the dim light, he saw a fox attracted by the dead bodies. The idea of escape then suggested itself; he caught the fox, and allowing it liberty enough to choose its own path, was conducted along a narrow passage terminating in a crevice just wide enough to admit the animal. He enlarged the opening with his hands, and returned to Eira. The news of his escape soon spread abroad; but the tale was so singular that the Lacedæmonians refused to credit it, until the rout of a body of Corinthians, with great slaughter, on their march to join in the siege of Eira, convinced them that 'Aristomenes, and no other, had done this.' After this exploit, he offered for the second time to the Ithomæan Jupiter the sacrifice called hecatomphonia, a rite peculiar to the Messenians, and performed by those who had slain a hundred men in battle. In the course of the war he had occasion to perform it a third time.

In the eleventh year of the siege of Eira, the fulfilment of an oracle warned Aristomenes that the contest could not be much longer protracted. The Messenians were in possession of some mystical treasure, which, if preserved, so it was said by oracles, would ensure the ultimate restoration of their national existence. This Aristomenes buried secretly in the most desolate part of Mount Ithome, hoping that the gods who had hitherto favoured them would watch over this the last deposit of the hopes of his countrymen. One stormy night, when the vigilance of the Messenian sentinels was lulled by the violence of the tempest, and by the knowledge that Aristomenes, confined by a wound, was unable to exercise his usual superintendence, the Spartans, warned by a deserter, took possession of the walls. When the alarm was given, the Messenians flew to arms, and for three days maintained possession of the place. At length, being overmatched in numbers, and exhausted by constant fighting, they found it necessary to abandon the place. Aristomenes collected the survivors, and placing their women and children in the midst, demanded, by signs, a free passage. The Spartans opened their ranks rather than encounter the onset of such an enemy reduced to desperation.

The remnant of the Messenians took shelter with their faithful friends, the Arcadians. Bent on avenging his country, Aristomenes selected 500 men of approved courage, and, in presence of the Arcadians, asked if they were ready to die with him, to obtain that end. All assented, and he disclosed his plan, which was to assault Sparta by night, while the army was still absent, and, if they could get possession of the city, to hold it as a pledge for the restoration of their own land; if not, to meet a glorious death. Three hundred Arcadians volunteered to join them; but the enterprise was frustrated by the traitor Aristocrates, who sent intelligence of it to Sparta. This time, however, his perfidy was detected, and he was stoned by his indignant countrymen. The Messenians, invited to join in the execution, looked towards Aristomenes, who sat weeping, with his eyes fixed on the ground; and we may infer, though it is not so stated in the story, that according to the old legend they withheld their hands.

The remnant that escaped from Eira, joined by the Messenians of Pylos and Methone, emigrated in a body, intending to seek the rich island of Sardinia, and they requested Aristomenes to put himself at their head. This he declined, saying, that he would never cease to war against the Lacedæmonians, and that he was sure some mischief would be continually accruing to them at his hands. In this hope he was disappointed. Damagetus, prince of Ialysus in Rhodes, being advised by an oracle to marry the daughter of the bravest man in Greece, selected Aristomenes as unquestionably deserving that title. Aristomenes went with his daughter to Rhodes, where he died, ungratified in his wish of striking another blow at Sparta. The exploits of Aristomenes formed the subject of a poem by Rhianus, in which the hero made as conspicuous a figure as Achilles in the poem of Homer. (Pausan. book iv. 6, &c.; Mitford, iv. 4; *Historical Parallels.*)

ARISTO'PHANES, a celebrated comic poet of Athens, son of Philippus, or Philippides; his first play was exhibited on the Athenian stage B.C. 427, and his last, B.C. 388. There seems every reason to believe that he was a native of Athens, though Suidas brings him from the island of Rhodes, and others from Ægina, where he certainly possessed some property. (See Suidas, Ἀριστοφάνης, for the various opinions as to the place of his birth.) He had three sons, whose names are recorded. Of his private history, the few facts which have been transmitted are of little moment. Though the period during which he lived was full of transactions of great importance in the eventful history of Greece, Aristophanes does not appear to have been actively engaged in any of them. His life, in fact, was entirely devoted to literature, and the numerous plays which we know him to have produced prove that his attention could have been occupied with little else. He is the only writer of the old comedy of whom we have any considerable remains, and it is chiefly through his works that we are able to form an opinion respecting this particular species of dramatic composition. The writers of the old comedy sometimes brought real characters, without even a change of name, upon the stage. At first sight, the power thus assumed by them seems of a nature incompatible with the peace and security of society, but in reality it was not greater than that possessed by the public journals of the present day. The comic writer, in fact, may be considered to have supplied the place of the journalist of modern times; but with far inferior effect, as the times, at which the plays were represented, were at considerable intervals, and they could only be witnessed by a limited number. We believe, too, that they followed rather than led the opinions of the public, and that they did little more than give a more pointed expression and a somewhat wider circulation to the opinion already entertained of the individual whom they satirized, or of the class whom they held up to ridicule. Neither are we inclined to allow that they exercised much influence on the Athenians, or ever led to any important decision. It was the orator, and not the comic writer, 'who wielded at will the fierce democracy' of Athens.

Aristophanes was the author of fifty-four comedies (Suidas), of which eleven have been preserved. Suidas enumerates the same plays that we now possess, and mentions no others as being extant. In the fourth year of the Peloponnesian war, B.C. 427, the poet brought out his first play, entitled Δαιταλεῖς, holding up to public contempt the character of the spendthrift; and next year he produced the *Babylonians*, in which he attacked in no measured terms the demagogue Cleon, and the constituted authorities of Athens: of these plays we possess only a few fragments. His severe treatment of Cleon in the *Babylonians* is said to have caused the demagogue to question the right of Aristophanes to be considered a citizen of Athens. Aristophanes was tried, and came off victorious by repeating the two verses put into the mouth of Telemachus by Homer, when he was asked whether he was the son of Ulysses: 'My mother,' replies Telemachus, 'says so, but I know not: for no person ever yet was sure as to his parentage.' (*Odyss.* i. 215.) This story, which is told in an anonymous life of Aristophanes, as to the quotation from Homer, is rather a ridiculous one.

In 425, during the sixth year of the Peloponnesian war, he gained the first prize in a contest with Eupolis and Cratinus: his play was entitled the *Acharnians*, in which he recommended to the Athenians the cause of peace, as openly and as strongly as the nature of the people whom he addressed would permit. The scene lay chiefly in Acharnæ, one of the *demi*, or small towns of Attica; and the object he had in view was pointed out by introducing on the stage the rustic Dicæopolis, who, disapproving of the obstinacy of his fellow-citizens, had concluded with the Spartans a separate peace, and is exhibited in the full enjoyment of its fruits. The result of the opposite line of conduct is shown in the sufferings of Lamachus, who is exposed to the want of the first necessaries of life, and writhing under severe wounds received in the field of battle. There is one scene in particular which is full of that comic humour for which Aristophanes is so distinguished. It is a sort of Amœbæan dialogue between Lamachus and Dicæopolis. The commands of the former are those of a man preparing for a campaign; the responses of Dicæopolis are those of a person making ready for a convivial entertainment. This play contains a bitter satire on Pericles for his attachment to Aspasia, and at the same time a strong testimony to the vigour and eloquence of this great man. (*Acharn.* 524-534.)

Aristophanes had already made the demagogue Cleon writhe under his satire; but it was not till B.C. 424 that he poured forth upon him the full measure of his wrath. It was in that year that he produced the *Knights*, or, as Wieland more aptly designates it, the *Demagogues*, the most valuable, perhaps, of all his extant plays. He held up before the Athenian people a faithful picture of their own character with a boldness which we cannot but admire, knowing, as we do, that they allowed any one to be brought upon the stage except themselves. Athens is represented as a house, and its master is a stupid old gentleman, Demos (*people*): Nicias and Demosthenes are his slaves, and Cleon his confidential servant, or slave-driver; Agoracritus, a sausage-seller, is the person whose destiny it is to subvert the demagogue. Thus the dramatis personæ are few, and the plot is perhaps still more meagre. It consists of humiliating pictures of Cleon, and a succession of proofs to Demos that this favourite servant is wholly unworthy of the trust and confidence reposed in him. As an historical document, however, this play cannot be too highly valued, as furnishing a strong and faithful picture of one of the most singular nations of antiquity. It gives by no means a favourable view of their character. Demus is irritable, jealous, full of suspicions, a prey to superstition, fickle in his opinions, and inconstant in his pursuits; a curious mixture of acuteness and blindness, of insolence and servility. It is said that no one was found with sufficient nerve to act the part of Cleon, or to make a mask to represent him, and that Aristophanes was himself obliged to appear on the stage in that character with his face merely painted. The *Knights* was the first play that Aristophanes brought on the stage in his own name. There are many touches in Arbuthnot's *John Bull*, as Mitford remarks, strongly resembling the most striking traits in the character of Demos, the personification of the Athenians.

Next year, B.C. 423, he produced another play, the *Clouds*, which only gained the third prize, though in later times it has acquired a notoriety which it does not seem to have enjoyed at first. This arose, probably, from an idea first started by Ælian in one of his gossiping stories, that it was a main cause of the condemnation of Socrates (see also one of the Greek arguments to the play); but when it is known that the philosopher survived the satire of the poet for upwards of twenty years (Socrates died B.C. 399), nothing more is required to prove the untenable nature of such an opinion. Still it is probable enough that this play may have done serious injury to the true character of Socrates among the populace of Athens. It contains a powerful and severe attack on the schools of the sophists, a race of philosophers who 'could make the worse appear the better reason;' but nothing, in our judgment, can justify the personal attack which the poet makes on Socrates, whose character, as far as we can form an opinion of it, was very different from that which is represented in the play. The plot is simple and clear; it is wrought up in a masterly style by a variety of comic incidents, and the characters are full of humour. Strepsiades is the most prominent; his rusticity strangely contrasts with the pedantry of the sophists. His son has ruined him by his extravagance, and he is willing to have recourse to any plan, however unprincipled, which he thinks likely to extricate himself from his embarrassments. He imagines that he has discovered a resource in the school of Socrates, by the sophistry and chicanery of whose doctrines he expects to be relieved from the dunning of his creditors. He presents himself before the philosopher, whom he finds suspended aloft in a basket; and the whole dialogue which follows between two characters so forcibly contrasted is conceived in the very best style of the author. At last, however, Strepsiades is convinced that his genius does not lie in that direction, and he determines to send his son Pheidippides to benefit by the philosopher's instructions. The youth makes great proficiency, which he shows in his dealings with his creditors and by beating his father, and then trying to convince the old gentleman that it is all right. The play closes with Strepsiades setting fire to the school-house of Socrates (φροντιστήριον), and burning out all the disciples; a significant hint, which, coupled with the concluding verses of the play, was well calculated to raise a religious persecution against Socrates. Cratinus, whom Aristophanes in his *Knights* had represented as sunk into a state of dotage, gained the victory over the *Clouds*. This play was caricatured by Eupolis, but it did not prevent the poet from labouring to improve his first idea, and it is probably the amended copy which we now possess. (See this point discussed by Wieland, *Att. Mus.* ii. 2; and by Hermann, Præf. xix.; see also the *Clouds* of Aristophanes, by F. G. Welcker.)

In B.C. 422 appeared the *Wasps*, an attack upon the jurisprudence of Athens, levelled chiefly at that numerous class of citizens who gained a livelihood by executing the office of *dicast*—an office somewhat resembling that of our Westminster special jurymen; but the parallel, to be complete, would require that the same special jurymen should be almost daily in attendance, and should be eager to discharge the duty. There cannot be said to be any plot. Philocleon is described as absolutely phrensied with that passion of which all his countrymen partook—a taste for litigation and frequenting the courts of law. His son Bdelycleon endeavours to reclaim him; but force, persuasion, and argument, are all tried in vain. The son is nearly driven to despair by the obstinacy and prejudices of his father, and at last falls upon a scheme which promises to extricate him from his difficulties. He proposes to convert his house into a court of justice, and to supply it with all suitable pomp. The old gentleman is pleased with the scheme, and the theft of a Sicilian cheese by a house-dog enables him to put it into immediate execution. To understand this play requires a minute acquaintance with the manners of the Athenians, and also with their judicial system. This play furnished Racine with the idea of his *Plaideurs*.

The play of the *Birds* was exhibited, B.C. 414, in the seventeenth year of the Peloponnesian war, and during the absence of the Salaminia, an official ship which was despatched to bring back Alcibiades from Sicily. (Thucyd. vi. 53. See ALCIBIADES.) Nearly every writer on this play, we believe, has found it almost impossible to say what is the leading idea of the plot; and consequently many critics have pronounced an unfavourable opinion on it. In the Transactions of the Royal Academy of Sciences of Berlin (1827) there is an essay by Süvern on the *Birds* of Aristophanes, the object of which is to demonstrate that the key to the true interpretation of the play is only to be found by referring to the date of the exhibition and the mission of the Salaminia. We understand that Mr. W. Hamilton is preparing a translation of Süvern's essay.

In B.C. 406 appeared the *Frogs*, in which Aristophanes attacks, with little generosity, the poet Euripides, who had lately died. Bacchus descends to the infernal regions in search of a good tragic writer, and after listening to a trial of skill between Æschylus and Euripides, decides that the merits of the former are far superior to those of the latter.

The best of his other extant works is the *Plutus*, which appeared first in B.C. 408, and again twenty years afterwards, B.C. 388. It does not belong to the old comedy, nor does it appear to have any reference to political subjects, being intended probably to vindicate the conduct of Providence in its ordinary distributions of wealth, and to show the great tendency of riches to corrupt the morals of those who possess them. The choral parts of the *Plutus* are lost, or at least do not exist, and it contains no Parabasis. The other plays which have been preserved are the *Peace* (B.C. 419); *Thesmophoriazusæ* (B.C. 411), an attack on Euripides, in which the plot is better managed than in most of the other plays; *Lysistrate* (B.C. 411); *Ecclesiazusæ* (B.C. 392).

Aristophanes is distinguished by the exuberance of his wit, his inexhaustible fund of comic humour, and the Attic purity and great simplicity of his language. He introduces, when it suits his purpose, every variety of dialect, coins new expressions for the occasion, makes bad puns without ceasing, and displays, at the same time, all the riches and beauties of the Greek language. It must be confessed, however, that his wit is frequently of a kind which cannot be relished by the taste of the present age, partly because his allusions are sometimes necessarily obscure, and partly, also, because they are grossly obscene. Indeed, the indecency of his allusions and the indelicacy of his expressions can only be excused because it was the fault of the time and people among whom he lived, and others were probably worse than himself. The exact rank which he ought to hold among antient comic writers it is difficult to assign, as none of their entire works have been preserved; but if we are inclined to trust the judgment of Plutarch, he was in every respect inferior to Menander, (vol. ix. p. 387, ed. Reisk.) Plato, however, is said to have had a high admiration of Aristophanes, and recommended the perusal of his plays to Dionysius the younger as the best mode of acquiring the purity of the Attic dialect. So fond, indeed, was Plato of his works, that they are said to have been found under his pillow after his death. (*Vit. Anonym.*)

The plays of Aristophanes, especially in the choral parts, often contain passages of great poetical beauty, but his subject did not allow such efforts to be either frequent or of any great length. We doubt, indeed, if he was capable of any continued effort of this description, as we observe a kind of mock solemnity in most of the poetical parts; and he could not long refrain from a joke, or some oblique stroke of satire. Where Aristophanes appears to be speaking in his own person, he is the advocate of morality, and the unsparing censurer of the gross and degrading habits of many of his countrymen. He was a friend to peace, and, to his credit, the enemy of Cleon. The real test of his character must be the *Clouds*. We do not see how it is possible to esteem the character of Socrates, and at the same time to believe that Aristophanes was an honest man. All the explanations and apologies with respect to this exhibition of Socrates appear to us unsatisfactory. Probably, like many wits of his own and subsequent ages, Aristophanes had neither the ability nor the turn of mind which would qualify him to investigate the principles of moral science, and he may have turned the philosopher into ridicule without knowing or caring what his doctrines were. Aristophanes often introduces the gods in the most degrading situations, and he makes an undisguised mockery of all the deities of Olympus. How this was tolerated, even in his age, it is difficult to understand.

There are numerous editions of the plays of Aristophanes. The first edition was printed at the Aldine press in Venice, 1498, fol., containing only nine plays. The *Thesmophoriazusæ* and *Lysistrate* were wanting. The edition of Kuster contains the valuable Scholia. One of the most complete, containing a Latin version, an index, and a large collection of notes, is that of Bekker, in 5 vols. 8vo. Lond. 1829. Bekker's text is founded on the collation of two exceedingly good MSS., the Ravenna and the Venetian, which were unknown to the earlier editors. It contains also the Scholia. The valuable Scholia on Aristophanes have been lately published by Dindorf, 3 vols. Lips. 1826. The *Knights*, *Acharnes*, and the *Wasps*, have been translated into English verse by Mitchell (London, 1822); and the *Clouds*, more successfully, by Cumberland (1797). There are several prose translations of single plays; *Plutus*, by Fielding and Young; the *Birds*, by a Member of one of the Universities (London, 1812); *Acharnians*, *Knights*, *Wasps*, and *Birds*. by a Graduate of Oxford (Oxford, 1830). Aristophanes is translated into French by Poinsinet de Sivry (1784), 4 vols. 8vo.; into German by Voss (Brunswick, 1821); and the *Clouds* and *Frogs* by Welker (Giessen and Darmstadt, 1810, 1812). Wieland translated the *Acharnes, Clouds, Knights*, and *Birds*. (See Rötscher, *Aristophanes und sein Zeitalter; eine Philologisch-Philos. Abhandlung zur Alterthumsforschung*. Berlin, 1827.)

ARISTO'PHANES of Byzantium, the pupil of Callimachus and Zenodotus, the master of Aristarchus, and the founder of the Alexandrine school of criticism, was perhaps born about B.C. 240, or somewhat later. It is not known at what time he removed to Alexandria, but probably he went there young. (See Suidas, 'Αριστοφάνης.) The invention of the Greek accents is attributed to Aristophanes, and the introduction of a system of punctuation. He was the first who attempted to arrange the Greek writers into classes, according to the branches on which they wrote, separating those of the highest authority from writers of inferior merit. This canon of classical writers was afterwards corrected and confirmed by his pupil Aristarchus. The immense number of works already extant in that age rendered some critical enumeration and classification of them necessary, and perhaps we are indebted to Aristophanes and his more distinguished pupil, not only for the purer text, but also for the preservation of many of the best writers, which, if they had not been stamped with their approbation, might have been neglected for those of inferior merit. But it is also probable, as it has been remarked, that many writers of the second class fell into undeserved neglect, and ceased to be copied in consequence of being excluded from the canon. [See ARISTARCHUS.]

Nothing of Aristophanes remains except what may form a part of the large commentary of Eustathius, the Venice Scholia, &c. (See Villoison's *Scholia*, Il. i. 298, 424, &c. where Aristophanes' edition of the Iliad is referred to.) Aristophanes wrote a work on Συγγενικά, or 'terms implying relationship' (see Eustath. Il. z. p. 648; who also quotes other works written by Aristarchus). A mere fragment of Aristophanes is printed in Boissonade's 'Επιμερισμοὶ of Herodian, 1819, 8vo.

See a passage in Atnenæus (book xiii. p. 583, Casaub.) apparently referring to a work by this Aristophanes.

ARISTOTLE (the Greek form of the name is Aristóteles) was born at Stageira (the name, before Aristotle's time, appears to have been Stageirus), a town on the west side of the Strymonic gulf in Chalcidice, in the first year of the ninety-ninth olympiad, or B.C. 384. Nicomachus, the friend and physician of Amyntas II., king of Macedonia, and the author of some medical treatises now lost, was his father; his mother was named Phæstis; and they both belonged to the race or clan of the Asclepiadæ, who were supposed to derive their origin from Asclepios or Æsculapius, the God of Healing, and of whose members many practised the medical art. Aristotle lost both his parents at an early period of his life: his father's relations with Amyntas appear, however, to have produced an acquaintance between him and Philip, the son of Amyntas, which was probably one of the reasons why that prince, when he had succeeded to the throne of Macedonia, chose Aristotle as the preceptor of his son Alexander. After the death of his parents, he was brought up under the care of Proxenus, a citizen of Atarneus, a city of Mysia in Asia Minor, but who was then settled at Stageira. Aristotle testified his gratitude to Proxenus and his wife by directing in his will that statues of them, as of his parents, should be set up at his expense: he likewise educated their son Nicanor, to whom he gave his daughter Pythias in marriage.

Bust of Aristotle, from a fine statue of the natural size in the Spada Palace at Rome, engraved in Maffei's work on the Statues of Rome, pl. 185. (See Visconti, *Iconographie Grecque*, vol. i. p. 186.)

In his eighteenth year (Olymp. ciii. 2, B.C. 367) Aristotle left Stageira, and went to Athens, the centre of letters and learning in Greece, attracted thither doubtless in great part by the fame of the philosopher Plato. It appears, however, that during the first three years of his residence there Plato was absent on a visit to Sicily. There can be no doubt that Aristotle paid a particular attention to anatomy and medicine, as appears both from his extant and what we know of his lost writings; and it may be possible (as is indicated by some statements of antient writers) that in his youth he practised, like Locke, the healing art: but he must from an early age have devoted his whole time to the study of philosophy and the investigation of nature, and have abandoned all thoughts of an exclusively professional career. His eagerness for the acquisition of knowledge, and his extraordinary acuteness and sagacity, doubtless attracted Plato's attention at an early period: thus we are told that his master called him *the intellect of the school*, and his house *the house of the reader;* that he said that Aristotle required the curb, while Xenocrates (a fellow-disciple) required the spur: some of which traditions are probably true. We are likewise informed that, when reading, he used to hold a brazen ball in his hand over a basin, in order that, if he fell asleep, he might be awaked by the noise which it made in falling. Although Aristotle did not, during Plato's life, set up any school in opposition to his master (as some writers have falsely stated), he taught publicly in the art of rhetoric, and by this means became the rival of the celebrated Isocrates [see ISOCRATES], whom he appears (although then at a very advanced age) to have attacked with considerable violence, and to have treated with much contempt. Cephisodorus, a disciple of Isocrates, wrote a treatise in four books to defend his master against Aristotle's attacks, in which he likewise charged that philosopher with degrading himself by the composition of a work on proverbs: whence we learn that Aristotle published some writings during the lifetime of his master.

Aristotle remained at Athens till Plato's death in B.C. 347, having at that time reached his thirty-seventh year. Many stories are preserved by the antient compilers of anecdotes respecting the enmity between Plato and Aristotle, caused by the ingratitude of the disciple, as well as by certain peculiarities of his character which were displeasing to the master. But these rumours appear to us to have no other foundation than the known variance between the opinions and mental habits of the two philosophers; and particularly the opposition which Aristotle made to Plato's characteristic doctrine of ideas: whence it was inferred that there must have been an interruption of their friendly relations. The probability however is, that Aristotle, at whatever time he may have formed his philosophical opinions, had not published them in an authoritative shape, or entered into any public controversy, before his master's death; in his Nicomachean Ethics moreover, which was probably one of his latest works, he says, that 'it is painful to him to refute the doctrine of ideas, as it had been introduced by persons who were his friends: nevertheless, that it is his duty to disregard such private feelings; for both philosophers and truth being dear to him, it is right to give the preference to truth.' (i. 6.) He is likewise stated to have erected an altar to his master, inscribing on it that he was a man 'whom the wicked ought not even to praise.' It has moreover been supposed that Aristotle was the author of the calumny, that Socrates had married a second wife during the lifetime of his first; but the charge rests on the inaccuracy of Diogenes Laertius, Plutarch, and other late writers, who have misrepresented a passage from Aristotle's work on Nobility, preserved in Stobæus, which treatise, it should be observed, is attributed to Aristotle on very doubtful authority. (See Luzac, *Lectiones Atticæ; De Digamia Socratis*, § 4.)

It appears that during Aristotle's first residence at Athens he was employed on an embassy to Philip, to whom he was attached by a double tie, as being both a Macedonian subject and the son of his friend and physician. It is also stated that he was the means of obtaining from Philip some favours for the Athenians. His departure from Athens at the time of Plato's death may therefore not improbably have been caused by the enmity between Philip and the Athenians, which arose at that time from a successful attack on Olynthus by the former. It may likewise have originated from the circumstance that Speusippus, the nephew of Plato, and not Aristotle, succeeded him as head of the academy. However this may be, Aristotle, together with his fellow-disciple, Xenocrates, a man, as it appears, of very rare excellence, went at this time to the court of Hermeias, the prince of Atarneus, who had previously received instruction in rhetoric from Aristotle at Athens, and now invited his former master to Asia Minor. Hermeias was a eunuch, and had been the domestic slave of a banker; but having returned from Athens, where he received a liberal education under Plato and Aristotle, he succeeded with Eubulus in liberating from the Persian yoke Atarneus and the neighbouring territory, of which, after the death of Eubulus, he remained sole ruler. After Aristotle had resided three years at Assus, a town near Atarneus, Hermeias fell into the hands of Mentor, a Greek general in the Persian service, by whom he was delivered to Artaxerxes Ochus, and by him put to death. Upon the death of their protector, Aristotle and Xenocrates fled from Assus, and the former took refuge in Mytilene, the chief city of the neighbouring island of Lesbos (Olymp. cviii. 4, B.C. 345). Aristotle moreover, seeing that Pythias, the sister of Hermeias, would, if she were left behind, be exposed to the utmost misery, when the country came to be occupied by the Persian soldiery, and actuated not only by his friendship for Hermeias, but also by the excellent character and disposition of Pythias, made her his wife, and saved her from the enemy by a rapid flight. (This account is given by Aristocles the peripatetic, from Aristotle's lost epistles to Antipater ap. Euseb. *Præp. Evang.* xv. p. 793, A. Strabo, xiii. p. 610, calls Pythias the niece of Hermeias; perhaps she was his adoptive sister.) For the patriotic and philosophic prince, thus destroyed by the treachery of a Greek renegade, Aristotle had a fervent and sincere affection, and he dedicated to his memory a beautiful poem, still extant, which, on account of the admiration which he expresses in it for the virtues of his lost friend, gave rise at a late period of his life to the absurd charge that he had deified a mortal, and was thus guilty of impiety. His wife Pythias died a few years afterwards in Macedonia, leaving him a daughter of the same name: he then took to his bed a domestic slave named Herpyllis, and by her he had a son, Nicomachus, to whom he addressed his great work on Ethics.

After two years' stay at Mytilene, Aristotle was (in Olymp. cix. 2. B.C. 342) invited by Philip to Macedonia to superintend the education of his son Alexander, then fourteen years old. There can be no doubt that much of what was admirable in the character of Alexander the Great is attributable to the influence of Aristotle. His love of literature, his veneration of great poets (instanced in his sparing the house of Pindar in the destruction of Thebes, and his destination of the precious casket in the Persian spoils to the works of Homer), his fondness for physical and even medical pursuits, and his intimacy with philosophers, were all doubtless the fruits of Aristotle's instruction, and distinguish him most advantageously from those illiterate and brutal conquerors who have been the scourge of the human race. Lord Bacon, in his *Advancement of Learning*, after citing some of Alexander's wise sayings, adds, that he considers him 'not as Alexander the Great, but as Aristotle's scholar.' The same sentiment is likewise expressed in the following epigram:

Maximus hic regum, doctissimus ille sophorum,
  Magnus Alexander, major Aristoteles.
Doctus Alexandrum meliorem reddidit ille,
  Non hic majorem magnus Aristotelem.

Two letters between Alexander and Aristotle are preserved by Plutarch (*Vit. Alex.* c. vii.), and Aulus Gellius (xx. 5), in the first of which Alexander reproaches his master with having made public the treatises which had served for his education, as he wished to surpass other men not less in knowledge than in power. To this Aristotle replies, that 'they have been published and not published: for that they are only intelligible to those who have heard him explain them.' Even if the suspicions of some writers that these letters are spurious should be approved, still there would remain no doubt of the important influence exercised by Aristotle on the mind of Alexander: it is likewise stated that he advised his pupil to consider all the Greeks as his friends, and all barbarians (or foreigners) as his enemies: a maxim of policy which Alexander unquestionably followed, so far as the direction of his conquests was concerned, and which agrees remarkably with Aristotle's views as developed in the first part of his 'Politics.' It was during his residence with Alexander that Philip re-established his native town, Stageira, which had been demolished in war; in memory of which benefit the Stagirites consecrated a festival, *Aristotelia*, to their great fellow-citizen, and called a month after his name.

Alexander probably did not enjoy Aristotle's instruction for more than three or four years: as from his seventeenth or eighteenth year his time was almost entirely occupied with public affairs and war. In B.C. 336, when Philip was assassinated, he succeeded to the throne of Macedonia, and two years afterwards he began his expedition into Asia, when he parted for the last time from his master, who went to Athens, having previously recommended to him as a companion in his campaigns a near relation of his own, the philosopher Callisthenes, who had received his instruction with Alexander. Xenocrates had two years before succeeded Speusippus in the academy; Aristotle, however, on his arrival at Athens, resolved to open a school, and chose a house which from its proximity to the temple of Apollo Lyceius was called the *Lyceum*. Attached to this building was a garden with walks (in Greek *peripatoi*), where Aristotle used to deliver his instruction to his disciples; whence his school obtained the name of the *Peripatetic*. It appears that his habit was to give one lecture in the early part of the day on the abstruser parts of his philosophy to his more advanced scholars, which was called the *morning walk*, and lasted till the hour when people drest and anointed themselves; and another lecture, called the *evening walk*, on more popular subjects, to a larger and less select class. It was probably during the thirteen years of his second residence at Athens that Aristotle composed or completed the greater part of his works which have descended to our days: the foundation of most of them was doubtless laid at an early period of his life; but they appear to have been gradually formed, and to have received continual additions and corrections. Among the works which especially belong to this period of his life are his treatises on natural history; which, as has been correctly observed by a late writer on this subject (Dr. Kidd, *Bridgewater Treatise, &c.*, p. 299), are not to be considered as containing the result of his own observations only, but as a collection of all that had been observed by others as well as by himself. It is stated by Pliny (*Nat. Hist.* viii. 7) that 'Alexander the Great, being smitten with the desire of knowing the natures of animals, ordered several thousand persons, over the whole of Asia and Greece, who lived by hunting, bird-catching, and fishing, or who had the care of parks, herds, hives, stews, and aviaries, to furnish Aristotle with materials for a work on animals.' We are likewise informed that Aristotle received from Alexander the enormous sum of 800 talents to prosecute his researches in natural history—a circumstance which did not escape the malice of his traducers, who censured him for receiving gifts from princes. (*Athenæus*, ix. p. 398 [comp. Boeckh's *Economy of Athens*, vol. i. p. 20]. Seneca *De Vita Beata*, c. 27. Ælian, *Var. Hist.* v. 19, who states that *Philip* furnished Aristotle with large sums of money for his history of animals, has doubtless confounded the father and son.) Callisthenes, who, as we have already seen, attended Alexander in his expedition to Asia, sent from Babylon to Aristotle, in compliance with his previous injunctions, the astronomical observations which were preserved in that antient city, and which, according to the statement of Porphyrius, reached back as far as 1903 years before the time of Alexander the Great; that is, 2234 years before the Christian æra. (Simplicius in *Aristot. de Cœlo*, fol. 123 A. l. 18, ed. Ald. 1527. The transmission of the observations to Aristotle is stated by Simplicius as a known fact: the length of time he gives on the authority of Porphyrius. See Bailly, *Histoire de l'Astronomie Ancienne*, liv. 4. éclaircissemens, § 17-23. On Aristotle's astronomical knowledge, see Bailly, *ibid.* liv. 9. § 10, 11.) The fact that astronomical observations of considerable antiquity were sent from Babylon to Aristotle (though they are nowhere mentioned in his extant writings) appears to be undoubted: the epoch from which they date is however uncertain, and is variously stated by antient writers. (See Pliny, *Nat. Hist.* vii. 56. explained by Bailly, *ibid.* liv. 4. éclaircissemens § 18.) We know from Cicero (*de Rep.* i. 16) that astronomical observations were sometimes calculated back by the antient priests; and consequently that observations stated to be of remote antiquity may not be less fabulous than the adventures of early kings and heroes.

Aristotle had at this time reached the most prosperous period of his life. The founder and leader of the principal school of Greece, and the undisputed head of Grecian philosophy, surrounded by his numerous disciples and admirers, protected by the great conqueror of Asia, and by him furnished with the means of following his favourite pursuits and of gratifying his universal spirit of inquiry, he had probably little left to fill up the measure of a philosopher's ambition. But he did not continue to enjoy the favour of Alexander till the end. Callisthenes, by his free-spoken censures and uncourtly habits, had offended his master, and had been executed on a charge of having conspired with some Macedonian nobles to take away his life (see ALEXANDER and CALLISTHENES); and the king's wrath appears to have extended to his kinsman Aristotle, as being the person who had originally recommended him. (Letter of Alexander to Antipater in Plutarch. *Alex.* c. 55.) It is not, however, probable that this circumstance caused any active enmity between the royal pupil and his master; nor, even if we did not know to a certainty that Alexander died a natural death, would there be any reason for listening to the absurd calumny that Aristotle was concerned in poisoning him. Aristotle indeed appears to have been considered to the last as a partizan of Alexander, and an opponent of the democratic interest. When the anti-Macedonian party obtained the superiority at Athens in consequence of Alexander's death, an accusation against Aristotle was immediately prepared, and the pretext selected was, as in the case of Socrates, *impiety* or *blasphemy*. He was charged by Eurymedon the hierophant and a man named Demophilus (probably a leader of the popular party) with paying divine honours to Hermeias; and perhaps with teaching some irreligious doctrines. In order to escape this danger, and to prevent the Athenians (as he is reported to have said) from *twice sinning against philosophy*, in the beginning of B.C. 322 he quitted Athens, and took refuge at Chalcis, in Eubœa, an island then under the Macedonian influence, leaving Theophrastus his successor in the Lyceum. There he died of a disease of the stomach, in the autumn of the same year, being in the sixty-third year of his age. His frame is said to have been slender and weakly, and his health had given way in the latter part of his life, having probably been impaired by his unwearied studies and the intense application of his mind. The story of his having drowned himself in the Euripus of Eubœa is fabulous.

The characteristic of Aristotle's philosophy, as compared with that of Plato, is that, whereas the latter gave a free scope to his imagination, and by his doctrine of ideas independent of the objects which they represent opened a wide door to the dreams of mysticism, the latter was a close and strict observer of both mental and physical phenomena, avoiding all the seductions of the fancy, and following a severe, methodical, and strictly scientific course of inquiry, founded on data ascertained by experience. The truly philosophical character of his mind, and his calm and singularly dispassionate manner of writing, are not more remarkable than the vast extent both of his reading and of his original researches. His writings appear to have embraced the whole circle of the theoretical and practical knowledge of his time, comprising treatises on logical, metaphysical, rhetorical, poetical, ethical, political, economical, physical, mechanical, and medical science: he likewise wrote on some parts of the mathematics; and, besides a collection of the constitutions of all the states known in his age, both Grecian and barbarian, he made chronological compilations relating to the political and dramatical history of Greece. His works, however, though embracing so large an extent of subjects, were not a mere encyclopedia or digest of existing knowledge; some of the sciences which he treated of were created by himself, and the others were enriched by fresh inquiries, and methodized by his systematic diligence. To the former belong his works on analytics and dialectics, or, as it is now called, logic; to the invention of which science he distinctly lays claim, stating that 'before his time nothing whatever had deen done in it.' (*Soph. Elench.* c. 34. § 6.) Nearly the same remark applies to his metaphysical treatise. 'But of all the sciences (we use the words of Cuvier) there is none which owes more to Aristotle than the natural history of animals. Not only was he acquainted with a great number of species, but he has studied and described them on a luminous and comprehensive plan, to which, perhaps, none of his successors has approached; classing the facts, not according to the species, but according to the organs and functions, the sole method of establishing comparative results: thus it may be said that he is not only the most antient author of comparative anatomy whose works have come down to us, but that he is one of those who have treated this branch of natural history with the most genius, and that he best deserves to be taken for a model. The principal divisions which naturalists still follow in the animal kingdom are due to Aristotle, and he had already pointed out several, which have recently been again adopted, after having once been improperly abandoned. If the foundations of these great labours are examined, it will be seen that they all rest on the same method. Everywhere Aristotle observes the facts with attention; he compares them with sagacity, and endeavours to rise to the qualities which they have in common.' (*Biographie Universelle, in Aristote.* See also Kidd's *Bridgewater Treatise*, c. 10, § 3, and *Appendix*, who has given a more detailed comparison of Aristotle's account of animals with the discoveries of modern science.) Among the sciences which he found partly cultivated, but which he greatly advanced, the more prominent are those of rhetoric, ethics, and politics. Of rhetoric he defined the province and analysed all the parts with admirable skill and sagacity; his treatise on the passions, in this short but comprehensive work, has never been surpassed, if it has ever been equalled, by writers on (what may be termed) descriptive moral philosophy. His ethical writings contain an excellent practical code of morality, chiefly founded on the maxim that virtues are in the middle between two opposite vices; as courage between cowardice and foolhardiness, liberality between niggardliness and prodigality, &c.; his remarks on friendship are also deserving of especial notice; a subject much discussed by the antients, but which has less occupied the attention of philosophers since love has played a more prominent part in consequence of the influence of the Germans and the introduction of the manners of chivalry in western Europe. His treatise on Politics is not, like Plato's *Republic* and the works of many later speculators on government, a mere inquiry after a perfect state; but contains an account of the nature of government, of the various forms of which it is susceptible, and the institutions best adapted to the societies in which those forms are established; with an essay, though unhappily an imperfect one, on education. This treatise is valuable not only for its theoretical results, but also for the large amount of information which it contains on the governments of Greece and other neighbouring countries. Throughout these last-mentioned works, the knowledge of the world and of human nature displayed by Aristotle is very observable; and although his mind appears to have preferred investigations of physical and metaphysical science, yet he holds a very high place in the highest rank of moral and political philosophers. Aristotle, it will be remembered, did not lead the life of a recluse student, but, as the friend of Hermeias, the teacher of Alexander, and the head of a philosophical school, he was brought into contact with a great variety of persons, and learnt by practice to know life under many different forms and in many different relations.

In these philosophical treatises Aristotle occasionally mentions others of his writings, which he calls *exoteric.* From the manner in which he sometimes speaks of them, referring to them on points of no great obscurity or difficulty with a sort of contemptuous or condescending tone it would seem as if they were not of a strictly scientific character. (*Eth. Nic.* i. 13; vi. 4. *Polit.* iii. 4; vii. 1.) In another place he says, that he has often considered the Platonic doctrine of ideas both in his exoteric and his strictly philosophical works (*Eth. Eud.* i. 8): with which Plutarch agrees, who states that Aristotle everywhere attacked this Platonic doctrine, as well in his ethical and physical works, as in his *exoteric dialogues.* (*Adv Colot.* vol. ii. p. 1115 B. comp. Arist. *Met.* xiii. 1.) From this passage it appears that some at least of Aristotle's exoteric works were composed in the form of a dialogue: Cicero likewise mentions this circumstance when, in writing to Atticus on his dialogue *de Republica*, he says that 'he prefixes *prooemia* or introductions to each book, as Aristotle does in those works which he calls exoteric.' (*Epist. ad Att.* iv. 16. Other circumstances of Aristotle's dialogues are mentioned by Cicero, *Epist. ad Att.* xiii. 19. *Ad Fam.* i. 9.) His systematic treatises, which formed a connected body of philosophy, were called *acroamatic*, that is, destined for lectures (though he never himself uses that name in his extant writings); and were thus, as Galen says, confined to his scholars and friends. This distinction between his acroamatic and exoteric writings is mentioned by Gellius (*N. A.* xx. 5), who states that the former included subjects of a refined and abstruse philosophy, and physical and dialectical questions; the latter rhetorical and sophistical exercises and political knowledge. Ammonius (Ammonius Hermiæ, *in Aristot. Categ.* fol. 6 B. ed. Ald.), an antient commentator on Aristotle, divides his works into those which he wrote in his own person, or acroamatic, and those which he wrote in the form of a dialogue, or exoteric: the latter, he adds, differ much from the former in the clearness of the style and the mode of reasoning employed in them. Simplicius (*Ad Aristot. Phys.* fol. 2 B.), another commentator, gives the same division into acroamatic and exoteric, and makes the same statement as to the popular nature of the latter; but under exoteric he includes Aristotle's historical works as well as his dialogues. To this difference Themistius (*Orat.* 26. p. 319) alludes when he says that some of Aristotle's works are obscure and hard of comprehension; but that others are perspicuous, fitted for general readers, and written in an attractive and ornamented style. The statement above quoted from Gellius that Aristotle's scientific and popular treatises were distinguished by their subjects is probably not quite correct: doubtless everything discussed in the latter was included in the former, though perhaps treated in a more summary and abstruse manner. Their difference appears to have consisted chiefly in the form of the work (most of the exoteric writings being dialogues), in the selection of the arguments, and in the nature of the style. Cicero particularly speaks of the copiousness and sweetness of Aristotle's diction (*Topica*, c. 1); and Quintilian doubts whether Aristotle is the more remarkable for the multiplicity of his knowledge, the quantity of his writings, *the sweetness of his style*, the acuteness of his discoveries, or the variety of his works (x. 1. 83): in his extant works, however (all of which belong to the acroamatic class), his style is in most parts singularly dry and unattractive, and not unfrequently obscure, from the extreme conciseness of the expression and the abruptness of the transitions. It seems, indeed, as if he was sometimes intentionally negligent, and even ungrammatical, from his contempt for all ornament or polish of style. These peculiarities of style are doubtless attributable to the destination of his philosophical writings, which often appear to be rather note-books for his lectures, requiring further expansion and illustration, than finished treatises prepared for publication. This character may be particularly seen in the Rhetoric and the Analytics; in others, as in the Nicomachean Ethics, it is much less apparent. In general, however, all the chief steps of an argument are stated, though sometimes they are only intimated; and the obscurity of Aristotle, which has been so much complained of, is in most parts like the obscurity of a mathematical treatise, which appears so great to a beginner; as in both cases the difficulty of comprehension arises not from the defect of the expression, but from the closeness and subtlety of the reasoning. The works which were thus used as lecture-books probably never obtained much circulation during Aristotle's lifetime, except among his disciples and friends; and they received from time to time additions and corrections; a circumstance alluded to by Cicero, and confirmed by allusions contained in them, which indicate different times of composition. (Cicero *de Fin.* v. 5. Niebuhr, *Hist. of Rome*, vol. i. *note* 30.)

None of Aristotle's exoteric writings have come down to us; all his extant works belong to the acroamatic or strictly scientific class. This would be the more singular, if the story told by some antient authors with regard to the preservation of his writings were true. It is stated by Strabo that Theophrastus, to whom Aristotle had bequeathed his library, left all his books to Neleus, who removed them to Scepsis, a town in Asia Minor; from him they passed to his descendants, who, being ignorant persons, kept the books locked up, and took no care of them. Afterwards, hearing of the eagerness of the Attalian kings, in whose dominions Scepsis was situated, to collect a library at Pergamus, they hid them in a cellar, where they were injured by damps and moths; at last the family sold them to Apellicon of Teos, at a high price, who, being fonder of books than reading, and seeking to supply the defects of his manuscripts, filled the chasms unskilfully in the copies which he caused to be made, and published the works full of errors. Immediately after the death of Apellicon, Sylla, at the capture of Athens, brought his library to Rome; where Tyrannion, the grammarian, made use of them, as also some booksellers, who increased the number of errors, by employing careless transcribers. Strabo adds, that the Peripatetic school after Theophrastus had scarcely any of Aristotle's works, except his exoteric writings; and they followed no accurate and systematic study of philosophy (xiii. p. 608). Such is the substance of Strabo's account, which is in part confirmed by Plutarch (*Sylla*, c. 26) and Athenæus (1. p. 3); but the researches of recent scholars have shown that this narration deserves little faith; inasmuch as it appears that nearly all Aristotle's scientific works were known to the followers of Theophrastus in the Peripatetic school, and that there were numerous copies of them in the Alexandrine library; all which and other facts, which we have not space to notice, are inconsistent with the supposition that Aristotle's philosophical works were concealed from the world till the time of Apellicon, more than two hundred years after his death. The text of most of his extant works moreover bears no marks of the supplements of unskilful revisers or of chasms caused by the decay of manuscripts; this, however, is not the case with all; the Poetic, for instance, has come down to us in a mutilated form, and in many parts of the Politics the text has suffered severely.

Aristotle's genuine extant works may be divided into three classes: 1. Those relating to the philosophy of the mind. 2. Those relating to the physical sciences. 3. Those relating to moral and political philosophy. To the *first* class belong the Metaphysics, the Categories, the treatise on Interpretation, or the Meaning of Propositions, the first and second Analytics, the Topics, and the work on the Refutation of Sophistical Arguments, which, with the exception of the first, obtained the name of his *Organon*, or instrument for the analysis of reasoning. Several of his logical works are lost, particularly his Methodics, or treatise on Method, in eight books. (See *Rhet.* i. 2. 10.) To this head may be referred, though with less propriety, his Rhetoric and Poetic: the last of which works is imperfect. Under the *second* class come the Physics, the Treatises on the Heavens, on Generation and Destruction, on the Soul, on Sensation and the Objects of Sense, on Memory and Recollection, on Sleeping and Awaking, on Dreams and Prophecy in Sleep, on Length and Shortness of Life, on Youth and Old Age, on Life and Death, on Breathing: on the last subject there is also another short treatise. There is likewise a treatise on Colours, and an extract from a work on Sounds. The Physiognomics is a treatise on the marks of character in the outward person. The title of his great work on Natural History means, literally translated, *Inquiries concerning Animals* (*περὶ τὰ ζῷα ἱστορίαι*). To this are annexed treatises on the Generation of Animals, on the Motion of Animals, on the Parts or Members of Animals, and on their mode of Walking. There is also a work on Meteorology, two books on Plants (which is a retranslation from a translation), a short essay on Mechanics, and a treatise on Indivisible Lines, which latter partly belong to mathematical science. A long collection of Problems, chiefly on physical subjects, with which Cicero was acquainted (*Tusc. Disp.* i. 33, comp. Probl. xxx. 1), has also been preserved. Under this head may be likewise mentioned a treatise on the Doctrines of Xenophanes, Zeno, and Gorgias, attributed to Theophrastus in a MS. collated by Bekker (vol. ii. p. 974): it appears, however, from Diogenes Laertius, that Aristotle wrote on these subjects. To the *third* class belong the three ethical treatises, the Great, the Eudemian, and the Nicomachean Ethics, which seem to have been written at different periods of his life, the first being the most meagre, and the last, addressed to his son Nicomachus (in which three books of the Eudemian Ethics are embodied), the most complete and matured. There is a short abstract of part of Aristotle's ethical system, called a treatise on the Virtues and Vices, which may, perhaps, be genuine: some ethical questions are also treated in the Problems (c. 27-30). The Politics are intended as a continuation of the Nicomachean Ethics: the genuine Œconomics are lost, unless the first book of the treatise attributed to him (which is on Domestic, not Political Economy) is an abridgment of them by Theophrastus. (See *Philological Museum*, part i.)

The most valuable of Aristotle's lost works, and indeed the most valuable of all the lost works of Greek prose, is his collection of 158 Constitutions, both of Grecian and Barbarian States, the Democratic, Oligarchical, Aristocratical, and Tyrannical being treated separately, containing an account of the manners, customs, and institutions of each country. (Cicero, *De Fin.* v. 4.) The loss of his works on Colonies, on Nobility, and on Royal Government; of his Chronological Collections, and of his Epistles to Philip, Alexander, Antipater, and others, is also much to be regretted. He likewise revised a copy of the *Iliad*, which Alexander carried with him during his campaigns in a precious casket: hence this recension (called the *casket-copy*) passed into the Alexandrine Library, and was used by the Alexandrine critics. (Wolf, *Proleg. ad Homer*, s. 45.) His entire works, according to Diogenes Laertius, occupied in the Greek manuscripts 445,270 lines.

Writings contained in the collection of Aristotle's works falsely attributed to him are, the treatise on the Universe (*περι κόσμου*), the author of which (Mr. Payne Knight remarks) has 'retailed the common opinions of his age in the common language of a common declaimer, and by a strange inconsistency attributed them to the condensed, refined, and abstruse Stagirite' (see also Lord Aberdeen on *Grecian Architecture*, p. 207): the Rhetoric to Alexander: the second book of the Œconomics, and a treatise on Marvellous Reports, written between the time of Agathocles and the first Punic war, probably about the 130th Olympiad, or B.C. 260. (Niebuhr, *Hist. of Rome*, vol. i. p. 16, and note 342.) An extract about Winds, from Aristotle on the Signs of Bad Weather (*περὶ σημείων*, vol. ii. p. 973, ed. Bekker, omitted in the Table of Contents) is considered by Niebuhr as spurious. (*Hist. of Rome*, vol. i. p. 15.) It appears, however, that Aristotle wrote a treatise on this subject. (*σημεῖα χειμώνων*, Diog. Laert. v. 25, *σημασίαι χειμώνων*, *Anon.* vol. i. p. 64, ed. Buhle; see Theophrastus, vol. i. p. 782, ed. Schneider.) The genuineness of part of the Physiognomics has likewise been doubted. (See Müller, *Archäologie der Kunst*, s. 331, n. 1.) A set of Epistles is also attributed to Aristotle, which, like those of Phalaris, Socrates, Euripides, and others, are all spurious.

Aristotle's philosophical works many centuries after his death obtained a prodigious influence, not only in Europe, but even in Asia: they were translated into Arabic, and from thence an abstract of his logical system passed into the language of Persia. (See Balfour in the *Asiatic Researches*, vol. viii. p. 89-135, ed. 8vo. London.) In Europe they acquired an immense ascendency in the middle ages, and were considered as an authority without appeal, and only second to that of Scripture: we are even informed that in a part of Germany his Ethics were read in the churches on Sunday in the place of the Gospel. Parts of his philosophy, which are the most worthless, as his Physics, were much cultivated; and his logical writings were in many cases abused so as to lead to vain subtleties and captious contests about words. The connexion between some of his philosophical tenets and the Roman Catholic theology tended much to uphold his authority; which the Reformation lowered in a corresponding degree. His doctrines were in general strongly opposed by the early reformers: in 1518 Luther sustained a thesis at Heidelberg, 'Qui in Aristotele vult philosophari prius oportet in Christo stultificari:' *He who wishes to philosophise in Aristotle must be first stultified in Christ.* (Bayle, *in Aristotle*, n. Y. See also a curious passage of Luther's, containing a most scurrilous attack on Aristotle, cited in Bayle, *Luther*, n. II.) Luther gave way afterwards, and did not oppose Aristotle as to human learning. Melancthon, who was, however, one of the mildest of the reformers, was a great supporter of Aristotle. (See, among his other works, his *Moralis Philosoph. Epitome*, Argentor. 1539; with the introductory address, and the commentary on the fifth book of Aristotle's *Ethics*.) Many of his doctrines were in the same century zealously attacked by Pierre de la Ramée [see RAMUS], a French philosopher; and Bacon afterwards, with others of his followers, added the weight of their arguments and authority. Aristotle's philosophy accordingly fell into undeserved neglect during the latter part of the seventeenth and the whole of the eighteenth century: of late years, however, the true worth of his writings has been more fully appreciated, and the study of his best treatises has much revived.

The best edition of Aristotle's entire works is that by Bekker, 1831, Berlin, 3 vols., quarto, in which the text is established on the authority of more than 100 MSS. of Italy, France, and England. Two volumes containing extracts from the Greek commentators, edited by Brandis, will complete the work. A cheaper and smaller edition has been recently published by Tauchnitz at Leipsig. Among the numerous editions of his separate works, the most worthy of notice are those of the Metaphysics, by Brandis; of the Organon, by Buhle; of the Rhetoric, by Gaisford; of the Poetic, by Tyrwhitt, Hermann, and Gräfenham; of the Nicomachean Ethics, by Zell and Cardwell; of the Politics and Œconomics, by Schneider and Göttling; of the History of Animals, by Schneider; and of the spurious treatise De Mirabilibus, by Beckmann.

The English translations of Aristotle are, for the most part, of little value, on account of their unfaithfulness and inaccuracy. That of the Poetic, by Twining, should, however, be excepted. A translation of all Aristotle's works, by Mr. T. Taylor, was published in 9 vols., quarto, London, 1810, but the large amount of the price and the small number of the copies printed have confined the knowledge of this work within very narrow limits.

On Aristotle's life, see the ancient biographies prefixed to the first volume of Buhle's edition, and Stahr's *Aristotelia*, 2 vols., Halle, 1830 and 1832. On his speculative doctrines, see the historians of philosophy, Brucker, Tennemann, and particularly Ritter, vol. iii. p. 3-395. On the effect of his writings on philosophy and religion in the middle ages, see Launoy, *de Varia Aristotelis Fortuna*; Bayle's article on *Aristotle*; Jourdain, *Recherches sur l'Age et l'Origine des Traductions Latines d'Aristote*; and Hampden's *Bampton Lectures*; and on all these subjects, see Fabric. *Bibl. Græc.* vol. iii. p. 195-408. ed. Harles.

ARISTO'XENUS of Tarentum, the earliest of the extant Greek writers on music. He was a disciple, first of his father Mnesias, who was acquainted with music, and subsequently of Aristotle, but, according to Suidas (*Ἀριστόξενος*), never spoke well of his great master after the latter had appointed Theophrastus as his successor. On the same authority it is stated that he wrote 453 treatises on music, philosophy, history, &c. This is all we know of his life, except that he is the author of a work on the Elements of Harmony, and the founder of a musical sect, usually called Aristoxenean, in opposition to the Pythagorean. The disciples of the former were also called *μουσικοί*, which should here be translated *musicians by ear*, in opposition to *κανωνικοί*, as the latter were termed, that is, *musicians by rule*. As this controversy not only excited much attention, but various writings on both sides have descended to us, we will endeavour to give a slight notion of the merits of it, so far as that can be done without inflicting on our readers the repulsive details of the Greek musical theory. The matter is of no great general interest, since, of all the fine arts, music is the only one in which Greece has not erected a lasting memorial of herself. Aristoxenus, indeed, is cited by Vitruvius as the representative of music in the same sentence with Apelles as that of painting, yet there are but few musicians who even know his name.

The Pythagoreans had discovered the simplicity of the ratios [see ACOUSTICS] which exist between the notes of the diatonic scale. Founding their notions entirely upon arithmetic, they laid down intervals, as concordant or discordant, by theory alone, even to the extent of rejecting the interval of an eleventh from among the consonances, though of course they retained the fourth. They had also discovered the unequal intervals which exist between the tones of the scale, and, had they considered different keys, would have been obliged to invent a method of temperament. In the entire rejection of the ear they were undoubtedly wrong; and Aristoxenus was equally so in taking the other extreme. The latter maintains that the ear and judgment are not only sufficient, but that 'those who reject the senses as not accurate enough, but help them by reasoning, and who stand up for numerical proportions and ratios of velocities as the causes of gravity or acuteness, not only use means foreign to the matter, but produce results absolutely contrary to the phenomena.' He asserts that the octave consists of six whole tones, each of them equal to the interval between the fourth and fifth to the tonic; that the fourth consists of two such tones and a half, the fifth of three and a half. It is now sufficiently known, that this system is erroneous even in the judgment of the ear, and that the only mark of musical tact displayed in it is the determination of the tone, not from the unassisted ear, though on its principles that would be admissible, but from the previous determination of a fourth and fifth. Six whole tones are more than an octave, and three different tones would be derived from the octave, fourth, and fifth, as defined by Aristoxenus. To put it in the power of any one to try his system, we subjoin the number of parts out of a thousand which each note requires; that is, calling the length of the string which sounds C, 1000, the length (tension being the same) corresponding to the several notes appears underneath them.

	C	D	E	F	G	A	B	C
System of Aristoxenus	1000	891	794	749	667	595	530	500
Perfect Intervals	1000	889	800	750	667	600	533	500

Of course the system of Aristoxenus is, so far as it goes, that now known by the name of *equal temperament*, which Dr. Smith (a stern theorist) prefers to all others, but which we trust will never be in common use, as its first principle is the abolition of all distinction between the characters of the different keys. The above is not on the exact principle of Aristoxenus, which cannot be represented, because it disagrees with itself; but the *practical* truth of the fourth and fifth of its scale (a mere accident) brings the preceding representation very close to it.

The system of Aristoxenus had its followers till the time of Ptolemy, who wrote against it in his *Harmonics*. One of the two treatises attributed to Euclid is Aristoxenean, but the other decidedly the reverse. Theon mentions both sects; and, if we may use the term, quizzes both, but asserts that they might do good by uniting their principles.

There is an opinion attributed to Aristoxenus, that the soul bears to the body some such relation as the sound of a string to the string itself: this is perspicuous poetry, but rather cloudy philosophy. (See Tenneman, *Manuel*, &c. Cousin's translation, who cites G. L. Mahne, *Diatr. de Aristoxeno Philos. Peripatetico*, 8vo. Amsterdam, 1793.)

The editions of Aristoxenus which we find noticed, are the following; *Aristoxeni Musici Antiquiss. Harmonicorum Element.* libri iii. &c. ab Ant. Gogauino Grauiensi, Venet. 1562; Latin only. The first Greek text appears to be, *Aristoxenus, Nicomachus, Alypius*, by J. Meursius, Leyden, 1616; *Antiquæ Musicæ Auctores septem, Gr. et Lat.* a Marco Meibomio, 2 vol. 4to. Elzevir, 1652. The fragments of the book on Rhythm were published for the first time by J. Morelli, Venice, 1785, 8vo. For further information, refer to Hawkins's *Hist. of Music*; Montucla, *Hist. de Math.*; Wallis, Appendix to his edition of *Ptolemy's Harmonics*; Gregory, Preface to his edition of *Euclid*.

ARITHMETIC, from the Greek ἀριθμητικὴ (*arithmétike*), 'the art of numbering,' should mean the science of number in general, including a great part of what is commonly called *algebra*; it is, however, usually restricted to mean only the science of the expression of numbers by symbols, and the application (not investigation) of all rules relating to them which are useful in the arts of life. Agreeably to the plan which we have laid down for the treatment of general terms (see ACOUSTICS), we shall here confine ourselves to the elucidation, philosophical and historical, of the method of naming and representing numbers; in doing which we shall refer to such other articles as will, all together, furnish the most complete view of the subject our work can afford. For the method of applying principles in practice, see the names of the various rules, ADDITION, SUBTRACTION, &c. For the account of what we must call the metaphysics of arithmetic, see NUMBER; and for the history of this branch, see PYTHAGORAS, PLATO, THEON, EUCLID, DIOPHANTUS, FERMAT, &c.; for that part of algebra which particularly concerns pure arithmetic, see NUMBERS, THEORY OF; for the arithmetic of concrete numbers, see WEIGHTS and MEASURES, and such articles as YARD, POUND, &c.

All the information hitherto possessed on the main points of arithmetical history (and a great deal more) has been lately presented to the world in so complete a shape, that it would be little better than affectation to make any more references than one, in an article which has no pretensions to original research. Of course we allude to Mr. Peacock's History of Arithmetic contained in the *Encyclopædia Metropolitana*, which is certainly the most complete treatise yet written on any one point of mathematical history. In using this work as our universal reference, we regret that our limits will not allow us to make such a formal abstract of it, as would oblige us to ask the permission of its owners before we published this number. But as the Treatise itself is of a length answering to more than eighty pages of this Cyclopædia, such an account of its contents would be impossible; and we therefore use it only as authority for citations of fact, in which we shall refer to the paging of the *Encyclopædia Metropolitana*. We, however, feel bound to bear testimony to its correctness on all points which our access to books has enabled us to investigate.

We find ourselves in possession of a method of representing numbers so simple and powerful, that the principle and practice of the most complicated rules follows from it with ease. It is so well known that we need not explain it; but when we separate from the rest the part which particularly distinguishes our *Numeration* from that of the antient Europeans, we shall find that our superiority consists in the adoption of the following conventions.

1. The value of a figure depends not only upon the simple number for which it stands when alone, but upon the place in which it stands. Thus, in 888 the three eights mean eight, eight tens, and eight hundreds.

2. The place of a figure, considered as affecting its value, is determined by the column in which it stands, and in the absence of succeeding figures to indicate the existence of other columns, their place is supplied by ciphers, which of themselves are considered as having no value. Thus the 8 in 800 is of the same value as that in 863.

To complete our particular system, on which, however, none of its advantages depend, we must add that each figure is increased *tenfold* for every place which it is removed to the left. In the first two conventions consists what is called the 'local value' of the figures; in the last is found the reason for the term 'decimal notation,' from the Latin word, *decem*, ten.

There can be no doubt that the mere decimal notation, which has been in use in almost every age and country, has arisen from the facility which the ten fingers afford for making calculations. The names of numbers have been almost universally formed distinct as far as ten, after which compound names have been employed. The exceptions to the rule are additional proofs of the generality of the principle; they are either deduced from five or from twenty, the number of fingers on one hand, or the number of fingers and toes together. We call the simple symbols of numbers *digits*, or fingers; the Caribbees call the number ten by a phrase which signifies 'all the children of the hand' (Peacock, 390); and in many languages the phrases for five, ten, and twenty, are connected, either by direct derivation or common etymology, with those for the hand or fingers. In France the scale from 60 to 100 is strictly vicenary (by twenties), and in the Indian archipelago the antient scales are vicenary. For more discussion on this point, we refer to NUMERALS. We shall here only quote two results of observation, as laid down by Mr. Peacock (371), which appear to be very well borne out. They are, that 'the natural scales of numeration alone have ever met with adoption,' meaning, by natural scales, those derived from the hands, or hands and feet; and that 'amongst all nations practical methods of numeration have preceded the formation of numerical language.'

But this does not mean that every nation has gone high in the scale of numbers. There are tribes which have never even risen to a *quinary* scale (by fives), owing to their never wanting, and therefore never giving names to, numbers as high as five. Aristotle (P. 391) mentions a tribe of Thracians which never counted higher than four; and the Yancos on the Amazon have been stopped by the complexity of their language. They count no higher than three, the name for which, in their language, is (P. 390), according to La Condamine, *Poettarrarorincoaroac*.

One of the Abipones, in describing a number of men greater than ten, would mark out a space of ground sufficient to contain them. This is, in its principle, the same resource as that to which the Greeks were driven by their cumbrous notation, viz., the substitution of geometry for arithmetic. [See SQUARE, EUCLID.]

To enable our reader rightly to estimate the advantage which we possess in our notation, we will here describe that of the Greeks, which is only equalled by that of the Chinese in its near approach to the Indian, or generally received system, and is very much superior to that of the Chinese in the simplicity of its symbols. We shall omit the substitution of letters for numbers, and content ourselves with abandoning the principle of 'local value,' and substituting in its place such a system of symbols as, without departing from the *principle* of Greek notation, will not confuse the reader by the adoption of new digits. For the actual signs used by the Greeks, see NUMERATION, NUMERALS. Let the first nine numbers be represented as usual, but let *ten* (instead of 10, in which 1 has local value) be represented by $1'$, twenty by $2'$, &c. Let $1''$ be one hundred, $2''$ two hundred, and so on; $1'''$ one thousand, $2'''$ two thousand, and so on. Let M stand for ten thousand, and let M affixed to a number make its value ten thousand times as great; thus, $4'2$M is 420,000 in our notation. We have here improved upon the system of the Greeks, unavoidably, in order not to confuse the reader, since 2000, 200, 20, and 2, would not among them present to the eye that analogy which exists between $2'''$, $2''$, $2'$, and 2, being in fact denoted by

βι, σ, κ, and β.

We now write some high numbers in our own decimal scale, accompanied by our imitation of the Greek.

46379268	$4'''6''3'7\text{M}.9'''2''6'8$
6007.0030	$6'''7\text{M}.3'$
72007106	$7'''2''\text{M}.7'''1''6$

In the first number, *where there is no cipher*, the Greek looks so like our own, that we might be led to imagine there was no essential difference. We might say, that as it would be natural, and was in fact usual, to write the higher numbers first, the mere occurrence of a fourth column would suggest the idea of thousands, so that a notion, which we must call one of *local value*, would be inevitably formed. And perhaps it was so: indeed it is surprising that neither Archimedes, Apollonius, or Diophantus, ever detected and improved the idea. But when we come to look at the second and third number, we see immediately that the continual derangement of the columns would prevent this notion from acquiring consistence. The symbol of *vacuity* is wanting; and we cannot see how great an impediment that defect presented, because we learn 20, 30, &c., as soon we learn *twenty*, *thirty*, &c. And though perhaps $2'$, $3'$, &c., might have suggested such a contrivance, yet there was no analogy between κ (20) and λ (30) and β (2) and γ (3).

The ingenuity both of Archimedes and Apollonius was employed in the extension of the preceding system, without alteration of its principle. That of the latter we shall imitate. Calling 10,000 M_1, let ten thousand times ten thousand be called M_2, ten thousand times that number M_3, and so on, and let any one of these placed immediately after a number mean that the preceding is to be taken ten thousand times if followed by M_1, ten thousand times ten thousand if by M_2, and so on. The following number

1768,9360,0142,0193

would then be represented by

$$1'''7''6''8M_3.9'''3''6'M_2.1''4'2M_1 1''9\ 3$$

on which we may make the same remarks as before. The method of Archimedes (which preceded this) differed from it only in making ten million the *radix* of the system. We now see why our arithmetic was called *ciphering*, cipher coming from an Arabic word signifying *vacant*. One such thought as occurred to Archimedes in the bath (see ARCHIMEDES) might have been fourteen centuries gained to the science.

We look in vain for anything like local value in the system of the Egyptians, or any other nation of antiquity who are known with *certainty* to have very antient records. That of the Jews was similar to the one just described, so far as it went, and the use of some letters common to both (P. 406) in the numeral system, but not so in the *alphabets* of the two, proves that the notation of both had a common source. [See NUMERALS.]

To the same article we must also refer for the Roman system, which extended itself throughout Europe during the first twelve centuries. It is much more rude than the Greek, and is a sufficient proof of the well known inaptitude of the former people for scientific invention.

The Chinese had several systems of numeration, all containing complicated symbols, and somewhat resembling that of the Greeks in principle; but with this important difference, that the symbol for 30, for example, has direct analogy with that for 3, being made by the juxtaposition of a symbol for ten; so that the improvement upon the Greek scale which we have been obliged to make in order to explain it, renders our imitation of the Greek a better resemblance of the Chinese. But they have no written method of expressing local value; though their *Schwan-pan* [see ABACUS] is a practical use of the principle.

Before we proceed to the history of our own scale, we must extend our remark, that the 'decimal notation' and 'system of local value' are distinct things. When we agree that 10 shall stand for ten, we merely express that a number in the second column from the right shall stand for ten times as much as the same in the first column. But we are at liberty to suppose that a number in the second column shall mean nine, eight, or any other number of times what it does in the first. Thus, if we choose a *quinary* scale, in which 10 stands for 5, we reject the symbols 5, 6, 7, 8, and 9, and our numerical scale runs thus—

1	2	3	4	10	11	12	13	14	20	21	22	&c.
one	two	three	four	five	six	seven	eight	nine	ten	eleven	twelve	&c.

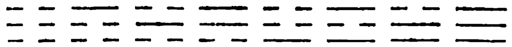
Thus 20 is *ten*, because 2 in the second column counts five times 2. But if we choose a higher scale than the decimal, we shall have to invent, instead of rejecting symbols; if, for instance, we take a *duodenary* scale, in which 10 means twelve, we are left without symbols for *ten* and *eleven*. Let *t* and *e* stand for these; then our scale of number, beginning from ten, is as follows:—

t	*e*	10	11	12	13	14	15	16	17	18	19	1*t*	1*e*	20	&c.
ten	eleven	twelve	thirteen	fourteen	fifteen	sixteen	seventeen	eighteen	nineteen	twenty	twenty-one	twenty-two	twenty-three	twenty-four	&c.

But the scale which best exemplifies the principle is the binary, in which 10 stands for 2, and in which there are consequently no symbols except 1 and 0. The system of numbers in this scale (from one to ten) is as follows:—

1 10 11 100 101 110 111 1000 1001 1010

A Jesuit at Pekin (P. 392) communicated to Leibnitz the following Chinese symbol, called by them the Cova, or *lineation*, and attributed to Fohi, the founder of the empire. It is suspended in their temples, and considered as a mystery—



If the long line be interpreted to mean *one*, and the broken line *nothing*, these symbols, each being read from the bottom to the top, give a system of binary arithmetic from 0 to 7 (both inclusive). And Leibnitz asserts that there is a larger *Cova*, which goes up to 63. But as no additional information has been obtained upon the subject, which, for anything certainly known to the contrary, may be a hoax, we can only say that there is some presumption that the Chinese long ago possessed the complete principle of the 'local value.

We trace our own knowledge of the decimal system direct to the Hindoos, who themselves ascribe it to the divinity. As to the manner of its introduction, there are some differences of opinion on that subject. One and the old account is, that Gerbert, after Pope Sylvester II., found it in Spain among the Moors (P. 415) in the latter part of the tenth century. But upon this there are strong reasons for hesitating. [See SYLVESTER II.] Another, and more probable account is, that Leonard of Pisa [see BONACCI and ALGEBRA] introduced it, in 1202, in a work entitled *Liber Abbaci*, &c. And some have supposed that the *Alonsine* (or Alphonsine) *Tables*, being constructed principally by Moors at the court of Alonso, must have been the first in which the system appears. (P. 413.) It is certain that this system had been before the twelfth century, and most probably as early as the ninth, in the hands of the Persians and Arabs, who ascribe it to the Hindoos, and call it by a name which signifies 'Hindoo science.' It is also certain that the Hindoos themselves have long used it (see BIJA GANITA and LILIWATI, names of Hindoo works), and that it is easy to trace the manner in which our numeral symbols have been derived from those of the Sanscrit. In this latter language there are distinct names for *units*, *tens*, &c. up to what we should call ***hundreds of thousands of millions of millions***. But whether we are to look to a Hindoo for the invention is a question on which no surmise can be made, till some probable account of the origin of Hindoo literature can be given.

The steps by which the new notation made its way through Europe are not capable of being very clearly traced. Montfaucon (P. 417) found them in an Italian manuscript which was finished in 1317; and many manuscripts of the works of authors a century older contain them, but it is well known that it was usual to substitute the new figures for the old in recopying. In the library of Corpus Christi College, Cambridge, (P. 418,) is a catalogue of eclipses from 1300 to 1348, to which they are subjoined. Graven dates on inscriptions have been given by Wallis and others as old as 1330; but, upon examination, reason has been found to suspect that 5 has been mistaken for 3. There does not seem to be evidence of any general use of the Arabic numerals before the invention of printing; and even the works of Caxton do not contain them, except in a woodcut. Merchants continued their accounts in Roman figures up to the sixteenth century. On the whole, we think that the general use of these numerals in scientific works did not much precede, if at all, the diffusion of algebra.

The only material addition which has been made to this groundwork of arithmetic is the invention of decimal fractions. This is an extension of the principle of local value, of so simple a character, that it is surprising the Hindoos never adopted it. They write fractions as we do, omitting only the line which separates the numerator and denominator, and they make great use of decimal fractions in approximating to the square roots of numbers, but without any peculiarity of notation.

The first fractional notation which we find among the Greeks consisted in writing the denominator where we now write the *exponent*. Thus retaining our imitation, $\frac{207}{365}$ would be written $2''7^{3''6'5.}$ This system is principally used by Diophantus; and in Eutocius we also find a peculiar symbol, something like κ, for *one half*. Ptolemy made a further step, in the application of the method of dividing the circle to all units whatsoever, known by the name of the *sexagesimal* notation. The degree o the circle is divided into sixty minutes, the minute into sixty seconds, that again into sixty thirds, and so on: Ptolemy divides every unit in the same manner. We have still retained in our division of the circle the $'$, $''$, $'''$, &c., used by him. In the notation alluded to (which is that of Ptolemy in the particular point referred to)

$$27\ 33'\ 21''\ 63'$$

would denote

$$27 \text{ units}, \frac{33}{60}, \frac{21}{3600}, \text{ and } \frac{63}{216{,}000}.$$

This sexagesimal notation retained its ground until the introduction of the Arabic numerals, and, with the aid of tables of reduction, was of material use.

Stifelius and Stevinus (P. 440) used circumflexed digits instead of $'$, $''$, &c., in the *sexagesimal* system, and an application of the same principle to the *decimal* system was first made by Albert Girard in or about 1590. This consisted in expressing fractions by tenths, hundredths, &c., in the following way—

$$16\,\frac{3}{10}\,\frac{4}{100} \text{ would be written } 1\ \overset{(0)}{6}\ \overset{(1)}{3}\ \overset{(2)}{4},$$

the number in brackets over a digit being the exponent of the power of ten, which must be used with that digit as a denominator. Here the application of the principle of local value practically begins; and it is clear, from the examples cited by Mr. Peacock, that the *cipher* was made use of to denote a vacant column. One of those examples is

$$\overset{(0)}{941}\ \overset{(1)}{3}\,\overset{(2)}{0}\,\overset{(3)}{4}$$

The rejection of the cumbrous and unnecessary exponents was made in some instances by Wright in 1616, and the system was formally introduced by Napier in 1617: the use of it was much extended by Oughtred in 1631. (See DECIMAL FRACTIONS.) From that time the modern form of the Indian arithmetic must be considered as established. The invention of LOGARITHMS (which see) is the principal aid to calculation which has been engrafted upon the system.

We subjoin a list of names, which the reader may consult on various points connected with the history of arithmetic, either in this work or elsewhere. The figures refer to the century before or after Christ in which the individual is supposed or known to have lived; and the Italics are works which are cited.

B.C. 6—Pythagoras. 4—Euclid, Aristotle, Plato. 3—Archimedes, Apollonius. 1—Vitruvius.

A.C. 2—Ptolemy, Diophantus. 3—Nicomachus. 4—Pappus, Theon. 5—Proclus, Eutocius. 6—Boethius. 9—Mahommed Ben Musa. 11—Gerbert. 12—Jordanus, Leonardo Bonacci. 13—Sacrobosco, Planudes. 15—Lucas de Borgo. 16—Scheubelius, Stifelius, Recorde, Albert Girard. 17—Briggs, Napier, Oughtred, Stevinus, Wright, Bouillaud, Mersenne, Wallis, *Algebra*, Bachet de Meziriac. 18—Weidler, *Historia Astronomiæ*, Kæstner, *Geschichte der Mathematik*, Montucla, *Hist. des Mathématiques*, Délambre, *Hist. de l'Astronomie Ancienne*, Hutton, *Tracts*, *History of Algebra*, Colebrooke, *Preface to Bija Ganita*.

We need not of course refer to the work of Mr. Peacock, which we have so often cited.

ARITHMETIC, POLITICAL. [See STATISTICS, INTEREST, ANNUITIES, POPULATION, MORTALITY, &c.]

ARITHMETIC OF SINES. [See TRIGONOMETRY.]

ARITHMETIC, SPECIOUS. [See VIETA.]

ARITHMETICAL COMPLEMENT is that which a number wants of the next highest decimal denomination. Thus, what 7 wants of 10, or 3; 32 of 100, or 68; 159 of 1000, or 841; ·017 of 1 or ·983. are the arithmetical complements of these numbers. The best way to find them is to begin from the left, subtract every figure from 9, and the last significant figure from 10, as in the following examples, which include all the cases —

N°	17634	19·0018	1734000
Ar. C°	82366	80·9982	8266000

ARITHMETICAL MEAN. By *the* arithmetical mean is meant, that number or fraction which lies between two others, and is equally distant from both. Thus the arithmetical mean between 6 and 14 is 10. To find this arithmetical mean, take the *half sum* of the two numbers. Thus, that of 4 and 17 is 10½. But any numbers are also said to be arithmetical means between two others, when all together form a series of equally increasing or decreasing numbers. Thus, 8, 10, 12, are three arithmetical means between 6 and 14. To interpose any number of arithmetical means between two numbers, divide the difference of those two numbers by one more than the number of means required, which gives the difference between the means. Thus, to interpose four arithmetical means between 27 and 102, divide 75 (102—27) by 5 (4+1) which gives 15. The means are, therefore, 27+15 or 42, 42+15 or 57, 57+15 or 72, and 72+15 or 87. If the means are fractional, the same process is employed. [See AVERAGE.]

ARITHMETICAL PROGRESSION is a name given somewhat improperly to a series of numbers which increase or decrease by equal steps, such as 1, 2, 3, &c.; 2, 4, 6, &c. 1½, 2, 2½, &c. The difference between any two successive terms, being *common* to all, is called the common difference. The *data* which distinguish one arithmetical progression from another, are the *first term*, the *common difference*, and the *number of terms*: from these it is easy to find the last term and the sum of all the terms. To find the last term, multiply the common difference by one less than the number of terms, and add the first term to the product. To find the sum of all the terms; take

the number of terms,
the sum of the first and last,

and multiply the half of either (whichever is most convenient) by the other. Thus, for 100 terms of either of the series

3	6	9	12....&c.	(A)
1	1½	2	2½...&c.	(B)

To find the last, or 100th, term of (A), multiply 3, the common difference by 99 (100—1) and add 3, the first term: which gives 300. Similarly to find the last, or 100th, term of (B), multiply ½ by 99 and add 1, which gives 50½. For the sums we have

	(A)	(B)
No. of terms	100	100
Sum of first and last	303	50½

Multiply half of 100 by 303, and by 50½, which gives 15150 for the sum of (A), and 2525 for that of (B).

Algebraically, let a be the first term, x the common difference, and n the number of terms. Let z be the last term and S the sum. Then

$$z = a + (n-1)\,x$$

$$S = \tfrac{1}{2}n\ (a+z) = na + n\frac{n-1}{2}x$$

from which any three of the letters being given, the other two can be found.

For the theory of which this article is a part, see Series, Differences, Integration.

ARITHMETICAL PROPORTION, the relation which exists between four numbers, of which the first and second have the same difference as the third and fourth. Thus:—

1	2	81	82
7	3	16	12
2⅓	3¼	1¾	2½

are severally in arithmetical proportion, and in every such proportion the sum of the extremes is equal to that of the means. Thus:—

$$12 + 7 = 3 + 16$$

ARIUS (Ἀρείος, *martial*) was a native of Cyrenaica, in Africa: the date of his birth seems to be unknown. He was distinguished for personal beauty, graceful manners, extensive learning, logical eloquence, and ascetic abstinence. He has been accused, but without sufficient ground, of restless ambition, and a predilection for innovations. The doctrine which he taught was not at that time a novelty, but had been propagated in the Alexandrine school of divinity, especially by those men, who, having an acute understanding, were nevertheless deficient in the contemplative faculties of the mind. Arius, the two Eusebii, and others, seem to have been rather anxious to defend the church against the introduction of creeds which appeared novel to all who had been brought up in the Alexandrine method of philological divinity. Arius obtained the favour of three successive patriarchs of Alexandria. The patriarch Peter of Alexandria ordained him deacon, but prohibited him from the exercise of ecclesiastical functions, upon Arius, A.D. 306, joining the party of Meletius. The patriarch Achilles of Alexandria, moved by the repentance of Arius, made him, A.D. 313, presbyter and pastor of the church Baucalis, at Alexandria; and the patriarch Alexander gave him the first rank among his clergy, although he is said by Theodoretus (*Hist. Eccles.* i. 2) to have been one of his competitors for the patriarchate. But Philostorgius (i. 3) says, on the contrary, that Arius, observing the choice likely to fall on himself, turned it to Alexander.

The patriarch Alexander, A.D. 318, having asserted, in a conference with his clergy, the unity of substance in the three persons in the Deity, Arius, in reply, accused the patriarch of having fallen into the error of Sabellius, who had confounded the three divine persons. Arius maintained that the Son was created out of nothing before the creation of the universe, and that he could be called God only on account of his participation in extraordinary powers. This doctrine Arius propagated in private; and after he had obtained many followers, he preached it publicly in the church. In order to introduce his opinions among the lower classes, he composed songs for sailors, millers, and travellers, in the measure of popular melodies. The work of Arius called *Thaleia* contained his doctrine in prose and verse. Alexander endeavoured to reclaim Arius by private admonitions in letters and by conferences, but failing in his attempts, he cited him, A.D. 321, before a synod of nearly one hundred Egyptian and Libyan bishops, convened at Alexandria, where his doctrine, his person, and his followers, were anathematized. Two letters of Alexander on this occasion are still extant: one is a circular report to the orthodox bishops (Socrat. *Hist. Eccles.* i. 6; Mansi, *Collect. Conc.* t. ii. p. 793; *Opera Athanasii*, ed. Montfaucon, t. i. pt. i. p. 397); the other is a letter, full of bitterness, to Bishop Alexander, at Constantinople. This letter calls the Arians *Exoukontians*, in allusion to the phrase ἐξ οὐκ ὄντων, *out of nothing*. Among the followers of Arius were two bishops, and several priests, deacons, and virgins.

Arius now began to travel through the neighbouring countries, where he excited sympathy for his misfortunes, and propagated his doctrine. Eusebius, bishop of Nicomedia, to whom Arius wrote a letter, still extant (Epiph. *Hæres.* 69. 6; Theodoret, *Hist. Eccles.* i. 4), absolved him from the Alexandrine excommunication; he also convened, A.D. 323, a synod in Bithynia, probably at Nicomedia, in his behalf; wrote in his favour to all the oriental bishops, and to the Emperor Constantine the Great, who, being at that time yet unbaptized, considered the dispute as trifling in itself, and recommended peace, A.D. 324, in a letter addressed to Alexander and Arius jointly.

Constantine commissioned Hosius, bishop of Corduba, to examine this dispute at Alexandria. Hosius having made a report unfavourable to Arius, Constantine convened the bishops of his empire, A.D. 325, in order to settle the points in dispute between Arius and Alexander. In this council at Nicæa 318 bishops were assembled. Before this body Arius still persisted in rejecting all confessions of faith which maintained the divinity of Christ and the consubstantiality of the divine word, and he opposed the expression ὁμοούσιος, applied to the Son as being of the *same* essence with the Father. Consequently he was again anathematized by the synod, and exiled by the emperor to Illyricum, together with two bishops, Theonas of Marmarica in Libya, and Secundus of Ptolemais, who continued to adhere to him, after Eusebius of Nicomedia, Theognis of Nicæa, and Maris of Chalcedon, alarmed by the emperor's threats, had forsaken his party. Capital punishment was denounced against all who would not deliver up the writings of Arius. After three years, Constantine became reconciled to Arius, through the instrumentality of an Arian priest, who was secretly sent to the emperor by Eusebius, bishop of Nicomedia, and by his sister Constantia. A confession of faith, which seemed to be in unison with the Nicene Creed, was drawn up, and presented by Arius, A.D. 330, to the emperor, by whom he was reinstated in his church at Alexandria; but Athanasius, then bishop of Alexandria, would not admit him. The synods of Tyre and of Jerusalem, A.D. 335, through the influence of Eusebius, re-admitted Arius into church communion, and recommended him to Athanasius; but Arius was sent by his opposers from Alexandria to Constantinople, in order to exculpate himself on account of the troubles excited by his presence at Alexandria. Arius presented to the emperor, A.D. 336, a third confession of his faith, and professed by oath to submit to the synod of Nice. It was accordingly resolved that Arius should be received into church communion in a solemn manner; but according to Socrates he was taken ill of a bowel complaint, during the procession, near the church which was appointed to be the scene of his triumph, and died on the same day, A.D. 336. Some writers ascribed his death to poison. But Athanasius, who probably had more accurate information, states, that Arius died on the evening preceding the Sunday on which he was to be received into church communion. Some Arians asserted that Arius had been killed by the magical practices of his enemies. This accusation contains, at least, a defence against the suspicion of poison.

Eusebius, who became bishop of Constantinople A.D. 339, obtained permission for the Arians to celebrate public worship at Alexandria and other places of the eastern empire. After the death of Constantine, A.D. 350, and the fall of the pretender Magnentius, A.D. 353, Constantius became ruler of the whole empire, and used his power to support the Arians in the councils of Arles, 354, and Milan, 355, the decrees of which he maintained by arms against the Athanasians. Many persons, unable to understand the distinction between the doctrines of Athanasius and Arius, were influenced in the choice of their party by unworthy motives. Most bishops, moved by the court, signed Arian creeds, although some continued to teach Athanasian doctrine. The people, except in occasional tumults, gave themselves little trouble about debates which they did not comprehend. The strict Arians rejected the doctrine of Christ being ὁμοιούσιος, *of similar essence*, as well as that doctrine which made him ὁμοούσιος, *consubstantiate*, or *of equal essence*, but the Semi-Arians maintained the opinion of his being *homoiousios*. The strict Arians, called also Ariomanites, insisted upon the Son being ἑτερούσιος, *of another substance*. The Goths, Vandals, Suevi, Burgundians, and Lombards embraced Arianism, but exchanged it afterwards for orthodoxy.

The history of Arianism may be divided into three periods: the first commenced a considerable time before the life of Arius, having originated in the Alexandrine schools of divinity of which Origen was the most splendid luminary. It terminated in the synod of Nicæa, A.D. 325. The second period began with the opposition of the Eusebians to the council of Nicæa, and terminated in the second synod of

Sirmium, A.D. 357. During this period the following synods were held: one at Tyre, A.D. 335, in which Athanasius was deposed and exiled to Gaul by Constantine; and immediately afterwards one at Jerusalem, in which Arius was received into church communion.

Another synod was held at Antioch, A.D. 341, in which the bishops declared that they could not be followers of Arius, because, 'how could we, being bishops, be followers of a presbyter?' In this synod, four creeds were approved, in which an endeavour was made to steer a middle course between the Nicæan *Homoousios* and the definitions of Arius; which two points were considered to be the two extremes of divergence from the then standard of ecclesiastical orthodoxy in the East. These four Antiochene creeds are extant in Athanasius *de Synodis*, § 22-25. A general council was again assembled at Sardica in Thrace, in which the emperors Constantius and Constans endeavoured to reconcile the combatants for oriental and occidental orthodoxy. Their endeavour proved fruitless. The orientals retired to the neighbouring city of Philippopolis, leaving their occidental opponents alone at Sardica.

Eusebianism was, under Constantius, as victorious in the east as the Nicæan creed was under Constans in the west. The Eusebians thought that the *Homoousian* orthodoxy might lead to Sabellianism, and therefore procured the deposition of Marcellus, bishop of Ancyra. The Sabellianism of his disciple Photinus was condemned in the second council of Antioch, A.D. 343, and by another council at Milan, A.D. 346. After the death of Constans, A.D. 350, and the victory over Magnentius, A.D. 353, Constantius endeavoured to establish Eusebianism by violent means in the west. In the synods of Arles, A.D. 354, and of Milan, A.D. 355, he compelled the assembled bishops to sign the condemnation of Athanasius.

The *third* period terminated with the suppression of Arianism by Theodosius I. The last vestiges of Arianism in the Roman empire are found in a law of Theodosius II. A.D. 428.

[For the sources of information on the Arian controversy, see the following articles:—EUSEBIUS Pamphili, bishop of Cæsarea; EUSEBIUS, bishop of Emesa; CYRILLUS, bishop of Jerusalem. These were the most distinguished writers in behalf of the Antitrinitarian party. The best writers among the Homoousiasts were ATHANASIUS, bishop of Alexandria; HILARIUS, bishop of Pictavia; EPIPHANIUS, bishop of Constantia; BASILIUS, bishop of Cæsarea; GREGORIUS, bishop of Nyssa; GREGORIUS of Nazianzus ὁ ϑεολόγος; AMBROSIUS, bishop of Milan; EPHRAEM, diaconus of Edessa, *propheta Syrorum*. Modern works on the history of Arianism are:—*Storia critica della Vita di Arrio*, scritta da Gaetano Maria Travasa, Clerico regulare Teatino, Venezia, 1746—8; Walch's *Historie der Ketzereien*, Th. 2. p. 385, &c.; J. A. Stark's *Versuch einer Geschichte des Arianismus*, Berlin, 1783—85, 2 tom. 8; J. Chr. F. Wundemann's *Geschichte der christlichen Glaubenslehren*, tom. i. p. 264, &c.; Münscher's *Dogmengeschichte*, Bd. 3. p. 351, &c.; Gieseler's *Kirchengeschichte*, book i.; Neander's *Kirchengeschichte*, Band. II. 767, &c.]

ARK, a chest or coffer. This term is frequently used by our earliest English and Scottish poets.

In 1347, in the brewhouse of the priory of Lindisfarne, was an *ark* for meal (see Raine's *North Durham*, p. 92); and among other articles of furniture occurring in an inventory of the household goods belonging to Sherborn hospital, taken in 1636, in the boulting-house, is '1 boulting ark.' (Hutch. *Hist. Durh.* ii. p. 599.) The same word is still in use, in the north of England, for the chest which is employed in containing meal.

Noah's ark was so named from its supposed resemblance to an ark or chest; by which name it occurs both in the Gothic and Anglo-Saxon versions of the passage in Luke, xvii. 27. Wiclif, in this passage, instead of ark, reads ship. The same term *ark* is used in our translation of the Old Testament, for the basket or cradle in which the infant Moses was laid when he was put into the Nile. (See Boucher's *Glossary*, by Stevenson.)

ARKANSAS RIVER, the largest affluent of the Mississippi next to the Missouri, rises in the Rocky Mountains, but its source is not known. Darby, in his *Geographical View of the United States*, conjectures that its source is nearly as far N. as 42°, and 111° W. of Greenwich; but this must only be taken as a guess; the lat. is certainly in excess, and the long. thus assigned is probably too much. James Peak, one of the highest summits of the Rocky Mountains, which lies between the Arkansas and Boiling Spring Creek, is about twenty-five miles N., 67° W. from a point near this Creek, which is placed in 38° 18′ 19″ N. lat., 105° 39′ 44″ W. long., by Major Long's party. The Arkansas joins the Mississippi in 33° 56′ N. lat., 91° 10′ W. long., with a course, following its bends, estimated at 2000 miles.

The sources of the Arkansas and of the great Rio del Norte are probably near one another. Captain Bell, who was with Major Long's party, traced the Arkansas into the mountains till his progress was stopped by the almost perpendicular gneiss rock, through a deep and narrow fissure in which the river pours with great violence. The Arkansas valley, near the mountains, is bounded by high cliffs of inclined sandstone; lower down these disappear, and there is a slope of alluvial earth extending on each side for several miles; and further down still, horizontal sandstone appears forming high bluffs, or precipices, on each side of the valley Trees of considerable size here grow along the margin of the river, but their tops are not so high as the level plain on each side, and the descent into this deep-sunk channel is in many places quite impracticable; at a short distance, this narrow valley is not seen at all.

The Arkansas has a general eastern course as far as the meridian of 99°; it has then a winding S.E. course to about 35° N. lat., 95° E. long., from which point it resumes an eastern winding course to about the meridian of 92° 30′, from which its course is about S.E. to its junction with the Mississippi. From its sources to about the meridian of 96°, the Arkansas flows through the great plains which stretch eastward from the base of the Rocky Mountains. Though the term plain is more applicable to this region than any other name, it is not strictly a plain; it is an undulating surface, presenting here and there detached table-lands at a small elevation above it, with some knobs and small ridges, the whole cut up into numerous extensive parterres by the beds of streams, to the action of which a great part of the present irregular form of the country is considered to be due, by those who have explored it. The Arkansas valley, for more than 100 miles from the place where it leaves the mountains, contains a considerable quantity of timber, chiefly cotton wood; but further E. the timber almost disappears, and the wide spreading prospect is nothing but a prairie. The river-valley widens in its eastern course, and the bluffs become less elevated; the bottoms are not more than a few feet above the level of the river, which in some parts is spread out a mile in breadth, and contains numerous islands. At some seasons the river is said almost to disappear. About the meridian of 97°, the Arkansas crosses the line marked in Major Long's map as the western boundary of the limestone and coal strata connected with the Ozark mountains; and about a degree, or a degree and a half, E. of this, it enters and traverses the hilly region of the Ozarks, in which it continues to the neighbourhood of Little Rock, when it enters the low alluvial country. Little Rock is about 120 miles from the Mississippi, not including all the small bends of the river.

This river is joined by numerous large tributaries. Running into it on the right bank are the Negracka or Red Fork, and the Nesuketonga or Grand Saline, which join the Arkansas W. of the meridian of 97°; both of them probably come from the Rocky Mountains.

Near the meridian of 95° the Arkansas is joined on the right bank by the Great Canadian, which rises in the Rocky Mountains, probably three degrees at least S. of the sources of the Arkansas, and is computed to run 1000 miles before it joins the main stream. Its general course is E., with a considerable bend to the S.; a space of great extent is thus included between the Arkansas and the Canadian, in which numerous streams, several hundred miles in length, have their origin and course. The great affluent of the Canadian, the North Fork, lies in this intermediate space; it joins the Canadian on the left bank six or eight miles lower down than the South Fork, which enters the Canadian on the right bank. Near its source the valley of the Canadian is narrow, and faced by bluffs from 200 to 500 feet high. Lower down its bed is wide, and only a few feet below the bottom land which lines it on each side. Though it drains an immense extent of country, it is quite stagnant for a large part of its course in summer, and its wide bed is in many places entirely dry; in one instance observed by Major Long, the Canadian was buried in its sands for more than 100 miles. The waters of the Canadian contain various proportions of common salt and sulphate of magnesia in solution, which often render them unfit for use; saline and nitrous efflorescences, and considerable incrustations of salt, characterize some portions of the country drained by the Arkansas and the Upper Canadian. Major Long's party, in their exploring expedition of 1819, 1820, mistook the Canadian for the Red River, and were not undeceived till they had traced this stream to its confluence with the Arkansas.

The character of this extensive region, W. of the Ozark mountains, and included between the Arkansas and the Rocky Mountains, will be best understood from reading the interesting narrative of Major Long's expedition. The trees are found almost exclusively on the banks of the streams; the high flats above the bottoms present in general nothing but a covering of grass or stunted shrubs. Sandy plains covered with wormwood and other plants; a burning sun which, even in September, raises the thermometer above 90° in the shade; and a general want of timber, water, and navigable streams, render these regions difficult and even dangerous to cross, and only fit for the residence of a nomadic people. Wild animals are sometimes found in abundance, and sometimes it is difficult to meet with them; the black bear, deer, antelope, white wolf, jackal, bison sometimes seen in countless herds, wild turkey, Virginian partridge, and marmot, commonly called the prairie dog, form part of the inhabitants of this wilderness. The wandering tribes of Indians are inconsiderable in numbers.

The annual flooding of the Arkansas commences early in March, and it attains its greatest height in the delta of Louisiana in the month of June; the flooding of the Arkansas is after that of the Red River, which lies further S., and contemporaneous with that of the Ohio. The flooding from the Missouri is the latest. In the bluffs of the Canadian, as well as on the upper part of the Arkansas, extensive beds of gypsum appear embedded in a ferruginous clay and a fine sand of a deep red colour; owing to this, the Arkansas, and the Canadian also, are generally of a deep red colour, especially during the floods. The waters of the North Fork of the Canadian and of the Upper Arkansas are of a greenish colour when not swelled by the rain.

(Darby's *View of the United States*; Long's *Expedition to the Rocky Mountains.*)

ARKANSAS TERRITORY, one of the territories of the United States not yet raised to the rank of a sovereign state. It is bounded by the state of Missouri on the north, the Mississippi on the east, Louisiania on the south, Texas on the south-west, and on the north-west by the western territory of the United States. It lies between 33° and 36° 30′ N. lat., and 89° 44′ to 100° 5′ W. long. from Greenwich. The river boundary on the east is about 360 miles, not reckoning all the small curvatures. A line of 170 miles drawn west along a parallel of latitude separates it from Louisiana. The Rio Roxo or Red River, one of the large affluents of the Mississippi, forms the remainder of the southern boundary separating Arkansas from the Mexican territories. The 100th western meridian from Greenwich forms the western limit of Arkansas; and the parallel of 36° 30′ separates Arkansas on the north from the north-west territory and from the state of Missouri, all but a small portion where the line follows the St. Francis river for 30′ south, and then runs for 34 miles eastward to the river Mississippi. The circuit of Arkansas is about 1320 miles, and the area is computed at 121,340 square miles, between one-fifth and one-sixth more than the reputed area of Great Britain and Ireland.

Arkansas may be divided into three physical regions, an eastern, a central, and a western region. The eastern, bordering on the Mississippi, is low and flat, generally covered with dense forest, without good water, and almost without stones. In the central section the ground begins to ascend gradually, and the forests are interspersed with prairies; hills also begin to appear increasing in elevation as we advance westward. These hills, known most commonly under the name of the Ozark mountains, form a continuous chain which probably is an offset from the Mexican system; but about this there is still some doubt. The Ozarks enter Arkansas from the province of Texas, and crossing the territory in a general north-east direction, but nearer to the eastern than the western limit, enter the state of Missouri. The Ozarks are not a ridge of hills, but, like the Appalachians, a mountain-system, probably occupying two degrees or more in breadth; the general direction of the mountain mass is from south-west to north-east. The falls on the upper Washita (34° 25′ N. lat.) are formed by a kind of hard freestone, extending across the bed of the river in the direction just mentioned.

The western portion of Arkansas is an extensive elevated level, continually increasing in height as it runs westward towards the Rocky Mountains: it is a country of grass almost without trees, traversed by the long streams which join the Rio Roxo and the Arkansas river. Besides the Rio Roxo, which forms, for above 400 miles, the south-western boundary of Arkansas, the territory is watered by other affluents of the Mississippi. White River and St. Francis both rise in the Ozarks of Missouri, north of the Arkansas River. White River is formed by the union of numberless streams which rise in the Ozarks, and are united in two main streams, the western called the White River, and the eastern the Big Black River. The Big Black River is formed by numerous streams which rise further N. in the Ozarks; one of these, called Spring River, which is not 200 miles long, discharges more water into the Big Black River than the Canadian, 1000 miles long, into the Arkansas. The united stream, under the name of White River, has a general southern course, and joins the Mississippi fifteen miles above the outlet of the Arkansas, after a course of above 400 miles. A channel forks off three miles above the junction of the main stream with the Mississippi, and runs into the Arkansas. The St. Francis flows between the White River and the Mississippi in a general southern direction, and joins the Mississippi about sixty-five miles direct distance N.E. of the junction of the Arkansas with the Mississippi.

The Ozarks, between the Arkansas and Red River, rising above the low lands and spreading out into a hilly region of great extent, become the sources of numerous streams. Of these, one of the principal is the Washita. We are not aware that the remotest source of this stream is yet laid down with any accuracy, but the position of the hot springs near one of its sources has been ascertained to be in 34° 31′ N. lat., and 92° 50′ W. long. There are four principal springs; the highest temperature observed was 154° of Fahrenheit; the lowest temperature was 132°. It was computed by Mr. Dunbar's party that the quantity of hot water discharged by all the four springs and some minor sources is about 3771½ hogsheads in twenty-four hours. Later visiters make the hot springs seventy in number. Major Long, who visited them in 1818, states the highest temperature to have been 151°. Several springs discharged respectively ten, twelve, and twenty gallons of hot water per minute: some of them were at least 100 feet above the bed of the river. Cold springs also exist on the same area as the hot springs. The hot water is colourless and tasteless, but makes a deposit of lime, siliceous matter, and oxide of iron. The Washita, increased by the Saline and several other tributaries, takes a southern course turning a little to the east. The junction of the Washita, Catahoola, and Tenza (about 31° 30′ N. lat.), forms the Black River, which empties itself into the Red River.

The climate and productions of this extensive territory vary with the elevation of the surface and the distance from the level of the Mississippi. The low region along the Arkansas is covered with a dense forest of trees, and an impenetrable undergrowth of shrubs and cane; its fertile soil produces cotton, Indian corn, melons, sweet potatoes, and some tobacco, but the sugar-cane will not succeed so far north. The peach, the nectarine, the grape, the papaw, and a variety of other fruits, succeed better than the apple, which is small. The papaw is sometimes thirty or forty feet high, and its trunk not less than a foot in diameter. The heat in summer is intense, and the annoyance from musquitoes sometimes almost insupportable. The only water fit to drink is the rain water, which is preserved in large jars sunk in the ground; the river water when filtered is fit for use, though many of the inhabitants are obliged to dispense with this process. Snakes and other venomous reptiles abound in the thick forests. In the early part of the year, the cold is often severe for a short time, and both snow and ice are occasionally seen at this season. Thunder-storms in summer are often terrific, and the rain descends in torrents. The climate is unhealthy, especially for new comers; ague and bilious fevers prevail in the summer and autumn, and are often fatal.

The Ozark region, which commences near Little Rock on the Arkansas, and extends nearly as far W. as the junction of the Canadian and Arkansas, is only partially known. Near the hot springs of the Washita, the soil in the river-valley is of good quality, and the lower hills, which are not above 300 feet high, as well as the base of the higher hills, are covered with a soil of middling quality. The black and red oak, with a variety of other woods, and a considerable undergrowth, are found in the valleys of this region. On the rocky parts of the hills there are three or four species of vines, said to produce an abundance of excellent grapes. An immense bed of dark blue schistose rock (clay slate) appears to form the base of the hot spring hill, and those near it; and pieces of this rock in a state of decomposition, possessing a strong aluminous taste, are frequently met with. The temperature of the atmosphere at the springs on the 31st of December, 1804, was 29° at sunrise, 32° at 3 P.M. with a wind S.E. and snow. On the morning of the 30th of December it was 9° at sunrise, 38° at 3 P.M. with a high N.W. wind. On January 2, 1805, the thermometer was 6° at sunrise. The Ozarks between the Arkansas and the Red River, though resembling the Appalachians as to general direction, are said not to show, like the mountains east of the Mississippi, a set of parallel ranges.

The real sources of the Washita are about 100 miles N.W. of the hot springs in an elevated region, from which some small tributaries flow into the Arkansas, and others into the Red River. The hills in this part are so thinly covered with pine and post oak, that the grey sandstone is the prevailing colour in the landscape. In the river-valleys of these mountains, as, for instance, on the Saline branch of the Washita, there are lands not inferior to any in the Mississippi valley; the timber is pine, oak, ash, hickory, and sugar-maple. These trees, the undoubted marks of a rich soil, are also found along the base of the mountains, S.E. of the hot springs, and form an exception to the general remark, that the best soils in Arkansas are in the river alluvium. The deer and the wolf abound in these high regions; and the wild turkey is still numerous on the banks of the White River. (For the geological structure and general character of the OZARKS, see that article.)

The region W. of the Ozarks has been already partially described. It commences near the junction of the Canadian and Arkansas; and though timber and thick undergrowth are found in the bottoms of the rivers, we trace from this point, or about a degree westward, the great red sandstone formation with its bare and monotonous surface which extends to the Rocky Mountains. The red colouring matter of the sandstone stains the waters of the Canadian a dark red colour, and the soluble salts associated with this rock give its waters a strong saline taste.

The mineral wealth of the territory is yet hardly known. Iron certainly exists, and probably lead and coal; salt might probably be produced in abundance from the salines near the Washita, and in other places.

The Arkansas derives its name from a tribe of Indians, probably now extinct; they spoke the Osage language. It was first explored and settled by the French in 1685. In 1763, the whole of Louisiana was ceded to Spain, who kept possession of it till 1800, when, by a secret treaty, it was given back to France. In 1803, Louisiana was purchased by the United States from France for 15,000,000 dollars, and it contained, according to the terms of the purchase, not only the state so called, but Arkansas, Missouri, and the N.W. territory. The post of Arkansas, on the left bank of the Arkansas river in the low country, is an old Spanish settlement. Little Rock, the seat of government, is higher up the country, on the right bank of the same stream, 34° 43′ N. lat., 92° 15′ W. long. The population in 1830 was 30,388, of whom 4576 were slaves.

The governor is appointed by the president, with the consent of the senate; the term of office is three years, and the salary 2000 dollars. There are four judges, with salaries of 1200 dollars each. The militia of the territory was 2028 in 1831. The territory sends one delegate to congress. The most recent division of the state that we have seen makes fifteen counties. According to a statement in the *Encyclopædia Americana*, the limits of what is properly called Arkansas territory have been reduced to 45,000 square miles. The population of Arkansas consists of Indians, some French, a very few Spaniards, Americans, and such adventurers from all countries as are found on the verge of civilization. Education does not exist in the territory, and the power of law is yet too feeble to repress and punish acts of personal violence, which are not uncommon.

Of the Indian tribes as at present existing in Arkansas, we can give no satisfactory account. The Quapaws, Choctaws, some Osages, and other tribes, still inhabit the territory. The Chickasaw Indians are now endeavouring to select a suitable spot in Arkansas for their future home.

(Darby's *View of the United States*; President Jefferson's *Message of February* 19, 1804, *communicating Dunbar and Hunter's Visit to the Hot Springs of the Washita*; Long's *Expedition to the Rocky Mountains*; Nuttall's *Arkansas*; *American Almanac*, 1834.)

ARKEEKO, a sea-port on the western coast of the Red Sea, in 15° 38′ N. lat. and 39° 37′ E. long. It lies three miles S. of the small island and town of Massowah, where the vessels from Jidda and other parts cast anchor. The goods that are destined for the Abyssinian market are then carried to Arkeeko, where the kafilas or caravans assemble. From Arkeeko the kafilas journey in a southward direction, passing over the Taranta mountains, and proceed to Dixan, the first Abyssinian town on that side, and thence to Adowa, the chief mart of trade in the kingdom of Tigre. [See ADOWA.] Arkeeko is about forty-miles N. by E. of Dixan, and about 100 N.N.E. of Adowa, but the distance is much greater by the road or track which the kafilas follow. Arkeeko lies in a sandy flat country which stretches between the coast of the Red Sea and the foot of the Taranta and Assauli mountains which divide it from Tigre. This maritime region is not now under the power of the Abyssinians, but is occupied by native independent tribes, nomadic and predatory like those of the Arabs, and often at war with their Abyssinian neighbours. They are nominally Mohammedans, and speak various dialects, of which Mr. Salt gives short vocabularies. The Hazorta tribe occupy the country immediately to the south of Arkeeko, and when at peace they escort the kafilas between Arkeeko and Dixan. The town or village of Arkeeko is under the rule of a nayib, or native chief, who is himself under a sort of dependence on the aga or military governor of Massowa, which latter used to be appointed by the shereef of Mecca. The authority of the pacha of Egypt has now superseded that of the shereef. The aga levies a duty upon all goods which are imported into Abyssinia. Arkeeko is a small and miserable place; its only importance consists in being the point of the coast nearest to the Abyssinian territories, and through which all intercourse by sea to that country is now carried on. The territory of the Baharnegash, a dependency of the kingdom of Tigre, stretches to within twelve or fourteen miles W. of Arkeeko. Mr. Salt gives a very bad account of the people of Arkeeko: 'they are much worse than their neighbours of Massowa, who are themselves not so good as the worst of the Arabs.' The bay of Arkeeko is separated to the eastward by the Giddam mountain and promontory from Annesley's Bay, which stretches southward to Zulla, the antient Adule, which was formerly the maritime emporium of Abyssinia. [See ADULE; Salt's *Abyssinia*; Valentia's *Travels*.]

ARKLOW, a town in Ireland, in the barony of Arklow, county of Wicklow, 46 miles south of Dublin, on the road to Wexford, in 52° 48′ N. lat., 6° 10′ W. long., from Greenwich. It is on the south bank of the Ovoca, or Avoca, about 500 yards from the sea, and has a main street, running nearly parallel to the stream, with a gentle descent towards the sea: this forms 'the Upper Town.' At the upper end of this is a barrack with a walled yard, connected with an old tower partly destroyed by Oliver Cromwell. Towards the lower end of this street, the road by the coast from Wicklow, which leads by a bridge of many arches over the Ovoca, enters the town; and a little below this is the part denominated the Fishery, consisting of mud cabins, built very irregularly. There is a handsome modern church, on a rising ground about the centre of the town, and a square chapel on an open and convenient spot in the Upper Town. The shore is skirted by a line of sand hills. Some steps have been taken to improve the haven, which is bad and little used, except by the fishermen. The herring fishery employs a number of boats, which have usually six hands in each. In the intervals between the herring seasons, the men dredge for oysters on the beds off the coast; they carry their oysters to Liverpool, and bring back earthenware and coals. Their children in the mean time make nets. This fishery is the chief occupation of the inhabitants of the town, who amounted in 1821 to 3808, and in 1831 to 4383. Arklow has a fever hospital and a dispensary. There are four fairs, at which are sold cloths and woollens of different descriptions, also black cattle, pigs, &c.

The parish of Arklow is a rectory and vicarage in the diocese of Dublin, episcopally united from time immemorial to the vicarage of Enorely, or Ennerily, and the curacies of Kilbride, Killahurler or Kilmain, and Temple Michael, all contiguous. Besides the ruins of the castle above-mentioned, there were the remains of a monastery for Cistertian friars, founded in the thirteenth century by Theobald Fitzwalter, fourth butler of Ireland (a former officer of state); but these are now removed.

In the rebellion of 1798, Arklow was the scene of a very severe contest. On the 9th of June, a body of insurgents (whose numbers are variously given at 'above 20,000, of whom 4000 or 5000 carried guns,' and at 31,000) advanced against the town, which was defended by nearly 1600 men, under the command of Major-General Needham and Colonel Skerrett. The assailants advanced with great impetuosity, and succeeded in entering and burning the part of the town nearest the sea—'the Fishery,' which consisted then, as now, of thatched cabins, inhabited by fishermen. The contest, however, was severest at the upper end of the town, and was maintained with great courage, the Durham Fencibles especially distinguishing themselves in the defence. Ultimately, about nightfall, the rebels were repulsed, and retired, without being pursued, towards Gorey, after suffering considerable but not well ascertained loss. (Carlisle's *Top. Dict.*; *New Stranger's Guide*; Musgrave's *Memoirs of the Rebellion in Ireland*; Gordon's *Hist. of Ireland*; Shaw Mason's *Stat. Account of Ireland.*)

ARKWRIGHT, SIR RICHARD, one of those extraordinary men whose ingenuity has exerted a most powerful influence upon the condition of civilised society, was born at Preston, in Lancashire, on the 23rd of December, 1732. His parents moved in an humble walk of life; and as he was the youngest of thirteen children, we may suppose that the amount of school learning which he received was exceedingly scanty. He was brought up to be a barber, an occupation which could afford but little promise of distinction, and it is probable that, had he continued to follow that business, the powers of mind which he exhibited, and to which his great success in life must be attributed, would have lain dormant, or might have been stifled by the petty cares attendant upon a low and precarious profession. About the year 1760 he quitted business as a barber, which he had previously carried on in the town of Bolton, and became a dealer in hair. This article he collected by travelling up and down the country, and when he had dressed it, sold it again in a prepared state to wig-makers. The profits of this business were increased, and the circle of his customers was enlarged, by means of a secret process for dyeing hair which he possessed, and which is said to have been a discovery of his own. This last fact is, however, doubtful, as chemistry was not among the subjects which he at any time studied; and it is probable that, had his first successful project been the result of his own investigations in that branch of science, he would have continued to devote his attention to similar objects, and not have been led away to the study of mechanics, of which also his knowledge appears to have been for some time exceedingly limited.

His first effort in mechanics was an attempt to discover the perpetual motion. This direction having been given to his thoughts, it may naturally be supposed, that the circumstance of his living in the midst of a manufacturing population, the growing demand for whose productions placed them in continual difficulty as to procuring the material principally required for their manufacture, would lead him to consider the possibility of contriving some machine by which that difficulty might be lessened or overcome.

Up to the time we have mentioned, the cloths of English manufacture called calicoes, which were made in imitation of Indian goods, and so called from Calicut, the place of their production, were formed by a mixture of linen and cotton: the warp was composed of linen and the weft of cotton, it being found impossible, by any means then known, to spin the fibres of cotton into a thread sufficiently strong to be used as warp. The cotton for the weft was at this time delivered in the raw state by the master manufacturers, together with the linen yarn, to cottagers living in the little villages of the district, who both carded and spun the cotton wool, and wove the cloth. The demand for these cloths soon became so great, that the females in the weaver's family by whom the carding and spinning processes were performed, could not prepare sufficient weft to keep the looms employed, and the weaver was obliged to engage additional hands for preparing the cotton. The limit to which this species of employment could be carried was soon reached, and if some more productive mode of spinning than that by the one-thread wheel, then the only machine known had not been discovered, the progress of the cotton manufacture must have been stopped, or at best would have been extremely slow. Mr. Guest, in his *History of the Cotton Manufacture*, tells us, that at this time 'it was no uncommon thing for a weaver to walk three or four miles in a morning, and call on five or six spinners, before he could collect weft to serve him for the remainder of the day.'

It has been said that the cotton yarn then produced in England did not exceed in quantity what is turned off by 50,000 spindles at the present day, being about the one hundred and fiftieth part of the number now in constant use. It is not our intention to go into further particulars on this subject, which may be better detailed under the head of COTTON MANUFACTURES, but some slight notice of the state of things preceding the great invention of Arkwright appears necessary, in order to show more clearly the advantage which the country has derived from his inventions.

It has been much the fashion to depreciate Arkwright's talents, and even to deny him altogether the merit of being an original inventor; and he has sometimes been considered as a plagiarist or pirate of other men's ideas. If, however, the evidence is carefully weighed upon which it has been attempted to convict him of this serious charge, we think it will be found to rest upon very slight grounds; while the proofs which he exhibited of possessing talents of the very highest order in the management of the vast concerns in which he was afterwards engaged, are unquestionable. The evidence brought forward upon the trial for repealing his patent in 1785 was that of persons in a low station of life, who spoke of circumstances which had occurred eighteen years before. One of the witnesses—the principal one—had been employed by Arkwright to assist in making the models for his machine, and, in order to invalidate the patent, he accused himself of having betrayed the confidence of the real inventor, for whom he had previously made a similar machine. The combination against Arkwright which produced this trial was of a very powerful description, and without wishing to impute to any persons so serious a crime as subornation of perjury, it is at least probable that all were ready to listen to and to reward witnesses who were willing to aid their cause, without inquiring too nicely into the actual merit of their testimony. Of late, the case of a still earlier invention has been brought forward, to which no allusion was made upon the trial in 1785; a circumstance which makes it probable, that the memory of its true nature was at that time completely lost. It is, therefore, consistent, not only with charity, but also with strict justice, to suppose that Arkwright himself, then a very illiterate and ill-informed man, knew no more of this earlier invention than the rest of the world after attention had been directed to the subject for so many years. We allude to the case of a patent for spinning by means of rollers, which was taken out in the year 1738, by Mr. Charles Wyatt, of Birmingham, in the name of Lewis Paul, a foreigner, with whom Wyatt had formed a partnership. The specification of Wyatt's invention has recently been brought to light and published, and there can be no doubt that it contains the principle of Arkwright's patent to an extent which deprives him of the honour of having been the *first* inventor of his plan, while it equally deprives of that honour the men upon whose testimony Arkwright lost his cause. It cannot, however, be considered impossible, or even improbable, that two men should actually invent the same machine. Wyatt's contrivance had been tried in Birmingham and at Northampton in 1741, but was so far from being successful, that the machinery was sold in 1743, and it is not known what became of it. That twenty years afterwards Arkwright should have had more than a traditionary knowledge of Wyatt's plan is not very likely. In the 'Case' which he drew up to be presented to Parliament in 1782, and which was printed and extensively circulated three years before the trial already alluded to, he makes mention of the fact in these words:—'About forty or fifty years ago, one Paul and others of London invented an engine for spinning of cotton, and obtained a patent for such invention; afterwards they removed to Northampton and other places. They spent many years and much money in the undertaking, but without success; and many families who had engaged with them were reduced to poverty and distress.' This 'Case' was drawn up at a time when his patent-right was being constantly invaded, and it is incredible, that, if he had possessed a knowledge of the particulars of Wyatt's patent, he should have thus drawn public attention to it, since he must, in that case, have known that the production of the specification would at once have deprived him of every ground upon which he attempted to establish his own rights as an inventor.

It is perhaps unnecessary on this occasion to enter at greater length into this matter, which, however, it was impossible to pass over unnoticed, considering how greatly the question of Arkwright's inventive talent has at various times been controverted. We shall now proceed in our account of this extraordinary man, on the supposition of his having been in reality what he represented himself to be, the inventor of the ingenious machine for which he obtained his patent.

In the course of his inquiries after some person qualified to assist him in making the movements for his first projected machine, which, as we have already said, was one for producing perpetual motion, Arkwright became acquainted with a clockmaker, named Kay, then residing at Warrington, whose services he engaged and retained for four or five years, first at Preston and afterwards at Nottingham. The account which Kay himself gave of this connexion upon the trial in 1785, where he was the principal witness, was, that it broke off in consequence of his having been unjustly accused of felony.

From the year 1767, it appears that Arkwright gave himself up completely to the subject of inventions for spinning cotton. In the following year, he went to Preston, and set about constructing his first machine, which was put up in the dwelling-house attached to the free grammar-school of that town. At this time Arkwright's poverty was such, that, 'being a burgess of Preston,' he could not appear to vote during a contested election, till the party with whom he voted gave him a decent suit of clothes. Shortly after, apprehensive of meeting with the same kind of hostility which had a short time previously been shown to a man named Hargreaves, who also had invented a machine for abridging labour in cotton-spinning, Arkwright left Lancashire and went to Nottingham. Here he made arrangements with Messrs. Wrights, bankers in that town, for obtaining the necessary supply of money; but these gentlemen, after a short time, declined to continue their advances, and introduced him to Mr. Need, a stocking-manufacturer of that place, as a gentleman likely to enter into his plans. Mr. Need was at that time in partnership with Mr. Jedediah Strutt, of Derby, the ingenious improver and patentee of the stocking-frame, whose opinion he naturally asked upon the occasion; and it is a remarkable fact, strongly corroborative of Arkwright's claim to be the original inventor, that, although Mr. Strutt saw and at once acknowledged the great merit of the invention, he pointed out various deficiencies which the inventor, from the want of mechanical skill, had been unable, with all his powers of contrivance, to supply. These defects were easily remedied by Mr. Strutt, and in the year 1769 Arkwright obtained his first patent for spinning with rollers, and Messrs. Need and Strutt became his partners in the manufacturing concerns which it was proposed to carry on under it.

The improvement for which this patent was obtained consisted principally in the use of two pairs of rollers, the first pair slowly revolving in contact with each other; while the second pair, at a little distance, was made to revolve with greater velocity. The lower roller of each pair was fluted longitudinally, and the upper one was covered with leather, by which means the two would have a sufficient hold upon the cotton passed between them. The cotton, when passed through the first pair of rollers, had the form of a thick but very soft cord, and was no further altered in its texture than receiving a slight compression; but it is evident that, as the second pair of rollers moved with twice, thrice, or ten times the velocity of the first, the cotton must be drawn out twice, thrice, or ten times smaller than when delivered from the first rollers. The validity of this patent was contested in 1772, on the ground of Arkwright not having been the original inventor of the process, but a verdict was given in favour of the patent, which no one afterwards attempted to disturb.

The first mill erected for spinning cotton by this method was at Nottingham, and was worked by horse-power; but in 1771 another mill was built at Cromford, in the parish of Wirksworth, in Derbyshire, to which motion was given by water; from this circumstance the machine was called the water-frame, and the thread received the name of water-twist.

Previous to this time no establishment of a similar nature had existed, none at least to which the same system of management was applicable; and it strongly marks the judgment and mental powers of Arkwright, that although the details of manufacturing or commercial business were altogether new to him, he at once introduced a system of arrangement into his works which has since been universally adopted by others, and which, in all its main features, has remained unaltered to the present time.

The great invention, which has been very slightly described above, was followed up by various improvements and combinations of machinery, for which a second patent was obtained in 1775. His right to this patent was disputed in 1781, on the plea that some of the contrivances which it comprehended were not original; and his monopoly was invaded to such an extent by other cotton-spinners, that to maintain it he was obliged to bring actions against nine different parties. The first of these actions was tried in July, 1781, when he was non-suited, not on the ground originally taken by his opponents, but because it was held that the specification or description of the invention which he had enrolled, did not comply with the terms upon which the patent was granted, viz. that it should contain such a full and particular account of the invention as would enable the public to avail themselves of its advantages after the expiration of the term for which the monopoly was granted. The result of this trial occasioned Arkwright not only to abandon the other eight actions which remained to be tried, but also, for a time at least, to forego the rights derived from his second patent. It was on this occasion that he drew up and published a pamphlet, to which allusion has already been made, and which he called his 'Case.' The object of this pamphlet was to impress the members of the legislature with the propriety of interfering for his protection.

Having in the beginning of 1785 obtained the testimony of several competent persons in favour of the sufficiency of his specification, Arkwright then commenced a new action, which was tried in February of that year, and decided in his favour thereby reinstating him in the possession of his monopoly. By this time, however, the number of persons interested in destroying that monopoly had greatly increased; on the faith of the former verdict large capitals had been embarked which would have been subjected to heavy depreciation if the patent could have been sustained, and accordingly in a very few months an action was brought for the cancelling the patent by a writ of *scire facias*, nominally at the suit of the crown, but actually prosecuted by the cotton-spinners of Lancashire, who would have been liable to penalties for continuing to use the invention. These parties actually formed an association for the purpose of trying this cause; and engaged scientific gentlemen to discover the technical defects of the patent and to arrange the evidence for its overthrow. It was on this occasion that the testimony of Kay was adduced to show that, previously to his having been employed in 1767 to make a model for Arkwright, he had been similarly engaged by another person who was likewise brought forward to corroborate the fact, and upon this evidence the jury found a verdict for the crown, and thereby annulled the patent. A new trial was applied for in the following term, on the ground that Arkwright had procured evidence to rebut that upon which the verdict was grounded, but the motion was refused by the court.

The opposition here described was not the only difficulty which Arkwright had to encounter from rival manufacturers. Although the yarn which he made was so far superior to that produced by the old method of spinning that it could be used for warp, they combined to discountenance its use. A very considerable stock lay upon his hands in consequence, and he and his partners were driven to undertake the conversion of this yarn into manufactured goods. They first used it with perfect success in making stockings, and soon after established the manufacture of calicoes, such as they are made at the present day. But here another difficulty assailed them. Their orders for this description of manufacture, then new to England, were exceedingly great, but could not be complied with, on account of the demand on the part of the officers of excise of a duty of sixpence per yard, as being calicoes similar to those imported, and upon which a like duty was levied, while other English-made cloths were subject to only half that rate. It was not until application for relief had been made to parliament that this obstacle was removed, and a large accumulated stock of cloths was disposed of. On this occasion an act of parliament was passed, in spite of the strenuous opposition of the Lancashire manufacturers, declaring that 'Whereas a new manufacture of stuffs made entirely of cotton spun in this kingdom has lately been introduced, and some doubts are entertained whether it is lawful to use it, it is declared to be not only a lawful but a laudable manufacture, and is therefore permitted to be used on paying threepence per square yard when printed, painted, or stained with colours.'

Five years expired from the first establishment of the works at Cromford before any profit was realized, but after that time wealth continued to flow in abundantly to the proprietors. The establishments were greatly extended, several new ones were formed, and, in many cases, Arkwright took a share with other persons in the erection and working of cotton-mills. This tide of prosperity continued to set in notwithstanding the adverse decision of the courts in regard to his patent. For several years, the market prices of cotton twist were fixed by Arkwright, all other spinners conforming to his scale. The same quality of this article which now sells for about 3*s*. per pound, sold, in 1790, for ten times that price, and was as high as 1*l*. 18*s*. per pound in 1786; and although a great part of this difference is no doubt owing to a progressive economy attained in the processes of manufacture, it is not difficult to imagine that the larger price must have been exceedingly profitable to the spinner.

Mr. Arkwright was appointed high-sheriff of the county of Derby in 1786, and on the occasion of presenting an address of congratulation to the king on his escaping the attempt at assassination by Margaret Nicholson, received the honour of knighthood. Notwithstanding the increasing inconvenience which he experienced from a severe asthma, with which he had been occasionally afflicted from early life, Sir Richard continued to give the most unremitting attention to business, and superintended the daily operations of his large establishments, adding from time to time such improvements to the machinery as were suggested by experience and observation. He sunk at length under a complication of disorders, accelerated if not produced by his sedentary habits, and died in his house at Cromford, on the 3d of August, 1792, in the sixtieth year of his age, leaving behind him a fortune estimated at little short of half a million sterling.

Considering the difficulties in which he was placed by the deficiency of his early education and the unfavourable tendency of his early employment, Arkwright must be acknowledged to have been a very extraordinary man. Even without claiming for him the honour of having been an original inventor,—an honour which, upon the best consideration we can give to the conflicting evidence brought forward, we are still [illegible] to award him,—we may certainly ascribe to him the possession of a clear and comprehensive mind, as well as the most unerring judgment. His plans were all laid with skill, and pursued with energy; he displayed the most unwearied perseverance in pursuit of his object under difficulties which would have borne down most men; and he forms one among the bright instances afforded by the annals of this country, that talent, when thus allied with patient energy and persevering industry, will not fail to ensure ultimate success to its possessor. (*Library of Entertaining Knowledge;* Baines's *History of the County of Lancaster;* Godson's *Treatise on the Law of Patents.*)

ARLES (Arelate, *Cæsar;* Ἀρελάται, *Strabo*), a town in France, in the department of Bouches du Rhône, 453 miles S. by E. from Paris, through Lyon, Avignon, and Tarascon; or, about 440 by Mende, Nîmes, Beaucaire, and Tarascon, crossing the Rhône between the two last-mentioned towns. It is 75 miles by a circuitous route through Aix and Tarascon, from Marseille, the capital of the department, but considerably nearer by the road through Jonquieres and the marshes near the coast. 43° 40′ N. lat., 4° 35′ E. long. from Greenwich.*

The city is on the left bank of the Rhône, just at the point where the river, dividing into two channels, encloses the marshy island of La Camargue, or Carmague. It is in a district abounding in marshes and pools, which surround it on almost every side, and produce vapours which are carried to the city by the winds. But for this circumstance, it would be one of the most delightful situations in France; the country around, with its verdant meadows, presents some agreeable scenes; and the alleys of mulberry-trees make pleasant promenades.

The town itself is but ill built, with narrow, crooked streets, and old houses. A bridge of boats unites it with the suburb of Trinquetaille, on the opposite bank of the Rhône, and serves also as a place of resort when the inhabitants wish to enjoy a cooling breeze. There is a Gothic cathedral, built, it is said, partly by St. Virgilius, archbishop of Arles, A.D. 626, and partly by Cardinal Alleman, one of his successors, in the 15th century. The portal is distinguished by sculpture of a grotesque and somewhat indelicate character. The most striking modern edifice is the town-hall, which was built in 1673, after the design of the architect Mansard. It is of white stone; and its two façades (for it stands between two *places*, or squares) display three orders of architecture intermingled. There are several antiquities in it.

The situation of Arles on the banks of the Rhône gives it considerable advantages for trade. There is also a navigable canal, which runs through the marshy district on the left bank of the eastern or main channel of the Rhône, from Arles to the Port de Bouc, on the Mediterranean, at the entrance of the Etang de Berre, or, according to the Society's map, to Foz, which is between Arles and the Port de Bouc. This canal, for the greater part of its course, runs nearly parallel to the above-mentioned branch of the Rhône, and not far from it. The corn, wine, fruits, manna, and oil, of the surrounding country, find sale at Arles; and several manufactures are carried on, as of glass bottles, soap, silk, tobacco, and brandy. The sausages of this place are in high repute. The population is about 20,000. There are a school of navigation, a high school, a museum of antiquities, and a public library. Before the revolution there were many religious houses.

Arles is the capital of an arrondissement containing thirty-three communes, and about 70,000 inhabitants. It was formerly the seat of an archbishop, who had for his suffragans the bishops of Marseille, Toulon, Orange, and St. Paul-trois-Châteaux—the remains of a much greater number of bishops who once acknowledged him as their metropolitan. At present, the archbishopric is united with that of Aix.

The claims of Arles to notice rest mainly upon its former greatness and its numerous existing antiquities. It is first mentioned by Cæsar (*de Bello Civili*, lib. i. 36, ii. 5), who built here twelve ships of war, previous to the siege of Massilia (Marseille). Strabo mentions it as a place of no small trade in his time. Pomponius Mela, a writer somewhat later than Strabo, describes it as one of the richest cities of the province of Gallia Narbonensis. Other authors make it a Roman colony; and it was probably from the circumstance of some of the colonists belonging to the sixth legion, that it got the name of *Arelate Sextanorum*. The name is variously written. *Arelate* is most common, but we find also Arelas, especially in the poets, Arelatæ (Ἀρελάται, Strabo), and Arelatum (Ἀρελάτον, Ptolemy), and in later times, Arelatus. The city appears to have suffered considerably from the Allemanni during the decline of the Roman empire, but in the early part of the fourth century it rose to greatness and distinction under the patronage of Constantine the Great. This prince appears to have built that part of Arelate which lay beyond the Rhône, and which forms in the present day the suburb of Trinquetaille, in the island of La Camargue. He gave to Arles the name of Constantina, which it continued to bear in the time of Honorius (a century later), who transferred to it the seat of the prætorian prefect of Gallia, which had previously been fixed at Trèves.

The dignity of Arles survived the fall of the western empire. It was the residence of a king of the Visigoths, and of a prefect under Theodoric, king of the Ostrogoths, who afterwards got possession of it. Under the kings of the Franks of the Merovingian family, who became masters of Arles after the Ostrogoths, the city declined. In the confused period which succeeded the death of Charlemagne, we find it giving name to a kingdom, sometimes called the kingdom of Arles, sometimes of Burgundy; the duration and extent of which are subject to considerable doubt. Arles passed under the dominion of the emperors of Germany, and, by the permission of Frederic II., became, in 1212, a republic, governed by a chief entitled the *Podestat*, elected by the people. It had also a chief judge, the *Viguier*, appointed by the *Podestat*, and two Consuls, nominated by the

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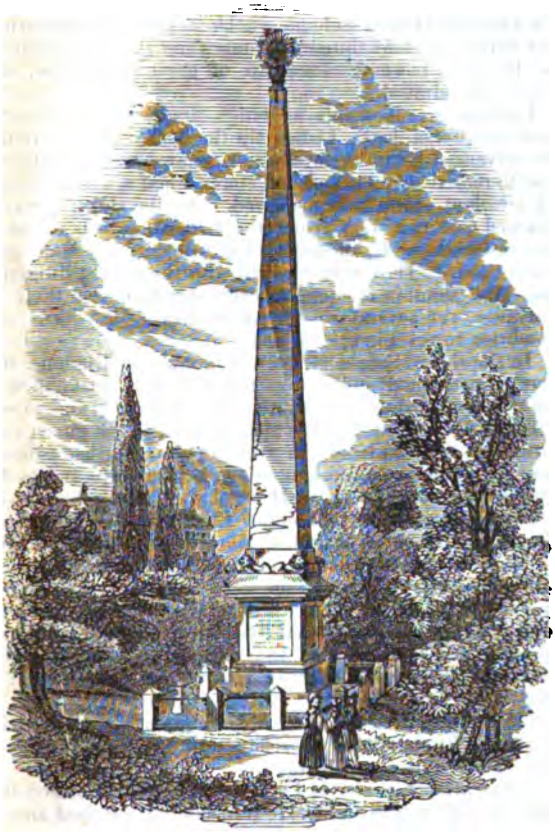
* So in the Map of France published by the Society for the Diffusion of Useful Knowledge. By Brue's Map (Paris, 1818), it is 2° 18′ E. of Paris, equivalent to 4° 38′ E. of Greenwich

Archbishop to take charge of the police. In a word, it appears to have become a municipal corporation; and under this constitution flourished to such a degree that its alliance was sought by Genoa and other commercial towns. Its independence was indeed overthrown, in the middle of the same century, by Charles I., Count of Anjou (brother of Louis IX. of France, or St. Louis), who was recognized as Lord of Arles, in feudal subjection to the emperor of Germany. Above a century after, the emperor Charles IV. appointed the dauphin, afterwards Charles VI. of France, his vicar in all the kingdom of Arles; and as the emperors quietly withdrew from all supremacy over it, the city, with its territory, came finally under the kings of France.

The antiquities of Arles are numerous and important; but the doubtful nature of some of the buildings, to which different names have been given, makes them apparently more numerous than they are, and occasions some difficulty in the description. There are the ruins of an aqueduct; of two temples, one supposed to be of Diana; of a triumphal arch; of a theatre, three columns of which make up what is called *Tour de Roland;* of a building, which is variously supposed to have been a temple of Minerva, a palace of Constantine (called *La Trouille*), and the capitol or seat of the municipal legislature; of baths, the stoves and galleries of which were discovered in digging for the foundation of the town-house and of the pedestal of the obelisk; and of urns, lacrymatoria (tear-bottles[*]), pateræ, lamps, and other utensils which have been obtained from the tombs. Three remains deserve a more extended notice: the obelisk, the amphitheatre, and the antient cemetery, called the Campus Elysius (Elysian Field), or, by corruption, Eliscamp.



Obelisk of Arles.

The obelisk decorates one of the squares next to the town-hall. The time when it was brought to Arles and the other circumstances attending its transport are unknown. It is of granite similar to that of the obelisks which were carried from Egypt to Rome, but is without any hieroglyphics. It appears never to have been set up in antient times, but to have lain where it was placed on being landed. For many ages, it was buried in the earth in the garden of a private individual; but was discovered in 1389, and in 1675, under the direction of the town-council, was brought from its concealment, and raised on a pedestal. It was originally of one piece, but when dug out, was found to be broken at the point: the broken part was discovered in another place. Its dimensions are about fifty-five English feet high, and the base is about seven feet and a half square. It rests on four lions *couchant* at the four corners: the lions lie on the pedestal, which is above twenty-one feet high, and has on its four sides Latin inscriptions, containing the most fulsome panegyrics on Louis XIV., to whose honou the obelisk was erected. The summit was crowned with a globe covered with *fleurs-de-lis*, and surmounted by the sun, the ensign of *Le Grand Monarque.* Whether these emblems of royalty have survived the fervours of the revolution, we have not been able to ascertain; but the obelisk itself, which is the only antient part of the monument, maintains its place.

Of the amphitheatre, the circuit is yet entire; and the remains, although blocked up with houses, are sufficient to convey an idea of the former grandeur of the edifice. It consisted of three stages, the lower of which, owing to the uneven surface of the site, was for the most part under ground, except on the north and north-east, where several arches appear above ground. The inequality of the site, by thus concealing or burying the greater part of the first stage, made it necessary to place the principal entrances on the second, which contains sixty arches (including the four principal entries), the number which is also in the third stage. The parapet which surmounted the third stage has disappeared, and it is impossible to say of what kind it was. The architecture is of the Composite order. The rows of seats which surrounded the arena [see AMPHITHEATRE] have almost entirely disappeared, and the space which they once occupied, as well as the arena itself, is filled with earth to the level of the second stage, and covered with houses. Three towers have been built during subsequent wars. The once open arches of the outer wall have also been built up, and the exterior defaced and hidden by houses erected against it. This amphitheatre is built of stone, inferior in hardness and whiteness to that of the amphitheatre at Nîmes: it is less perfect than that edifice, but was capable of holding about five thousand more spectators.

The principal dimensions are thus given in Guis' *Description des Arènes ou de l'Amphithéâtre d'Arles.* 1665:—[*]

	English feet.
Circumference of the oval	1265 or 1245
Longer diameter, N. to S.	466
Shorter do. E. to W.	341 or 338
Longer do. of the arena . . .	249 or 246
Shorter do. do. . . .	126 or 124
Breadth from the outer wall to the parapet of the arena, across the benches . .	110 or 109

Number of persons whom the amphitheatre would contain, above 23,000.

The measurement of the circumference given in *Le Grand Dictionnaire* de Martinière rather exceeds the above: and he gives the height of the arches in the exterior wall as above twenty-one English feet, the width as eighteen or nineteen. He adds that the walls are above two toises or about thirteen English feet thick, formed of massy blocks of stone without lime or cement to unite them; and that the amphitheatre would conveniently hold 30,000 persons.

Excavations have been made in the amphitheatre within a few years, and many antiquities discovered.

The cemetery of Campus Elysius is on a pleasant hill out of the city. It is divided into two parts. In the first of these, called *Moulaire* (from which is a beautiful prospect) the antient monumental stones have mostly been carried away to present to different individuals, or broken up to be used as building materials: but the second part, which is still called *Eliscamp,* contains several tombs, those of the Pagans being distinguished by the letters D M (*Diis Manibus*), and those of the Christians by a cross. The same causes which have led to the removal of nearly all the tombs of the other part, have materially diminished those in Eliscamp.

An antient statue, which is called by Martinière and others a statue of Venus, but which an old writer, François de Rebatu, Dean of the See of Arles (in a tract bearing date 1659), and the writer in the *Encyclopédie Méthodique,* describe as a statue of Diana, was dug up in 1651. It was found in digging a well, in several pieces; and has been much admired. It was restored and transferred in 1684 to the gallery at Versailles, and subsequently to the gallery of the Louvre.

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[*] So called on account of their supposed use; considered by others to have been intended for perfumes.

[*] These dimensions are to be considered as approximations rather than as rigidly exact; for the two columns, though both taken from the same author, one being reduced from the Provençal measures, canes and pans (the cane = 8 pans, and the pan = 9¼ in. French), and the other from French toises, feet, and inches. do not agree.

It is supposed that the country round Arles was by no means so marshy in the time of the Romans; the obstacles which prevent the waters from flowing into the sea or into the channel of the Rhône having arisen since.

The people of Arles are considered to have retained more than those of most other towns of the manners of antient times. One instance of their adherence is far from creditable: bullfights were kept up here till a comparatively late period. Horse and foot races are still practised. The beauty, grace, and gentility of the women are much praised.

Arles was the native place of the Emperor Constantine II. son of Constantine the Great; of Morand and Patrat, dramatists; and of Saverien, a mathematician and biographer of some merit. (*Le Grand Dictionnaire* de Martinière; *Géographie de la France; Encyclopédie Méthodique;* &c.)

ARLON (the Roman Orolaunum), a small town in the Duchy of Luxembourg, belonging to the King of the Netherlands, in 49° 42′ N. lat., and 5° 47′ E. long. It stands on a hill, near the sources of the Semoy, a branch of the Maas, fourteen miles W.N.W. of the town of Luxembourg, and between that and the town of Neufchateau. Its population is about 3,600. It has some iron works and furnaces, a considerable corn trade, and linen and woollen manufactures. Arlon was once a town of considerable importance; it was fortified, and was taken and re-taken by the French and the Spaniards in the wars of Louis XIV. It was entirely destroyed by a fire in 1785. Arlon was the birth-place of the two learned brothers Busleyden, one of whom became cardinal and archbishop of Toledo in the time of Charles V.; the other was the founder of the College of the three languages at Louvain.

ARMA'DA. This term, which is derived from the Latin word *armata*, ‘armed,’ and consequently comes from the same root as the French *armée* and our *army*, is used in Spain to denote exclusively a naval armed force, or fleet of war. *Flota* is used in the same language for a fleet of merchant-men. Armado, which occurs in Shakspeare's *King John*, act iii. sc. 4, Sandys's *Travels*, p. 51, &c. is a corrupted term; so Fairfax, in the translation of *Tasso*, i. 79.

> ‘Spread was the huge *armado* wide and broad.’

Ben Jonson, however, writes it correctly, Armada.

Nares, in his *Glossary*, thinks that this word was not known in England before the Spanish projected invasion in 1588; and it is now rarely used but in speaking of that particular fleet the fitting out and destruction of which form the subject of the next article.

ARMADA, SPANISH. In the beginning of May, 1588, the preparations of Philip II. for the invasion of England, which had so long kept Europe in amazement and suspense, were brought to a conclusion; and the Spaniards, in the confidence of success, previous to its sailing, gave their fleet the name of the Invincible Armada. It consisted, at this time, of 130 vessels: 65 of these were galleons and larger ships; 25 were pink-built ships; 19 tenders; 13 small frigates; 4 were galeasses; and 4 galleys. The soldiers on board amounted to 19,295, the mariners to 8050; of these, 3330 soldiers and 1293 mariners had been supplied by Portugal: besides which, the rowers in the galeasses amounted to 1200, and in the galleys to 888. There were also on board 2431 pieces of artillery, and 4575 quintals of powder: 347 of the pieces of artillery had likewise been supplied by Portugal. Two thousand volunteers of the most distinguished families in Spain, exclusive of the sailors and soldiers already mentioned, are stated to have accompanied the expedition.

Philip's preparations, in the Netherlands, of a further force, were not less advanced than those of Spain. Besides a well-appointed army of 30,000 foot and 4000 horse, which the Duke of Parma had assembled in the neighbourhood of Nieuport and Dunkirk, that active general had provided a number of flat-bottomed vessels, fit for transporting both horse and foot, and had brought sailors to navigate them from the towns in the Baltic. Most of these vessels had been built at Antwerp; and, to prevent the Dutch from intercepting them should they pass by sea, they were sent along the Scheldt to Ghent, thence by the canal to Bruges, and so to Nieuport by a new canal dug for the particular occasion. This laborious undertaking, in which several thousand workmen had been employed, was already finished, and the duke now only waited for the arrival of the Spanish fleet; hoping that, as soon as it should approach, the Dutch and English ships, which cruised upon the coast, would retire into their harbours.

The details of the regular force which the English assembled to oppose the Armada, both by sea and land, are minutely given in a manuscript now in the British Museum (*MS. Reg.* 18 C. xxi.), formerly belonging to the Royal Library. At the time when Queen Elizabeth began her preparations, her fleet did not amount to more than thirty ships, none of them near equal in size to those of the enemy. Ultimately, however, the different descriptions of vessels, large and small, which formed her navy, amounted to 181 ships, manned by 17,472 sailors. The military force consisted of two armies, one for immediately opposing the enemy, under the Earl of Leicester; the other for the defence of the queen's person, commanded by Lord Hunsdon. The army appointed for the defence of the queen's person amounted to 45,362, besides the band of pensioners, with 36 pieces of ordnance. Lord Leicester's army amounted to 18,449; the total of both armies to 63,511, besides 2000 foot who were expected from the Low Countries. The forces of the Presidentship of the North remained stationary, in case anything should be attempted on the side of Scotland; as were also the forces of the Presidentship of Wales.

The Armada was to have left Lisbon in the beginning of May, but the Marquess de Santa Cruz, who had been appointed admiral, at the moment fixed for the departure was seized with a fever, of which he died in a few days; and by a singular fatality, the Duke de Paliano, the vice-admiral, died likewise at the same time. Santa Cruz was reckoned the first naval officer in Spain; and Philip found it extremely difficult to supply his place: he at last filled it with the Duke de Medina Sidonia, a nobleman of high reputation, but entirely unacquainted with maritime affairs. Martinez de Recaldo, however, a seaman of great experience, was made vice-admiral.

In these arrangements so much time was lost, that the fleet could not leave Lisbon till the 29th of May. It had not advanced far in its voyage to Corunna, at which place it was to receive some troops and stores, when it was overtaken by a violent storm and dispersed. All the ships, however, reached Corunna, La Coruña (the Groyne, as it is called by our historians and sailors), though considerably damaged, except four. They were repaired with the utmost diligence, the king sending messengers every day to hasten their departure; yet several weeks passed before they were in a condition to resume the voyage.

In the mean time a report was brought to England that the Armada had suffered so much by the storm as to be unfit for proceeding in the intended enterprise; and so well attested did the intelligence appear, that, at the queen's desire, Secretary Walsingham wrote to the English admiral, requiring him to lay up four of his largest ships and to discharge the seamen. Lord Howard was happily less credulous on this occasion than either Elizabeth or Walsingham, and desired that he might be allowed to retain these ships in the service, even though it should be at his own expense, till more certain information were received. In order to procure it, he set sail with a brisk north wind for Corunna, intending, in case he should find the Armada so much disabled as had been reported, to complete its destruction. On the coast of Spain he received intelligence of the truth: at the same time, the wind having changed from north to south, he began to dread that the Spaniards might have sailed for England, and therefore returned without delay to his former station at Plymouth.

Soon after his arrival Lord Howard was informed that the Armada was in sight. He immediately weighed anchor, and sailed out of the harbour, still uncertain of the course which the enemy intended to pursue. On the next day he perceived them steering directly towards him, drawn up in the form of a crescent, which extended seven miles from one extremity to the other. Plymouth was at first supposed to be the place of destination; but it was soon apparent that the Duke de Medina adhered to the execution of the plan which had been laid down for him by the court of Madrid. This was, to steer quite through the Channel till he should reach the coast of Flanders, and, after raising the blockade of the harbours of Nieuport and Dunkirk by the English and Dutch ships, to escort the Duke of Parma's army to England, as well as land the forces which were on board his own fleet. Lord Howard, instead of coming to close and unequal fight, contented himself with harassing the Spaniards on their voyage, and with watching attentively all the advantages which might be derived from storms, cross-winds, and other accidents. It was not long before he discerned a favourable opportunity of attacking the vice-admiral Recaldo. This he did in person; and on that occasion displayed so much dexterity in working his ship, and in loading and firing his guns, as greatly alarmed the Spaniards for the fate of their vice-admiral. From that time they kept closer to each other; notwithstanding which, the English on the same day attacked one of the largest galeasses. Other Spanish ships came up in time to her relief, but in their hurry, one of the principal galleons, which had a great part of the treasure on board, ran foul of another ship, and lost one of her masts. In consequence of this misfortune she fell behind, and was taken by Sir Francis Drake; who, on the same day, took another capital ship, which had been accidentally set on fire. Several other rencontres happened, and in all of them the English proved victorious. Their ships were lighter, and their sailors more dexterous, than those of the Spaniards. The Spanish guns were planted too high, while every shot from the English proved effectual. The Spaniards, however, still continued to advance till they came opposite to Calais, where the Duke de Medina, having ordered them to cast anchor, sent information to the Duke of Parma of his arrival, and entreated him to hasten the embarkation of his forces. But the duke, though he embarked a few of his troops, informed Medina that the vessels which he had prepared were proper only for transporting the troops, but were utterly unfit for fighting; and for this reason, till the Armada was brought nearer, and the coast cleared of the Dutch ships which had blocked up the harbours of Nieuport and Dunkirk, he could not stir from his then station (at Bruges) without exposing his army to certain ruin. In compliance with this request, the Armada was ordered to advance; and it had arrived within sight of Dunkirk, between the English fleet on one hand and the Dutch on the other, when a sudden calm put a stop to its motions. In this situation the fleets remained for a whole day. About the middle of the night of August the 7th a breeze sprung up, and Lord Howard had recourse to an expedient which had been planned the day before. Having filled eight ships with pitch, sulphur, and other combustible materials, he set fire to them, and sent them before the wind against the different divisions of the Spanish fleet. The Spaniards beheld these ships in flames approaching them with great dismay: the darkness of the night increased their terror, and the panic flew entirely through the fleet. The crews of the different vessels, anxious only for their own preservation, thought of nothing but how to escape from immediate danger. Some weighed their anchors, whilst others cut their cables, and suffered their ships to drive before the wind. In this confusion many of the ships ran foul of one another, and several of them received such damage as to be rendered unfit for future use.

When daylight returned, Lord Howard had the satisfaction to perceive that his stratagem had produced the desired effect. The enemy were still in extreme disorder, and their ships widely separated and dispersed. His fleet having received a great augmentation by the ships fitted out by the nobility and gentry, as well as by those of Lord Seymour, who had left Justin de Nassau as alone sufficient to guard the coast of Flanders, and being bravely seconded by Sir Francis Drake and all the other officers, he hastened to improve the advantage which was now presented to him, and attacked the enemy in different quarters at the same time with the utmost impetuosity and ardour. The engagement began at four in the morning of August the 8th, and lasted till six at night. The Spaniards in every rencontre displayed the most intrepid bravery; but, from the causes already mentioned, did little execution against the English, while many of their own ships were greatly damaged, and ten of the largest were either run aground, sunk, or compelled to surrender.

The principal galeass, commanded by Moncada, having Manriquez, the inspector-general, on board, with 300 galley-slaves and 400 soldiers, was driven ashore near Calais. Fifty thousand ducats were found on board of her. One of the capital ships, having been long battered by an English captain of the name of Cross, was sunk during the engagement. A few only of the crew were saved, who related that one of the officers on board having proposed to surrender, he was killed by another who was enraged at his proposal; that this other was killed by the brother of the first; and that it was in the midst of this bloody scene that the ship went to the bottom. The fate of two other of the Spanish galleons is particularly mentioned by contemporary historians, the St. Philip and St. Matthew: after an obstinate engagement with the English admiral's ship, they were obliged to run ashore on the coast of Flanders, where they were taken by the Dutch.

The Duke de Medina now not only despaired of success but saw clearly that by a continuance of the combat he should risk the entire destruction of his fleet. The bulk of his vessels rendered them unfit not only for fighting but for navigation in the narrow seas. He therefore determined to abandon the further prosecution of his enterprise; yet even to get back to Spain was difficult: he resolved, therefore, to sail northwards, and return by making the circuit of the British isles. Lord Seymour was detached to follow in his rear, but from the bad supply of ammunition which he had received from the public offices, was deterred from renewing an attack which, in all probability, would have led to the Duke de Medina's surrender.

A dreadful storm arose, after the Spaniards had rounded the Orkneys, and the whole fleet was dispersed. Horses, mules, and baggage, were thrown overboard to lighten a few of the vessels. Some of the ships were dashed to pieces on the rocks of Norway; some sunk in the middle of the North Sea; others were thrown upon the coasts of Scotland and the Western Isles—the wreck of one being still visible, it is said, at Tobermoray, in the Isle of Mull; and more than thirty were driven by another storm, which overtook them from the west, on different parts of the coast of Ireland. Port na Spagna, on the coast of Antrim, near the Giants' Causeway, obtained its name from this circumstance. (See *Trans. of Geol. Soc.* vol. iii. plate 10.) Of these, some afterwards reached home in the most shattered condition, under the vice-admiral Recaldo; others were shipwrecked among the rocks and shallows; and of those which reached the shore many of the crews were barbarously murdered, from an apprehension, it was pretended, that in a country where there were so many disaffected Catholics it would have been dangerous to show mercy to so great a number of the enemy. Camden says, 'They were slain, some of them by the wild Irish, and others put to the sword by command of the lord-deputy; for he, fearing lest they would join with the Irish rebels, and seeing that Bingham, governor of Connaught, whom he had once or twice commanded to show rigour towards them as they yielded themselves, had refused to do it, sent Fowl, deputy-marshal, who drew them out of their lurking-holes and hiding-places, and beheaded about two hundred of them.'

The Duke de Medina having kept out in the open seas, escaped shipwreck; and, according to the official accounts, arrived at Santander in the Bay of Biscay about the end of September, 'with noe more than sixty sayle oute of his whole fleete, and those verye much shattered.'

Strype, in his *Annals*, reckons the Spanish loss upon the coast of England to have amounted to fifteen ships and above 10,000 men, besides seventeen ships and 5394 men sunk, drowned, and taken upon the coast of Ireland.

The statements, however, published at the time apparently upon authority, say, 'In July and August, ships 15, men 4791; sunk, &c., upon the coast of Ireland, 17 ships, 5394 men:' making a total of 32 ships, and 10,185 men.

There is a very curious work relating to the Spanish Armada preserved in the King's Library at the British Museum; a volume of extreme rarity, which was finished at Lisbon, May 9, 1588, while the fleet was in the port of that place prepared for the expedition, entitled *La Felicissima Armada, que el Rey Don Felipe nuestro Señor mandò juntar en el puerto de la Ciudad de Lisboa, en el Reyno de Portugal, el Año de mil y quinientos y ochenta y ocho*; hecha por Pedro de Paz Salas, fol. Lisb. 1588; por Antonio Alvarez, Impressor. This copy in the King's Library was the identical one which was procured at the time of its publication for Lord Burghley, to acquaint him with the true detail of all the preparations; and he has noted in his own hand, in the margins of different pages, a variety of particulars relating to the defeat. In one instance, he has noted the change of a commander from one Spanish vessel to another different vessel. The following are a few of Lord Burghley's notes:—

Galeon S. Phelippe; 'taken at Flushyng, 31 July.
D. Francisco de Toledo; 'this man escaped into Nuport.

La Nao Capitana; 'this shipp was taken by Sir Francis Drake.' El Gran Grifon Capitana; 'this man's ship was drowned, 17 September, in the Ile of Furemare, Scotland.' Barca de Amburg; 'she was drowned over against Ireland.' San Pedro Mayor; 'wrecked in October, in Devonshire, neare Plimmouthe.' La Galeaça Capitana nombrada S. Lorenço; 'this was drowned afor Callys.'

The following entries perhaps afford an explanation of the lord-deputy's barbarous conduct in Ireland. Members of some Irish families were on board the Spanish fleet:—

Admundio Estacio; 'brother to James Eustace, Viscount Baltyglass.' Don Carlos Orconor; 'of Offolly, sonn to old Oconore.' Tristan Vinglade; 'Wynsland.' Ricardo Bereey, Roberto Laseo, Christoval Lonbardo; 'of Mounster.'

The copy of this work in the Royal Library, from which a few particulars in the earlier part of the preceding account have been taken, is accompanied by twelve charts of the coast of England, showing the different situations of the Spanish Armada and the English fleet through the whole of the contest. This also, which is a separate work, is of very rare occurrence, entitled *Expeditionis Hispanorum in Angliam Vera Descriptio*, Anno Do. MDLXXXVIII. published by Robert Adam, and engraved by Augustin Ryther. The different actions and positions represented in these charts are minutely explained in a quarto tract, printed by A. Hatfield in 1590, and sold at Augustin Ryther's shop, entitled *A Discourse concerning the Spanish Fleet invading England in the yeere* 1588,—a copy of which is also preserved in the library of the British Museum.

Camden, speaking of this great victory, says, 'Whereupon several monies were coined, some in memory of the victory, with a fleet flying with full sails, and this inscription, *Venit, vidit, fugit,* "It came, it saw, it fled;" others in honour of the queen, with fire-ships and a fleet all in confusion, inscribed, *Dux fœmina facti*, that is, "A woman was conductor of the exploit."' The medals and jettons, however, which were struck on this occasion, were entirely Dutch. None were struck in England. The most remarkable of considerable size is that which represents the Spanish fleet upon the obverse, with the words *Flavit Jehovah et dissipati sunt*, 1588, 'Jehovah blew and they were scattered.' Reverse, a church on a rock, beaten by the waves, *Allidor non lædor*. These, and one or two more, will be found in the *Histoire Médallique des Pays-Bas*, tome i. p. 383-386; and in Pinkerton's *Medallic History of England*, pl. viii. no. 7, 8; pl. ix. no. 1, 6.

Philip II. published two jettons, with the inscription, *Immensi Tremor Oceani*, 1587 and 1588.

It is usually said that the circulation of an English newspaper first began in 1588, when *The English Mercurie* was 'published by authoritie for the prevention of false reports.' Copies of several of these Mercuries, dated Whitehall, July 23d, July 26th, and Nov. 24th, are preserved among Dr. Birch's historical collections in the British Museum; but as they are marked as Nos. 50, 51, and 54 in the corner of the margin, we are to conclude that such publications had occasionally been resorted to at critical times, much anterior to the event of the Spanish Armada.

The chief details in the preceding account have been drawn from Camden's *History of Elizabeth;* Strype's *Annals of the Church;* Ellis's *Original Letters;* and Watson's *History of Philip II.*

ARMADILLO (*Dasypus*, Linnæus), in zoology, a genus of mammals belonging to the order *Edentata*, and forming, with the allied genera *Chlamyphorus* and *Orycteropus*, a small but very distinct family intermediate between the sloths and ant-eaters, and characterized by the possession of molar teeth only. The sloths, on the contrary, as has been shown in the article Ai, have not only the ordinary molar teeth of common quadrupeds, but are likewise provided with large and powerful canines; though, as far as we know anything of their economy, they appear to be a purely herbivorous family, and to be even incapacitated by other details of their organization for the capture or destruction of a living prey; whilst the ant-eaters, as we have seen under that article, are not only deprived of canine, but likewise of molar teeth; consequently, are without teeth of any description, and thus form the only family of the order *Edentata* that literally answers to the name and definition. Nor are these the only distinctions which subsist between the three families of edentatous mammals which we have here indicated. Others have been already pointed out in the articles just referred to, and it will be sufficient to mention, in addition, that the ant-eaters differ from the other two families by the want of clavicles, a most important and influential element in the anatomical structure of all vertebrated animals, and the armadillos, the more immediate subject of our present consideration, by the peculiar nature of their external covering. 'When we speak of a quadruped,' says the eloquent Buffon, 'the very name carries with it the idea of an animal covered with hair, as that of a bird or a fish suggests the corresponding ideas of feathers or scales respectively, as attributes inseparable from these beings; yet nature, always more fertile in her resources than we are skilful in tracing her relations or appreciating her designs, escapes at every moment from our most extensive observations, and astonishes us by her exceptions, still more than by her general laws.' A remarkable instance of the truth of these observations is presented bv the genus of quadrupeds which we are about to consider. Instead of hair, the armadillos are covered with a species of hard bony crust, forming three bucklers on the head, shoulders, and rump, respectively, the two latter being connected by a number of transverse moveable bands, very similar in form and appearance to the plate armour of the middle ages, from which indeed these animals have acquired the name of armadillos, a name of Spanish origin, which has been adopted by English writers. These bucklers likewise hang down on each side, so as to form an effectual protection to the belly, and partially to cover the legs and feet; whilst the pliancy produced by the moveable bands interposed between the bucklers of the rump and shoulders, and which are themselves connected by the soft pliant skin of the animal, permits the most varied and rapid motions. The bucklers themselves, as well as these connecting moveable bands, are composed of numerous small polygonal plates, placed contiguous to one another like the stones of a mosiac pavement, but without any actual articulation, and they are incapable of separate motion. The whole thus forms a kind of shelly buckler not unlike that of a lobster; and though incapable of actual motion, yet the thinness of the shell, and, during life, the pliancy occasioned by the animal oil which penetrates it, allow it to yield to a certain degree, and thus to accommodate itself in some measure to the motions of the body. But the great and principal motions, as already observed, are entirely due to the moveable transverse bands, interposed between the two principal bucklers of the body, and which vary in number according to the species, and even within certain limits according to the age, sex, or individual. These are situated immediately above the loins, or in the region to which all the principal motions of the animal economy have been assigned; the bucklers of the head and shoulders are entirely disunited, and have none of these moveable bands interposed between; but that of the head projects considerably backwards, and affords complete protection to the neck, which is indeed so short as to be barely distinguishable. We have in former articles had repeated occasion to speak of the megatherium, and to point out the analogies which that singular extinct animal bore to the sloths and ant-eaters. Here again it presents itself to our notice under a new point of view, and in fact it appears to have been a kind of connecting link between the most opposite and incongruous animals, and to have had a more or less intimate relation to every known genus of Edentata. It was but very lately, however, that we had reason to suspect that it presented any very close affinity to the armadillos in particular, other at least than the general want of incisor teeth, which forms the distinguishing characteristic of the order to which both these genera belong; but the recent discovery of fossil bones of the megatherium in the republic of Buenos Ayres has made us acquainted with a new and unexpected analogy between these animals. The bones in question were accompanied by the fragments of a buckler, of very large dimensions, manifestly belonging to the same animal, and perfectly similar in structure and appearance to that of the armadillos. This discovery was alone wanting to enable us to form a perfect and correct idea of the most remarkable inhabitant of the antediluvian world.

The throat, breast, belly, and thighs, of the armadillo are naked, or covered with a thick granulated skin, thinly furnished with warts or tubercles, which give origin to a few coarse, bristly hairs. The commissures of the moveable bands on the loins are likewise provided with a number of long hairs; but, with this exception, the body is covered only by its peculiar shell. The tail is straight, round, thick, and pointed: it is adapted, at the root, to a notch or cavity in the posterior edge of the buckler of the croup, and, with the exception of one species, is universally covered with bony rings, formed, like the rings of the bucklers, of numerous small pieces connected together, but capable of a certain degree of motion, and thus admitting of considerable flexibility in the tail itself. The head of the armadillos is flat, and terminated by a pointed muzzle, which assists them, like the snout of the hog and mole, to turn up the earth in search of roots and worms. Their ears are erect and pointed, and their eyes very small. They have flat, corpulent bodies; and their legs are so disproportionately thick and short, that they barely serve to elevate the body above the surface of the ground. Their toes, also, of which there are either four or five on the anterior and invariably five on the posterior extremities, are remarkably short, but they are furnished with extremely long powerful claws, slightly curved, and in every respect well adapted for digging or burrowing. So rapid indeed are the armadillos at this operation, that they easily bury themselves to any depth beyond the reach of their pursuers. They can only be forced from their subterranean retreat by directing smoke or water into their burrows: their strength and the tenacity of their hold are so great, that they have been known to leave their tails in the hands of the hunter, rather than permit themselves to be drawn forth. Yet, notwithstanding the shortness of their legs, and the heavy corpulent make of their bodies, the armadillos run with a velocity which could not be anticipated from their general appearance. Most of the species will easily outstrip a man. Their ordinary burrows most commonly run for three or four feet, at an angle of about 45° to the plane of the horizon, then make a sudden bend, and terminate at the distance of eight or ten feet from the mouth. Here, for the most part, they conceal themselves during the day-time; for the greater number of the species are nocturnal, and never move abroad whilst the sun is above the horizon. This rule, however, admits of some exceptions—a few species being found abroad at all times indifferently; and it has been remarked that these are neither so swift nor so timid as the nocturnal species.

The teeth of the armadillos are all of a simple cylindrical form, and stand apart from one another like those of the generality of cetacea and reptiles. They vary in number, from seven or eight to seventeen or eighteen on each side of each jaw; and are so arranged, that when the mouth is closed, the upper teeth fit into the interstices of the under, and these into the interstices of the upper teeth alternately. The animals never attempt to bite, nor has nature given them any other means of defence than the ease and rapidity with which they avoid danger by burrowing. Their food consists principally of fallen fruits, roots, and worms; but they do not reject carrion, and have been known to penetrate into graves, when not properly protected by stones or brick-work. Azara informs us that ants are never found in the districts inhabited by the armadillos, and that these animals break into the ant-hills, and devour the insects as greedily as the true ant-eaters. Nature, it is true, has not provided them with the same apparatus for this purpose, but the armadillos may, notwithstanding, destroy vast quantities of ants, though it is probable that they expel them from their own peculiar districts as much at least by destroying the habitations as by actually devouring the insects themselves. The ordinary food of the armadillos consists chiefly of the roots of the manioc, of potatoes, maize, and other similar substances of a vegetable nature, though, as already observed, without rejecting animal substances naturally soft or so far decomposed as to be easily torn without the help of canine teeth. They are also very destructive to the eggs and young of such birds as build their nests on the ground, and greedily devour worms, frogs, small lizards, and, M. d'Azara says, even vipers. The chief animal food of the armadillos, however, is derived from the immense herds of wild cattle which cover the plains and savannas of every part of South America. These are rarely slaughtered but for the sake of the hide and tallow; and as the carcasses are left to rot on the pampas or plains, the smell soon attracts vast crowds of carnivorous animals of various species, and among others, great numbers of armadillos, which greedily devour the half-putrid flesh, and soon become extremely fat and corpulent. In this condition, notwithstanding the filthy nature of their food, their flesh is esteemed a great delicacy, both by the native Indians and by the Portuguese and Spaniards of America. The animal is roasted in its shell, and considered one of the greatest dainties which the country produces.

The armadillos see but indifferently, particularly in bright sunshiny weather; but their sense of hearing is extremely acute, and amply compensates for any imperfection of sight. When alarmed by any unusual or strange sound, they prick up their ears, stop for a moment to satisfy themselves of its distance and direction, then commence a precipitate retreat to their burrow, or, if that be too remote, begin to construct a new one. Smell is, however, by far the most acute of their senses. Azara tells a singular story, which strikingly illustrates the intensity of this sense in the armadillos, as well as the unerring certainty with which, by a kind of intuitive knowledge of the principles of engineering, they are enabled to direct their subterraneous course to any particular point. 'My friend Noséda,' says he, 'having arranged a trap for the purpose of taking chibigouzous, and having placed in it, by way of bait, a cock, with a small quantity of maize to support him, it so happened that a few grains of the maize fell through between the boards which formed the bottom of the trap. An armadillo arrived during the night, and wishing to get at the maize thus accidentally spilt, opened a trench or burrow at some distance from the trap, and without deviating a hair's breadth from the straight line of his direction, pushed it on to the very spot where the grain had fallen, and possessed himself of the booty.'

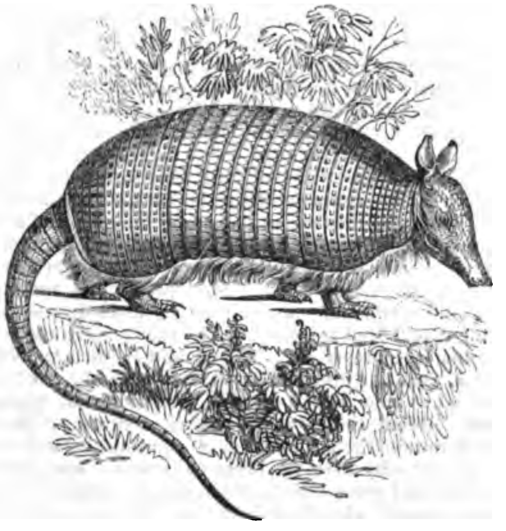
It is generally believed that the female armadillo brings forth but once during the year, but she produces at a birth frequently six, eight, or even ten, young ones; yet she has never more than four teats, and, according to the report of M. Azara, the most accurate and extensive observer who has written upon the history of these animals, in some species only two,—an anomaly, with respect to the number of young and the number of teats, which appears to contradict the general rule observable among other mammals. Azara, indeed, supposes that some of the young die for want of proper nourishment, and that the mother only rears those for which she has a sufficient supply of milk. In support of this supposition he adduces the instance of a female armadillo in the possession of an acquaintance, which produced nine young ones at a birth, out of which three died shortly afterwards, and the remaining six were nursed by the mother. This was no doubt true in this particular instance, but it is difficult to believe that the rule can be generally true, or that so complete a contradiction, as such a phenomenon would indicate, can possibly subsist between the functions and structure of organs in other respects so intimately allied to one another as the matrix and the mammæ. The only actual anomaly, or exception to the general rule which subsists among other animals, is to be found in the disproportion subsisting between the number of teats and the number of young produced at a time; and this is more apparent than real, since we can easily conceive that two or even more young ones may be supported by a single teat.

The tropical and temperate regions of South America are the original and proper habitat of all the known species of armadillos. Ignorant or careless writers, it is true, have frequently mentioned them as natives of Asia and Africa, but such mistakes probably arise from confounding these animals with the pangolins (*manis*), or scaly ant-eaters of the Old World, a very different genus, and more nearly allied to the true ant-eaters than to the present genus in all respects save the horny nature of the covering which supplies the place of hair, and even this differs essentially in its character from the bucklers of the armadillo. The armadillos are active, hardy animals, and thrive and breed rapidly with a moderate portion of care in most temperate countries. Such of the species as prefer a vegetable food, and whose flesh is consequently the most palatable and wholesome, might even be domesticated with advantage, and bred in warrens, like rabbits. In their native climates, however, they still abound in such incredible numbers, that the inhabitants will not be at the trouble of rearing what they can so readily procure to any required amount. When, therefore, the natives of Brazil or Buenos Ayres maintain the armadillo as a domestic animal, it is more for curiosity than for profit: the woods and pampas supply the wild animal in inexhaustible abundance. They are most usually taken in traps during the night; or, when found in open day at any distance from their burrows, are pursued by small dogs, which intercept their retreat till the hunter has time to secure them. One species only, when thus attacked, has the faculty of rolling itself up in a round ball like a hedge-hog, but they are generally timid and extremely helpless, and none ever attempt to defend themselves either by using their teeth or claws.

Up to the year 1801, the period of the publication of Don Feliz Azara's *Essays on the Natural History of the Quadrupeds of Paraguay*, a work invaluable for the numerous original and acute observations which it contains upon this department of zoology, the various writers upon this subject had distinguished the different species of armadillos from one another by the comparative number of the moveable bands which separate the bucklers of the croup and shoulders. Azara, however, showed that the number of these bands is by no means, as had been heretofore supposed, constant in the same species, but that within certain prescribed limits this number varies continually according to the age and sex of the individual, and consequently that it is necessary to seek in other characters for more definite and certain means of distinguishing the species. 'Of all the species,' says this author, 'which I have described, I have had individuals of the second, fourth, and seventh, with both six and seven bands each; of the fifth I have seen individuals with six, seven, eight, and even nine bands; of the sixth with five, six, and seven bands; and although, having encountered but few individuals of the other species, I cannot affirm the same thing so positively of them, yet I have no doubt but that they are subject to the same variation as the others.' These observations of Azara have rendered it necessary to look for other and less variable characters of specific distinction; and accordingly Baron Cuvier, for greater facility of definition, has divided the whole genus into five small groups, principally distinguished from one another by the number and form of their teeth and claws. After the example of Buffon, he and other French zoologists employ the name of *tatu*, or *tatou*, by which these animals are distinguished among the Guarani Indians, the aboriginal inhabitants of Paraguay and the southern provinces of Brazil, instead of the more common and certainly very appropriate name of armadillo, by which they are known to English and Spanish writers. The first of Baron Cuvier's subdivisions,

I. The CACHICAMES, have four toes on the anterior and five on the posterior extremities, seven teeth only on each side both of the upper and lower jaw, a pointed muzzle, and a long tail, surrounded by a succession of osseous rings, each of which is composed of a number of polygonal plates arranged in numerous series. The two middle claws are excessively large and of equal length; the lateral, particularly the internal, which represents the thumb, are much shorter, but all are powerful, trenchant, and well fitted for burrowing. To this division belongs

1. *The peba* (*D. peba*, Desmarest), called by the Guaranis *tatouhou*, or *black tatu*, is extremely common in Paraguay, though it does not extend to the province of Buenos Ayres. This species is well figured in the original edition of Buffon's celebrated *Histoire Naturelle*, and described by Daubenton under the name of *cachicame*, which, according to Gumilla, is the generic name of the armadillos among the Indians on the banks of the Ornnoco. Azara calls it the black armadillo, from its Guarani name; and it has been admitted into the generality of zoological catalogues under the somewhat ambiguous appellations of *Dasypus novemcinctus*, *D. octocinctus*, and *D. septemcinctus*, three different species being thus formed from the same animal, under the erroneous supposition that the number of moveable bands between the bucklers of the shoulders and croup was invariable in the same species.



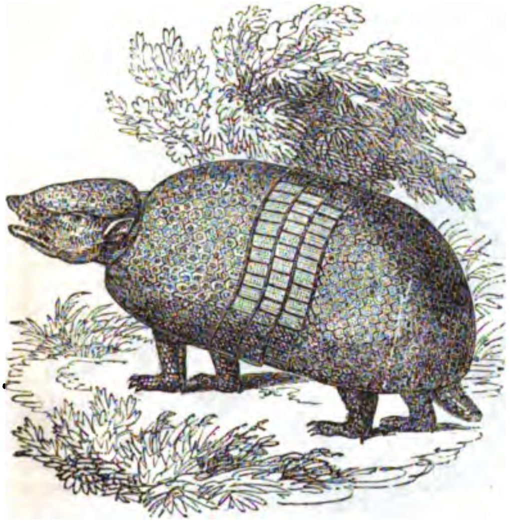
The length of the peba, from the snout to the origin of the tail, is about sixteen inches, that of the tail fourteen, and its circumference at the base six inches. The head is small, long, and straight; the nose extremely elongated, taper, and terminated by a sort of small muzzle something resembling the snout of a hog; the mouth is large; the eyes small, and placed on the sides of the head; the ears long, and placed close together; the tail long and attenuated; the legs short: and the feet small. The buckler of the shoulders extends in front over the whole neck, and towards the rear as far as the back, descending on each side to the elbows. It is composed of small pieces adhering to one another, and disposed in numerous parallel concentric rings, having the concavity towards the front, the first ring embracing the neck of the animal. The buckler of the croup extends from the back to the origin of the tail, and descends on each side to the knees. It is composed, as in the former case, of small pieces arranged in a great number of parallel concentric rings, passing transversely over the hips, but having their concavity turned in the opposite direction from that of the rings on the shoulder, or in such a manner that the last embraces the root of the tail. When viewed externally, the little pieces composing these bucklers have the appearance of irregular tubercles, but when examined on the under side of the buckler they are found to be hexagons almost as regular as those of the cells of bees, and fitted as precisely to one another. Between the bucklers of the shoulders and croup are interposed a variable number of transverse moveable bands marked with zig-zag lines forming very acute angles, and in some degree gliding over one another according to the different motions of the animal. Out of fourteen individuals examined by Azara, there were two with six of these moveable bands, one with seven, seven with eight, and four with nine; and it was observed that the full-grown ones always had the greatest number of bands, which renders it extremely probable that new bands are detached from the bucklers as they are required by the increasing growth of the animal. The buckler of the head descends from the ears to the muzzle, and covers each cheek as far down as the orbits; and there are small detached scales interspersed in various situations over the throat, the under-jaw, the legs, and feet, and even on the outer face of the ears. The tail is extremely long and taper: it is composed of a great number of osseous rings forming a long tubular case, and connected like the joints of a cane. The peba, or, as it is commonly called in Brazil, tatu-peba, has thirty-two teeth eight on each side both of the upper and under jaws. It inhabits Guiana, Brazil, and Paraguay, is a timid nocturnal animal, tolerably swift-footed, and very expert in burrowing; it is never found in the woods, but delights in the open plains and cultivated fields, and is much hunted by the inhabitants on account of the delicacy of its flesh, which, when roasted in the shell, is fat and well tasted; it is said to resemble that of a sucking pig.

2. *The mule armadillo* (*D. hybridus*, Desmarest), called *M'bouriqua*, or mule tatu, by the Guaranis, in allusion to its long upright ears, differs from the last species principally by its smaller size, and the comparative shortness and smallness of its tail. The length from the nose to the origin of the tail is stated by Azara to be only eleven inches and a quarter; the tail itself is six inches and a quarter long, and three inches in circumference at the root; whence it appears that the tail of the present species is only half the length of the body, whilst in the tatu-peba its dimensions are very nearly equal. The legs of the present species are also rather shorter than those of the peba, the body is broader and less covered with hair on the under surface, and the moveable bands generally fewer in number, and capable of being separated to a greater distance from one another. Their number generally varies from five to seven without distinction of sex, but it is to be observed, that the former number is only found in very young animals; and altogether the small size and general external resemblance of the two species make it sometimes difficult to distinguish

between the adult M'bouriqua and the young peba, especially if great attention be not paid to the comparative length of the body and tail, which forms the only certain criterion. This species inhabits the open uncovered country, like the former, but extends much farther south, and is common on the pampas of Buenos Ayres. It differs from the peba more by its habits than in external form, for it is not nocturnal, nor does it burrow with the same facility as that species. The female brings forth from eight to twelve young ones about the beginning of October, and it is a common belief among the country people, confirmed, in one instance, by an actual dissection performed by Azara, that the individuals of a particular litter are invariably of the same sex.

3. The *tatu verdadeiro* (*D. verdadeiro*) is a species very similar in size and proportions to the mule armadillo; but the point of its tail is terminated by a horny case of a single piece; the moveable bands are broader, and the plates of the croup buckler are of considerably larger size. We know very little more about this species than the few characters here reported. It inhabits the woods of Brazil, resides in burrows, and is found abroad at all hours during the day-time. Koster is the only traveller who mentions this animal, but Baron Cuvier had an opportunity of establishing its specific distinctions, by the examination of some specimens brought to France by M. Auguste de St. Hilaire.

II. The second subdivision which Baron Cuvier establishes among the armadillos, and which he calls APARS, is characterized by having the claws and teeth in all respects similar to those of the preceding, save that the number of the latter amounts to nine or ten on each side both of the upper and lower jaws; but the animals of the present group are immediately distinguishable from all others of the genus by the faculty which they possess of completely rolling themselves up like a hedgehog into a round ball, in which situation they may be tumbled about, or even, it is said, thrown over precipices, without receiving any material injury. There is but a single known species.

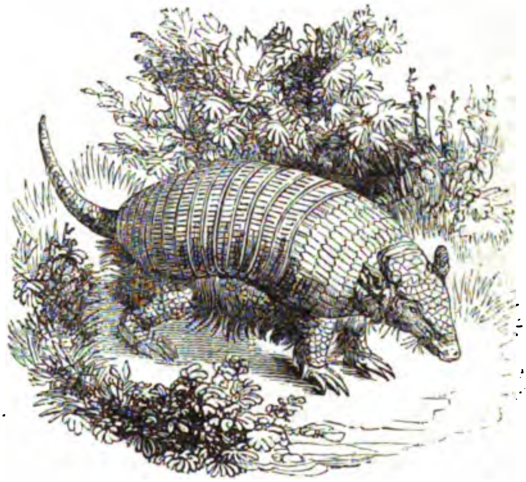


[The Mataco. *D. Apar.*]

4. The *Mataco* (*D. apar*, Desmarest, and *D. tricinctus*, Linnæus), called also *Bolita*, or the little ball, from its faculty of assuming a spherical form, is nearly fifteen inches long from the nose to the origin of the tail; the head is three inches long, and the tail not quite two inches and a quarter. The head is oblong and of a pyramidal form; the muzzle pointed; the ears short and nearly round; and the legs and claws comparatively smaller and weaker than in the other species; the tail also is much shorter, and does not taper so much; it is flattened at the root, and covered above with a rough granular crust. The small pieces which compose the bucklers and moveable bands are themselves of very irregular figures, and disposed in a more confused manner than in other species, bearing no distant resemblance to a number of small rough fragments of stones thrown at random over the surface. The buckler of the shoulders forms a prominent angle on each side which advances forwards over the cheek; it is composed of nine or ten parallel bands of small plates, of a polygonal figure, except those of the last row, which, like the plates of the moveable bands, form irregular parallelograms. The buckler of the croup is composed of thirteen transverse rows of small plates, similar to those of the shoulders, and between the two bucklers are interposed three moveable bands only; a number by which the mataco is readily distinguishable from all other armadillos, though it is probable that it may vary in a small degree, as it is found to do in other cases. Its usual resource, and only defence when frightened or surprised, is to roll itself up; for it does not construct burrows like the tatu peba, nor does it possess sufficient speed to escape by flight. It is found in Brazil, Paraguay, and Buenos Ayres, but is nowhere very common.

III. The EUCOUBERTS, or third division of Baron Cuvier have five toes on the fore feet, and nine or ten teeth throughout, but they are principally distinguished by having two teeth in the intermaxillary bones of the upper jaw, representing, as it were, the incisor teeth of ordinary mammals, and thus forming an exception, not only to the other armadillos, but even to the order of edentata, which are principally characterised by their want of teeth of this description.

5. The *poyou* (*D. Eucoubert*, Desmarest, *D. Sexcinctus*, Linnæus), or yellow-footed armadillo (for thus Azara interprets the name), measures about sixteen inches from the nose to the origin of the tail, which is itself about half the length of the body. The head is large, flat, and nearly triangular, the face short, the muzzle obtuse, the ears erect and of moderate size, and the eye small. The number of moveable bands varies from seven to eight, according to the individual; the tail is surrounded at its base with three or four bony rings, but throughout the rest of its length it is merely covered with regular tuberculous scales; the interstices of the moveable bands give origin to a great number of long, bristly, grey hairs, and the female is provided with only two pectoral mammæ. But independently of all other considerations, the *tatu-poyou* is easily distinguished from all the other armadillos by the unusual flatness and broadness of its body, and the consequent comparative shortness of its legs. It is very common in Paraguay, and burrows in the ground with an almost incredible agility. Its strength and activity are very remarkable; and notwithstanding the shortness of its legs, it runs so swift, that few men can outstrip it. It is of a restless, unquiet character, bold, curious, and intrepid; when any noise is made at the entrance of its burrow, or when otherwise tormented, it grunts like a young pig, and comes forth without fear to investigate the cause; yet when actually attacked it is incapable of making any sort of defence, and can only save itself by retreating to the bottom of its hole, or burrowing to a still greater depth. The poyou feeds much upon carrion, and for this reason its flesh, though fat, is never eaten by the inhabitants of European origin, though the Indians make no distinction in this respect between it and the other armadillos. When it stops or rests, it has a custom of squatting close to the ground like a hare in her form, and in this situation the great breadth of the body is remarkably apparent, being nearly three times its height.



[The Poyou. *D. Eucoubert.*]

6. The *hairy armadillo* (*D. Villosus*, Desmarest) measures fourteen inches in length from the nose to the origin of the tail, the head is nearly four inches in length, the ear two-

thirds of an inch, and the tail five inches. In form and appearance this species bears a very strong resemblance to that last described, but it is of smaller size, and is comparatively better covered with hair, a circumstance from which it derives the name by which it is most usually distinguished. The head is triangular, the muzzle pointed, the ears large, elliptical, and inclined outwards, and the number of moveable bands varies from six to seven according to the individual. The border of the bucklers, as well as the lower side of the moveable bands, is indented in a remarkable manner, and forms sharp angular points, which serve to approximate the present species to the following, not less than to distinguish it from all the other known armadillos. There are eight teeth on each side, both above and below; numerous long, flexible, brown hairs spring from every part of the body, but more especially from the sides and belly, and even cover the first half of the tail; and the female, as in the poyou, has only two pectoral mammæ.

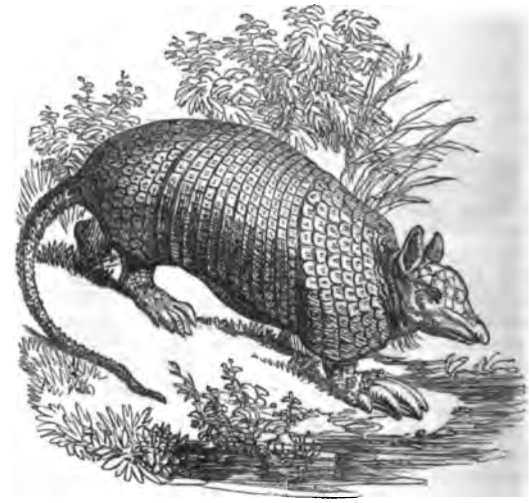
This species does not inhabit Paraguay, nor, as far as we are at present aware, any other part north of the Rio Plata, but it is found at every step on the Pampas or plains of Buenos Ayres, south of that river. 'In an expedition,' says Azara, 'which I made into the interior, between the parallels of 35° and 36° south latitude, I met with vast multitudes of this species of armadillo, so that there was scarcely an individual of the party who did not each day capture one or two at least; for, unlike the poyou, which moves abroad only during the night, this animal is to be found at all times, and upon being alarmed promptly conceals itself, if not intercepted. In March and April, when I saw them, they were so extremely fat, that their flesh surfeited and palled the appetite; notwithstanding which the pioneers and soldiers ate them roasted, and preferred them to beef and veal. The hairy armadillo,' continues M. Azara, 'like others of the genus, has undoubtedly a very acute sense of smell, since it scents the carcases of dead horses from a great distance, and runs to devour them; but as it is unable to penetrate the hide, it burrows under the body till it finds a place which the moisture of the soil has already begun to render putrid. Here it makes an entrance with its claws, and eats its way into the interior, where it continues feasting on the putrid flesh, till nothing remains but the hide and bones, and so perfectly do these preserve their position, that it is impossible, from a mere external view to anticipate the operations which the armadillos have been carrying on within.' The same author observes further, that this species never constructs burrows to reside in, that it avoids low, damp situations, and is only found on the dry upland plains.

7. The *pichiy* (*D. Minutus*, Desmarest) measures only ten inches in length from the snout to the origin of the tail, which is itself four inches and a half long; the head is two inches and eight lines long, two inches broad across the orbits, and the ears are a quarter of an inch in length, and very sharp-pointed. The frontal buckler is composed of irregular plates, the eyes being small and nearly concealed under its margin; there are no plates on the temples, but their place seems to be supplied by a pencil of stiff brown hairs; the neck is extremely short, and furnished above with a row of minute scales; the shoulder buckler presents nothing remarkable, but that of the croup is deeply indented along the edges, and the moveable bands, to the number of six or seven, according to the age of the individual, are composed of rectangular plates, bordered on each side by compressed scales, lunated and pointing backwards. Each scale is more or less distinctly marked with two longitudinal linear depressions, which divide it into three parts, of which the middle is plain and of an oblong figure, but the lateral are, as it were, divided into six or eight tubercles. The claws are but moderately developed, the tail is covered with strong scales disposed in rings, and the interstices of the scales and bands are furnished with a considerable quantity of hair, though less abundantly and not so long as in the last species.

The pichiy inhabits the Pampas to the south of Buenos Ayres, and extends from 36° of latitude southward to the confines of Patagonia. It inhabits burrows, to which, however, it does not confine itself during the day, like some other species; its flesh is said to be remarkably tender and well tasted. Two individuals of this species which had been brought from Port Desire, on the east coast of Patagonia, lived for some time in the Jardin des Plantes at Paris, and would doubtless bear even the rigour of our more northern climate without injury or inconvenience.

IV. The **Kabassous**, or fourth division of Baron Cuvier, have likewise five toes, both on the anterior and posterior extremities, but those of the fore feet are disposed obliquely, in such a manner, that the thumb and index are small, the middle and fourth toes armed with tremendously large trenchant claws, and the fifth very small. This construction gives them the means of burrowing with extraordinary facility, and of clinging to the ground with such determination and obstinacy, that it is with the utmost difficulty they can be taken from it. They have nine or ten teeth throughout.

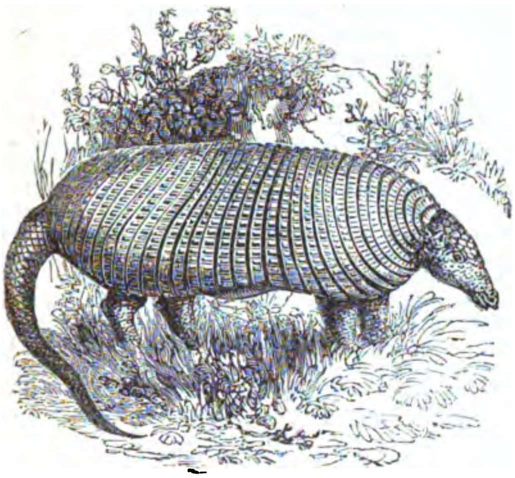
8. *The Tatouay* (*D. Tatouay*, Desmarest), or wounded armadillo, is so called by the Indians in allusion to its tail, which is naked, or as it were rudely deprived of the crust or bony tube which covers this organ in all the other species. The whole length of the tatouay, as given by Azara, is twenty-six inches and a half, from which if we subtract seven inches and a half for the length of the tail, it leaves one foot seven inches for that of the body. The tail is round, pointed and naked, with the exception of a few small round scales or crusts on the under surface of the third nearest to the extremity, which frequently trails along the ground when the animal walks; the rest is covered with soft brown fur, interspersed with a few stiff short hairs on the superior surface. The head is longer, narrower, and more attenuated than that of the poyou, though considerably less so than in the peba and mule armadillo; there are eight molars on each side of the upper, and seven on each side of the lower jaw; the ears are unusually large, being nearly two inches long, and in figure forming a segment of a circle; the body is round; the claws of the fore-feet, particularly that of the middle toe, are excessively large; and the female is provided with only two pectoral mammæ. The bucklers of the croup and shoulders are composed of ten and seven rows of scales respectively, each scale forming an oblong rectangle, those of the coccia being the largest of all; the moveable bands are thirteen in number, composed of scales much smaller than those of the bucklers, and of a nearly square figure. The habits of this species are altogether unknown. It inhabits Guyana and Brazil, and is rarely found so far south as Paraguay. Baron Cuvier, in his enumeration of the species of armadillos, inserted in the fifth volume of the *Ossemens Fossiles*, part i. p. 120, mentions an undescribed species closely allied to the present, but differing, among other characters, by the comparative shortness, and still more perfectly naked tail. We know nothing more of this animal than what is contained in this slight notice.



[The Tatouay. *D. Tatouay.*]

V. The **Priodontes**, or last subdivision of the armadillos, in addition to the unequal toes and enormous claws of the kabassous, have from twenty-two to twenty-four small teeth throughout, on each side of the jaws, making in all from eighty-eight to ninety-six teeth—a greater number than are found in any other mammal. This group contains but a single species at present known, viz.:—

9. *The Great Armadillo* (*D. Gigas*, Cuvier), which is nearly three feet three inches in length, from the nose to the origin of the tail; the head is seven inches and a half long, the ears an inch and three-quarters, and the tail one



[Great Armadillo. *D. gigas.*]

foot five inches. Its superior size is alone sufficient to distinguish this species from all the other known armadillos, but it possesses numerous other characters not less remarkable. Its head is proportionably smaller than in the other species, the forehead is more protuberant, and the face, from the eyes downwards, assumes a tubular cylindrical form, like that of the peba: the ears are of a moderate size, pointed, and habitually couched backwards; the bucklers of the shoulders and croup are composed of nine and eighteen rows of plates respectively, and separated by moveable bands to the number of twelve or thirteen, formed of rectangular scales, about half an inch square. The tail is remarkably thick at the root, being upwards of ten inches in circumference: it is gradually attenuated towards the tip, covered with plates disposed in rings at the base, and forming spiral or crescent-shaped lines throughout the rest of its length. The claws are remarkably large and powerful, but in their relative form and dimensions differ little from those of the tatouay already described.

This species inhabits Brazil and the northern parts of Paraguay. It is never found in the open country, but keeps close to the great forests, and burrows with surprising facility. Those who are employed in collecting the Jesuits' bark frequently meet with it in the woods, and report that when any of their companions happen to die at a distance from the settlements, they are obliged to surround the body with a double row of stout planks, to prevent it from being scratched up and devoured by the great armadillo.

ARMAGH, an inland county in the north of Ireland, in the province of Ulster. It is bounded on the N. by Lough Neagh [see NEAGH, LOUGH], on the E. by the county of Down, on the S. by the county of Louth, and on the W. by the counties of Monaghan and Tyrone. The greatest length, which is from north to south, is nearly 32 English miles; the breadth, from east to west, is about 20 miles. The area is estimated, by Dr. Beaufort, at 454 square miles, or 290,786 acres; but he observes that this is very much under the full number of acres, from fractions having been rejected in the calculation; other estimates give 458 square miles, and 293,919 acres. It is subdivided into eight baronies, divisions nearly corresponding to the hundreds of English counties. The county was erected by the Lord Deputy of Ireland, Sir John Perrot, in 1584. (Ware's *Antiq. of Ireland.*)

The surface is hilly, but, except in the south and west parts of the county, which are more rugged, the hills do not rise to any great height; the soil is generally fertile, except in the mountainous district just noticed, though even there the land is cultivated to a considerable extent, and is thickly peopled. The principal mountains are Sliebh Gullen (1900 feet); Sliebh Girkin, or the Newry Mountains (1340 feet); the Fathom Mountains, lying along the Newry river (820 feet); and the Foughall or Faughell Mountains (822 feet), a little to the north-east of Jonesborough. These may all be considered as forming one group in the south-east part of the county. They are a continuation of the Mourne Mountains of the county of Down. [See DOWN.] Granite is their principal constituent. To the N. of this mountainous district a considerable tract extends from the county of Down on the one side, to that of Monaghan on the other, in which greywacke and greywacke-slate are the prevalent rocks; while red sandstone predominates in that part which lies along the margin of Lough Neagh. Sienite is traced in the neighbourhood of Newry; and mica-slate composes the sides of the narrow valley between Sliebh Gullen and Sliebh Girkin. Limestone skirts the Blackwater and Callenwater. (*Trans. of Geol. Soc.* vol. iii.)

The Callen, the chief river in the county, rises in the barony of Fews, and flows N. into the Blackwater; but its course cannot be estimated at more than twenty-six or twenty-seven miles. There are some small loughs or lakes, as Lough Clay in the west, from which a small stream flows into the Callen; Lough Ross, and the loughs of St. Patrick and St. Peter, on the border towards the county of Monaghan. The river Bann with the Newry Canal forms the eastern boundary of the county, separating it from that of Down, and affording water-carriage from Lough Neagh to the Bay of Carlingford; the Blackwater on the N.W. separates it from the county of Tyrone.

In 1788 the medium temperature in the neighbourhood of the city of Armagh, distant about thirty-two English miles from the Irish Sea, and elevated about fifty-eight feet above the coast, was ascertained (by means of a well sunk sixty feet to the bottom of a gravelly hill) to be 47·5° of Fahrenheit. (*Trans. of Royal Irish Acad.* 1788.) But we are informed that it is 49°·5 at the observatory.

In the neighbourhood of the chief town, numerous inclosures and cultivated fields indicate an abundant population, and in this vicinity there are a few orchards. In the northern part of the county, towards Lough Neagh, there are very extensive bogs, the soil of which is very black and deep: but the increase of population has led to the cultivation of some parts of these, as well as of the greatest part of the mountainous districts. The principal landed proprietors are Lords Charlemont, Gosford, and Caledon; Mr. Brownlow, Mr. Cope, and others. A large portion of the soil belongs to the church and to college establishments and corporations, which have not the power of granting freehold leases for lives; the common tenure on other properties is a lease for twenty-one years and one life. To such an extent has subletting been carried, that the country has been described as resembling in some parts a disjointed village, and general poverty has been the usual result. If a father had a family the land was divided among his sons, and part of it went frequently as a portion to the daughters. The linen trade, carried on as it is by the individual weaver, is considered to have promoted this division of land. There seems, however, to be a disposition at present to check this system, and to consolidate the small holdings into larger farms.

In the hands of such occupiers we cannot expect superior husbandry. The description given of the state of tillage in the flat parts of the county of Antrim [see ANTRIM] will, in a great degree, apply to the neighbouring county of Armagh. The rotation of crops, if so irregular a succession deserves that name, is similar in each; the joint contribution of animals to form a team for the plough, and the 'con-acres' of the dry cotter, as described in the account of Antrim, are found in this county also. The joint team for the plough is indeed rather more respectable, consisting usually of two horses, one belonging to the driver, the other to him who holds the plough. Oats are the chief kind of grain raised. Wheat and barley are not so extensively grown. The cultivation of wheat, which was introduced into Ulster at a comparatively recent epoch, has increased materially; and Belfast, the great outlet of its produce, now exports corn of excellent quality to England: the consumption of wheaten bread among the peasantry is also much greater than formerly. Potatoes and flax are also among the chief articles of agricultural produce; but the potatoes are very inferior in quality to those grown in the south of Ireland.

Grazing is little attended to in any part of the north of Ireland. The little farmers or cotters keep cows, but they are badly managed and hardly treated: patches of the artificial grasses are sown; and part of the grass (which, in Ulster, is commonly confined to the banks of rivers) also serves the cows for food, but the want of fodder in winter materially diminishes the quantity of milk. Few beasts are fattened, the crowded population leaving little land for pasture. There are no extensive dairy farms; but as the little farmers keep cows, a considerable quantity of butter is sold for exportation. The breed of cattle is small and stunted. Sheep are not much attended to, and their wool is not produced in greater quantity than the domestic purposes of the grower require. The horses are inferior in size and appearance: the linen merchants, who travel about to different markets, use a small, hardy, and sure-footed native breed of hacks. Goats and pigs are reared, the latter in great numbers.

Although agriculture has been improving since the time of Mr. Wakefield's publication (to which we are indebted for many of the foregoing particulars), yet it is still very inferior to that of England. The fields are ill-inclosed and ill-drained, and not kept clear of weeds; the farming in many cases is slovenly, though there are instances to the contrary.

Linen is the staple manufacture, and the county has consequently been affected by the decline of that business. The mode of manufacture by small farmers has been already described. [See ANTRIM.] It does not appear that the cotton manufacture has gained any footing; but a mixed fabric of cotton and flax, called 'Unions,' has been partially substituted for that of linen. The demand for linen is not so active as it has been, and yet all that the weavers bring to market is sold. The introduction into England and Scotland of machinery for spinning flax has been felt in Ireland, where it has reduced the wages of spinners, which were always low. They cannot now earn more than eighteen pence per week. Spinning machinery has been introduced to a certain extent into this county.

The condition of the weavers has been materially affected by these causes. At one time they could earn 2*s.* per day, and, by working extra hours, 2*s.* 6*d.*; now their earnings do not average more than 1*s.* a day (which is about the pay of a field labourer), but it does not appear that there are many of them out of employ. The depression of the linen trade has led some to go to Manchester and the neighbourhood: others give more time to their little farms; and the introduction of steam communication with England has given them a new and better market for their produce. The condition therefore of the peasantry has rather improved than otherwise. Their food, except the increased consumption of wheaten bread, still consists of potatoes, milk, bread, and butter, and occasionally pork. The clothing of the females is better than it used to be, though they still go without shoes or stockings. The habitations of the peasantry are also improved.

The moral character of the females is correct; and the peasants show a disposition to provide for the wants of their aged parents. Mendicants here, as in Ireland generally, are numerous, and, as a body, very immoral.

The mineral productions of this county are inconsiderable. Marble is quarried near Armagh; and at Keady, about eight miles from that city, a lead mine was once worked. The chief roads are those from Dublin to the city of Armagh, one through Newry, and the other through Castle Blayney; the continuation of these to Coleraine; and the roads from Armagh to Belfast, Monaghan, and Londonderry.

The population in 1821 was 197,427, and in 1831 220,651. It was estimated by Dr. Beaufort, in 1790, at 120,000. The only towns of any importance are Armagh (population 9,189), and Lurgan (population 2,842). [See LURGAN.] The others are all small, as the following list, with their population in 1831 will show:—Tanderagee, 1559; Rich-hill, 937; Newtown Hamilton, 1050; Keady, 896; Charlemont, 517; Market-hill, 1043; Blackwater, 528; Loughgall, 325; and Portadown, 1591. Part of the more important town of Newry (population 13,134) is in Armagh; the greater part is in the county of Down. [See NEWRY.] It appears that though the population of the country is dense, it is not much collected in towns and villages. The number of pupils at schools in the county in 1821, was 12,407, viz., 8,529 boys, 3,878 girls; in 1824 it was about 13,700, viz., about 7900 boys, 5,200 girls; of about 600 the sex was not stated.

Three members are returned to the imperial parliament from this county: two for the county itself, and one for the city of Armagh. Newry returns a member.

It is difficult, from the variation of authorities, to state the number of parishes in the county. In the population return for 1821, twenty-three parishes, as used for civil purposes, are given as wholly or partly in this county; but these, from the consolidation of parishes into unions and the erection of perpetual curacies, must not be regarded as coincident with the existing ecclesiastical divisions.

It is not very easy to ascertain the state of religious parties in the county. In 1812 Mr. Wakefield estimated the proportion of Catholics to Protestants as three to one, the Catholics occupying all the mountainous parts, and being mixed with Protestants in the more level. He observes that the influence of the priests was small; and the bigotry of their flocks not so great as in the south of Ireland. In the year 1824, according to the reports of the commissioners of education in Ireland, the proportion of Catholic scholars to those of Protestants of all classes, was 53 to 81 by the returns of the Protestant clergy, or 52 to 78 by those of the Catholic clergy: but the different rank in life of the Catholics and Protestants renders this an unfit criterion of the relative population. The proportion of the pupils of the Established Church to Presbyterians was at the same time about 47 to 29, according to the returns of the Protestant clergy, or 44 to 30, according to those of the Catholics. This, as the parties are on a more equal footing in their rank in society, affords a better criterion; but Mr. Wakefield, in 1812, thought that of the Protestants in this country (county?) a very small proportion belonged to the Established Church. But we have reason to believe that in this opinion Mr. Wakefield was mistaken.

Among the antiquities of the county may be mentioned the cairn on the top of Sliebh Gullen, said to form the roof of a cavern of artificial construction; and that called the vicar's cairn, about five miles south-east of the city of Armagh, on a lofty hill, which is thought to be excavated. (*Mem. R. I. A.* vol. viii.: Wakefield's *Account of Ireland*, 1812; Dr. Beaufort's *Memoir of a Map of Ireland*, 1792; *Parliamentary Papers*.)

ARMAGH, a city of Ireland, in the barony and county to which it gives name, 81 miles from Dublin. It is in the northern part of the county, and not far from the little river Callen, a feeder of the Blackwater, which flows into Lough Neagh.

The town is on an eminence, with the cathedral in the centre crowning the summit, and is surrounded by other small eminences. Some of the streets form an irregular circuit round the cathedral, and on the slope of the hill; all the others, leading into the town from the surrounding country, terminate in this circuit, except three, which are continued to the summit, and lead to the cathedral enclosure. Armagh which had sunk greatly to decay, owes much of its renovation to the munificence and public spirit of Dr. Richard Robinson, Baron Rokeby, who was archbishop from 1765 to 1794. The town is rather more than three-quarters of a mile from north to south, and above half a mile from east to west.

Of public edifices the cathedral deserves the first notice, although in richness and beauty of architecture it is inferior to many of our English cathedrals. Its situation is commanding, from being on the summit of the hill on which the city is built. After undergoing many changes from the period when St. Patrick is said to have founded it (viz., in 445), it was destroyed in 1566 by Shane O'Neil, who wished to revenge some insult which he thought had been offered him by the primate (Loftus). It was rebuilt in 1616 by primate Hampton, and in 1642 it was again destroyed by Sir Phelim O'Neil during the primacy of the celebrated Usher. It was again rebuilt by primate Margetson in the year 1675, and repaired and improved by primate Robinson; and a complete restoration is at present going on. It is in the form of a cross 183½ feet long from east to west; and in breadth across the transepts 119 feet in the clear. From the intersection arises a square tower (the battlement of which is 31 feet above the roof) surmounted by a spire 40 feet high. From the ground to the top of the weathercock is 150 feet.

Part of the tower and the spire were built during the primacy of Robinson. The same prelate built near the town a handsome archiepiscopal palace, of large dimensions, and in a light and pleasing style of architecture. It is in the midst of a lawn skirted by plantations; the offices are detached and hidden behind a plantation at a small distance. He also contributed largely to the erection of a new school-house in the town, containing large dormitories, dining-room, and school-room, apartments for the master, and a spacious walled play-ground. This school, an exceedingly well-endowed royal foundation of Charles I., long maintained, under Mr. Carpendale, the master whom primate Robinson appointed, a high reputation, and was regarded as the Westminster or Eton of Ireland. A public library and an observatory were built and endowed by the same primate, who also directed the erection of barracks, procured the establishment of a county infirmary, and ornamented the city with a new market-house and shambles. By refusing to grant leases except on the condition of the tenants rebuilding the houses, he raised the place from an almost deserted village, a nest of mud cabins, to be one of the most beautiful and flourishing inland towns in Ireland[*].

Armagh is the assize town of the county, and has a jail, as well as a handsome court-house, lately built. It is lighted with oil, but as gas works are being erected, it is expected that it will soon be lighted with gas. The footways are neatly and durably flagged, the streets are clean, and the care of the magistrates keeps away beggars. The magistrates of the place are a 'sovereign,' and a 'registrar.' There are several excellent walks about the town. Water is supplied from a pool or reservoir called Lowry's Lough, on an eminence east of the city. Main and lateral pipes run through every street; but the water is not very good, owing to the preparation of flax in the surrounding district.

The chief trade is in linen, which is made in the country around, and brought into the town on the market-day (Tuesday), and sold by the weavers to the drapers for bleaching. There are five fairs in the year. It is probable that the general depression of the linen trade has affected the prosperity of this place. The population of the town, in 1821, was 8,493, and in 1831, 9,189: but the whole parish contains about three times that number. Armagh sends one member to parliament. Before the Reform Bill, the franchise was in the hands of twelve burgesses, self-elected, who returned the primate's nominee.

The see of Armagh is said to have been founded by St. Patrick in the fifth century, and was made an archbishopric in 1152. The archbishop bears the title of 'Lord Primate and Metropolitan of all Ireland.' The diocese was once divided into two parts, the English, now the upper, and the Irish, now the lower part. It extends into five counties—Armagh, Londonderry, Louth, Neath, and Tyrone. The archbishop's province includes the sees of Dromore, Down and Connor, (united), Derry, Raphoe, Clogher, Kilmore, Ardagh, and Meath: the province of Tuam is to be incorporated with it whenever that see becomes vacant. The chapter consists of a dean, precentor, chancellor, treasurer, archdeacon, and four prebendaries, with eight vicars choral. The see is valued in the king's books at 183*l.* 17*s.* 1½*d.*, and by the board of first-fruits at 400*l.* The primate's income was estimated by Mr. Arthur Young, in 1779, at 8000*l.* per annum, and by Mr. Wakefield (1812) at 12,000*l.*: it was really 15,000*l.*, but is diminished by the Church Temporalities Act. He presents to sixty parishes in his own diocese, and to six parishes in other dioceses.

The number of benefices in the diocese has varied considerably, from the formation of unions and the erection of perpetual curacies. By the report of the commissioners of ecclesiastical inquiry in Ireland (dated April, 1831), it appears that there were then eighty-three benefices, sixty-eight consisting of single parishes or separate portions of parishes, and fifteen consisting of parishes or portions of parishes united. The diocese of Clogher, when vacant, is to be incorporated with that of Armagh.

Armagh is a rectory, being, with several other parishes, comprehended in a parochial union, in which six curacies (four of them perpetual) have been instituted. The living has been for a long time held by the dean of the cathedral. The cathedral is the parish church; and there is another place of worship belonging to the establishment. There are also a Roman Catholic chapel and a Presbyterian meeting-house, both on a large scale; a place of worship for the Seceders; another for the Independents, and two Methodist meeting-houses. There are several churches in the out-parts of the parish. One of them, at Grange, owes its erection to the munificence of primate Robinson. It is of white stone, and its tall spire makes it a handsome object. Besides the county infirmary above-mentioned, there is a lunatic asylum for 106 patients of the counties of Monaghan, Cavan, Fermanagh, and Armagh. A fever-hospital has been built, and is maintained at the expense of the present lord primate; a 'shop for the poor' has been instituted by some individuals of his family; and a mendicity subscription afforded relief in the year 1830 to 500 persons, to the amount of nearly 584*l.*

Besides the royal foundation school there are several establishments for education, as, a chartered school for 20 girls, founded by Dr. Drelincourt; a school for fifty girls, supported by Lady Lifford, and two for eighty boys and as many girls, by the primate; and a Sunday school for 160 boys. The whole number of children under instruction in the city, in 1821, was 1071 (934 boys and 137 girls), and in the whole parish 2319, viz., 1899 boys and 420 girls.

Armagh formerly contained many monastic establishments. The priory of the regular canons of St. Augustin was said to have been founded by St. Patrick, and was, for some years, one of the most celebrated religious establishments in the world. There were a priory of the Culdees (*Culdei* or *Colidei*), who were secular priests, and served in the choir of the cathedral, their prior being a precentor there; a friary of Dominicans, and one of Franciscans.

In the early periods of its history the town was subject to many severe visitations. Conflagrations happened in the years 670, 687, and 778. In 832 the Danes plundered it; and in 839 they burned it to the ground with all its sacred edifices. On six other occasions in the same century it was laid waste by these barbarians. The annals of the three following centuries abound with notices of plunderings or fires. During that period Armagh was plundered thirteen times; it has been burnt (partly or wholly) seventeen times. Probably no other town ever suffered such a succession of misfortunes. (Young's *Tour; Wakefield's Account of Ireland; Liber Hiberniæ; Parliamentary Papers*, &c.)

The position of the observatory of Armagh is 54° 21′ 12″·7 N. lat. 6° 38′ 52″ W. long.

ARMAGH OBSERVATORY. [See OBSERVATORY.]

ARMAGNAC, a county in the province of Gascogne (Gascony), chiefly comprehended in the present limits of the department of Gers. While the old divisions of France continued in use, it had Languedoc on the east, the Agenois and Condomois on the north, Gascogne Proper on the west, and Bearn, Bigorre, and Comminges on the south. All these, except Languedoc and Bearn, are subdivisions of Gascogne. Few maps that we have seen give this county in all its extent, as described by Piganiol de la Force. (*Nouvelle Descript. de la France*, 2d edit. 1722.) It extended on the east to the Garonne; and on the south, some of the districts included in it (as les Quatre Vallées) stretched into the very heart of the Pyrenees. It comprehended the districts of High or White Armagnac, Low or Black Armagnac, Astarac, Brullois, L'Eauzan, Fezenzac, Gaure, Fesenzaguet, Lomagne, Les Baronies, Riviere-Verdun, Riviere-Basse, les Quatre Vallées (de Magnoac, de Neste, d'Aure, and de Barousse), already noticed, and Nebouzan. The chief towns were Auch (population, in 1826, 11,000), Lectoure (population 6000), Vic-Fezenzac (population 4000), L'Isle Jourdain (population 4000), Mirande (population 2000), Nogaro, Fleurence (population 3000), Leyrac Vic, or Lavit, Castelnau de Magnoac, La Barthe, Mauléon, Arreu, or Arreau, and Sarrancolin. These, which, with the exception of Leyrac and Mauléon, may be traced in the departments of Gers and Hautes Pyrenées, in the map of France published by the Society for the Diffusion of Useful Knowledge, will give some idea of the extent and ramifications of the province of Armagnac[*]. [For an account of such of these places as require further notice, see AUCH, LECTOURE, MIRANDE, GERS, and HAUTES PYRENEES.]

The county of Armagnac arose in the tenth century by the division of the lands of the Count of Fezenzac, whose younger son Bernard received that part of the county of Fezenzac which adjoins Bigorre, and thus became the first Count of Armagnac. The failure of the elder branch of the family of Fezenzac (which had retained that title) brought the territory under the sway of the younger or Armagnac branch in the early part of the twelfth century. The domains of these nobles were extended by subsequent acquisitions, especially under Bernard, Count of Armagnac, constable of France under Charles VI. in the fifteenth century, a man of great ambition, haughtiness, and cruelty, who gave name to one of the factions which then divided that unhappy country. John, the last Count of Armagnac, having incurred general odium by his crimes, and rendered himself obnoxious to Louis XI. of France by his political conduct, caused the downfal of this antient and powerful family. Besieged in 1472-3 in Lectoure, of which he had got possession, he was himself killed and the town taken by the perfidy of his enemies. The county was confiscated; and though it was subsequently re-established by Francis I., it reverted to the crown by inheritance on the accession of Henry IV. It was again re-established in 1645, during the minority of Lewis XIV. in favour of Henry of Lorraine, Count of Harcourt, and his heirs male.

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[*] Primate Robinson died at Clifton near Bristol, in October, 1794, but his body was brought over to Armagh and interred in a vault under the cathedral. A bust of him, by Bacon, adorns that edifice, which contains also a whole-length figure of the late Primate Stuart by Chantrey, one of Dean Drelincourt by Rysbrach, and some other pieces of sculpture by Irish artists.

[*] It may be noticed here that the district marked '*Armagnac*' in the Society's map of *France in Provinces*, is not so extensive as that above described, even though the small nameless divisions in that map lying to the S. and E., which properly belong to Armagnac, be included in it.

Armagnac was commonly divided into High and Low:—High Armagnac comprehended only the district so called, in which are the towns of Auch and Lectoure; and Low Armagnac included all the other districts given above. It is very fertile in grain and wine. Its brandy is of good quality, but not equal to that of Cognac. Very fine Bon-Chretien pears are also produced. (Piganiol de la Force, *Descr. de la France;* Martinière, *Le Grand Dictionnaire;* Balbi.)

ARMAGNAC, COUNTS OF, were descended from the antient dukes of Aquitaine and Gascony, and took their title from the county of Armagnac. John I. increased the importance of his family by marrying a daughter of the House of Bourbon. He was one of the powerful chiefs, in the south-west of France, strongly opposed to the claims of the English, and for this reason highly trusted by the French king, by whom he was made governor of Languedoc. Although we find him accompanying the Black Prince in his Spanish expedition against Peter the Cruel, he was still the prince's enemy when France and England renewed the contest. He died in 1373. His grandson, John III., who married the heiress of the House of Comminges, led an army of adventurers into Italy, where he laid siege to Alessandria, and fell under its walls in 1391. Bernard, younger brother of John III., succeeded him: he became the most celebrated of his family, and gave his name to the great party which he headed in opposition to the Burgundians. His aunt married the Duke of Berry, one of the French princes; and Bernard, in 1410, gave his daughter in marriage to the Duke of Orleans, then too young to head his party, and the task consequently fell to the Count of Armagnac. This distinction enabled him to rally under his banner the warlike and needy population of Gascony, whom he led, in the year 1410, to attack Paris. The cruelty with which these rude bands treated the court and the people round the capital inspired them with horror for the cause of Orleans, and contributed in no small degree to give that character of atrocity to the civil wars of the time in which they stand unequalled. The Armagnacs were composed of a rustic or pastoral population: the Burgundian cause was chiefly supported by the burgesses of the north of France and Flanders; and thus the mutual hatred of citizen and peasant increased the animosity between the opposite parties.

In 1412 both Armagnacs and Burgundians courted the alliance of England. The former made the higher offers, and stipulated to restore Aquitaine to Henry IV. of England, in return for his support. The discovery of the articles of this treaty, which were found upon one of the emissaries, did more to weaken the party of the Armagnacs in France, than even their cruelty or their want of success. In the following year, however, the excesses of the Burgundians having disgusted the Parisians, the Armagnacs obtained for the first time the superiority in the capital, and indeed throughout the kingdom.

The accession of Henry V. to the throne of England, his alliance with Burgundy, his invasion of France, and the victory at Agincourt, changed the face of affairs. The Count d'Armagnac, who had not been present at the battle, but who hurried from the south with a small army to defend the capital, was now the sole reliance of the dauphin. He was accordingly created Constable in the last days of 1415, and he soon showed himself an active and severe leader. Towards the citizens, especially of Paris, he showed himself a merciless tyrant, levying contributions, disarming them, forbidding them to meet in any numbers, however small, and punishing the least murmur by the sword of the executioner. In the field he was not so successful. The Earl of Dorset, with very inferior forces, put an army of Armagnacs to disgraceful flight; and the Count, in his rage, had no other satisfaction but that of hanging some of his own runaway soldiers. His cruelties and his defeat weakened his party, which he still however supported by terror. His harshness made an enemy of the queen, who meditated on making use of the authority of the dauphin to shake off the Armagnac yoke. The dauphin, John, son of Charles VI., soon expired, it was said by poison; and at the same time the death of other foes or rivals showed either the good fortune or the treachery of the Count d'Armagnac.

Queen Isabel, whom the Count of Armagnac had confined at Tours, was not, however, without her revenge. She communicated to the Duke of Burgundy her wish to escape from the bondage in which she was held; and an expedition undertaken by that prince rescued Isabel from the hands of the Count. The Burgundians soon drove the soldiers of Armagnac from the open country, and compelled the Count to concentrate his force in Paris; but the universal hatred borne to him rendered all his efforts at resistance vain. One of the gates was betrayed in the night to the enemy, and the Burgundians got possession of Paris, but not without a struggle. At first the persons of the Count and the chief members of the Armagnac party were respected, but after a few days the populace, being exasperated by past struggles, and excited by recollection of the tyranny of the Armagnacs, burst open the prisons, and massacred all within. This took place on the 12th of June, 1418. A white scarf, worn obliquely over the person, was the badge of the Armagnacs. The populace cut a stripe of flesh, in form of this scarf, from the body of the murdered Count. More than 3000 persons are said to have perished in this revolution.

John, Count of Armagnac, grandson of the preceding count, though less powerful as a party chief, was equally notorious for his crimes and his turbulence. An incestuous intercourse with his sister, which he avowed, and sought to cover by a marriage, first drew upon him the indignation of the pope Pius II., and of his sovereign, Charles VII. He was excommunicated, and forced by the royal troops to take refuge in exile. A prosecution was commenced against him before the parliament of Paris: he first appeared to answer the charges, but upon his again taking to flight, he was condemned, and his domains confiscated. The count, by repairing to Rome, contrived to soften the pope's anger, and procured the reversal of his sentence of excommunication. Under Louis XI., in 1461, the Count of Armagnac obtained possession of his fiefs, but soon joined in the revolt against that prince, which the Burgundians abetted. Louis XI. purchased the cessation of his enmity at the price of 10,000 crowns,—a sum bestowed in vain. For several years, Armagnac seemed an enemy in every sense worthy of Louis XI.,—revolting, defending himself bravely, when overcome at last vowing submission once more, and again acting the traitor. In his character and career he resembles the late Ali Pacha of Janina, and he met with a similar fate. Cardinal d'Albi, who was sent against him by the king, entered into negotiations with him, concluded terms of peace, and even a consecrated wafer was broken and taken. by both parties in sign of good faith. Relying on this, Armagnac relaxed in the vigilance of his guard; and the soldiers of the cardinal found means to introduce themselves into the fortress of Lectoure, and to massacre the count and his followers in 1473. The king's commands required the total extermination of the Armagnac race. Jeanne de Foix, the legitimate wife of the count, who was pregnant, was compelled to swallow a draught of poison. His brother Charles was seized, tortured, thrust into an unwholesome dungeon, but survived, and was liberated after the death of Louis XI.

A descendant of the family was created cardinal under Francis I.; he was known as an upright administrator and a patron of letters. He died in 1585, at a very advanced age. [See Nemours.]

ARMATOLI', a sort of national militia among the Greeks, instituted, according to some, during the Byzantine empire, but others refer it to a period subsequent to the conquest of Greece by the Turks. They were originally the mountaineers of northern Greece. The sultans, finding great difficulty in reducing them to submission, were constrained to come to terms of pacification with them, and, on the payment of a trifling tribute, they were allowed to retain their arms, and to form themselves into a military community, occupying their native districts, and governed by their own laws. They were charged with the suppression of brigandage in the mountain passes. The chiefs were styled Capitani, Polemarchs, or Protatos; the jurisdiction of a chief was called an armatolic, and he resided generally in the principal village of his canton. The office was hereditary, descending to the eldest son, who obtained a diploma from the pacha of his district, to whose authority he submitted. The band was composed of and commanded by Greeks exclusively; and, according to Fauriel, the number of cantons, immediately prior to the revolution, amounted to seventeen. The members who, in point of number, are unrestricted, were called pallikari: their costume was that generally known as the Albanian; their arms consisted of a yataghan, sabre, musket, and pistols; they were brave and temperate, and inured to hardship and fatigue.

About the middle of the last century, however, the Porte thought fit to appoint a Dervenji Bashi, in whose hands the care of all the passes was placed: this was a measure designed for the subversion of the armatoli. Ali, pacha of Joannina, having been also appointed Dervenji Bashi, made strenuous efforts to destroy their independence; but his cruelties drove the greater part to rebellion, and they fled to their native fastnesses. Here, as in the Morea, they maintained a sort of turbulent independence, and, at the first cry of the revolution, issued forth to assist in the liberation of their country. (Emerson's *Modern Greece;* See Leake's *Morea,* ii. 106.)

ARME'NIA. The extent of country designated by the name Armenia is not defined by any permanent natural boundaries. In the course of its history we find its limits exposed to constant changes.

When taken in the widest sense of the expression, Armenia may be said to embrace the country from lake Urmia and the junction of the rivers Kur and Araxes in the east, to the upper course of the Kizil Irmak or Halys in the west; and from the upper course of the rivers Chorok and Kur in the north, to the Taurus mountains in the direction of Bir, Mardin, and Nisibis, in the south. This extent is given to Armenia in the outline of a map prefixed to Avdall's translation of Michael Chamich's *History of Armenia.* (Calcutta, 1827, 2 vols. 8vo.)

The Armenia of Herodotus (v. 52) bordered on the west on Cilicia, from which country it was separated by the Euphrates; towards the N. it included the sources of the Euphrates (i. 180); towards the S. and E. its limits are not distinctly defined; probably Mount Masius separated it from Mesopotamia, and Mount Ararat from the country of the Saspires, who occupied the valley traversed by the Araxes. (See Rennell's *Geograph. Syst. of Herodotus,* vol. i. p. 369, 2d edit.)

The Armenia of Strabo (xi. 14) is limited on the S. by Mesopotamia and the Taurus; on the E. by Great Media and Atropatene; on the N. by the Iberes and Albani, and by the Parachoathras and Caucasus mountains; on the W. by the Tibareni, the Paryadres and Skydises mountains, as far as the Lesser Armenia, and to the country on the Euphrates which separates Armenia from Cappadocia and Commagene.

Abulfeda and other oriental geographers not only extend the limits of Armenia considerably to the N., so as to include Tiflis and part of Georgia, but also comprehend Cilicia and part of Cappadocia under the appellation of Belad-al-Armen. (See the geographical index to Alb. Schultens' *Vita Saladini,* Lugd. Batav. 1755. fol., and the *Geographical Works of Sadik Isfahani,* edited by Sir William Ouseley, London, 1832, 8vo. p. 6.)

The greater part of Armenia constitutes an elevated tableland, intersected in all directions by rapid streams, and with numerous ranges of higher mountains rising above it. Armenia, in fact, belongs to the great plateau of Iran; its southern boundary, which rises like a wall above the lower level of Mesopotamia, is the Kurdistan range, which passes in a W.N.W. direction a little to the N. of Mosul, is cut by the deep bed of the Tigris at Jezirah, passes a little N. of Nisibin, and past Mardin to the point where the Euphrates traverses the great range of the Taurus.

Near the town of Erzerum we find a chain of mountains which, by several projecting branches, is connected with the Caucasus, and separates the valley of the Chorok and its tributary streams in the west from that of the Kur and Araxes in the east, while the upper course of the northern branch of the Euphrates, often called the North Frat, marks its southern declivity. Its parts bear different names: among the Turks they are known by the appellations of Elkezi, Cheldir, Bin-Gheul (*i.e.*, the thousand lakes), &c., and among the Armenians by the names of Khakhdikh, Barkhar, Garin, &c. These mountains partly correspond to the situation of the Paryadres, Skydises, and Montes Moschici, of the antients. The Bin-Gheul, or Pinkiol, gives origin to the Araxes and to the northern branch of the Euphrates [see ARAS]; on the Barkhar the river Kur has its source.

The chain of hills which separates Armenia from Georgia, commencing near Akhalzikh (41° 37′ N. lat.), and accompanying in a south-easterly direction the course of the river Kur, is by the Georgians named Klardjethi or Taosi, by the Armenians, Medin (*i. e.* The Dark), or Sdorin-Govgas (*i. e.* The Low Caucasus).

South of the Araxes we meet with a range of mountains, called by Colonel Monteith the Mosian (Masian?) hills, some of which are covered with eternal snow, extending from the banks of the Araxes opposite Erivan westward to the Euphrates. They are in Turkish called Kus-dagh, Kiziljehdagh, Aghir-dagh, or Ala-dagh; in Armenian, Dagherdagh and Masis. They must not, in consequence of the last name, be confounded with the Montes Masii of the Greek and Roman geographers, which are farther south. At the eastern extremity of this chain, and washed by the Araxes, is situated an elevated mountain, the Abus of Ptolemy (Mannert, v. ii. p. 140), called by the Turks Agri-dagh, and by the Persians Koh-i-Nuh (*i. e.* Mount Noah), and believed by the natives to be the Ararat of Scripture. Parrot, the first European traveller who ascended this mountain, found its height to be 16,200 Paris or about 17,260 English feet. According to another popular tradition in the country, the Ararat of Scripture is the present Mount Judi, S.W. of the Lake Van, in the Gordyæan mountains. At a distance of about forty miles from Mount Ararat, on the northern side of the Araxes, there is another high peak, Mount Ali Guz, the height of which Colonel Monteith states to be 15,000 feet. [See ARARAT.]

S.W. of the Masis is Mount Nebad or Nebadagan, according to Saint-Martin the Niphates of the antients. Towards the south of the Nebad are situated the Dzaghge hills, in which the Murad-chaï has its source.

South of the Murad, and forming the separation between Armenia and Mesopotamia, are the Kurdistan Mountains, already described as part of the southern boundary of the high land, or, as these parts of it were antiently called, the Masius and Carduchian mountains. The Armenians themselves have no general appellation for this line of mountains, which constitutes the southern frontier of their country.

East of the Tigris, and immediately south of the lake Van, we find the Kareh, Judi, and Amadiah mountains (the Montes Gordyæi of the antients), and towards the frontiers of Persia the Kara-dagh. (See Saint-Martin, *Mémoires sur l'Arménie,* vol. i. p. 36-54.)

These chains of mountains and their accumulations of snow contain the sources of innumerable streams. The Tigris has its origin in the Niphates, but its sources have not yet been determined with precision. Herodotus (v. 52) speaks of three rivers, each bearing the name of Tigris; the two western streams coming from the country of the Armenians, the third, farther to the east, from the Matieni. This is supposed by Mannert to refer to the three upper branches of the Tigris, viz. that of Diarbekir, that of Meiafarekin, and that of Erzen. But there are some objections to this opinion, as it includes the Great Zab, and other streams, which must have been crossed on the road to Susa. Pliny makes the remark (*Hist. Nat.* vi. c. 31) that the Tigris is called by this name only when it flows rapidly, and that as far as its course is slow it is named Diglito; according to Josephus (*Antiq. Jud.* i. 2), the entire river was called Diglath: this name survives almost unchanged in the present Dijlat. What Pliny relates of the Tigris passing through the lakes Arethusa and Thospitis seems applicable to the branch which passes by Erzen, for the lake Thospitis of Pliny is probably the same as the Thonitis or Arsene of Strabo (xi. 14, t. ii. p. 461, ed. Tauchn.). The river Kentrites, mentioned by Xenophon (*Anab.* iv. c. iii. 1) as forming the frontier between Armenia and the country of the Karduchi (or Gordyæi), is supposed by Mannert to be the Nikephorios of later writers, now called Khabur or Sered (our river of Bedlis), which has its source in the mountains south of the lake Van.

The Euphrates, and its first great auxiliary stream, the Murad-chaï, also designated as the southern branch of the Euphrates, have their sources in the very heart of Armenia. The northern Euphrates arises in the Bin-Gheul hills in the district of Garin near Erzerum. In the name Garin it is easy to recognize that of Caranitis, where Pliny (v. 24) says that the Euphrates has its origin. According to

Pliny, this river bears at first the name of Pyxirates, and farther on that of Omirras, and is called Euphrates only after entering the plains of Syria and Mesopotamia. The Murad-chaï flows in a western direction as long as it remains within the limits of Armenia. It is probably the river called Euphrates by Xenophon (*Anabasis*, iv. c. v. 2), who says that the ten thousand Greeks in their retreat forded it, the water only reaching up to the navel; the sources of the river they understood to be at no great distance, but in this they were somewhat misinformed, if they crossed it, as we suppose, on the W. side of Lake Wan. The river Teleboas, over which the Greeks had passed before they came to the Euphrates (*Anab.* iv. c. iv. 3), has not yet been well determined. The Murad-chaï joins the Euphrates near Kebban, 38° 40′ N. lat. Below that place, and in its passage through the Taurus mountains, the course of the Euphrates is interrupted by rapids which obstruct the navigation to and from Syria.

The Cyrus or Kur is the principal river of Armenia. It has one of its sources in the hills north of Kars, and another in the Lake Pharhavan near Akhal-kalak. They meet at Pikelek. The Kur then passes by the forts of Khertwis and Aspindza, and farther down by the towns of Gori and Tiflis. Near Jebat or Jevat the Araxes joins the Kur, and the two rivers pour their united waters through three mouths into the Caspian Sea. Of the Araxes or Aras, which has its source at Dekman in the Bin-Gheul hills near Erzerum, some account has already been given in a separate article. [See Aras.]

The Chorok has its source in the hills west of Baberd. In its upper course it is called Masatteresi, and farther down takes the name of Chorokh. It passes the towns of Baberd, Sper, Khotrjur, Berdagrac, and Ardvin, and after having during the greater part of its course followed a north-eastern direction turns westward, and falls into the Black Sea between Batum and Kunia or Gonia. (See the *Nouveau Journal Asiatique*, vol. xii. p. 458-470.)

Among the lakes of Armenia, that of Wan is the most important. It lies in a basin surrounded by lofty hills on the S., W., and N., and is separated from the lake of Urmia to the E. by a chain of hills. Its elevation is no doubt several thousand feet, but we are not aware of any measurements being made. Ptolemy mentions it under the name of Lake Arsissa: this name still survives in the fortress of Arjis situated on the northern side of the lake, which is noticed as one of the principal towns of Armenia by oriental geographers. (See Abulfeda, in the Index to Schultens' *Vita Saladini*; Ouseley's *Sadik Isfahani*, pp. 6 and 62.) The circumference of the lake is estimated at 240 miles. It contains two considerable islands, on which have been built Armenian convents. Fourteen vessels are constantly employed in conveying goods from the different towns on its banks. Eight rivers fall into the lake, but none of them are of great importance. Jaubert (*Voyage en Arménie et en Perse*, p. 127) describes the scenery of the surrounding hills as extremely picturesque. (See Col. Monteith, in the *Journal of the Royal Geographical Society*, vol. iii. p. 50.)

Towards the north-east of Erivan is the lake of Goukeka or Sevan, also named Kiagar Kuni. From it springs the river Zengay or Zenghi, which passes by Erivan and then falls into the Araxes.

In the Masis or Mosian hills, west of Mount Ararat, and at a distance of twenty-seven miles towards the south from Kara-kulla on the Araxes, Col. Monteith visited a lake of twenty-four miles in circumference, at the extraordinary elevation of 6000 feet. At its western extremity a stream came from it, passing Bayazid and Maku, and then falling into the Araxes.

The climate of Armenia, notwithstanding its southern position, is, in the higher regions, extremely cold. The summits of several of its mountains are covered with eternal snow. The German traveller, Schulz, who visited Armenia in 1827, found the hills between Trebizonde and Erzerum, especially the Ghulat and the Karakapas, covered with deep snow in the month of June; and Tournefort found the wells near Erzerum thinly frozen over during the night in July. On the southern boundary of Armenia, and on the road from Diarbekir to Bedlis up the valley of the river of Bedlis, Father Avril found the tops of the hills covered with snow in April. (Avril, *Voyage en divers états d'Europe et d'Asie*, Paris, 1692, 4to., p 40, &c.) The climate at Etchmiadzin near Erivan in the valley of the Araxes around Mount Ararat, Ker Porter found even in November mild and delightful; but he observes, that the cold during winter even here is sometimes 16° or 18° below zero of Reaumur (4° and 8° 5′ below zero of Fahrenheit). (*Travels*, vol. i. p. 191.) The plains verging towards Azerbijan and Persia are said to be scorched in summer with excessive heat, and to require much artificial irrigation for the purposes of agriculture.

The soil of Armenia exhibits in many places appearances of volcanic products. This was particularly remarked by Col. Monteith in the neighbourhood of the town of Maku, situated in a narrow valley which extends from the Araxene plain near Ararat in the direction of the Lake Van; and also in the country around the lake of Goukeka.

Strabo (xi. c. 14. t. ii. p. 461) and Pliny (xxxvii. 23) notice the wealth of Armenia in precious stones and metals. Strabo, in particular, mentions gold-mines at a place named Kambala in the country of Hyspiratis (probably in the northern part of Armenia, between the rivers Kur and Phasis), which were worked by the natives at the time of Alexander's expedition. (An account of the mines in a neighbouring part of the country, ceded to Russia by the peace of Turkmanchaï, in 1828, may be seen in the *Nouveau Journal Asiatique*, vol. vi. p. 152-157.) In modern times the Armenian mines have produced plenty of excellent iron and copper, which are exported to Mosul. Rich mines of gold and silver are at this day known to exist near Kebban and Argana, in the two branches of the Taurus which inclose the valley of Karpoot (antiently Sophene), through which the Euphrates passes in its way from Armenia to Syria.

Abundant mines of rock-salt are found in the valley of Kulpia, which slopes towards the Araxes, at a distance of four miles below the fortress of Koor Ougley. 'These mines,' Col. Monteith observes, 'have for many ages supplied Georgia and even the Caucasus with salt. A range of hills, bordering the valley on the east side, is apparently entirely composed of that mineral, and in the sides of these numerous excavations have been made. Under the Persians, these mines were farmed for 3000*l.* per annum, and a village of 100 families was employed exclusively in working them.'

Marco Polo (edit. of the Paris Geogr. Soc. p. 311), in his account of Armenia, notices a copious well of mineral oil near the confines of Georgia. The oil, he says, is extensively used for burning and other purposes, and people come from remote countries to get it.

The valleys of Armenia are fertile in grain, tobacco, manna, hemp, cotton, and in fruit-trees, particularly a large description of apple, and walnuts. The excellence of the Armenian cotton is noticed already by Marco Polo ('*Ibi est bambace pulcrior de mundo et melior*,' l. c. p. 311).

Strabo (xi. c. 14, t. ii. p. 462, ed. Tauchn.) speaks with praise of the Armenian horse. 'Horses from the house of Togarmah' (*i. e.* from Armenia) are enumerated by the Hebrew prophet Ezekiel (xxvii. 14) among other articles of traffic brought for sale or exchange to Tyre. Near Erivan, Sir Robert Ker Porter saw a large kind of buffalo employed for the purposes of agriculture.

Armenia seems at an early period to have been divided into the Greater and the Lesser Armenia. Armenia Minor was the part west of the Euphrates. It appears to have comprised, in the time of Strabo, the districts of Arabkir and Devriki in the present Turkish pashalic of Siwas, and those of Erzinghan and Duruperan in the pashalic of Erzerum. During part of the middle ages the country was also named Cis or Sis, in allusion to the capital of Cilicia, which for a time formed part of Armenia Minor.

Armenia Major is by native writers divided into fifteen provinces, which Saint-Martin (i. p. 65) enumerates as follows:—1. Upper Armenia, 2. Daikh, 3. Kukarh, 4. Udi 5. Fourth Armenia, 6. Duruperan, 7. Ararat, 8. Vasburagan, 9. Siunikh, 10. Artsakh, 11. Phaidagaran, 12. Akhd snikh, 13. Mogkh, 14. Gordjaikh, 15. Persarmenia.

At the present day Armenia is divided among Turkey, Persia, and Russia. The Russian frontier between the Black and the Caspian Sea commences on the Euxine at Fort St. Nicholas, about ten miles south of the river Phasis or Rion; following the course of the hills which here inclose the valley of that stream, the frontier first takes an eastern direction; it then turns southward, traverses the S.W. branch of the Kur, follows the course of the Arpatchaï to its junction with the Araxes, and after crossing the latter river proceeds S.E., straight towards the Ararat, leaving the western summit of that mountain on the Russian side. The frontier then follows the Araxes during the greater part of its middle course, till where that river breaks through the Talidj or Talish hills: here the frontier turns south, and reaches the border of the Caspian Sea near Astara. The line which separates the Persian from the Turkish dominions in Armenia begins at Mount Ararat, and proceeds in a southern direction, following the range of hills which separate the streams falling into the Tigris and lake Van from those that run towards the Araxes and lake Urmia.

The name of the antient capital of Armenia was Artaxata, or Artaxiasata. (Strabo, xi. 14, t. 2, p. 460. Tacit. *Ann.* vi. 33, xiii. 39, &c.) It was situated, according to Strabo, on a sort of peninsula formed by a curve of the river (*ἐπὶ χεῤῥονησιάζοντος ἀγκῶνος*). Tavernier, Tournefort, and Chardin, suppose that a mass of ruins, found near where the Zengay or Zenghi falls into the Araxes, marks the situation of Artaxata, and Mannert (v. ii. p. 168) adopts this opinion. To Colonel Monteith, however, the situation of these ruins did not appear to answer to the description of Artaxata: he thinks that the remains of the antient capital are situated farther down the Araxes, in a bend of the river, at the bottom of which he saw the ruins of a bridge of Greek or Roman architecture. (*Journal of the Royal Geogr. Soc.*, iii. 47.)

The German traveller Schulz discovered, in 1827, near Wan, the ruins of a very antient town, called Shamiramakert (*i. e.*, the town of Semiramis), by Armenian historians, the foundation of which is by them ascribed to Semiramis. Mention of it is made by Moses Chorenensis, who names Maribas Catina, a Syrian writer who wrote about the year 140 before our æra, as his authority for the account which he gives of the town. Schulz found the ruins covered with inscriptions in the arrow-headed characters, many of which he copied. In one of them (an inscriptio trilinguis) the late M. Saint-Martin found the name of Kshearsha son of Dareioush (Xerxes son of Darius) mentioned repeatedly, which in his opinion can apply only to the Xerxes who led the great expedition against Greece. (See *Nouveau Journal Asiatique*, vol. ii. p. 164, &c.) According to the Armenian historians, the town of Shamiramakert was called Wan from a king of that name, who was the last but one of the Haik dynasty. (See Avdall, *History of Armenia*, vol. i. p. 44.)

The town of Tigranocerta, which according to Tacitus (*Ann.* xv. 5) was situated at a distance of thirty-seven milliaria N.E. of Nisibis, must, in the opinion of D'Anville and Mannert, be sought near the river Khabur, which they take to be the antient Nicephorius (the Kentrites of Xenophon). Armenian writers call the town Dikranagerd, and make it identical with the modern town of Kara-Amid or Diarbekr. (Saint-Martin, *Mémoires*, &c. i. pp. 170, 171.)

Magnificent ruins still exist of the celebrated antient town of Ani. They are about four miles west of the monastery of Kotchiwan, in a plain, protected towards the south and east by a deep and impassable ravine through which the river Arpatchai runs. The place is laid down on Sir Robert Ker Porter's map in 40° 32′ lat., 43° 36′ long. E. of Greenwich. On the history of Ani, called 'Ανίον by the Greeks, see a note by Klaproth in the *Nouveau Journal Asiatique*, xii. p. 194.

The remains of many other noble cities are still to be seen on the banks of the Araxes. The ruins of a bridge near Kara-kulla are supposed to mark the site of the antient Armavera. Farther down the Araxes, Colonel Monteith saw the ruins of a magnificent temple of Diana in the valley of Guerney.

Marco Polo (Paris edit. p. 310) in his account of Armenia, mentions an important mercantile town of the name of Laias (written also Layas and Laras in different MS. copies), where tradesmen from Venice, Pisa, Genoa, and from India (*mercatores Veneti, Pisani, et Januenses, et de omnibus partibus Indiæ*) met and exchanged their merchandise.

Abulfeda notices the following as the principal towns of Armenia: Arjish, Dabil, or Al-Dabil, Dawin, Wastan, Arzenjan, Mush, Arzen or Arzen-al-Rum (Erzerum), Melazjerd, Bidlis (Bedlis), and Akhlat. (See the geographical index to Schultens' *Vita Saladini*, s. v. Adserbeisjana.) Sadik Isfahani adds Alah-tak, Wan, and Takrit. Most of these towns still exist. Erzerum or Arzen-al-Rum (antiently called Garin, and in Greek, Theodosiopolis), at a distance of fourteen days' ride from Constantinople, is the principal place of Turkish Armenia. Jaubert estimates the number of its inhabitants at 70,000. Akhalzikh, a fortress near the river Kur, is the principal town in Turkish Georgia. Arjis or Arjish and Akhlat are antient towns on the northern and western borders respectively of the lake Wan. The town of Wan is supposed by Colonel Monteith to have at present about 20,000 inhabitants. Eriwan and Nakhshiwan are the two principal towns of Russian Armenia. The former is situated in a delightful plain watered by the Araxes, and its tributary river the Zenghi, and peopled by numerous villages: it has about 14,000 inhabitants. At a short distance from Eriwan is situated the celebrated Armenian convent of Etchmiadzin, or Etchmiatchin, the seat of an Armenian Patriarch; it was founded according to tradition by St. Gregory, A.D. 304. It is among the Turks known under the name of Utch-kilissia, *i. e.*, 'the three churches.' This convent is all that now remains of the great city of Vagharshabad, which is supposed by Saint-Martin (vol. i. p. 115) to have been founded in the sixth century before the Christian æra.

The latest publication relating to Armenia seems to be the *Researches of the Rev. E. Smith and the Rev. H. G. O. Dwight in Armenia*, &c. 2 vols. Boston, 1833. We have not had an opportunity of consulting this work for the present article.

History of Armenia.—The Armenians call the progenitor of their nation and the first ruler of their country Haïg or Haïk, whose father they believe to have been Torgoma, the Thogarma of Scripture (Genesis x. 3), the son of Gomer and grandson of Japhet. Haïg had originally lived in the country of Shinaar; but he retired from the oppression of the Assyrian king Belus, and established himself in the hills of the neighbouring Armenia. Belus pursued the emigrant with an armed force into his new abode, but was defeated by Haïg and fell in battle. This is said to have happened twenty-two centuries before the Christian era. (*Avdall*, i. 6.)

About three hundred years later, Aram, the sixth successor of Haïg ruled over Armenia. He signalized his reign by the conquest of part of Media, Assyria, and Cappadocia. The governor appointed by Aram in the last province laid the foundation of a town, which he called after his own name, Mishak, Majak, or Mazaca: it was subsequently named Cæsarea. The conquest of Aram first made known the people over whom he ruled, and neighbouring nations called them Aramides, and subsequently Armenians, from the name of their king. (Moses Chorenens. p. 47-49. ed. Whist.)

His son and successor, Ara, fell in a war with the Assyrian queen, Semiramis. Armenia then became dependent on the Assyrian throne, though it was still governed by native princes. King Scavordi, about the middle of the eighth century before Christ, threw off this allegiance. His son, Paroir, or Baroir, joined Arbaces and Belesis, the governors of Media and of Babylonia, in their revolt against Sardanapalus. After this, the kings of Armenia were again independent sovereigns.

In the reign of Haikak, the contemporary of Nebuchadnezzar, and the fifth king in succession from Paroir, the family of one of the exiled Jewish nobles, Shambat, came into Armenia. From him descended the great family of the Bagratians, which subsequently, about the middle of the ninth century of our æra, came to the throne of Armenia.

The next king but one after Haikak, was Dikran, or Tigranes I., who assisted Cyrus in his rebellion against Astyages and the Medes. To him Armenian authors (Moses Chor. p. 71; Avdall, vol. i. p. 41) ascribe the foundation of the city of Tigranocerta; but Plutarch and Strabo assign it to Tigranes, the contemporary of Mithridates. He was followed by his youngest son, Vahagn, who became celebrated by many deeds of valour in his wars with the Medes: the Armenians and Georgians composed and sung poems in his praise.

A corps of Armenians formed part of the Persian army in the expedition of Xerxes against Greece. They, and a corps of Phrygians, wore the same kind of armour, and were both commanded by Artochmes, a son-in-law of Darius. Herodotus, in mentioning these facts (vii. 73), expresses an opinion that the Armenians were a colony of the Phrygians; Strabo (xi. c. 14., t. ii. p. 463, ed. Tauch.) seems inclined to consider them as of Thessalian origin, but his arguments are not very convincing.

About the middle of the fourth century before our æra Vahey was upon the throne of the Haïgs. He assisted Darius in his war with the Macedonians, but fell in battle in the year B.C. 328. Armenia became a Macedonian province, and was ruled by governors, the first of whom, Mithrizes, a Persian, was appointed by Alexander three years after the death of Vahey. Already in the year 317, however, the Armenian chief, Ardwand, or Erwand (Ardoates), headed a revolution against the reigning governor, Neoptolemus, threw off the Macedonian yoke, and maintained himself for thirty-three years as an independent sovereign. After his death the Armenians were obliged to submit for a time to the supremacy of the Seleucidæ, until two Armenian nobles, Artaxias and Zariadras, availed themselves of the moment when Antiochus the Great had suffered a defeat from the Romans (B.C. 190), to declare their country free from its allegiance to the Syrian kings. Armenia was at this epoch divided into two kingdoms, that of Armenia Minor on the western, and that of Armenia Major on the eastern side of the Euphrates. In Armenia Minor the descendants of Zariadras continued to rule till the fall of Mithridates: thenceforward the country became attached to one or the other of the neighbouring states, and in the reign of the emperor Vespasian was made a Roman province: subsequently its limits were extended so as to embrace Melitene, Aravene, and part of Cataonia; and under the Byzantine emperors we find it divided into Armenia Prima and Secunda, the former governed by a consul, the latter by a *dux* (ἡγεμών). (See F. A. Cramer's *Geographical and Historical Description of Asia Minor*, Oxford, 1832, vol. ii. p. 148, &c.)

In Armenia Major the family of Artaxias (the Armenian Arsacidæ) maintained itself till the year B.C. 5, and gave eight, or, according to others, ten kings to the Armenian throne. The most important of these is Tigranes I. (B.C. 95-60), the son-in-law and ally of Mithridates. He rendered himself master of Armenia Minor, Cappadocia, and Syria, but lost all these conquests after the defeat of Mithridates. Lucullus invaded Armenia, and defeated near Tigranocerta the mixed and numerous army of Tigranes. (Plut. Lucull. 25, &c.) The peace concluded in the year B.C. 63 only left him Armenia. His son and successor, Artavasdes, was perfidiously seized by Marcus Antonius, and delivered as a prisoner into the hands of Cleopatra, the queen of Egypt (B.C. 34). After this time Armenia became an object of unceasing contention between the Romans and the Parthians, who alternately installed and dethroned its rulers.

In A.D. 232, Armenia was conquered by Ardeshir, the first of the Sassanide kings of Persia. The country remained subject to this dynasty till Dertad, or Tiridates, the son of Khosru, and the only survivor of the Arsacide family, supported by a Roman army, made it free again. Early in the fourth century Tiridates and many of the Armenian nobility were converted to Christianity by St. Gregory, whom pope Sylvester I., in A.D. 319, confirmed as pontiff of Armenia. The conversion of Constantine to the Christian faith occurred about the same time: this circumstance, while establishing friendly relations between the Greek empire and Armenia, exposed the latter country to the increased hatred of the heathen government of Persia. New conflicts and disturbances ensued, till (A.D. 387) Theodosius the Great entered into a compact with the Persian king, Sapores, according to which the eastern part of Armenia was to belong to Persia, and the western part to the Roman empire. Sapores, with a view to conciliate the minds of the Armenian nobles, many of whom were quitting the country in disgust, appointed Khosru, an offspring of the Arsacide family, as a tributary king over Persian Armenia. In 428, however, the Persian king, Behram V., deposed Artaces, or Artashir, the last of the tributary Arsacide rulers, and, with the consent of the degenerate Armenian nobles, appointed a Persian officer to govern the country. All the efforts of the Persian court were now directed towards the suppression of Christianity in Armenia, and the introduction of the doctrine of Zoroaster, as the difference of religion appeared to be the chief obstacle to the lasting fealty of the province. On these grounds the Armenian Christians became subject to constant vexations, and even cruel persecutions, from their Persian rulers. The '*History of Vartan*,' translated from the Armenian of Elisæus, by C. F. Neumann (published by the Oriental Translation Committee, London, 1830, 4to.), exhibits a detailed and highly interesting picture of the religious wars under which Armenia was suffering about the middle of the fifth century.

Even after the fall of the Sassanide dynasty in 632, Armenia did not enjoy tranquillity, as its provinces soon became the scene of conflict between the Grecian and the rising Mohammedan empire. In 855, during the caliphat of Motawakkel, an Arabian army, under the command of Buga, conquered Armenia: many of its principal nobles were brought to Bagdad, where the greater number of them were forced to become converts to the Mohammedan religion; only Sempad, the Bagratide, died a martyr to Christianity. His son, Ashod, gained the confidence of the Caliph, who, in 859, installed him king of Armenia. He became the founder of the Bagratide dynasty, which occupied the throne of Armenia till the year 1080. During the greater part of the tenth century, in the reign of Apas (928-951), Ashod III. (951-977) and Sempad II. (977-989), Armenia enjoyed tranquillity. Not long afterwards the country became an object of contest between the Byzantine empire and the Seljukide Turks. Gagik, the last of the Bagratide kings, was treacherously killed (1079), and Armenia, though still partially governed by native princes (the Orpelians and others), became mainly dependent on the Greek empire, while in the northern provinces, the Turks, and in the southern parts, the Kurds, encroached upon its limits.

From the year 1226, Georgia and Armenia suffered much from the incursion of the Mogols, which continued till near the end of the thirteenth century. (See Klaproth's paper *Des Entreprises des Mongols en Géorgie et en Arménie, &c.* in the *Nouveau Journal Asiatique*, vol. xii. pp. 193 and 273.)

After the murder of Gagik, and the fall of the Bagratide dominion in Armenia Proper, Rupen, a relative of the last king, fled with his family into Phrygia, and established an Armenian principality in the Taurus mountains north of Cilicia, which gradually extended its boundaries to the coast of the Mediterranean Sea. It soon derived importance from the services which its princes rendered to the monarchs of Europe during the crusades. Leon II., who reigned from 1185 till 1219, was in 1198 crowned king of Cilicia, by Archbishop Conrad of Mainz, who was sent for that purpose by the German emperor, Henry VI., and Pope Cælestinus III.; and a crown was likewise presented to him by the Greek emperor, Alexius. The Cilicio-Armenian kingdom continued till the latter part of the fourteenth century. The last king, Leon VI., was in 1375 taken prisoner by the Mamluks of Egypt, and, after a long captivity, wandered as an exile through Europe, from one country to another, till he died at Paris in 1393. (See Vahram's *Chronicle of the Armenian Kingdom in Cilicia*, translated by C. F. Neumann. London, 1831, 8vo. Published by the Oriental Translation Committee.)

The Mamluks were soon obliged to yield up their rule over Cilicia, and part of Armenia Proper, to the Ottomans. The Armenians, now a nation without a country or home, rather than endure cruel persecutions in the land of their fathers, spread themselves all over Asia and Europe. As early as the year 1331, Armenian refugees came to Kamenz in the Lausitz (Lusatia.) Others followed the Ottoman conquerors to Constantinople (1453), where the Grand Signior gave them a patriarch. They were well received in Russia, where numbers established themselves at New-Nakhchivan, on the Don, at Moscow, and at St. Petersburgh. In 1605 twelve thousand families were led forcibly away from Armenia into Persia, by the command of Shah Abbas. They settled at Julfa, one of the suburbs of Ispahan, giving to this quarter of the city the name of their city, Julfa, on the Araxes, in Armenia. Many who still remained at Tauriz, Erzerum, Kars, and Bayazid, have recently withdrawn to the Russian provinces south of the Caucasus. Armenian merchants are now found established in India, on the islands of the eastern Archipelago, in Singapore, in Afghanistan, Persia, in every part of Asia Minor, in Syria and Egypt, and in nearly all the countries of Europe. Almost every important fair or mart, from Leipzig and London to Bombay and Calcutta, is visited by them.

The *Armenian language*, observes M. Klaproth (*Encyclopédie des Gens du Monde*, t. ii. p. 298), is rough, and overcharged with consonants. Besides a great number of Indo-Germanic roots, it shows many analogies to the Finnic dialects of Siberia, and other languages of northern Asia. According to Balbi (*Atlas Ethnographique du Globe*) and Adelung (*Mithridates*, vol. i. p. 420, &c.), the Armenian does not belong to any known family of languages, but stands quite alone. Its grammar is excessively complicated: like the northern languages of Europe, it has an article attached to the end of words. It does not distinguish the genders. The declension has ten cases in the singular and plural; and in the conjugation of the verbs we find a corresponding copiousness of inflection. The antient or literary Armenian is so different in its grammar and structure from the present Armenian that it may be considered as a dead language. In good Armenian authors, of any age or country, no diversity of dialect is observable. The construction resembles that of the Greek language. Into the modern Armenian many foreign words have been introduced, especially from the Turkish; the grammar is altered, and the construction of sentences is modelled after the fashion of the Turkish language.

To those who wish to study the Armenian language the following works are recommended:—J. J. Schröderi *Thesaurus Linguæ Armenicæ antiquæ et hodiernæ.* Amst. 1711. 4to. *A Grammar, Armenian and English*, by Father Paschal Aucher. Venice, 1819. 8vo. *Dictionnaire abrégé Français-Arménien*, par Paschal Aucher. Venice, 1812. 2 vol. 8vo. *Choix de Fables de Vartan en Arménien et en Français.* Paris, 1825. 8vo.

Armenian Literature.—Previous to the introduction of Christianity, the religion and civilization of Armenia appear to have been similar to those of the neighbouring Persians and Parthians. With the exception of a few fragments of antient songs preserved by Moses Chorenensis, we possess no literary remains out of this period. With the Christian religion, however, a taste for the study of the Greek language and literature became prevalent. Till the beginning of the fifth century, the Armenians, in writing their language, used various foreign alphabets—the Persian, the Greek, or the Syrian, particularly the latter; but as the number of characters in these alphabets was insufficient to express all the sounds of the Armenian language, Mesrob invented, for the use of his countrymen, a particular alphabet written from the left to the right, and originally consisting of thirty-six characters, to which, subsequently, two more were added. This alphabet, which was introduced in the year 406, is that which the Armenians still use.

The continuous succession of writers, in various departments of literature, which Armenia has produced from the commencement of the fourth century down to our own age, and the zeal with which the Armenians, since their dispersion, have established printing-offices wherever they have settled in any considerable numbers, prove their fondness for the cultivation of letters. They either have, or have had, printing-offices at Amsterdam, Leipzig, Venice, Leghorn, at Leopol in Poland, at Constantinople, at Smyrna, in several towns of Russia, at Astrakhan, at Etchmiadzin, at Julfa near Ispahan, at Madras, and in several other places.

Besides the alphabet of which he was the inventor, Mesrob presented his countrymen with a translation of the Bible, made, as far as the Old Testament is concerned, from the Septuagint; but the Greek text, from which we must suppose it to have been made, does not agree altogether with any one of our recensions. The Armenian version is supposed by some critics to have been interpolated in the sixth century from the Syriac Peschito, and in the thirteenth from the Latin Vulgate.

The Armenian historians are valuable on account of the information which they supply on the history of the Byzantine empire, of the Sassanidæ, the Mohammedan Arabs, the Seljuks, the crusades, the Mogols, and, in short, on the entire history of the East since the fourth century. They show, upon the whole, more judgment than the Arabian and Persian historians in the selection of the facts which they record, and display a better taste in their manner of relating them: some appear rather too fond of interrupting the narrative by long strains of pious meditations. The Armenian chronicles should, however, be used with caution, particularly as regards the more remote periods of history. Saint-Martin has pointed out an important anachronism, into which, he says, Gibbon has been led by Moses Chorenensis, regarding the history of Armenia contemporary with the reigns of Constantinus and Constantius. (*Nouveau Journal Asiatique*, t. iv. p. 402, &c.)

The most antient Armenian historian probably was Agathangelus, the secretary of King Tiridates, early in the fourth century. The authenticity of a chronicle which is attributed to him seems, however, to be questionable.

Zenob, a Syrian by birth, pupil and secretary to St. Gregory, lived early in the fourth century. To him is ascribed a chronicle of the province of Daron, which was printed at Constantinople, 1719, 12mo.

Moses of Khoren, or Khorni, in the province of Daron, surnamed Kerthogh, or Kerthoghair, *i.e.* 'the grammarian poet, is considered by the Armenians as the first of their classical writers. He had from his early youth attached himself to Sahag (or Isaac), the patriarch of Armenia, a descendant of St. Gregory, who, in concert with Mesrob, most zealously endeavoured to propagate Christianity, and to diffuse a love for knowledge among his countrymen. Moses was by him sent to Alexandria (A.D. 434) in order to make himself perfectly familiar with the Greek language. He remained there several years, and returned to Armenia (442) by way of Rome, Athens, and Constantinople. Moses was subsequently raised to the archiepiscopal see of the provinces Pakrevant and Ardzruni, and died in A.D. 487, it is said at the age of 120 years. We possess a Chronicle by him, divided into three books (edited, in Armenian and Latin, by the brothers Whiston, London, 1736, 4to.), in which he gives the history of Armenia from the time of Haig down to the death of Mesrob and Sahag; also a treatise on rhetoric, and a work on geography. Saint Martin is also inclined to ascribe to Moses of Khoren an Armenian translation of the *Chronicon* of Eusebius (edited, in Armenian, by Aucher, at Venice, in 1818, and in Latin, in the same year, by Mai and Zohrab, at Milan), which was printed from an old MS. on vellum, found in 1794 by Zohrab at Constantinople.

Elisæus, or Eghishe, a contemporary of Moses of Khoren, was secretary to Vartan, a prince of the family of the Mamigonians: in 449 he was appointed bishop of the district of the Amadunians. He wrote a history of the religious wars of Vartan with the Persians, of which he himself had been eye-witness. An English translation of this work, by C. F. Neumann, was published at London in 1831 by the Oriental Translation Committee.

Another distinguished contemporary of Moses Chorenensis was the philosopher David. He visited Athens where he attended the lectures of Syrianus, the teacher of Proclus; he afterwards went to Constantinople, where he seems to have remained for a considerable period. He died in Armenia, it is supposed, early in the sixth century. (See C. F. Neumann's *Mémoire sur la Vie et les Ouvrages de David*, in the *Nouveau Journal Asiatique* of 1829.)

Lazarus of Parb (Parbetsi), surnamed the Rhetorician, who flourished in the sixth century, wrote a history of Armenia during the years 386-485. (Printed at Venice in 1793.)

Thomas the Ardzrunian, a contemporary of Lazarus, wrote a history of the life of Vartan, and subsequent events down to the year 500.

Joannes, bishop of the Mamigonians, lived in the seventh century. He wrote a history of Armenia from the commencement of the third century till the year 640. It was printed at Constantinople in 1719.

Anias Shiraguzi, in the seventh century, is the author of several biographical, astronomical, and chronological works.

Joannes Catholicus, in the ninth and tenth centuries, wrote a history of Armenia from Haïg till the reign of the Bagratian king, Ashot II. (A.D. 920.) This work, which yet remains unpublished, is considered by the Armenians a model of elegant style.

Matthias Erez, of Edessa, in the twelfth century, wrote a chronicle which comprehends the history of Armenia from the reign of Ashod III. (A.D. 951) till the establishment of the Armenian principality in Cilicia (A.D. 1128.) This work was continued by Gregory, in the same century, as far as the year 1161.

Samuel of Ani (Anetsi), likewise in the twelfth century, wrote a concise but accurate chronological work, extending from Adam to the pontificate of Gregory Vikayaser (A.D. 1164.) It has been continued by others till the year 1337.

Nerses Klaietsi, surnamed Shnorhali (*i. e.* 'the graceful') was born shortly before the close of the eleventh century and died in 1173. During the last twenty-six years of his life, he resided at Hromkla, commonly called Rumkala, a fortified place on the Euphrates. He is considered as the inventor, or principal cultivator, of rhymed poetry. With the exception of a brief history of Armenia, his works are mostly theological. (According to Gregorios Magistros, an Armenian writer of the eleventh century, the Armenians received their theory of prosody and rhyme from the Arabs, and Sahlum the son of Shahpu, and Aharon the son of Kahan were the first Armenian poets.)

Nerses Lampronetsi, the nephew of the former, was born in 1153, and died in 1198. His writings are almost exclusively homiletical and liturgical.

Vartan, a pupil of the monk Vanagan, in the thirteenth century, wrote a history of Armenia, commencing with the earliest times, and going down as far as the year 1272. This work is considered valuable on account of the information about the history of the countries bordering upon Armenia, and of the accuracy and criticism shown by the author.

Vahram, a native of Edessa, and secretary to King Leon III. of Cilicia (who reigned from 1269 till 1289), is the author of a short history of the Armenian kingdom in Cilicia. A more comprehensive work, on the same subject, was written by Sempad, towards the end of the fourteenth century.

After the fourteenth century, we find Armenian literature on its decline. With the exception of a valuable work on the history of Armenia, by Michael Chamchean, which was printed at Venice in 1786 (3 vols. 4to.), we hear of scarcely any work of merit. (See *Quadro della Storia Letteraria di Armenia, estesa da* P. S. Somal. Venice, 1829, 8vo.)

For about a hundred years, there has existed at Venice a congregation of Armenian monks, who are constantly publishing works on religion, theology, literature, and science, such as they think likely to benefit their countrymen. They dwell on the little island of San Lazaro, and call themselves Mekhitaristes, which name they derive from that of their founder, Peter Mekhitar, who fixed himself at Venice in 1717. (See *A brief Account of the Mechitaristican Society, founded on the island of S. Lazaro.* By Alexander Goode. Venice, 1825. 4to.) They have a printing-office well stocked with Armenian types, formerly cast at Amsterdam under the directions of Lucas Vanant. Many important works of a general interest have already come from the Armenian press of San Lazaro: one of the latest is an edition, in Armenian and Latin, of three *Sermones* of Philo the Jew, the Greek original of which is lost. The Armenian text is taken from a MS. written in A.D. 1296, which Zohrab discovered at Leopol in Poland, in 1791, collated with another copy made in the year 1298, and found in the library of the Armenian patriarch at Constantinople.

The Armenian Christians adopt the Apostolic, the Nicæan, and the Athanasian creeds, but reject the decrees of the Council of Chalcedon, and follow the doctrine of Eutyches and of the Monophysites, in admitting but *one nature* in the person of Christ, viz., that he is God only: this is, in the rite of their church, symbolically expressed by the use of red wine, unmixed with water, in the Lord's Supper. They assert that the Holy Ghost proceeds from the Father only, who accordingly, in their profession of faith (Schröder, *Thesaurus Linguæ Armenicæ*, p. 251), is called *genitor Filii et spirator Spiritus Sancti*, while the Holy Ghost is described as *procedens a Patre, coessentialis Patri et conglorius Filio.* They have the seven sacraments of the Catholic church, viz., Baptism, the Lord's Supper, Confirmation, Matrimony, Consecration of Priests, Confession of Sins, and Extreme Unction. They admit the doctrine of the transubstantiation of the bread and wine used in the Lord's Supper, which they administer under both forms to laymen as well as to ecclesiastics, though deviating from the rite adopted by other Christian sects, by dipping the bread into the wine. The Armenian clergy are divided into monastics and seculars. The former (under which class are comprised patriarchs, archbishops, bishops, doctors, monks, and hermits) live in celibacy; the secular clergy, *i. e.* the officiating priests, are permitted and advised to marry. The Armenian Church does not acknowledge the supremacy of the Pope. It was, at the beginning of the last century, governed by four patriarchs, who resided at Etchmiadzin, Sis, Aghthamar, and Gandsasar. The number of their bishops was calculated to amount, about the same time, to between fifty and sixty.

The Armenian Christians have an æra of their own, according to which they count their years, and which commences with the year 551 of our Dionysian æra. Their year is a moveable solar year. (See Ideler, *Lehrbuch der Chronologie*, p. 439, &c.)

ARMENIACA. [See Apricot and Prunus.]

ARMENTIERES, a town in France in the department du Nord, close upon the Belgian frontier, and ten miles W.N.W. of Lille, the capital of the department. It is a neat little town on the river Lys, the navigation of which contributes to its trade. The population is variously given at 6000 (Balbi) and 7700 (Malte Brun) persons, whose chief occupation is spinning flax, hemp, and cotton yarn. Some trade in woollen and linen cloth, lace, and leather, is carried on: also in bricks, of which great quantities are made in the neighbourhood. Armentières, when a frontier town of Flanders, was of some importance as a place of strength; and suffered much in different contests between the French and the Flemings; but upon its capture by Louis XIV. in 1667 it was dismantled. 50° 41′ N. lat., 2° 52′ E. long. of Greenwich. (M. Brun; Balbi; *Dictionnaire Universel de la France, &c.*)

ARMIGER. [See Esquire.]

ARMILLA, a bracelet, or large ring, for the wrist or arm. The wearing of the Armilla, or bracelet, as an ornament, is of very high antiquity. It occurs in Genesis, chap. xxiv. 22, 23, where Abraham sends his servant to seek a wife for Isaac. The Amalekite who slew Saul (2 Sam. i. 10) 'took the crown that was upon his head, and the *bracelet* that was on his arm,' and brought them to David.

The Armilla, or bracelet, as a decoration for both sexes was perhaps the most universal of all ornaments—common to almost every nation, and far more general than the *torques*, or collar for the neck. It was sometimes worn upon the wrist, sometimes near the shoulder, and occasionally upon the ancles. Bartholinus, in his treatise *de Armillis Veterum*, asserts, that it was of such general use as to be worn even by slaves, when they could obtain permission from their masters. This accounts for the great number of armillæ which have been found, of a slender shape and mean form, in bronze, in different countries once possessed by the Romans.

As an ornament of dress, the Armilla is frequently spoken of as massive. Livy (l. i. c. 11) says the golden bracelets of the Sabines were of great weight. Petronius Arbiter (c. 67) speaks of the Roman women as wearing bracelets of six pounds and a half, and even of ten pounds' weight, though the fact seems incredible.

It is not, however, as a mere ornament of dress that we are to consider the armilla; its most important use was as a gift of reward. Ælian (*Hist.* lib. i. c. 22) says the Persian kings rewarded all ambassadors, whether from Greece or other nations, with presents of armillæ. Plutarch, Xenophon (*Anabasis*, i. 2. 27), and Herodian, all allude to them as military or royal gifts.

Livy, in his account of the Samnite war (l. x. c. 44), says that at Aquilonia, Papirius, who had been engaged in various service, in the field, the camp, and the city, gave *armillæ* and coronets of gold to Spurius Nautius, to Spurius Papirius his own nephew, to four centurions, and to a whole band of the hastati. To the horsemen also, as a reward of valour, he gave armillæ and little horns of silver.

The gift of the *golden* armilla, however, was reserved peculiarly for the Roman citizen. Pliny says, to auxiliaries and strangers they give gold torques; to their own citizens only silver. But, exclusive of these, the Roman citizens have armillæ given them, which foreigners have not. (*Hist. Nat.* l. xxxiii. c. 10.)

Aulus Gellius, in the eleventh chapter of his second book, describing the exploits of Dentatus, says he was called the Roman Achilles; that he had been in more than a hundred and twenty actions; that he had never received a wound in the back, but that he had five and forty wounds in front; and that among his rewards he had achieved eight golden crowns, one obsidional, and three mural crowns; that he had received eighty-three torques, and more than a hundred and sixty armillæ. (*Noct. Att.* l. ii. c. 11.)

Gruter (Inscript. MXCVI. 4) has preserved a monumental inscription in memory of Lucius Lepidius, who had served in different legions, and received various armillæ, torques, and other ornaments, as rewards, from the Emperor Vespasian. Smetius (fol. lxxiii. b.) gives another, for a soldier upon whom both torques and armillæ had been bestowed by Trajan. Numerous other such inscriptions will be found in the different collections. Brissonius has given the formula of one of these donations: '*Imperator te Argenteis Armillis donat.*'

The draconarii, or standard-bearers, wore armillæ. See Ammianus Marcellinus (l. xx. c. 4), where the soldiers crown Julian with one of them.

There was another use to which the armilla or bracelet was applied from the very remotest ages of the world. It was used as an offering. In the Book of Exodus bracelets are included among the free gifts for the tabernacle.

Offerings of serpentine armillæ, or torques, were also made to Æsculapius.

Gifts of armillæ, however, were not confined to the warriors of Greece and Rome. The practice was as prevalent in the remoter regions of the north. The fragments which remain of the compositions of the Scaldic bards are full of allusions to the gift of bracelets. Snorro Sturleson's History affords ample proof of this. Hrolf Krake, King of Norway, whose reign is ascribed to the fifth century, is mentioned as bestowing them by Saxo Grammaticus. (*Hist. Dan.* ii. p. 29.) In the Saxon Chronicle, under the year 975, the English Edgar is expressly called beoꞃna beah-ᵹyꝼa, the *bestower of bracelets*, the rewarder of heroes; a term, indeed, usual as an epithet for a great chieftain in most of the Saxon poems. It occurs no where more frequently than in the song of the Traveller, and in the well-known poem of Beowulf.

Nor were armillæ gifts of reward made in person only; we find them frequently mentioned as legacies in the Saxon wills. In the will of Brihtric and his wife Ælfswytha (he was one of the Thanes of Archbishop Ælfric), preserved in the Textus Roffensis, among the articles which formed a legacy to the king, we have a bracelet of gold of the weight of eight mancuses; and to the queen a bracelet of thirty. In the will of Wulfer, which follows the will of Brihtric in Dr. Hickes's Thesaurus, we find a legacy of a bracelet of sixty mancuses. (*Dissert. Epist.* p. 51.)

William of Malmesbury informs us, that when Earl Godwin made his peace with Hardiknut, in the year 1040, he sealed it by a magnificent present—a ship, whose stern was richly ornamented with gold; and within it, eighty soldiers, each clothed in the most sumptuous habiliments of war, with armillæ of pure gold on both arms, each weighing sixteen ounces. (W. Malmesb. edit. Francof. 1601, l. ii. p. 77.) The same writer (p. 102), describing the manners and customs of the English in 1066, upon the conqueror's arrival, says their arms were laden with golden bracelets: "*Armillis aureis* brachiis onerati."

Arngrim Ionas, in his work on Iceland, speaking of the pagan rites which were used in the chief temple of southern Iceland, in the isle of Kialarnes, describes an armilla of twenty ounces weight, which was kept upon the altar, and which, being sprinkled with the blood of victims, was touched by those who took any solemn oath. He says it was either of silver, or silver and brass mixed. (*Crymog. Rer. Island.* l. i. p. 63.) He adds, that for this purpose it was worn upon the Judge's arm during trials. (*Ibid.* p. 76.)

There is a passage in the Saxon Chronicle, under the year 876, which refers to a ceremony not altogether unlike the practice in Iceland. It says, that when the Danes made their peace with the English Alfred, at Wareham in Wessex, they gave him the noblest among them as hostages, and swore oaths to him upon the holy bracelet.

Armillæ, as we learn from Bartholinus, were sometimes marriage presents. Virgins, it appears, did not usually wear them. (*De Armill. Vet.* p. 79.) From different passages in the Roman classics, we learn that they were sometimes given as birth-day presents. Placed among treasures, there was a superstition that an armilla would augment them. Lovers thought them efficacious; and ivory armillæ were used in the cure of epilepsy. See other superstitions in Pliny. (*Hist. Nat.* ed. Harduini, tom. ii. 451, 11; 472, 10; 531, 22.) Armillæ are still used as playthings for children.

Among the articles which from time to time have been turned up in the bogs of Ireland, armillæ of gold have not been the least numerous. Some years ago, several in this metal, of different sizes, were found under Beachy Head in Sussex, amongst the chalk which the tide had undermined. Two or three of these are still preserved in Mr. Payne Knight's collection of bronzes.

The Hamilton, Townley, and Knight collections of antiquities, in the British Museum, contain armillæ in great quantities, and of almost every variety of form, in gold, in silver, and in bronze. See the Hamilton Room, Case 68; Mr. Knight's collection, Case 8; and the Hamilton and other gems.

In vol. xii. of the *Archæologia*, pl. li., a bronze armilla is engraved, found upon the wrist of a full-sized skeleton at Westwang Field in the East Riding of Yorkshire. See also, in the same work (vol. xxii. p. 285) some observations upon an antient bracelet of bronze, found on the sand-hills of Altyre on the coast of Murrayshire: from these observations many of the materials for this account of the armilla have been derived.

ARMILLARY SPHERE. The Latin word *armilla* signifies a bracelet, and the armillary sphere is one in which the principal circles of the heavens are constructed of some solid material, and put together into their relative positions; thus presenting the appearance of a hollow sphere, of which all the surface has been cut away except the equator, ecliptic, colures, &c. This instrument is now little more than a toy, the complete sphere being generally preferred for the purposes of instruction; but in the antient astronomy, and even so late as the time of Tycho Brahé, an instrument, the simple description of which is, that it was the whole or part of an armillary sphere, was extensively used in astronomical observation. On this point we refer the reader to ASTROLABE.

ARMINIANS are the followers of James Arminius, or those who are considered to entertain his sentiments. It does not appear that the conference in which Arminius was engaged at the time of his death, was productive of any good effect upon the state of party feeling in Holland. The government, however, were evidently leaning towards his side; for in the following year (1610), on sending an embassy to France, Uitenbogaert was appointed chaplain. At Paris Uitenbogaert had frequent conferences with the celebrated J. Casaubon, who was then overseer of the Royal Library at Paris, although a Protestant. These conferences served to strengthen Uitenbogaert in the opinions which he had adopted, inasmuch as Casaubon, for the most part, agreed with them.

In the mean time, during the absence of Uitenbogaert in 1610, the disputes went on in Holland with increasing violence. They had now spread so widely that nearly all the country were engaged in them, clergymen and laymen, the learned and unlearned. A large majority of the clergy and leading religious men adopted the sentiments of Gomar, and espoused his cause. The Arminian party, fearing that matters would come to extremities, and that their party might be crushed, drew up a representation of their sentiments, which was presented to the States-general, and was named by its authors *Remonstratio*, or Remonstrantie, that is, Remonstrance. This gave rise to the name Remonstrants, by which the party has been usually called on the continent of Europe, from that time to the present. The Wesleyan Methodists call themselves Arminians, and their magazine appeared formerly under the title of the Arminian Magazine. [See REMONSTRANTS; OLDEN BARNEVELD; GROTIUS; DORT; EPISCOPIUS; BOGERMANN; HEINSIUS.]

ARMI'NIUS. James Arminius (called in Latin Jacobus Arminius, and in Dutch Jacob Hermanni, or von Harmine, or Harmensen) was born in 1560, at Oudewater, a small but pleasant and thriving village in South Holland. His father died while he was an infant. It happened, however, that there was at Oudewater a priest called Theodore Emilius, distinguished for erudition and piety, who had forsaken the Romish church, and had emigrated from place to place in order to avoid its persecution. Moved by compassion for the indigent condition of Arminius, Emilius took him under his care, instructed him in the learned languages, and inculcated frequent lessons of practical piety. He became so interested in the extraordinary talents and rapid improvement of his young pupil, that he continued his education until he was sufficiently advanced in his studies to be sent to a university. It appears that some time before his death Emilius had removed to Utrecht with his pupil; and there he died, leaving the young Arminius without any means of support. Soon after this event, however, the youth obtained a second patron in Rodolph Snell, a native of Holland, who on account of the incursion of the Spaniards had been obliged to quit his residence at Marburg in Hesse. Snell was himself distinguished for his knowledge of the mathematics. He soon returned to Hesse, accompanied by his young pupil; but he had scarcely arrived there before news came that the Spaniards had taken Oudewater, burnt it, and massacred all the inhabitants. Arminius set out immediately for his native place: on his arrival, he found it a heap of ruins; every house was burnt, and his mother, sister, brother, relations, and nearly all his fellow-townsmen, murdered. He returned immediately to Hesse, performing the whole journey on foot. Here, however, he did not stay long. News reached him that the University of Leyden had been founded by the prince of Orange, on which he set out once more for Holland, and at first repaired to Rotterdam, then an asylum for the surviving sufferers at Oudewater, and also for many refugees from Amsterdam.

At Rotterdam, Peter Bertius, the father of P. Bertius who afterwards wrote the funeral eulogy of Arminius, was persuaded to receive him into his own family; and he afterwards sent him, with his son P. Bertius, to the University of Leyden. Here young Bertius was the constant companion of Arminius, whom he describes as exceedingly devoted to literary pursuits. Arminius cultivated the study of poetry, mathematics, and philosophy, and became the ornament and example of the whole class to which he belonged. His principal instructor in theology was Lambert Danæus, who had taught at Geneva, and was distinguished by his knowledge of the Christian fathers and the scholastic divines.

After remaining at Leyden about six years, the senate of Amsterdam, being moved by the high reputation for brilliant talents and extraordinary application which Arminius had acquired, sent him in 1582, at their own expense, to Geneva, then the head-quarters of the reformed Calvinistic churches. Here he enjoyed the instruction of the celebrated Beza, the friend and successor of Calvin, in the famous theological school of Geneva. But he soon created a prejudice against himself among the leading men in this school on account of his enthusiastic attachment to the philosophy of Ramus, which he taught to his fellow-students in private, and which he boldly and zealously defended in public. The philosophy of Aristotle was at that time considered as the summit of perfection, not only at Geneva, but in all the schools and universities of Europe. The views of Ramus were opposed to this philosophy; and of course Arminius, who appeared as a zealous advocate for the opinions of Ramus, could not expect to meet with the approbation of the instructors at Geneva. Accordingly he was soon obliged to quit the place, and he immediately repaired to Basle, where Jacob Grynæus was then a distinguished teacher. Here he won so much applause and admiration by his attainments and devotedness to study, that he was speedily offered a doctorate in theology by the theological faculty at Basle, being at that time only twenty-two years of age. This, however, he declined, deeming himself too young to be made the subject of such an honour.

The commotion excited at Geneva by his opposition to the philosophy of Aristotle, soon began to subside in his absence. In 1583 he returned to Geneva. His own feelings were now greatly moderated on the subject of Ramus's philosophy, and he appears to have lived in tranquillity during his second residence at Geneva. How long he remained here during his second residence is not well ascertained; but as he returned to Geneva in 1583, and went into Italy in 1586-7, it seems probable that his stay was about three years.

He was attracted to Italy by the philosophic fame of James Zabarella of Padua, whither he went, attended by a young Hollander, his constant companion. After hearing a course of lectures, he travelled through Italy, visited Rome, then returned to Geneva for a short time, and soon after to Holland. While on his travels, he and his companion carried with them a Greek Testament and a Hebrew Psalter, which they read daily, in their exercises of devotion. In 1587 Arminius returned to Holland, and on repairing to Amsterdam he found that reports had been circulated there greatly to his disadvantage, respecting his favourable views of the Roman Catholic religion. Among other things, it was said that he had kissed the Pope's feet; that he was intimate with Jesuits; that he was introduced to Cardinal Bellarmine; and that he had renounced the Protestant religion. All this was entirely false.

Arminius found his patrons at Amsterdam cold and suspicious when he first returned. He succeeded, however, in satisfying them that he had been slandered, and he soon received an invitation as minister in one of the churches at Amsterdam, over which he was placed in 1588, being then twenty-eight years of age. On his return from Italy he had passed through Geneva, where Beza gave him a letter to his patrons, in which he speaks highly of him as 'animo ad faciendum officium optime comparatus, si Domino Deo placeret ipsius uti ad opus suum in ecclesia sua ministerio.'

Arminius soon became exceedingly popular as a preacher at Amsterdam. His sweet and sonorous voice, his manner, his ardour, his distinguished talents, and finished education, all combined to give him extensive popularity and influence. The rumours which had been set afloat concerning his inclination towards Catholicism gradually died away, and all classes of men united in extolling his talents as a preacher and a pastor.

Volkerts Coornhart, a man of distinguished talents and learning, who lived at this time at Amsterdam, was strongly opposed to the doctrine of predestination as held at Geneva and in Holland, and had written much against it. Two ministers at Delft, Arnold Cornelius and Renier Dunteklok, had undertaken, in conference and by writing, to oppose Coornhart. In order to do this, however, as they thought to the best advantage, they had relinquished the views of Calvin and Beza in respect to the *decretum absolutum*, viz. the doctrine that the decree of election and reprobation preceded all respect to the fall of man and to his obedience or disobedience. This is what has since been called supralapsarianism. On the other hand, the ministers at Delft maintained, not only that God in his decree regarded man as created, but also that he had respect to his lapsed condition. This is what has since been called sublapsarianism. The work which the Delft ministers published at this time, entitled 'Answer to some Arguments of Calvin and Beza on the subject of Predestination,' first gave rise to these denominations in the Christian church. The book of the Delft ministers, containing strictures on the supralapsarianism of Calvin and Beza, was sent by its authors to Martin Lydius, then professor of theology at Franecker. He was dissatisfied with it; but instead of undertaking to answer it himself, he solicited Arminius to defend his teacher, Beza. This Arminius was at first inclined to do; but, after a thorough perusal of the answer, he suspended his purpose, as his mind had been filled, by the perusal of the book, with doubts or difficulties in regard to some positions of Beza and Calvin. In 1597 Arminius repaired to Leyden, to confer with the celebrated F. Junius, who was then professor of theology there. The result of this was a long and amicable correspondence on the subject of decrees, necessity, liberty, &c., which is published in the works of Arminius. Junius treated these subjects with mildness and great ability, but he did not satisfy the scruples of his friend.

Uitenbogaert,* a very popular and able minister, at this time resident at the Hague, was known to sympathize in sentiment and feelings with Arminius. To him Arminius wrote, beseeching him to assist in the examination of the difficult questions in which he was engaged. Uitenbogaert, as appears by the sequel, entered warmly into his views.

In 1598 Arminius wrote his 'Examen Modestum Libelli Perkinsii, T. E.,' or his examination of a treatise in defence of predestination, which Perkins, an Englishman, had published under the title of 'Armilla Aurea.' In 1599 Arminius and his friend Uitenbogaert endeavoured to move the states of Holland to order a new translation of the Bible to be made by that excellent scholar Drusius. But in this they failed, owing to a strong suspicion entertained by many of the clergy, that they were aiming at the overthrow of the opinions then prevailing in the churches of Holland.

In 1600 Arminius opposed those of his brethren who were urging an annual subscription of all the ministers to the creed and catechism of the churches in Holland. In 1602 the plague made dreadful ravages in this country, and particularly at Amsterdam. Arminius is said to have distinguished himself greatly by his attention and kindness to the sick and to those who lost their friends. During this plague F. Junius and L. Trelcatius, professors of divinity at Leyden, died, and the curators of the university in 1603 elected Arminius to fill the place of Junius. It was only by the interposition of the curators at Leyden and of the leading men in the government of the states, that the synod at Amsterdam could be persuaded to allow Arminius to leave his church at Amsterdam; a fact which strongly marks the attachment of the people to their minister.

It is said, that F. Gomar, a distinguished professor of theology in Leyden at this time, was opposed to the election of Arminius. Soon after the new professor entered on his office, he and his colleague Gomar were brought to a friendly conference, in which Arminius explained himself so plainly and fully against the doctrines of Pelagius, that Gomar professed to be satisfied. But during the next year Arminius delivered a lecture on predestination, in which he maintained that God had eternally decreed to save believers and to punish the impenitent; the one to the praise of his glorious grace, the other in order to display his power and his indignation against sin. Arminius doubtless meant that God had respect in his decree to the belief of the one and the unbelief of the other. Gomar openly attacked this lecture; Arminius replied; and thus commenced a dispute which has not yet subsided. Gomar carried it on actively during the rest of his life. The students of the university soon became engaged in it, and were divided; a part held with Gomar, but the majority with Arminius, whose lecture-room was always crowded.

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* The name occurs in various forms: Uitenbogaert, Uitenbogaart, &c.—We have adopted that orthography which occurs in some old Dutch books.

This state of things very naturally took hold of the public sympathies. The ministers of the Gospel became divided, as well as the students of the university; but the majority appear to have taken the side of Gomar and to have blamed Arminius. As the contest went on, the teachers of religion began first to dispute, then to preach and write against each other, until all Holland was in a state of religious war. In 1604 some theses of Arminius on the divinity of Christ occasioned him new trouble. The matter related to the epithet *αὐτόθεος* as applied to Christ. Arminius explained it according to the Nicene Creed, in which the term occurs, *very God of very God*. His opponents gave it the contrary interpretation, that is, 'One who is God of himself, and has his essence from himself and not from the Father.'

In 1607 the ministers of Gouda published a catechism, which for the most part was expressed in the language of Scripture, and was intended to be simple and brief. Arminius was accused of favouring this catechism, which, it was averred, would open the flood-gates to all manner of error. All these occurrences served to increase the excitement in Holland. This finally rose so high that the States-general were called upon by Arminius and Uitenbogaert to convoke a general synod, before which Arminius might defend himself. The supreme court admitted Arminius and Gomar to a conference before them, and the result was, that this council informed the States-general that the disputes between the parties were on intricate points of little or no importance; and that, with respect to them, a man might believe either one way or the other without forfeiting his faith or injuring the church (*salvâ fide et salvâ ecclesiâ*). The States-general enjoined the parties to drop their disputes, and to teach nothing against the creed or the catechism.

The attempt of the government to put a stop to the disputes concerning religion, although well-meant, was entirely unsuccessful. Arminius and Gomar still carried on their theological warfare; the students of the university, of course, followed their example, and ministers through the country, and, finally, private individuals, became deeply engaged, on one side or the other, in this contest.

In the same year, 1608, Arminius was summoned by the States-general to appear before them at the Hague, and give them an account of his sentiments. This he did in his famous 'Declaratio,' published in his works. The States-general, as a body, were at this time inclined to favour Arminius. But the disputes continuing with increased violence, in the next year (1609) they summoned Arminius and Gomar before them once more, each accompanied by four ministers of his own party, in order that they might hold another conference in their presence. This was soon interrupted by the sickness of Arminius. Gomar and his friends insisted on a general synod, knowing that they had a majority of the clergy on their side. Uitenbogaert, the special friend of Arminius, who was present as one of his assistants, warned the States against being prejudiced by the violence and the number of the opponents of Arminius. He expressed an entire willingness to have a general synod; he only remarked, as Beza once said, that he did not wish Satan to be the president of it.

In the mean time Arminius died, on the 19th of October, 1609. His last sickness was exceedingly severe. Exhausted by the fatigues of body and mind which he had undergone during the many years of his theological warfare, deeply wounded by the ill-reports which the heat of dispute had engendered and zeal against him had extensively circulated, he fell under a complication of diseases—fever, cough, atrophy, and arthritis. It is said, that notwithstanding all his sufferings he died with great calmness and resignation, lamenting the evils to which the Church had been exposed, and earnestly praying for her peace and prosperity. In his last will, made on his death-bed, he solemnly testifies that he had, with simplicity and sincerity of heart, endeavoured to discover the truth by searching the Scriptures, and that he had never preached or taught anything which he did not believe to be contained in them.

This article is abridged from the *Biblical Repository* Andover (New England), 1831, pp. 226-308. See also,

1. Jacobi Arminii Opera Theologica, Lugd. Bat. 1629 small quarto. To this is prefixed Petrus Bertius, De Vitâ et Obitu J. Arminii.

2. The works of James Arminius, D.D., formerly professor of divinity in the University of Leyden, translated from the Latin, to which are added Brandt's life of the author with considerable augmentations; numerous extracts from his private letters; a curious and authentic account of the synod of Dort and its proceedings; several interesting notices of the progress of his theological opinions in Great Britain and on the Continent. By James Nichols, author of Calvinism and Arminianism compared in their Principles and Tendency. Volumes 1 and 2: London, 1825 and 1828.

3. Bayle, Dictionnaire Historique et Critique, tome 1, 1730.

4. Supplément au Dictionnaire de M. Bayle, par J. C. Chaufessie, tome 1, 1750.

5. Schroeckh, Christliche Kirchengeschichte seit der Reformation, Theil V. 1806.

6. Histoire abrégée de la Reformation des Pays Bas, traduite du Hollandois de Gerard Brandt, 3 vol. 12mo, 1726.

7. Acta Synodi Nationalis Dordrechti habitæ, to which is appended the Judicia Theologorum Exterorum, who were present at the synod; Dort, 1620, published under the direction of the synod. Also D. Heinsii Prefatio ad Ecclesias, a narrative concerning Arminius and his party, prefixed to the Acta Synodi.

8. Sim. Episcopii Opera Theologica, Goudæ, 1665, 2 tom. fol., in which are contained many pieces of an historical nature respecting the Remonstrants.

9. J. Halesii Epistolæ, letters of John Hales, chaplain to the English embassy at the Hague, and published originally in English in the 'Golden Remains' of the ever-memorable John Hales of Eton College, 1659, 4to. The Latin edition (Halesii Epistolæ) was published by Mosheim at Hamburgh in 1724, and is prefaced by about 200 pages concerning the synod of Dort and the life of Hales.

10. Calvinism and Arminianism compared in their principles and tendency, by James Nichols. London, 1824, in two volumes, 8vo. This important work gives the fullest information on the doctrines of Arminius.

ARMINIUS. [See Hermann.]

ARMLEY, a chapelry in the parish and borough of Leeds. [See Leeds.]

ARMO'RICA, ARMORICÆ CIVITATES, the name given, in the time of Cæsar, to the maritime districts of Celtic Gaul, situated between the mouth of the Ligeris (Loire) and that of the Sequana (Seine); the word is derived from the Celtic, *ar mor*, which means 'near the sea.' That tract of country was occupied by several tribes, the Veneti, Osismii, Curiosolites, Rhedones, Caletes, &c., who formed a sort of confederacy. Their towns and fortresses were built along the coast, and they had a considerable fleet, with which they carried on an intercourse with the opposite coast of Britain. Being subdued by the Romans, after repeated struggles, they formed part of the province called Lugdunensis Secunda, which was afterwards subdivided into Secunda and Tertia; the maritime districts of this province were styled *Armoricanus tractus*, and nearly corresponded in extent to the modern French provinces of Britanny and Normandy. (D'Anville, *Notice de l'ancienne Gaule.*) Maximus, a Roman officer, having revolted with the legions of Britain against the Emperor Gratian, A.D. 383, passed into Gaul with two legions and a large number of islanders, among whom was one Conan Meriadec, a chieftain from the south of Scotland, to whom Maximus assigned the government of Armorica, which appears to have included the modern provinces of Britanny and western Normandy. This is the first recorded emigration of Britons into that province, which was followed by others, as Meriadec, having obtained the confirmation of his government from Theodosius, after the death of Maximus, induced many of his countrymen to come and settle under his protection.

In the middle of the fifth century, thousands of Britons, driven from their native country by the incursions of the Picts from the north, crossed the channel, and sought refuge among their countrymen in Armorica. That country, left unprotected by the Roman emperors, had erected itself into an independent state, under the government of Conan's descendants, and, favoured by its situation, had repelled the attacks of the northern tribes, who devastated the rest of Gaul. The ships of Armorica carried on a considerable trade in those times, and the country seems to have attained a remarkable degree of prosperity amidst the general desolation of the west of Europe. The Christian religion was early propagated in Armorica; Bishops of Dol, Quimper, and Vannes, are recorded at the end of the fourth century, and the old annals of the country have preserved the memory of numerous saints, whose Celtic names are little known to the rest of the world.

Fresh emigrations continuing to pour in from Britain, the British population seems in a great measure to have displaced, near the coast at least, the original inhabitants, who withdrew to the interior districts; and from this circumstance the country began to be called Bretaigne or Bretagne, and the people Bretons. The council of Tours, held in 567, in one of its canons makes a distinction between the Breton and the Roman inhabitants of Armorica. The successors of Conan were styled Counts of Bretagne. The French historians have said that they did homage to Clovis, king of the Franks, as their sovereign; but this appears doubtful. At all events, their vassalage must have been merely nominal, as we find them acting as independent princes, and frequently at war with Clovis's successors, until the country was finally subdued by Charlemagne. The name of Armorica had long before this event been superseded by that of Bretagne, under which name it again became a separate duchy, with only a nominal dependence on the crown of France. [See BRETAGNE; Daru, *Histoire de Bretagne.*]

ARMOUR is a term generally applicable to any defensive habit, used to protect the person of the wearer from the attack of an enemy. The English word for it in the aggregate, in the fifteenth and sixteenth centuries, was *harness*.

Among the more civilized antient nations, brass, iron, and other metals, were preferred for its fabrication; and in the time of Asiatic magnificence, even gold was not spared. Herodotus (vii. 71) says that the Libyans who assisted Xerxes in the great army wore leather armour, or probably skins only is meant; of which material, he adds (b. i. 71), the armour of the antient Persians also was composed.

But for the earliest memorials of armour we must look to the sacred writings, where we find the shield, the helmet, and the breast-plate used by the Israelites. Goliath of Gath (1 Sam. xvii. 6) wore greaves to defend the legs, which were also worn by the warriors of other Asiatic nations; and, at the siege of Troy, by the Grecians in general. Homer's epithet of ἐϋκνημῖδες Ἀχαιοί (the well-greaved Achæi) is familiar to every classical reader. His description of the thorax or breast-plate of Agamemnon, at the beginning of the eleventh book of the *Iliad*, shows that decorated armour was used at this early period. The same conclusion follows as a matter of course from the description of the shield of Achilles, and it proves that occasionally great pains and skill were employed in decorating armour. The golden armour of Glaucus (*Iliad*, vi. 236) is stated to be worth a hundred oxen. Among the Egyptians, armour of metal was confined to kings and nobles; the helmet of Psammetichus was of brass; the common soldiery wore quilted linen for helmets, and carried large wooden shields. (Xenophon, *Anab.* i. 8.) The breast-plate which Amasis sent to Athenæa (Minerva) at Lindos was made of linen, on which figures of animals were woven; the ornamental parts were of cotton-thread and gold. (Herod. iii. 47.) As to Greek armour, several specimens of the helmet and cuirass occur upon the frieze of the Elgin marbles; in one instance (slab 51) we have a scaled cuirass richly ornamented. In the bronzes of Siris, purchased from M. Bröndsted for the British Museum, the warriors have helmets and shields only. One has a round, the other an oval shield: their bodies are unclothed.

The complete Roman armour consisted of the helmet, shield, lorica, and greaves. The lorica was originally of leather, as we learn from Varro; in the time of Servius Tullius, according to Livy, the whole of the Roman body armour was of brass. The laminated lorica was heavy. Tacitus (*Hist.* lib. i.) informs us, that its weight was made a subject of complaint by some of the soldiers in the time of Galba; and the emperor himself, in his old age, found the weight of his cuirass too much for his feeble frame. (*Hist.* lib. i. c. 35.) The Roman lorica was frequently enriched on the abdomen with embossed figures, on the breast with a Gorgon's head by way of amulet, on the shoulder-plates with scrolls of thunderbolts, and on the leather border which covered the tops of the lambrequins (or pendent flaps) with lions' heads; and these were formed of the precious metals. Each Roman legion had its own device marked upon its shields. In the time of Trajan, as is exemplified in the armour represented upon his column, the lorica was shortened, being cut straight round above the hips. A bronze breast and back plate of this kind are preserved in the British Museum, upon the front of the former of which one of the paps of the breast still remains, like a high button, to which the shoulder-plates were fastened, which held the back and breast together.

From these facts a general notion will be gathered of the kind of body-armour used among the antient nations. But as to the minute varieties of it, which are to be found in statues, or upon gems, coins, vases, and other representations, exhibiting the differences and peculiarities which existed, according to the time, the country, or the progress of improvement among the people, the details would be endless. Some of the most important facts will be mentioned under the proper heads, such as SHIELD, HELMET, &c.

Upon the history of defensive armour, as it was worn in England, we shall be more minute. The early Britons are believed to have used none except the shield. Sir Samuel Meyrick, on the authority of Aneurin, the British bard, says, that the Anglo-Saxons under Hengist and others, wore many of them loricæ of leather and four-cornered helmets. This armour, he thinks, was probably acquired through the alliance of their fathers with the Romans, under Carausius and his successors. Aneurin says that Hengist wore scale-armour. A very early illuminated manuscript in the Harleian Collection, No. 603, represents a warrior exactly answering this description. Drawings of the eighth century represent the Anglo-Saxon soldier without any other defensive armour than the shield and helmet, which latter, Sir Samuel Meyrick remarks, seems, in general, to have been nothing more than leather, and is often omitted even in representations of battles. His offensive arms are the sword and the spear. The form of the shield at this period is always oval; it is usually surrounded by a broad rim on the outside, and has a sharp boss projecting from the middle, both of metal; the materials were wood, covered with leather. One of the laws of Æthelstan prohibits the making of shields of sheep's-skin, under the penalty of thirty shillings. The helmet, as it is commonly represented in drawings of this æra, appears to have been nothing more than a cap of leather, with the fur turned outwards; but personages of rank had one of a conical form made of metal and gilt.

When the tunic supplanted the lorica, Sir Samuel Meyrick observes, the Roman pectoral was still retained, and called halꞅ-beaꞃh or beoꞃȝ, 'neck-guard;' bꞃeoꞅꞇ-beꝺeꞃ, 'defence for the breast;' and bꞃeoꞅꞇ-ꞃocc, 'breast-plate.' It may be seen on a warrior in an illumination in a manuscript of the Cottonian Library, marked Tiberius, B. v., in which the resemblance to the Roman pectoral is quite manifest. The Saxon authors, he continues (*Crit. Inquiry into Ant. Armour*, Introd. p. lxiii.), are by no means explicit with respect to the form or materials of the breast-guards, but the epithet applied to such as were of metal is 'rigid.' Others are mentioned which are said to have been 'rough or shaggy,' so that we may suppose them to have been formed of wool or hair, or perhaps of undressed hides.

Notwithstanding these remarks, the word lorica frequently occurs in the writings of the most eminent Saxon authors, and sometimes is mentioned in terms which might imply that it was made of metal. Aldhelm, who lived in the latter part of the seventh century, in some ænigmatical lines (*Poet. nonnulla*, 12mo. Mogunt. 1601, p. 51, *De Lorica*), speaks of a warrior's vesture which feared not darts drawn from the long quivers:—

> '—— En! vestis vulgi sermone vocabor:
> Spicula non vereor longis exempta pharetris.'

Whether this was the scaled-armour, such as worn by Hengist, or that made of flat-rings in the Phrygian style (as designated in Hope's *Costume*), is not quite clear. In an illumination, however, of the eighth century, a king habited in a tunic covered with flat rings occurs; and in another manuscript of that period similar armour occurs. (See the Cottonian MSS., Claud. B. iv., and Cleopatra, C. viii.) The Saxon authors call this ȝiehꞃynȝeꝺ byꞃn, or 'ringed byrne.' Some illuminations seem to show that the rings were worn edgewise, (compare the MS. Cleopatra, C viii.), and in either case the name is equally applicable.

Towards the close of the ninth century, the corium, or corietum, was the armour generally used, and appears frequently in the drawings of that period. It was formed of hides cut into the resemblance of leaves, and covering one another; sometimes all of one colour, as blue, &c., and sometimes of two, as brown and orange; the upper part being of the one, while that which covers the thighs is of the other. It should be observed, that the Saxon byrne, originally in shape like a tunic, became in form afterwards a complete cuirass, sitting close to the body, and generally terminating with it. Alcuin (*De Offic. Divin.*) speaks of the Anglo-Saxon military tunics of linen in the following terms. 'The soldiers are accustomed to wear linen tunics, so well fitted to their limbs as to enable them, with the utmost expedition, to direct the dart, poise the shield, wield the sword,' &c. The weight of the ringed byrne seems to have been found a great impediment to activity. Hence, when Harold, in 1063, obtained immediate and decisive success over the Welsh, it was owing to the change of armour among his soldiers. He had observed that these mountaineers could not be pursued to their fastnesses by his troops when clad in ringed tunics, and he therefore commanded them to use their antient leather suits, which would not impede their activity. (Ingulfus, fol. 68. Joh. Sarisb. *De Nugis Curialium*, lib. vi. c. vi. p. 185.)

The Saxon artists, it appears, made no distinction between the cynehealm, or royal helmet, and the crown. The monarch is depicted by them, in his court and in the field of battle, with the same kind of head-covering, even when every other part of his dress is marked with decisive variation; but upon the figure of Edward the Confessor, in his great seal, the diadem is evidently put on a helmet. The casque of the nobility is usually pointed in the form of a cone, and made of brass or some other metal. In the two succeeding centuries its shape is the same; but it is ornamented with gold and precious stones, and is improved by the addition of a small piece to protect the nose, called a nasal. (See an illumination in the Cottonian MS., Tiberius, B. v.)

Leg-guards are decidedly mentioned by the early Saxon writers; but they uniformly appear to have been made of twisted pieces of woollen cloth, coming from within the shoe, and wound round the legs to the top of the calves, in imitation of the hay-bands used by their rude ancestors.

The shield still continued oval, and indeed until the Norman conquest; but it differed from time to time greatly in dimensions, especially in the tenth and eleventh centuries, in the drawings of which times it appears of various sizes, from a magnitude sufficient to cover the head and body, to a diameter not greater than a foot and a half. This variation is further supported by historical testimony, for we find mention made of 'little shields,' and 'smaller shields.' In the will of Æthelstan, dated 1015, the shoulder-shield is included among the legacies, and it is distinguished from the target. It was probably of the larger sort, and received its appellation from being usually slung upon the shoulder.

When the Danes made their first appearance in England, Sir Samuel Meyrick says, they seem to have had no other armour than a broad collar, which encircled their chest and the lower part of their neck, or a small thorax of flat rings, with greaves, or rather shin-pieces, of stout leather. About Canute's time, the Anglo-Danes adopted a new species of armour, which, he thinks, they probably derived from their kinsmen, the Normans. This consisted of a tunic, with a hood for the head, and long sleeves, and what were afterwards called chausses, *i. e.* pantaloons, covering also the feet, all of which were coated with perforated lozenges of steel, called, from their resemblance to the meshes of a net, macles, or mascles. They wore, too, a helmet, or skullcap, in the shape of a curvilinear cone, having on its apex a round knob, under which were painted the rays of a star. This helmet had a large broad nasal, to protect the nose, and the hood was drawn up over the mouth, and attached to it, so that the only exposed parts were the eyes. The authority for these observations is the manuscript in the British Museum commonly called Canute's Prayer-book. Spears, swords, and battle-axes, or bipennes, were the offensive arms, and the shield remained as before.

Such had been the state of armour in Britain when William led his army of Normans and Flemings to the victory at Hastings.

From this period, the great seals of our kings, those of the greater barons, and monumental effigies, give the outline of the changes which took place in the fashions of armour. The great seal of William the Conqueror represents him on one side seated on a throne, upon the other he is in a hauberk apparently of rings set edgewise, which kind of armour had been used by the Anglo-Saxons. The Norman body-armour represented in the Bayeux tapestry is of two kinds; one of rings or mascles, sewn flat on the vesture; the other of leather. The helmets are conical, and have the nasal. The ring-armour of the Bayeux tapestry forms both breeches and jacket at the same time: 'this,' says Sir Samuel Meyrick, 'I take to be the haubergeon, as there are some few specimens of the tunic or hauberk, and both being mentioned in the *Roman de Rou*. This opinion,' he adds, 'is further strengthened by a specimen of this curiously shaped armour existing on a monument in Ireland as late as the time of Edward III. It appears to have been put on by first drawing it on the thighs, where it sits wide, and then putting the arms into the sleeves, which hang loosely, reaching not much below the elbow, as was the case with the Saxon flat-ringed tunic: the hood attached to it was then brought up over the head, and the opening on the chest covered by a square piece, through which were passed straps, that fastened behind, hanging down with tasselled terminations, as did also the strap which drew the hood, or capuchon, as it was called, tight round the forehead. This is evident in several figures in the Bayeux tapestry; but the manner in which the armour was put on and fastened is best shown where William is arming Harold. The Duke of Normandy is there represented as placing the helmet on the head of the Saxon earl with his left hand, while his right is busied making tight a strap, which is drawn through the rings on the breast of the latter. No examples of such shaped armour in England occur previously or in any subsequent reign; but it appears to have been introduced into Ireland, and worn in that country, as has been above observed, as late as the time of Edward III.; nor does any distinguishing name seem to have been applied to it: hence I conclude that it is what Wace calls the haubergeon, in his description of the appearance at the battle of Hastings of Bishop Odo, the conqueror's half-brother.' The legs of the figures in the tapestry are, generally speaking, bound with bands of different colours, rising out of the shoe in the antient Saxon manner; but, in some instances, and where the hauberk is worn, they appear covered with mail to the ankles. Such, however, is the case only with the most distinguished characters, as William, Odo, Eustace, &c. This covering for the legs, according to William of Malmesbury, was called *heuse* or *hose;* whence Robert of Normandy, being rather short-legged, we are told by Ordericus Vitalis, his contemporary, was often called by his father Curt-hose. The shield, as depicted in the tapestry, and introduced by the Normans, was of a very peculiar form. It has been called heater-shield and kite-shield by modern antiquaries, from its supposed resemblance to those familiar objects; but by the Normans themselves it was merely termed *escu*, from the Latin, *scutum.* While in the tapestry most of the Saxon shields are represented round or oval, with a central boss, as in the illuminations of that people, there is no instance of a Norman with any other than the long kite-shaped shield.

The armour of the reign of William Rufus remained precisely the same as in that of the Conqueror; and we have no new specimen of any part, except the *chapel de fer.* This appears on the seal of Rufus, and resembles a Tartar cap, being a cone which projects beyond the head.

The great seal of Henry I. represents that king in ringed-armour. Other specimens of his time occur in the enamelled copper of Geoffrey Plantagenet, engraved by Stothard, and described by John of Marmoustier, and in a representation of similar date, engraved by Strutt, in his *Dresses and Habits of the People of England*, from a manuscript in the possession of the late Francis Douce, Esq.

In the reign of Stephen, what is called tegulated armour appears to have prevailed, which consisted of several little plates, covering each other in the manner of tiles, and sewn upon a hauberk, without sleeves or hood. The seal of Richard Fitzhugh, Earl of Chester, engraved in the *Vetusta Monumenta* of the Society of Antiquaries, affords a fine specimen of this kind of hauberk. The nasal of the helmet appears to have been disused toward the close of this reign; though, upon his great seal, Stephen is represented with it.

Henry II. is represented upon his great seal in a flat-ringed hauberk, wearing a conical helmet without a nasal. The flat rings, however, gave way soon after the commencement of his reign, and the hauberk with rings set edgewise came into general fashion. The shape of the shield became somewhat shortened, and often more angular on each side at the top.

Richard I., in his first seal, appears in a hauberk of rings set edgewise, from under which falls the drapery of his tunic; in the second seal he has the same without drapery; in both he is represented with chausses; in the first, wearing a conical helmet, but with its apex somewhat rounded; in the second, with a cylindrical one, surmounted by the *planta-genista* (or broom-plant) in reference to his name, and having an aventaille or plate to protect the face.

The great seal of John affords the first example of an English king wearing a surcoat; it is put over a hauberk of rings set edgewise. Surcoats are supposed to have originated with the Crusaders, for the purpose of distinguishing the many different nations serving under the banner of the cross, and to throw a veil over the iron armour, so apt to heat excessively when exposed to the direct rays of the sun. Besides the surcoat, the hauketon was a military garment in great esteem during this reign. Thus, in a wardrobe account dated in 1212, we find a pound of cotton was expended in stuffing an aketon belonging to King John, which cost twelve pence, and the quilting of the same was charged at twelve pence more. John is represented with a cylindrical helmet, but without any covering over his face. The monument in the Temple church ascribed to Geoffrey de Magnavilla, or Mandeville, which appears to be about this period, has one very similar, but with a nasal and cheek-pieces.

Henry III.'s great seals afford us the earliest specimen of the *ouvrages de pourpointerie*, which came more into fashion toward the latter part of his reign. His hauberk and chausses are of this padded work, stitched. On his first seal his helmet is represented as with the visor or aperture for sight, not in the aventaille, but in the helmet itself, while the latter has merely perforations for the breath, and is therefore fixed at the lower part. His second seal exhibits him in a cylindrical helmet of a more perfect form, the aventaille, which contains both the before-mentioned conveniences, being apparently made to open and shut by means of hinges and a clasp. This seal of Henry III. also represents him in a surcoat. A remarkable monumental effigy of a knight of this reign, in the armour of rings set edgewise, occurs in the church of Malvern in Worcestershire. The monumental figure of Richard Longespée, Earl of Salisbury, who died in 1224, is another specimen. 'The horse soldiers, at this time,' says Sir S. Meyrick, 'consisted of the heavy cavalry, who were the knights, and completely covered with mail, or, as Matthew Paris expresses it, *ad unguem armatos*, the face and left hand excepted.' In a manuscript, entitled *The Lives of the Offas*, written by Matthew Paris (MS. Cotton. Nero, D. i.), and of the time of Henry III., the knights appear generally in gamboised armour (padded work, stitched), with surcoats, and wearing shin-pieces or greaves of steel. One, however, is in a hauberk, with hood and chausses of flat contiguous rings, and probably this is the latest example of such armour being worn. Some appear with visors, consisting of a convex plate of steel, on which is a cross, with perforations for the sight, and punctures for the breath, tied upon the hood. Others have a nasal skullcap, though not the latest representation of this defence; and others the cylindrical helmet common to this period. The helmets of the kings are distinguished from the rest by a crown at top. They have all, too, those coverings for the knees called poleyns. This word is often erroneously confounded with poulaines, which were the long points at the toes of shoes, worn in Richard II.'s time, as well as anterior; but we learn from the following passage from Carolus Blessensis, in Lobineau's *Hist. Bretagne*, vol. ii. p. 566, that they were for the knees: 'Fecit sibi per Oliverium auferri à genibus polenas, et antebrachia à brachiis:' He caused Oliver to take the poleyns from his knees, and the vambraces from his arms. Pourpointing, or elaborate stitching, it appears, became at this time a trade, and there were several pourpointers in Paris and London. The use of the pourpoint seems greatly to have gained ground, and the military in the delineations of this and the next reign are almost constantly depicted in it. Sir Samuel Meyrick says, 'it has been observed, that in the illuminations of this period, the archers are represented wearing leathern vests over their hauberks of edge-ringed mail. These appear to have been the jack in its primary form, which originated with the English, and which afterwards assumed a shape so cumbersome. From the *Chronicle* of Bertrand du Guesclin, composed about the time of Richard II., we learn that it continued to be worn over the hauberk, for he says, 'S'avoit chascun un jacque par dessus son haubert,' —each had a jack above his hauberk. This small vest was called jacket, and in the Latin of the time, *jaquetanus*, as was the *jacque*, *jacquemardus* and *jacobus*. The monument of Eudo de Arsic, who died about the latter part of this reign, seems to represent him in the jacque. He is clad in mail, and wears this garment, which is made with sleeves, sits close to the body, is buttoned down the front, and has a puckered skirt reaching to the knees. In later times it was generally of leather, for Coquillart, an old French writer, '*sur les Droits nouveaux*,' describes it as of chamois, extending to the knees, and stuffed with flocks, so as to be a kind of pourpoint. During the latter part of this reign, the shape of the helmet underwent a partial change, taking the form of a truncated cone on the top of a cylinder: the apertures for the sight were horizontal, and pierced in the transverse part of a cross that ornamented the front. The crusade in this reign, says Sir Samuel Meyrick, seems to have introduced a new and most ingenious species of armour, probably of Asiatic discovery, and still worn by those nations at the present day. This was the interlaced rings, which, as dependent on each other, did not require to be sewn to an under garment. The earliest specimen he considers to be the monumental effigy of De l'Isle, in Rampton church, Cambridgeshire, which exhibits him in the flat coif worn during the greater part of this reign, but made, as well as his hauberk and chausses, of interlaced chain. The shape of his shield, however, is that of the close of Henry III.'s reign, and, with his surcoat, is ornamented with his armorial bearings. The *chapel de fer* continued to be used in this reign. The chanfron, or armour for the horse's head and face, first occurs in the clause-roll of the fifty-fourth Henry III.

Considerable improvements were made in armour during the reigns of the first three Edwards. Ailettes, or shoulder pieces, appear to have been introduced in that of Edward I. In Edward II.'s time, armour appears to have assumed a mixed character, being neither altogether mail nor wholly plate. *Armures de fer*, toward the close of this reign, became the distinctive term, among the French writers, for plate-armour. The Florentine annals, says Sir Samuel Meyrick, consider the year 1315 as remarkable for a new regulation in armour, by which every horseman who went to battle was to have his helmet, breastplate, gauntlets, cuisses, and jambes all of iron, a precaution which was taken on account of the disadvantages their cavalry had suffered from wearing light armour at the battle of Catino; but this usage did not find its way into general practice in Europe for at least ten years after. The seal of Edward Prince of Wales, afterwards King Edward III., represents him with ailettes on which are his arms, in the same manner as Edmund Crouchback is exhibited in Westminster Abbey, and in a missal belonging to the late Francis Douce, Esq. What is curious in this is the early representation of the mamelieres, or pieces put on the breast, from which depended chains, one of which was attached to the sword-hilt, and the other to the scabbard. The armour at the close of this reign may be seen in an initial letter of a grant from King Edward II., constituting his brother, Thomas de Brotherton, Marshal of England. (See the MS. in the Cottonian Library, Nero, D. vi.) In the chancel of Ash church, in Kent, is the monumental effigy of a knight which exhibits still further the progress toward plate-armour.

The helmet on the seal of Edward II. is of a cylindrical form, with a grated or pierced aventaille and visor attached: a clasp which fastens this on the right side is very visible and it is probable that on the other it was retained by hinges. It was very much the custom during this reign to wear over the armour the cointisse, or surcoat, ornamented with the warrior's arms.

The monumental effigy of John of Eltham, who died in 1329, exhibits the fashion in which armour was worn at the commencement of the reign of Edward III.; similar to which is the figure on the monument of a knight in Ifield church, in Sussex. The splendid manner, it is observed, in which some of the knights of this period chose to have their armour made proved sometimes fatal to them. Froissart tells us, that 'Raymond, nephew to Pope Clement, was taken prisoner, but was afterwards put to death for his beautiful armour.' The monument of Sir Oliver Ingham, at Ingham church, in Norfolk, who died in 1343, shows the further gradual progress of mixed armour. His monument also affords us one of the earliest specimens of the justing helmet of this time, surmounted by its crest—an owl with wings expanded. The equestrian statue of Bernabo Visconti, at Milan, engraved in the *Archæologia*, vol. xviii. pl. xii. xiii. xiv. with its details, affords a magnificent specimen of the mixed armour used at this time upon the continent. Moveable visors attached to the bacinets (or skull-caps in the form of a bason) appear to have come in about the middle of the reign of Edward III. The Black Prince's monument at Canterbury, who died in 1360, is another specimen of the period. The monument of Humphry de Bohun, Earl of Hereford, in 1367, Sir Samuel Meyrick observes, is the earliest specimen of plate-armour with taces, or overlapping plates to envelope the abdomen, at the bottom of the breastplate, without any surcoat. It was not till the reign of Henry V. that this practice became general. Humphrey de Bohun wears plate over the insteps, but the rest of his feet is covered with chain.

The reigns of Richard II. and Henry IV. were still more distinguished by the increased ornament of armour. The armourers of Italy were much employed at this time by the English nobility. When Henry, Earl of Derby, proposed the combat with the Duke of Norfolk at Coventry, he sent to Galeazzo, Duke of Milan, for armour, who gave the knight who bore Henry's message not only the choice of all his armour, but sent with him to England four of the best armourers of Milan to give personal attendance upon Henry for his equipment. Chaucer, noticing a tournament at this period, says,

> 'Ther mayst thou see devising of barneis
> So uncouth and so riche, and wrought so well
> Of goldsmithry, of brouding, and of stele;
> The sheldes brighte, testeres, and trappures;
> Gold-hewen helmes, hauberkes, cote-armures.'—v. 2498.

Soon after the year 1400, chain-mail seems to have been entirely disused; and the complete armour of plate adopted. Henry V. is so represented on his great seal, as well as in one of the illuminations of the celebrated Bedford Missal; in the latter he is represented being armed by one of his esquires. Black armour was at this period often used for mourning. Henry IV. is constantly represented in black armour in the illuminations to the celebrated manuscript on *The Deposition of Richard II.*, preserved in the Harleian Collection.

A more splendid specimen of armour of the reign of Henry VI., than that represented on the effigy of Richard Beauchamp, Earl of Warwick, in the Beauchamp Chapel at Warwick, will not be found anywhere; he died in 1439.

The fashion of armour prevalent through the reign of Edward IV. may be judged of from that monarch's great seal, and from the monumental effigy of Sir John Crosby, in the church of St. Helen, without Bishopsgate, in London. The latter died in 1475. Soon after this time, numerous specimens of armour occur with immense elbow-plates; these continued till the time of Henry VIII.

The perfection of plate armour is supposed to have been attained in the reign of Richard III.

A fine and singular suit of armour, which undoubtedly belonged to King Henry VII., is still preserved in the Tower of London, and is considered the greatest curiosity in that collection; it is accompanied by a chanfron, manefaire, and poitral of the same period, for arming the horse.

Fluted armour was sometimes used in the reign of Henry VII.; this fashion is supposed to have come from Germany.

Drawings of various military figures of the middle of King Henry VIII.'s reign, made at the time, occur in the Cottonian manuscript in the British Museum marked Augustus II., and amongst them Henry himself in armour. A great deal of the armour of this period had devices, arms, &c. stamped or engraved upon it; and some was *damasquinée*, or inlayed with gold.

In the reign of Edward VI. a slight change took place in the form of the breast-plate, which was again a little changed in the reign of Mary. During Elizabeth's reign, no great alteration took place. 'But armour *cap-à-pie*,' says Sir Samuel Meyrick, 'began to fall into disrepute soon after the accession of King James I., and, in the latter part of his reign, the jambs or steel coverings for the legs were almost wholly laid aside.' At Strawberry Hill, there is a suit of armour said to have belonged to Francis I. of France, which Sir Samuel Meyrick ascribes to the reign of James. It is embossed and gilt, and is considered to be probably one of the latest specimens of armour with raised figures upon it.

King Charles I. is continually represented in armour; and he took great pains to bring about a uniformity in the fashion of armour among his officers and soldiers. But the troubles of his reign, and the success of the levellers of that period, caused a material alteration, so that soon after the establishment of the Protectorate we find the helmet and cuirass only worn; the latter consisting of a breast and back plate. The wearing of armour to the knees continued only to the time of Cromwell. The cuirass and a kind of helmet, however, are still retained amongst us for the royal regiments of Life Guards; and have, likewise, been resumed in the armies both of the French and Germans.

For this account of armour, various works have been consulted—Grose's *Treatise;* Gough's *Sepulchral Monuments* &c.; but the chief outline has been taken from Sir Samuel Meyrick's *Critical Inquiry into Antient Armour as it existed in Europe, but particularly in England, from the Norman Conquest to the Reign of Charles II.* The collection of antient armour possessed by that gentleman's son at Goodrich Court, in Herefordshire, and his own extensive researches, have supplied more information upon the subject than it is probable could have been given by any other writer.

The reader who wishes for further information may consult Sir Samuel Meyrick's *Engraved Illustrations of Antient Armour from the Collection at Goodrich Court*, 2 vols. fol. Oxford, 1830, where (pl iv. to x.) a series of tournament armour of successive dates, from 1458 to 1586, is exhibited.

Bordeaux steel is frequently mentioned by Froissart as excellent for armour. Felippo Negroli, of Milan, was the eminent armourer who worked for Francis I. of France, and the Emperor Charles V.

Some remarks on the antient mode of putting on armour, communicated to the Society of Antiquaries by Sir Samuel Meyrick in 1821 (see the *Archæologia*, vol. xx.), unravel, by the help of an antient document, what was previously an enigma. The knight began with his feet and clothed upwards· viz. 1. his sabatynes, or steel clogs; 2. the greaves, or shin-pieces; 3. the cuisses, or thigh-pieces; 4. the breech of mail; 5. the tuillettes, or overlapping pieces below the waist; 6. the breast-plate, or cuirass; 7. the vambraces or covers for the arms; 8. the rere-braces, or arrière-bras, the covering for the remaining part of the arm to the shoulder; 9. the gauntlets; 10. then the dagger was hung; 11. the short sword; 12. the cloak, or coat, which was worn over the armour; 13. the bacinet; 14. the long sword; 15. the pennoncel, held in the left hand; 16. the shield.

ARMS, in a general sense, includes all kinds of weapons, whether of offence or defence. Among the earliest, we may probably reckon the bow and arrow. It enabled man to kill wild animals for food before its use was required as a weapon of war. As a military weapon, it was probably succeeded l the sling. Lucretius says,—

> 'Arma antiqua, manus, ungues, dentesque fuere,' &c.
>
> * * * * * *
>
> Man's earliest arms were fingers, teeth, and nails,
> And stones, and fragments from the branching woods.
> Then fires and flames they joined, detected soon;
> Then copper next; and last, as latest traced,
> The tyrant iron, than the copper vein
> Less freely found, and sturdier to subdue.'

Homer and Hesiod tell us, that, in the early ages, the arms and instruments of the heroes were composed entirely of χαλκὸς (*copper*), perhaps hardened with tin. The word is commonly translated *brass*, but it could hardly have been the compound metal which we understand by brass. Defensive arms have been already treated of under ARMOUR. The present article is confined chiefly to weapons of offence.

The Jews appear to have had swords, daggers, spears, javelins, bows, arrows, and slings: axes or maces were also used by them as weapons of war.

Herodotus (vii. 61-80) gives a minute description of the weapons used by most of the different nations which formed the great army of Xerxes. Amongst these, the Medes and Persians had short spears, bows, arrows made of reeds, and daggers; the Assyrians, besides spears and daggers, had wooden clubs knotted with iron; the Bactrians and Parthians, bows made of reeds, and short spears; the Arabians had bows, large, flexible, and curved at the ends; the Æthiopians, bows made from the spath (σπαθη) of the palm, four cubits, or six feet, long; their arrows were short, and pointed with sharp stones instead of iron; they had spears headed with the sharpened horns of the *dorcas* [See ANTELOPE, p. 70], and knotted clubs. The Libyans had their spears hardened at the end by fire. The Paphlagonians, Phrygians, and Thracians, had spears, javelins, and daggers. In the Persian army at the battle of Cunaxa, we find chariots armed with scythes mentioned. (Xenophon, *Anab.* I. 8.)

The Grecian armies were composed of various sorts of soldiery. In the earliest ages, as we see from Homer, the chief personages often fought in chariots; but this practice seems not to have existed in the historical ages. The cavalry of Thessaly and that of Macedonia obtained the highest reputation among the Greeks. It was with this cavalry that Alexander mainly defeated both the troops of the Persian king and those of the rulers of the Penj-ab. With the age of Alexander elephants were brought into use, and they were employed both by Pyrrhus the Greek King of Epirus, and by Hannibal also, in their invasions of Italy. The Greek foot soldiers were distinguished by the terms ὁπλῖται (*hoplitai*), those who wore armour, and carried broad shields and long spears; and ψιλοὶ (*psiloi*), the light troops, who, with no other protection than a helmet, were armed with darts, bows and arrows, or slings. The πέλτασται (*peltastæ*), who carried the peltæ, or narrow-pointed shields, and spears, were a species of light troops, and considered as an intermediate kind. The heavy-armed foot were the chief strength of the Grecian armies.

The Greek spears were generally of ash, with a leaf-shaped head of metal, and furnished with a pointed ferrule at the butt, with which they were stuck into the ground. Pausanias saw a spear in the temple of Minerva at Phaselis, said, according to the legend, to have belonged to Achilles, the blade and ferule of which were of copper. The same diligent and credulous observer saw a knife at Nicomedia, altogether made of copper, which once belonged to Memnon; that is, it was a very old knife, kept as a curious piece of antiquity. The Macedonians had a particularly long spear called σάρισσα (*sarissa*), which was fourteen or sixteen cubits in length. (See Polybius for this extraordinary length, and the notes to the *Onomasticon* of Julius Pollux, v. σάρισσα.)

Swords, spears, javelins, bows, and slings, were the offensive arms of the Romans, whose infantry soldiers were divided into *hastati*, who fought with spears; *principes*, who led the van; *triarii*, the third line; *velites*, the light troops; *funditores*, the slingers; and *sagittarii*, the archers. Their cavalry used the javelin on horseback. The arrows of the sagittarii had not only their pikes barbed, but were furnished with little hooks just above, which easily entered the flesh, but tore it when an attempt was made to draw them out. What greatly contributed to render the Romans masters of the world, was, that as they successively fought against all nations, they renounced their own arms and methods of fighting wherever they met with better. Romulus, after the war with the Sabines, is said by Plutarch (Romulus, 21) to have adopted the broad buckler of that nation, instead of the Argolic buckler (*aspis Argolica*), which the Romans had used till that time: a story of little historical value, but confirmatory of the opinion that the Romans improved their military art by adopting the best things from other nations, and that they traced this policy to the supposed origin of their national existence.

The early Saxons, previous to their arrival in Britain, besides the buckler and dagger, used a sword bent in the manner of a scythe; but their descendants soon changed it for one that was long, straight, and broad, double-edged, and pointed. The ordinary weapons of the Saxons, after their arrival in our island, for the infantry, were spears, axes, bows and arrows, clubs, and swords. Few of the infantry had any other defensive armour than small round shields with spikes in the centre. The cavalry were more uniformly armed with long spears which they carried in their right hands, and swords which hung by a belt on their left sides.

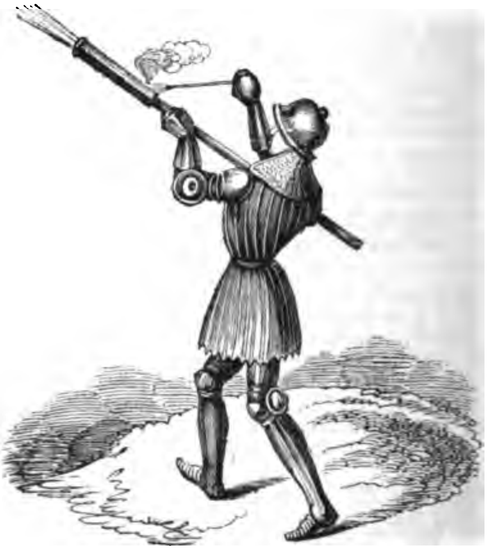
The arms of the Normans differed but little from those of the Saxons; their spears or lances were usually made of some light strong wood, pointed with steel, very sharp, and well-tempered; to these, with the sword and dirk, they added the cross-bow, as has been already shown in the article ARCHERY. The Normans also appear to have introduced a kind of field-artillery, consisting of instruments or machines from which darts and stones were thrown to a considerable distance: to which, also, they added arrows headed with combustible matter for firing towns and shipping.

Our military weapons were probably but little altered till the time of Edward I., when the English long-bow seems to have been adopted, or rather arrived at its proper use.

Gunpowder was invented in the thirteenth, and the larger sort of fire-arms in the fourteenth century: these will be separately treated of under the head of ARTILLERY.

Portable or hand fire-arms, to which we shall confine ourselves at present, were not invented till a century later. Sir Samuel Meyrick, in a Memoir in the *Archæologia* of the Society of Antiquaries, has collected most of the scattered notices to be found in military writers relating to their introduction. He has, indeed, given the very year of their invention, upon the authority of an eye-witness. 'It was in 1430,' says Bilius, 'that they were contrived by the Lucquese when besieged by the Florentines;' and we shall find that not only is the credit of the first conception of these weapons due to the Italians, but most of the subsequent improvements.

A French translation of Quintus Curtius, written in 1468, preserved among the Burney MSS. in the British Museum, exhibits two warriors in one of its illuminations, who bear the earliest representations of hand fire-arms with which we are acquainted: they appear to be hand-guns.



The following is the enumeration of the different pieces of portable fire-arms and their accompaniments, almost all of which have been engraved by Skelton, in his *Specimens of Arms and Armour*. Hand-cannon, hand-gun, arquebus, arquebus à croc, haquebut, demi-haque, musquet, wheel-lock, currier, snaphaunce, caliver, carabine, esclopette, fusil, musquetoon, fowling-piece, petronel, blunderbus, dragon, hand-mortar, dag, pistol, tricker-lock, fire-lock, self-loading gun, fancy-gun, musket-arrows, match-box, powder-horn and flask, touch-box, bandeleers, cartridges, patron, sweynes-feathers, and bayonet. The recollection of the fact, that *phialæ* (small pots) had been sometimes used for casting the Greek fire, was likely to lead to some more dexterous invention. The Emperor Leo, in his *Tactics*, ch. xix. § 6, περὶ ναυμαχίας, *on sea-fight*, describing the use made of artificial fires in vessels employed in pursuit after a naval battle, says, 'on the prows of such vessels were placed σίφωνες (*siphones*), large tubes; they were of copper, through which these fires were blown into the enemies' ships.' Anna Comnena (*Alex.* l. xiii.) says, 'that soldiers were supplied with copper tubes, and blew artificial fire, in the same way, upon their enemies in battles on land.' Here we have, undoubtedly, the origin of fire-arms.

The *hand-cannon* was a simple tube fixed on a straight stock of wood, about three feet in length. It was furnished with touch-hole, trunnions, and cascable, like a large cannon. The touch-hole was, in the first instance, at top; but the liability of the priming to be blown away led to the improvement of placing a small pan under the right side to hold the powder. This pan was the first step to the invention of the gun-lock.

The *hand-gun* was an improvement on the hand-cannon. It was cast in brass, and, as a tube, was of greater length; a flat piece of brass, made to turn upon a pin, covered the pan which contained the powder: it had also the addition of a piece of brass fixed on the breech, and perforated to ensure the aim. The hand-gun appears to have been in use in England at least as early as 1446. The Greeks made use of it to great advantage in their last defence of Constantinople in 1453.

As soon as the hand-gun had received a contrivance suggested by the trigger of the cross-bow, to convey with certainty and instantaneous motion the burning match to the pan, it acquired the appellation of *arquebus*, corrupted into harquebus. Previous to this invention, the match had been held in the hand in using the hand-gun as well as the hand-cannon. The arquebus is first mentioned by Philip de Comines, in his *Account of the Battle of Morat* in 1476. In England, on the first formation of the Yeoman of the Guard in 1485, one-half were armed with bows and arrows, the other with arquebuses. At the battle of Fournoe, in 1495, we read of mounted arquebusiers. A large party of arquebusiers are seen in the picture at Windsor which represents King Henry VIII.'s procession to meet Francis I., between Guisnes and Ardres. The arquebus, like the hand-cannon and hand-gun, being fired from the chest, while its butt remained straight, the eye could with difficulty only be brought sufficiently near to the barrel to afford a perfect aim. By giving to the butt a hooked form, the barrel was elevated, while the horizontal position would be retained. This idea originating with the Germans, gave name to the fire-arms thus constructed, and was thence by the English termed a *haquebut*, hakebut, hagbut, or hagbush. The invention as well as the name was known in England as early as the reign of Richard III. We find numerous haquebutters in the English army in the time of Henry VIII.

The *demihaque* was a kind of long pistol, the butt-end of which was made to curve so as almost to become a semicircle. The demihaques were smaller, and probably about half the weight of the haquebuts, the diameter of the barrel being much less. In the *Gesta Grayorum*, printed in 1594, we are told they carried bullets, and sometimes half shots.

The *musquet* was a Spanish invention. It is said to have first made its appearance at the battle of Pavia, and to have contributed in an especial manner to decide the fortune of the day. Its use, however, seems for a while to have been confined. It appears not to have been generally adopted till the duke of Alba took upon himself the government of the Netherlands in 1567. M. de Strozzi, Colonel-General of the French infantry under Charles IX., introduced it into France. The first Spanish musquets had straight stocks; the French, curved ones. Their form was that of the haquebut, but so long and heavy, that something of support was required; and hence originated the *rest*, a staff the height of a man's shoulder, with a kind of fork of iron at the top to receive the musquet, and a ferule at bottom to steady it in the ground. On a march, when the piece was shouldered, the rest was at first carried in the right hand, and subsequently hung upon the wrist by means of a loop tied under its head. A similar rest had been first used by the mounted arquebusiers. In the time of Elizabeth, and long after, the English musqueteer was a most encumbered soldier. He had, besides the unwieldy weapon itself, his coarse powder for loading, in a flask; his fine powder for priming, in a touch-box; his bullets in a leathern bag, the strings of which he had to draw to get at them; while in his hand was his burning match and his musquet rest; and when he had discharged his piece, he had to draw his sword in order to defend himself. Hence it became a question for a long time, even among military men, whether the bow did not deserve a preference over the musquet.

An ingenious contrivance to supplant the match-lock appeared in the reign of Henry VIII. This was the *wheel-lock*, invented in Italy. M. de Bellai informs us, that one of the first occasions on which it was used was in 1521, when Pope Leo X. and the Emperor Charles V. confederated against France, and their troops laid siege to Parma, which was defended by the Marquis de Foix. It was a small machine for exciting sparks of fire by the friction of a furrowed wheel of steel against a piece of sulphuret of iron, which, from such application, acquired the name of pyrites or fire-stone. The spring which turned this wheel was attached to it by a chain, formed like those in watches, and was wound upon the axle, or, as the term was, 'spanned' with a small lever called a spanner. This instrument had at one end a hole made square to correspond with the projecting axle of the wheel, and being adjusted, was moved in the direction of a screw, which made the wheel revolve, and a little slider that covered the pan retire from over it. The spanner was then removed, as the wheel was held by a catch connected with the trigger, and the cock, like that in modern firelocks, except having its position reversed, containing the pyrites, was brought down upon the wheel, which, rapidly revolving, grated against the pyrites and elicited the fire. Wheel-locks were for a long time chiefly manufactured in Germany. They were certainly brought to England in the time of Henry VIII., in whose reign we find them mentioned in inventories under the name of 'fierlocke.' Benvenuto Cellini (*Memoirs*, vol. i. p. 182, Roscoe's transl.) mentions his mounting a brown Turkish horse, and placing a wheel lock arquebus at the pummel of the saddle, in the year 1530.

The *Currier*, or *currier of war*, is another species of fire-arm first noticed in a letter from Lord Wentworth to Queen Mary (see the *Hardwick State Papers*), while writing respecting the siege of Calais. It is again noticed in the Earl of Essex's operations in Ireland in the time of Queen Elizabeth. (Birch's *Memoirs*.) The earliest account of it is given in a work entitled *The Knowledge and Conduct of Warres*, printed in 1578. Sir John Smith, in his *Animadversions on the Writings of Captain Barwick*, describes it as of the same calibre and strength as the arquebus, but with a longer barrel.

Grose observes, that the *Snaphaunce* derived its name from the troops who made use of it. These were a set of marauders whom the Dutch termed *snaphans* or 'poultry stealers.' The use of the match-lock exposed them to this inconvenience, that the light from the burning match pointed out their position, and they were unable to purchase the wheel-lock from its expense. In this dilemma they formed the snaphaunce from a study of the wheel-lock. A flat piece of steel, furrowed in imitation of the wheel, was placed on a steel post, which, being screwed beyond the pan, was made moveable. Then the furrowed piece being brought to stand over it, on pulling the trigger, the flint, which they substituted for the pyrites in the cock, struck against it, and the spark was produced. This was an invention of the time of Elizabeth, and its comparative cheapness rendered it fashionable in France, Holland, and England. The snaphaunce was a near approach to the fire-lock.

The *Caliver* differed from the musquet in being lighter and shorter. It was a fire-arm of a regulated standard as to the diameter of its bore, which was larger than that of the arquebus. It was made to fire with a match-lock. A match-lock caliver is preserved at Brancepeth Castle, Durham, which bears the date of 1611.

Of the *Carabine*, Sir Samuel Meyrick says, 'In the extraordinaries for the war in Picardie, in 1559, we first meet with the troops called carabins, who were light cavalry in the service of Henry II., King of France.' M. de Montgommeri informs us, that 'they wore a cuirass sloped off the right shoulder, that they might the more readily couch their cheeks to take aim; that they had a cabasset on their heads, and their bridle-arms protected by an elbow-gauntlet. Their offensive weapons were a carabine three feet and a half in length, so named from themselves, and a pistol. Their manner of fighting was, to form a little squadron, deeper than wide, to discharge their pieces rank after rank, wheeling off, and forming immediately and successively in the rear of the rest, and thus prepare for a second discharge.' Now, although the origin of the word is involved in much obscurity, it is more consistent with analogy to suppose that the carabineers were so named from the gun, rather than that from them. The French derived this species of troops from the Spaniards; and Duetal tells us that the Calabrians, who used the carbine, gave it this appellation. If so, it was probably at first used by them at sea in those vessels termed carabs. M. Bellon, in *Les Principes de l'Art Militaire*, tells us, that 'the carabines were armed with a large wheel lock arquebus, three feet or more in length, a sword, and a short pistol, in the time of Louis XIII., but being suppressed by his successor in 1665, we know that that king formed from them his carabineers.'

The *Esclopette*. The peculiar characteristics of this fire-arm, says Sir Samuel Meyrick, 'I have not been able to discover. It was called in Latin *sclopeta*, a diminutive of *sclopus;* and occurs in the *Chronicon Estense* under the year 1534, as well as in the decree of the Council of Tarragona in 1591, who forbade the clergy to make use of it. Probably it was only the foreign name of the demihaque.'

'The name of the *Fusil* as a fire-arm, in England,' says the same authority, 'does not appear to be older than the time of Charles II., though invented in France in the year 1630.' There are in the British service three regiments of fusileers or fuzileers, the Scots, now the 21st foot, raised in 1678; the English, now the 7th foot, levied in 1685; and the Welsh, now the 23d, formed in 1688 or 1689. The Sieur de Gaya, in 1688 (*Traité des Armes*), describes it as of the same proportions as the 'mousquet,' and furnished with a fire-lock; adding, that 'although by couching the cheek you can take better aim, yet it often misses fire from the use of the flint.' It seems to have been of the same length and calibre, but lighter than the musket. In modern times its size has been diminished.

The *Mousquetoon*, or musketoon, was also of French origin. The same author describes it, in 1688, as not so long as the fusil, nor capable of carrying a ball so far by one-third, its barrel not rifled, but differing from the carabine in being furnished with a fire-lock instead of a wheel-lock, and from the carabine *à l'extraordinaire* not only in this, but in its fluted bore.

The *Fowling-piece*, though properly speaking a fabrication for the sole purpose of killing game, is entitled to a place in the history of military weapons from the circumstance of the Earl of Albemarle noticing it for the soldiers' use, in his 'Observations,' compiled about the year 1646, and published in 1671. He says, 'It is very fit likewise that you have in each company six good fowling pieces, of such a length as a soldier may well be able to take aim, and to shoot off at ease; twelve of them being placed in a day of battel, when you bring a division of foot to skirmish with an enemy, on the flanks of a division of foot, and six on the other flank, as you shall see them placed in these three battels following. Those soldiers that carry the fowling pieces ought to have command when they come within distance of shot of that division of the enemy that they are to encounter with, that they shoot not at any but at the officers of that division.' We have here plainly the origin of riflemen.

The President Fauchet, who lived in the time of Francis I., and that of his successors till the time of Henry IV., introduces to our notice a piece called a *Petronel* or *poitrinal*, because it was rested on the poitrine or chest, after the old manner, and thence fired. It was the medium between the arquebus and the pistol, and differed from the long dag merely in having its butt made broader, so as to rest in its position with proper firmness. Fauchet says, it was believed 'that this arm was the invention of the bandouliers of the Pyrenean mountains.' Mention is made of it in 1592, at the siege of Rouen by Henry IV., and in the Hengrave Inventory of 1603 we have 'Item iij pethernels.' Nicot, in his dictionary, asserts that 'it was of large calibre, and, on account of its weight, carried in a broad baudrick over the shoulder.'

The *Blunderbus*. This is a fire-arm shorter than the carbine, but with a wide barrel. Sir James Turner, in his *Pallas armatâ*, p. 137, thus describes it: 'The carabineers carry their carabines in bandileers of leather about their neck, a far easier way than long ago, when they hung them at their saddles: some, instead of carabines, carry blunderbusses, which are short hand-guns of a great bore, wherein they may put several pistol or carabine balls, or small slugs of iron. I do believe the word is corrupted, for I guess it is a German term, and should be donderbucks, and that is, thundering guns, donder signifying thunder, and bucks a gun.' Sir Samuel Meyrick remarks that Sir James Turner is right in his etymology, except that 'bus' and not 'bucks' is the term for a gun, a name that became general after its introduction in the word arquebus: the modern German word is büchse. Blunderbus being called in the Dutch language *donderbus*, in all probability it was from Holland that the English derived it: it does not appear to have been much known before the time of Charles II.

The *Dragon*. The troops called dragoons have been most absurdly said to have been so denominated from the Draconarii of the Romans. They were raised about the year 1600 by the Mareschal de Brisac, in order to be superior to the German Reiters, who used the pistol to so much advantage. On this account they had a more formidable weapon like a small blunderbus, the muzzle of which being ornamented with the head of a dragon, gave it its denomination, and from this weapon those who used it were called dragoneers and dragoons. Other, but less satisfactory, explanations of the term dragoon (with no reference to the fire-arm called a dragon) will be found in Sir James Turner's *Pallas armatâ*, in Pere Daniel's *Milice Françoise*, and in Count Bismark. The dragon will be found among Skelton's engraved *Illustrations*.

The *Hand-mortar*. Grenades are said to have been first used in 1594, and gave origin at a later date to the troops thence denominated grenadiers. Like the dragon it appears to have been fired from the shoulder.

The *Dag*. In pursuing the inquiry into the origin of this term, says Sir Samuel Meyrick, nothing could be more perplexing than to find, that while dag implied a kind of pistol pistolese, in the Italian language, signified a great dagger or wood-knife. The weapon appears to have been suggested by the demihaque, and differs from the pistol solely in the form of the butt end, that being invariably terminated by a straight oblique line instead of a knob. In this respect it greatly resembled a petronel, and that it gave the distinction is clear, from what is wrongly called a Highland pistol being by the Highlanders themselves termed a tack, and its having its butt made flat and terminated slant-wise. The dag was of various sizes, and hence in inventories of arms we meet with long, short, and pocket dags, and dags with different kinds of locks. It appears to have been almost coeval with the pistol, which is known to have been invented in the reign of Henry VIII.; for in the inventory, taken in 1547, of stores in the different arsenals in England, 'one dag with two pieces in one stock' occurs, with 'a white tacke with fler locke graver, and all the stocke white bone; two tackes, after the fashion of a dagger, with fier lockes vernished with redde stockes, shethes covered with blacke vellet garnished with silver and guilt, with purses, flaskes, and touch boxes of black vellet garnished with iron guilt; two tackes hafted like a kniff with fier lockes and double lockes, &c.' The snaphaunce dag seems to be alluded to in the play of Jack Drum's entertainment:

> He would shew one how to hold the *dag*,
> To draw the cock, to charge and set the flint.'

The *Pistol*, according to Sir James Turner, was invented at Pistoia, in Tuscany, by Camillo Vitelli, and in the reign of Henry VIII. M. de la Noue says, 'the reiters first brought pistols into general use, which are very dangerous when properly managed.' These reiters, or more properly ritters, were the German cavalry, who gave such ascendancy to the pistol as to occasion in France, and subsequently in England, the disuse of lances. We learn this interesting fact from Davila, who, speaking of the battle of Ivry, in 1590, takes occasion to extol the use of lances, and express his regret that the French cavalry, composed of gentlemen volunteers, had, in the revolutions of the civil wars, ceased to use them. He tells us, that in consequence of their having adopted pistols as more ready, in imitation of the German reiters, the king was obliged to oppose the lances of the enemy's cavalry by dividing his own into small bodies, that they might offer less resistance to the charge, and more easily get out of the way. Père Daniel informs us, that the horsemen who were armed with pistols, in the time of Henry II., were thence called pistoliers, a term subsequently introduced into England. John Bingham, in his *Notes on the Tactics of Ælian*, published in 1616, gives us an engraving of the arms and armour of this species of troops at that time, from which a correct knowledge may be obtained of their form. The first ordonnance of Henry II., King of France, respecting the pistol, is directed to the men at arms, and dated 1549; the regulations of Mary Queen of England were of a similar character; both implying that the adoption of the pistol, in the first instance, was by permission. The manual exercise of this weapon is detailed and exhibited in several plates in Captain Cruso's *Military Instructions for Cavalry*, published in 1632. Sir James Turner, in his *Pallas armatâ*, published in 1670, says, the French then used locks with half-bends (snaphaunces), as well as for the most part the English and Scots; the Germans rose or wheel-locks; the Hollanders used both.

The *Trickerlock*. 'A match tricker-lock compleat' occurs in a schedule of the year 1629. This was the adoption of what is now termed a hair-trigger, which was added to the former one, and gives a more instantaneous discharge. A tricker wheel-lock of the reign of Charles I., a tricker match-lock of that of Charles II., and a tricker fire-lock of that of James II., upon this principle, are preserved in Mr.

Meyrick's collection of arms and armour at Goodrich Court, in Herefordshire.

The *Fire-lock*. Sir Samuel R. Meyrick is in possession of a portrait of a republican officer, said to be that of Colonel Joyce, which proves that the modern firelock is an invention as early as the middle of the seventeenth century, for he has a firelock pistol in his hand. This is important evidence, for it has been shown that the name had been equally applied to the wheel-lock. The firelock was evidently suggested by the snaphaunce. It originated with the French about the year 1635. The steel post on which the furrowed piece had been placed was got rid of, and that set upright on the cover of the pan. The cock was moved sufficiently near to permit its opening; the pan, by the sudden impulse on striking this furrowed piece, performing this operation, and giving fire at the same time. Such a firelock of the time of Cromwell will be found among Skelton's engravings. The term firelock was no longer applied to the fire-arm with the wheel, which was now termed 'the rose or wheel lock.'

The *Self-loading Gun* originated in Italy about the close of the English Protectorate. The butt was made to answer the purpose of a flask, and a small touch-box was attached to the pan. At the breech was a cylinder, with a hole to receive the bullet. To the axle of this cylinder was affixed a lever, on turning which the bullet was conveyed to its proper place; sufficient portions of charge and priming were cut off, and the piece cocked at the same time. This, therefore, rendered the firelock just described as expeditious as the long bow; but the contrivance was attended with great danger, and occasioned the subsequent inventions of a moveable breech containing several charges, or a small barrel to be brought to the breech when requisite to load, &c.; but none of these contrivances were ever adopted by infantry regiments.

In 1712, a brass fire-arm called the *Fancy gun* was invented. It was in the shape of a walking-cane, and might be used as a gun or pistol; but it was never used for military or even general purposes.

Musket-Arrows, sometimes called fire-arrows, are at least as old as the time of Queen Elizabeth. They occur in the inventories of the royal arsenals. Sir Richard Hawkins, in the account of his voyage to the South Sea in the year 1591, speaks of using them with great success. In Elizabeth's time, these arrows, which carried combustibles, were of wood; at a subsequent period they were made of iron. Arrows of this latter kind were used in the Civil Wars, at the siege of Lyme. Lord Bacon says the arrows shot by muskets were called sprights.

The *Match-box*. One great inconvenience, says Sir Samuel Meyrick, of the burning match was, that it discovered the soldier on guard, and counteracted the necessary secrecy for enterprizes by night. To remedy this defect, small tubes of tin or copper, pierced full of holes, were invented by a Prince of Orange, apparently Prince Maurice. They are thus described by Walhuysen, a captain of the town of Danzig, in his *Art Militaire pour l'Infanterie*, printed in 1615. 'It is necessary that every musqueteer should know how to carry his match dry in moist or rainy weather, that is, in his pocket or in his hat, by putting the lighted match between his head and hat, or by some other means to guard it from the weather. The musqueteer should also have a little tin tube, of about a foot long, big enough to admit a match, and pierced full of little holes, that he may not be discovered by his match, when he stands sentinel, or goes on any expedition.' This was the origin of the match-box, till lately worn by our grenadiers on one of the cross belts in front of their chests.

The *Powder-horn* and *Flask*. The convenient form of the horn to hold gunpowder, one end being broad, into which it might be conveyed with ease, and the other with a small aperture by which it might be discharged into the barrels of fire-arms, naturally suggested it as best adapted for the purpose. But it was not long before the narrow end was entirely closed, and the broader one furnished with a tube that might contain just sufficient powder for one charge. In this state it appears suspended in front from the necks of the arquebusiers in the triumph of Maximilian I. This modification of the powder-horn suggested the more capacious flask, which, with its name, in reference to its resemblance to a bottle, is of German origin. The flask was known in England as early as the reign of Henry VIII., and appears on a hackbutter of that date in one of Strutt's engravings, taken from an original drawing in the British Museum, suspended like the horn, but at the hip, instead of on the breast. So in the inventory, taken 1 Edward VI. we have 'One horne for gonne-powder, garnished with silver. Three grete flaskes covered with vellet, and three lytle touch boxes.' And in that at Hengrave, 'xxiiij flaskes, and as many tootche boxes.' M. Montgommeri Corbosson, in his *Treatise on the French army in the time of Henry IV.* informs us that 'the captain of a company, mounting guard, ought to carry an arquebuse and a powder-flaske, and wear on his head a great plume of feathers.' Varieties of powder-horns and flasks will be found in Skelton's engravings.

The *Touche-box*. Gunpowder was at first not corned: when, however, it had been manufactured into granules, such as were considered proper for the charge, it was discovered that the finer these were made the quicker would they ignite. This was the origin of priming or serpentine powder, and consequently of a small case to hold it, which is in reality a flask on a smaller scale, to which the name given was touch-box.

Bandoliers. To enable the soldier to load his piece with greater rapidity, small cylindrical boxes, each containing one charge of powder, either of wood or tin, and covered with leather, were suspended to a belt or band, put either over the shoulder or fastened round the waist. They seem to have been first introduced in the reign of Henry III. of France. The earliest instance which Sir Samuel Meyrick met with of the bandolier was in Montfaucon's *Monarchie Françoise*, pl. ccxciv.; Davis, in his *Art of War*, he says, would induce the belief that the English received them from the Walloons in the neighbourhood of Liege. Sometimes six were placed before, and six behind the person, when slung over the shoulders; sometimes more. Nine are appended to a waist-belt in Mr. Meyrick's collection. Immense numbers still remain at Hampton Court. Sir James Turner, who published his work in 1670, says they were first laid aside about thirty years before by the Germans. Soldiers who were without cloaks could not keep them from snow and rain which soon spoiled them, and made the powder useless; and in surprisals, the noise which they made betrayed those who carried them.

The *Cartridge*. Sir James Turner, speaking of the pistol, says, 'all horsemen should always have the charges of their pistols ready in patrons, the powder made up compactly in paper, and the ball tied to it with a piece of packthread.' In this description we have evidently the cartridge, though not expressed by name. It is a curious fact that these were first confined to the cavalry, and that the general adoption of the cartridge was not earlier than the common use of the modern firelock. Lord Orrery, in his *Treatise on the Art of War*, says, 'I am, on long experience, an enemy to the use of bandeleers, but a great approver of boxes of cartridges, for then, by biting off the bottom of the cartridge, you charge your musket for service with one ramming. I would have these cartridge-boxes of tin, as the carabiners use them, because they are not so apt to break as the wooden ones are, and do not in wet weather, or lying in the tents, relax. Besides, I have often seen much prejudice in the use of bandoleers, which, being worn in the belts for them above the soldiers' coats, are often apt to take fire, especially if the matchlock musket be used; and when they take fire, they commonly wound and kill him that wears them, and those near him; for likely, if one bandoleer take fire, all the rest do in that column; they often tangle those which use them on service, when they have fired, and are falling off by the flanks of the files of the intervals to get into the rear to charge again.'

The *Patron* was an upright semi-cylindrical box of steel, with a cover moving on a hinge, filled with a block of wood with five perforations to hold as many pistol-cartridges. Skelton has engraved some of Elizabeth's time, and in the *Diversarum Gentium Armatura Equestris*, printed in 1617, the German cavalry are represented with a brace of pistols in the same holster at the saddle-bow, and patrons at their hips.

The *Sweynes-feather*, and *Musket-rest*. To remedy the inconvenience of a musketeer's being compelled to draw his sword, and defend himself after the discharge of his piece, and to render him more competent to act against the pikemen, a long thin rapier blade, fixed into a handle, and carried in a sheath called a sweynes feather, *i.e.* hog's bristle, the invention of which is by its other name attributed to the Swedes, was given him instead. This, after a discharge, he drew out of its scabbard, and fixed into the muzzle of his gun, which gave him a weapon of great length; but as the soldier had then more to carry in his hand than previously, an attempt was made to unite the sweynes-feather with the rest. This latter, instead of having a wooden shaft simply, was made of a thin tube of iron, covered with leather, which held within it the feather. Thus it was preserved from rain, and when wanted, it could be ejected by a jerk. The sweynes-feather was invented in the reign of James I. During the civil wars, its name was sometimes corrupted into swan's-feather. One of the musket-rests, armed with a projecting pike from one of the prongs of its fork, is represented in Grose's *Treatise on Antient Armour*, pl. xl. fig. 5. The Duke of Albemarle, in his *Observations upon Military and Political Affairs*, written in 1646, and printed in 1675, recommends arming musketeers and dragoons with muskets and sweynes-feathers, with the heads of rests fastened to them. The rests themselves were apparently disused about the middle, or toward the latter end of the civil wars, the weight and incumbrance of the musket and its apparatus being probably found too great for the active service inseparable from campaigns carried on by small detachments.

The *Bayonet*. Sir Samuel Meyrick observes, that as the sweynes-feather was laid aside when the rest which contained it was relinquished, the musketeers were reduced to the same inconvenience as they experienced before it had been invented. To resume the simple sweynes-feather was not deemed expedient, as from its length it was extremely awkward to manage, and pikemen were a species of troops that had become disused. This induced such soldiers as were armed with daggers to stick them into the muzzles of their pieces after having fired. In this practice we have the origin of the bayonet, which was so termed from having been first made at Bayonne. The French called them bayonet à marche, and first introduced them into their army in 1671. These were formed with plain handles, formed to fit tight into the muzzles, rather enlarging towards the blade to prevent their entering too far into the piece. Subsequently a ring was added, by which it was placed on the muzzle, in which way the French used it in the reign of William III., to the astonishment of the 25th regiment of foot, on whom they poured a volley, halting in their charge.

Besides the authorities quoted in this article, Grose's *Military History*, Henry's *History of Britain in the Different Periods*, Strutt's *Manners and Customs*, and the various authors quoted by them, may be referred to.

ARMS, COATS OF. [See Heraldry.]

ARMSTRONG, JOHN, a poet and physician, born at Castleton, in Liddesdale, about the year 1709. He qualified himself for his profession at the university of Edinburgh; and came to pursue his fortune in London, where he obtained some celebrity as an author, but never gained much practice as a physician. He had, however, interest enough to procure the appointment of physician to the army in Germany in 1760. He died in September, 1779.

His principal work is a didactic poem on the 'Art of Preserving Health,' published in 1744. Didactic poems find few readers now; and the poem of Armstrong is probably very seldom read. Yet the work is well spoken of by critics of the last century, as containing vigorous sentiments poetically expressed, and much valuable instruction respecting diet, regimen, and locality in reference to health; it has obtained a place in many collections of the works of British poets. Armstrong's other pieces are numerous, and now nearly forgotten. He contributed to Thomson's *Castle of Indolence* the stanzas at the end of the first canto, descriptive of the diseases produced by indolence. His society seems to have been courted by men of talent, for besides this evidence of intimacy with Thomson, Wilkes, Smollet, and Fuseli, are named among his friends. (Aikin, *Gen. Biog.;* Life in Chalmer's *British Poets.*)

ARMY, THE ENGLISH. The word *army*, like many other military terms, has come to us from the French. They write it *armée*, 'the armed,' the 'men in arms,' which is precisely what the English word *army* means. An army is defined by Locke to be a collection of armed men obliged to obey one man. There are various definitions given by writers on the Law of Nations.

The word army is not used to designate a single regiment or battalion, or any small body of armed men. An army is a large body of troops distributed in divisions and regiments each under its own special commander, and having officers of various descriptions to attend to all that is necessary to make the troops effective when in action; the whole body being under the direction of some one commander, and moving according to his orders. This officer is called the commander-in-chief, the general, and sometimes the generalissimo, that is, the chief among the generals.

We may briefly explain why we limit this article to a sketch of the origin of the English army, without including as is sometimes done in similar works, an historical sketch of the armies of antient nations. The armies of Greece, Rome, and the antient Oriental nations, were, owing to various causes, different from those of modern Europe, and the consideration of their true character belongs to the history of those nations. From the impossibility of saying anything satisfactory within reasonable limits, and also from a desire to avoid the errors which we observe in all short sketches of this description, we shall, under such heads as Greeks, Romans, Egyptians, &c., notice their military system, so far as it possesses a distinct character.

The history of the armies of continental Europe, as, for instance, that of Prussia, is inseparably connected with the political history of each state, and will be treated under those heads. For other particulars connected with the formation of an army, see Enlisting, Recruiting, Soldier, and also Militia.

The whole military force of a nation constitutes its army, and it is usual to estimate the comparative strength of nations by the number of well-appointed men which they are able to bring into the field. In another sense, an army is a detachment from the whole collected force; a number of regiments sent forth on a particular expedition under the command of some one person who is the general for that especial purpose. Instances of this latter sense of the word occur in the expressions 'Army of Italy,' 'the Army of Spain,' &c., as formed by Napoleon. Such a detachment may be a large or a small army; and should it return with its ranks greatly thinned and without many of its officers, it would still be an army, if the distribution into divisions and regiments remained, though actually consisting of not more than a single regiment with its full complement of men and officers. In this state it is sometimes not unaptly called the skeleton of an army.

An army is the great instrument in the hands of a government, by which, in the last extremity, it enforces obedience to the laws at home, and respect from other powers who show a disposition to encroach upon any rights belonging to the nation. When the efforts of the ministers of peace and justice at home are inadequate to enforce submission to the laws; when the correspondence of cabinets and the conferences of ambassadors fail in composing disputes which arise among nations, the army is that hand of power which is put forth to maintain order at home and rights abroad.

The legitimate purposes for which an army is maintained are manifestly so important to the well-being of a state, that attention must have been directed to this subject in the very beginning of political society. But to have an army always appointed and always ready for the field can only be effected in a state of high civilization, when the various other offices in a great community are also properly distributed and filled. No better proof can be afforded of the high civilization of Egypt and other countries in early times than the well-appointed and powerful armies which they were able to bring into the field. This was effected in Egypt by having a particular caste or class of soldiers, corresponding pretty nearly to the Kshatriyas of India. (See Herod. ii. 164, &c.) The armies of the Greeks, especially in the post-Alexandrine period, those of Carthage under the command of Hannibal, and the armies of Rome in the best days of the Republic and the Empire, were not inferior to any of modern times in numbers, appointments, discipline, or the military skill of their commanders. It is not, however, to them that we are to trace the origin or the history of our modern armies.

An army, meaning by that term a body of men distinct from the rest of the nation, constantly armed and disciplined, was unknown to the remote fathers of the English and the other modern European nations. The whole male population was the army; that is, every person learned the use of arms, was ready to defend himself, his family, and his possessions; and in time of common danger, to go out to more lasting warfare under the command of some one chief chosen from amongst the heads of the tribes. Such was the nature of the vast armies which presented themselves from time to time on the Roman frontier, or contended against Cæsar when he made his conquest of Gaul; and such was the power which, on so short a warning, was arrayed against him on the British coast under the command of Cassibelaunus, when he made that descent from which neither honour accrued to the Roman arms, nor benefit to the Roman state. In all these nations the warlike spirit was kept up by the sense of danger, not so much from foreign invaders, as from neighbouring and kindred tribes.

In the writings of Cæsar and of Tacitus, the two authors from whom we derive our best acquaintance with the manners and habits of the Germanic and the western nations of Europe, we see the warlike character of those nations, and the principles on which their military affairs were conducted. A whole male population trained to arms; confederating in time of common danger under some one chief; with little defensive armour, and none offensive but darts, spears, and arrows; throwing up occasionally earthworks to strengthen a position—this is the outline of their military proceedings. (Tacit. *Annal.* ii. 14.) There is little peculiar in the military system of the antient Britons; yet it must have been by long practice and perseverance that the warriors attained that skill which attracted the attention of Cæsar. His description of one of their chariots, driven by a charioteer whose attention was solely directed to the management of the chariot, while in it stood the painted warrior dealing his darts around him, or running along the beam while the chariot was in its swiftest motion, presents an object at once picturesque and terrible.

When Britain was reduced to the form of a Roman province, a regular army was introduced and permanently settled in the island, for the purpose of enforcing submission, and of defence against foreign invaders. Many of the remains of Roman authority in Britain, as roads, walls, encampments, and inscriptions, are military. In that curious relic of Roman time, the *Notitia*, which is referred to the age of the Roman emperors, Arcadius and Honorius, we have a particular account of the distribution of the whole Roman army, and we see, in particular, how Britain was then divided for military purposes, and what were the fixed stations of particular portions of the Roman legions.

It was the policy of Rome to recruit its legions from among the barbarous nations, but to employ such soldiers in countries to which they did not belong. Thus, in the inscriptions relating to military affairs which have been found in England, many tribes of Gaul, of Spain, and Portugal, are named as those to which particular soldiers or particular bodies of troops belonged. And so in foreign inscriptions the names of British tribes are sometimes found. The grounds of this policy are apparent. The military portion of these nations was thus drawn away. There remained only the quiet and the peaceable, or the females, the young, the infirm, and the aged. As long as the Roman army was sufficient for their protection, it was well. But when that army was withdrawn, we see, as in the case of Britain, that a people so weakened would easily fall a prey to nations which had never been subdued by the Roman arms, and we see also what was probably the true reason of the difference between the spirited resistance which was made to Cæsar on his two landings in Britain, and the clamorous complaint and feeble resistance with which the people of Britain met the Pihts and the Saxons.

From this time we lose sight of any entire British population of the part of the island called England. The conquests made by the Saxons appear to have been complete, and their maxims of policy and war became the principles of English polity. They seem to have been at first in that state of society in which every man is a soldier; and the different sovereignties which they established were the occasion of innumerable contests. We have, however, but little information on this subject; and even the supposed policy of Alfred in the separation of a portion of the people for military affairs, in the form of a national militia, is a part of his history on which we have not any very satisfactory information.

We find, however, that the Saxon sovereigns had powerful armies at their command; and the most probable account of the mode in which they were got together seems to be this:—the male population were exercised in military duties under the inspection of the earls, and their deputies the sheriffs or vicecomites, in the manner of the arrays and musters of later times; being drawn out occasionally for the purpose, and being thus ready to form, at any time when their services were required, an efficient and powerful force.

We see from that curious remain of those times, a piece of needle-work representing the wars and death of Harold, that the Saxon soldiers were not those half-clothed and painted figures which had presented themselves on the shores of Britain when the Roman armies made their first descent. We see them clothed from head to foot in a close-fitting dress of mail. They have cavalry, but no chariots. The archers are all infantry. Both infantry and cavalry are armed with spears, to some of which little pennons are attached. Some have swords, and others carry bills or battle-axes. They have shields, the bosses on which are surrounded with flourishes and other ornaments; and there are sometimes other devices, but nothing which can be regarded as more than the very rudiments of those heraldic devices which were afterwards formed into a kind of system by the heralds who attended the armies, and by which the chiefs were distinguished from each other, when their persons were concealed by the armour. The piece of needle-work representing the wars of Harold is supposed to be the work of Matilda, the queen of William the Conqueror, and the ladies of her court. It is preserved in the cathedral of Bayeux, whence it is commonly called the Bayeux tapestry. One of the many valuable services rendered to historical literature by the Society of Antiquaries has been the publication of a series of coloured prints, in which we have, on a reduced scale, a perfectly accurate representation of this singular monument of antient English and Norman manners.

A great change took place in the military affairs of England at the Conquest. It is to that period that the introduction of fiefs is to be referred, a system which provided, among other things, for an army ever ready at the call of the sovereign. It may suffice in this place to say, that the king, reserving certain tracts as his own demesne, distributed the greater portion of England among his followers, to hold by military service; that is, for every knight's fee, as they were called, the tenant was bound to find the king one soldier ready for the field, to serve him for forty days in each year. The extent of the knight's fee varied with the varying qualities and value of the soil. In the reign of Edward I. the annual value in money was 20*l.* The number of knights' fees is said by old writers to have been 60,060. The king had thus provision made for an army of 60,000 men, whom he could call at short notice into the field, subject them when there to all the regulations of military discipline, and keep them for forty days without pay, which was usually as long as their service would be required in the warfare in which the king was likely to be engaged. When their services were required for any longer time, they might continue on receiving pay.

Writs of military summons are found in great abundance in what are called the 'Close Rolls,' which contain copies of such letters as the king issues under seal. But this system, it is evident, had many inconveniences; and the kings of England had a better security for the protection of the realm against invasion and for the maintenance of internal tranquillity, in that which seems to be a relic of Saxon polity. We allude to the liability of all persons to be called upon for military service within the realm; to the power which the constitution gave to the sheriff to call them out to exercise, in order that they might be in a condition to perform the duty when called upon; and to the obligation which a statute of Edward I. imposed on all persons to provide themselves with certain pieces of armour, which were changed for others by a statute of James I. We see in this system at once the practice of our remoter ancestors, and the beginning of that drafting of men to form the county militia which is a part of the military polity of the country at present.

The sheriffs were the persons to whom the care of these affairs was committed; but it was the practice of the early kings to send down into the several shires, or to select from the gentry residing in them, persons whose duty it was to attend the musters or arrays, which were a species of review of these domestic troops, and who were intended, as it seems, to be a check upon the sheriffs in the discharge of this part of their duty. The persons thus employed were usually men experienced in military affairs; and when the practice became more general, there was a permanent officer appointed in each county, who had the superintendence of these operations, and was called the lieutenant: this is the origin of the present lord-lieutenant of counties, an officer who cannot be traced to a period earlier than the reign of Henry VIII.

Foreigners were also sometimes engaged to serve the king in his wars; but these were purely mercenary troops, and were paid out of the king's own revenues.

We see, then, that the early kings of England of the Norman and Plantagenet races had three distinct means to which they could have recourse when it was necessary to arm for the general defence of the realm: the quota of men which the holders of the knights' fees were bound to furnish; the posse-comitatûs, or whole population, from sixteen to sixty, of each shire, under the guidance of the sheriffs; and such hired troops as they might think proper to engage. But as the posse-comitatûs could not be compelled to leave the kingdom, and only in particular cases the shire to which they belonged, the king had only his feudal and mercenary troops at command when he carried an army to the continent, or when he had to wage war against even the Scotch or Welch. We are not to suppose that troops so levied, especially when there were but contracted pecuniary resources for the hiring of disciplined troops of other nations, would have been sufficient to make head against the power of such a sovereign as the king of France, and once to gain possession of that throne. And this leads us to another important part of our subject.

The mutual inconveniences attendant on the nature of the military services due from those who held the feudal tenures of the crown naturally disposed both parties to consent to frequent commutations. Money was rendered instead of service, and thus the crown acquired a revenue which was applicable to military purposes, and which was expended in the hire of native-born subjects to perform service in the king's armies in particular places and for particular terms. The king covenanted by indenture with various persons, chiefly those of most importance in the country, to serve him on certain money-terms with a certain number of followers, and in certain determinate expeditions. There appears little essential difference between this and the modern practice of recruiting armies. It was chiefly by troops thus collected that the victories of Creci, Poictiers, and Agincourt were gained.

In the office of the Clerk of the Pells in the Exchequer, Dugdale perused numerous indentures of this kind, and has made great use of them in the history which he published of the Baronage of England. A few extracts from that work will show something of the nature of these engagements.

Michael Poynings, who was at the battle of Creci, entered into a contract with King Edward III. to serve him with fifteen men at arms, four knights, ten esquires, and twelve archers, having an allowance of twenty-one sacks of the king's wool for his and their wages. Three years after the battle of Creci, King Edward engaged Sir Thomas Ughtred to serve him in his wars beyond sea, with twenty men at arms and twenty archers on horseback, taking after the rate of 200*l.* per annum for his wages during the continuance of the war. In the second year of King Henry IV., Sir William Willoughby was retained to attend the king in his expedition into Scotland, with three knights besides himself, twenty-seven men at arms, and one hundred and sixty-nine archers, and to continue with him from June 20th to the 13th of September. When Henry V. had determined to lead an army into France, John Holland was retained to serve the king in his 'voyage royal' into France for one whole year, with forty men at arms and one hundred archers, whereof the third part were to be footmen, and to take shipping at Southampton on the 10th of May next following. In the 12th of Henry VII. John Grey was retained to serve the king in his wars in Scotland, under the command of Giles Lord Daubeney, captain-general of the king's army for that expedition; with one lance, four demi-lances, and fifty bows and bills, for two hundred and ninety miles; with one lance, four demi-lances, and fifty bows and bills, for two hundred and sixty-six miles; and with two lances, eight demi-lances, and two hundred bows and bills, for two hundred miles. These were nearly half what is now the usual complement of a regiment.

Troops thus levied, together with foreign mercenaries, make the nearest approach that can be discovered in the early affairs of the English monarchy to a permanent, or, as it is technically called, a standing army. The king might, to the extent of his revenue, form an army of this description: but as to the other means of military defence or offence put into his hands, the persons engaged were only called into military service on temporary occasions, and soon fell back again into the condition of the citizen or agriculturist. But the king's power was necessarily limited by his revenue, and the maintenance of a permanent force appears to have been little regarded by our early sovereigns, since, before the reign of King Henry VII. it does not appear that the kings had even a body-guard, much less any considerable number of troops accoutred and ready for immediate action at the call of the king. In modern times, Charles VII. of France (1423-1461) first introduced standing armies in Europe: this policy was gradually imitated by the other European states, and is now a matter of necessity and of self-defence. In England, probably in a great degree owing to her insular situation, this took place later than in most continental countries. Still the example, however, of the continental states, a sense of the great convenience of having always a body of troops at command, and the change in the mode of warfare effected by the introduction of artillery, which brought military operations within the range of science, and made them more than before matters which required much time and study in those who had to undertake the direction of any large body of men, disposed the king and the nation generally to adopt the practice of having a permanent army, varying in numbers with the dangers and necessities of the time.

The few troops who formed the royal guard were the only permanent soldiers in England before the civil wars. The dispute between Charles I. and his parliament was about the command of the militia. Charles II. kept up about 5000 regular troops as guards, and to serve in the garrisons which then were established in England. These were paid out of the king's own revenue. James II. increased them to 30,000; but the measure was looked on with great jealousy, and the object was supposed to be the destruction of the public liberties of Englishmen. In the Bill of Rights (1689) it was declared that the raising or keeping a standing army within the kingdom, in time of peace, unless it be with consent of parliament, is against law. An army varying in its numbers has ever since been maintained, and is now looked on without apprehension. It is raised by the authority of the king and paid by him: but there is an important constitutional check on this part of the royal prerogative in the necessity for acts of parliament to be passed yearly, in order to provide the pay and to maintain the discipline.

The following tabular view of the military force of the various civilized nations is from the most recent authorities.

Military Establishments on Foot and in Reserve, 1833, 1834.

	Population.	Army.	Militia, or Nat. Guards, &c.
America, United States of	13,890,000	6188	1,308,047
Anhalt	138,000	1220	
Austria	33,865,000	271,400	479,000
Baden	1,236,000	10,100	
Bavaria	4,163,000	20,000	
Belgium	4,172,000	110,000 (including militia)	
Brazils	5,130,000	15,000	46,000
Bolivia	1,250,000	2500	30,000
Brunswick	248,600	3067	
Britain, Great (United Kingdom of)	24,900,000	108,672	
Central America	1,800,000	2000	20,700
Chili	1,600,000	8000	20,800
China	183,000,000	1,291,641	
Cochin-China	5,200,000	54,000	15,000
Colombia (Venezuela and New Granada)	1,890,000	30,000	
Church, States of the	2,610,000	10,000	9000
Denmark	2,030,000	38,819	
East Indies (British)	112,500,000	205,200 (besides Eng. troops)	
Egypt	3,500,000	110,000	
France	32,770,000	360,000	3,639,700
Greece	900,000	10,000	
Hanover	1,660,000	9000	
Hayti	850,000	15,000	60,000
Hesse-Cassel	656,000	9000	
Hesse (Grand Duchy of)	741,300	8000	
Holland, without Limburg or Luxemburg	2,780,000	35,000	42,500
Ionian Islands	194,000	1600 (besides Brit. troops)	
Lucca	145,000	800	
Mecklenburg-Schwerin	459,000	3000	
Mexico	6,500,000	25,000	
Modena	380,000	800	
Nassau	365,500	1800	
Oldenburg	247,000	1600	
Paraguay	600,000	8000	83,000
Parma	438,000	1320	
Persia	12,000,000	25,000	720,000

Peru	1,700,000	3000	
Plata (States of La)	2,400,000	20,000	
Portugal	3,400,000	——	
Prussia	13,300,000	122,000	400,000
Russia in Europe, and Poland	50,820,000	690,000	
Saxony (Kingdom of)	1,570,000	12,000	
Saxe-Coburg-Gotha	160,000	600	
Saxe-Meiningen	143,000	500	
Saxe-Weimar-Eisenach	235,800	1100	
Sardinia	4,370,000	29,640	
Scindiah	4,000,000	22,000	
Sweden and Norway	4,050,000	41,540	180,000
Switzerland	2,100,000	33,578	33,578 (reserve)
Sicilies (Kingdom of the Two)	7,500,000	30,000	
Siam	2,800,000	60,000	
Spain	14,200,000	71,800	25,000 (on paper)
Tuscany	1,400,000	5500	
Turkey	8,000,000	30,000	120,000
Würtemberg	1,620,000	16,900	

It may be added that, according to Schnabel's calculations in 1832, the standing armies maintained by the principal European States relatively to their respective populations were as follows:—

Denmark	1 in every	50 inhabitants
Sweden	1 —	53
Würtemberg	1 —	59
Poland	1 —	60
Prussia	1 —	68
Bavaria	1 —	69
Russia	1 —	70
Austria	1 —	100
France	1 —	110
England	1 —	140
Two Sicilies	1 —	200
Tuscany	1 —	400
States of the Church	1 —	500

We should observe, however, that the data which he assigns as the ground-work of his calculations do not in general agree with our own, which, in most cases, are derived, if not from official, at least from competent authorities.

The following is a more complete subdivision of the British force:—

Officers	Great Britain	4404	
	India	1208	
			5612
Non-commissioned officers	Great Britain	6265	
	India	1468	
			7739
Rank and file	Great Britain	77,847	
	India	17,480	
			95,327
			108,672

Great Britain	88,516
India	20,156
	108,672

ARNAOUTS, the name given to the inhabitants of Albania. [See ALBANIA.]

ARNALDO DA BRESCIA was born in the town of Brescia about the beginning of the twelfth century. He studied in France under the famous Abelard. Having returned to Italy, he became a monk. The corruption of the clergy was very great at that time, and Arnaldo, endowed with an impassioned mind and a great flow of oratory, began to hold forth in public against the ambition, the temporal power, and the luxurious life of abbots, prelates, and cardinals, not sparing the Pope himself. The scandalous contest between the church and the empire carried on by the haughty pretensions of Gregory VII. was then fresh in the memory of men. Arnaldo maintained that ecclesiastics as well as laymen ought to be subordinate to the civil power; that the disposal of kingdoms and principalities did not belong to the church of Christ; and that the clergy ought to be satisfied with their tithes and the voluntary oblations of the faithful, and not to hold, as they then did, sovereign lordships and feudal estates. To these doctrines he added others of a mystical character about the Trinity and the nature of the soul, which were eagerly laid hold of and perhaps distorted by his enemies. His declamations against the clergy indisposed the Papal court towards him. By preaching against the temporalities of the church, Arnaldo had excited the passions of the people; Brescia revolted against its bishop, the fermentation spread to other towns, and complaints against the author of all this poured in at Rome. Innocent II., upon this, had Arnaldo condemned, together with other heretics, in the council of Lateran, in 1139. Such at least is the positive statement of Otho of Freisingen and other historians of those times, but Arnaldo's name is not mentioned in the canons of the council. He was not excommunicated at that time, but was banished from Italy, and forbidden to return without the Pope's permission. (See Mosheim's *Ecclesiastical History*, translated by Dr. Murdock, and the translator's *note* on the subject of Arnaldo.) He then proceeded to France, where he seems to have found favour with the papal legate Guido, afterwards Pope Celestinus II.; but he met with an unrelenting adversary in St. Bernard, the zealous and vehement Abbot of Clairvaux, who denounced Arnaldo, wrote against him, and forced him to seek refuge at Zürich, where he remained five years. He there resumed his preaching against the abuses of the clergy, and found many favourable listeners But St. Bernard traced him there also, and caused the Bishop of Constance to banish him from his diocese. Arnaldo upon this returned to Italy, and hearing that the people of Rome had revolted against the Pope, he repaired there, and put himself at the head of the insurrection. Lucius II. had died of the wounds received in a popular affray, and Eugenius III., a disciple of St. Bernard, succeeded him in the papal chair, but was driven away from the city by the people and the senate. Arnaldo exhorted the Romans to re-establish the Roman republic with its consuls, to reinstate the equestrian order, and to emulate the deeds of their glorious ancestors. The multitude, thus excited, hurried on to excesses which Arnaldo probably had never contemplated. They attacked and demolished the houses of the cardinals and nobles of the papal party, killed or ill-treated the inmates, and shared the plunder among themselves in the name of Brutus and Cato, Fabius and Paulus Emilius. Arnaldo, however, still remained poor; he really despised wealth, his morals were irreproachable, and it seems that he judged of others by himself, a common delusion among honest popular leaders.

The Roman senate wrote to the Emperor Conrad III., professing allegiance, and inviting him to come and be crowned at Rome; but the Emperor paid no attention to the invitation. Rome continued for ten years in a state of agitation little differing from anarchy, at war with the Pope and the people of Tibur, and at variance within itself. St. Bernard, in his epistles, draws a fearful picture of the state of the city at that time. Eugenius III. died in 1153, and his successor Anastasius IV. having followed him to the grave shortly after, Adrian IV. was elected Pope in 1154. He was a man of a more determined spirit than his predecessors. A cardinal having been attacked and seriously wounded in the streets of Rome, Adrian resorted to the bold measure of excommunicating the first city in Christendom, a thing without a precedent. The Romans, who had set at nought the temporal power of the Pope, quailed before his spiritual authority. In order to be reconciled to the pontiff, they exiled Arnaldo, who took refuge among some friendly nobles in Campania. When the Emperor Frederic I. came to Rome to be crowned, the Pope applied to him to have Arnaldo arrested. Frederic accordingly gave his orders to the Margrave or Viscount of Campania, and Arnaldo, being delivered into the hands of the Prefect of Rome, was strangled, his body burnt, and the ashes thrown into the Tiber, in the year 1155. [See ADRIAN IV.]

ARNAULD, ANTOINE, a French theological and philosophical writer of the seventeenth century, was born at Paris in 1612. His father, named also Antoine Arnauld, was a distinguished advocate, and a great antagonist of the Jesuits, against whom he both pleaded and wrote; and indeed he mainly contributed to their expulsion from France under Henry IV. The Jesuits were afterwards re-admitted into the kingdom, but they met with an opponent in the younger Arnauld as determined as his father had been. Arnauld, after being ordained priest, was made Doctor of the Sorbonne in 1641. He exhibited an early disposition for theological controversy, by writing the *Théologie Morale des Jesuites*, in which he exposed the dangerous casuistry adopted by several moralists of that order. The Jesuits, who had not forgotten the hostility of the elder Arnauld, retorted against the son, by violently attacking his work *De la Frequente Communion*, which was published in 1643. Soon after, the disputes which broke out among the French clergy about Jansenius, bishop of Ypres, and his book *Augustinus* several propositions of which concerning the intricate questions of grace and free-will had been condemned by the Pope, gave Arnauld a fresh opportunity of exercising his polemical talent. [See JANSENIUS.] Arnauld took the part of Jansenius in two letters, which were condemned by the Sorbonne, and the writer, on his refusing to retract his opinions, was expelled from that learned body. He then withdrew to Port Royal des Champs, a convent of nuns, not far from Paris, of which his sister Angelique Arnauld was the abbess, and where Pascal, Nicole, and other learned men of that time, who were friends of Arnauld and shared his opinions, resorted for quiet and studious retirement. There they wrote various works on literature, philosophy, and religion, which bear the name of the works of MM. de Port Royal. Arnauld wrote parts of several of these works, such as the *Grammaire Générale Raisonnée; Elémens de Géometrie;* and *L'Art de Penser*. He also had a share in the famous letters written by Pascal against the Jesuits, which are known by the name of *Lettres Provinciales*. The disputes about Jansenius and his five propositions, after agitating all France for many years, and drawing bulls of censure from several Popes, to which a part of the French clergy refused to submit, notwithstanding the imperious orders of Louis XIV., were at last appeased for a time by the conciliatory spirit of Pope Clement IX., who accepted a compromise. This was called the peace of Clement IX. Arnauld contributed to this desirable arrangement by an eloquent memorial, which he addressed to the pontiff through the Abbé Rospigliosi, the Pope's nephew. After this peace, Arnauld was presented to the Pope's nuncio, and also to Louis XIV., who received him graciously, and invited him 'to employ his golden pen in defence of religion.' His next work, in which he was associated with his friend Nicole, *De la Perpétuité de la Foi de l'Eglise Catholique touchant l'Eucharistie*, was dedicated to the Pope. This occasioned a warm controversy between Arnauld and the reformed minister Claude, in the course of which Arnauld wrote *Du Renversement de la Morale de J. C. par la Doctrine des Calvinistes touchant la Justification*, Paris, 1672. Arnauld, at the same time, continued his war against the Jesuits, and wrote the greater part of the work styled *Morale Pratique des Jésuites*, 8 vols., 12mo., in which many authentic facts and documents are mixed up with party bitterness and exaggeration. That powerful and ambitious society did not bear this patiently; they represented Arnauld as a dangerous man, and the leader of a sect, whose house was the resort of many restless and turbulent spirits, the old adherents to the errors of Jansenius. Harlay, the Archbishop of Paris, assisted in prejudicing the king against Arnauld, and Louis XIV. issued an order for his arrest, which, however, does not seem to have been very earnestly enforced. Arnauld concealed himself for some time at the house of the Duchess of Longueville, who esteemed him and appreciated his talents; but afterwards considering it prudent to leave France, he repaired to Brussels in 1679, where the Marquis of Grana, the Spanish governor of the Low Countries, assured him of his protection. There he published, in 1681, his *Apologie pour les Catholiques*, which is a defence of the English Catholics against the charges of Titus Oates' conspiracy. In this work, laying aside all party animosities, he undertook the defence of his old antagonists the Jesuits, whom he considered as having been calumniated in those transactions. This apology was, at the same time, a refutation of a book of Jurieu, the well-known reformed minister in Holland, who had accused the French clergy of being implicated in the English conspiracy. Jurieu, in reply, published a book entitled *L'Esprit de M. Arnauld*, written in a style of coarse personal invective, to which Arnauld did not condescend to reply. Another work, not so creditable to Arnauld's judgment, is one against the Prince of Orange, William III. of England, whom he styled a new Absalom, a new Herod, and a new Cromwell. (8vo. 1689.) It was published anonymously, like most of Arnauld's works, and many persons did not believe it to be his; but it seems now ascertained that he was the author. It is said that Louis XIV., whose political views it suited, had this book printed and distributed at his own expense.

From his retirement at Brussels Arnauld made several excursions into Holland. His reputation had spread everywhere, and he was kindly received. About this time he entered into a controversy with his old friend Father Mallebranche, who, in his metaphysical works, had announced some peculiar doctrines on the subject of grace, predestination, and other theological problems. Arnauld began by attacking Mallebranche's definition of the nature of our ideas, and his famous proposition that 'we see all objects in God.' In refutation of these, Arnauld wrote his *Traité des Vraies et des Fausses Idées*, Cologne, 1683; and afterwards, *Réflexions Philosophiques et Théologiques sur le Nouveau Système de la Nature et de la Grace du Père Mallebranche*, 1685; besides nine letters addressed to the Father on the same subject. This controversy was carried on by Arnauld with his usual vehemence, and it had the effect of souring Mallebranche's naturally pacific temper. The Father wished for a truce; he declared 'he was tired of making himself a spectacle to the world, and of filling the *Journal des Savans* with their mutual wranglings.' But controversy was Arnauld's element; without any feeling of malignity in his disposition, his zeal for truth, or what he considered as truth, joined to a great fluency of expression and a mind of iron, made him restless and fond of disputation. His friend Nicole, whose temper was milder, told him one day he was weary of disputes, and wished to rest himself. 'Rest!' exclaimed Arnauld, 'will you not have enough of rest hereafter during all eternity?' He continued to the last, although past eighty years of age, to carry on his various controversies, with the Jesuits, with Mallebranche, with the Calvinists and with the sceptic philosophers, among whom was Bayle. He also wrote on several points of dispute between Rome and the Gallican church. His last work was *Réflexions sur l'Eloquence des Prédicateurs*, 1694. He died in his exile at Brussels, on the 8th of August of that year, after receiving the sacrament from the curate of his parish. There is an interesting account of his last moments by Father Quesnel, who was his companion in the latter years of his life. He was buried in the church of St. Catherine at Brussels, but his heart was embalmed and taken to Port Royal des Champs, where it was deposited with the remains of his mother and six sisters, who had all been inmates of that convent. Boileau and Racine wrote epitaphs in honour of Arnauld. His works, which filled more than 100 volumes of various sizes, were collected and published at Lausanne and at Paris, in 50 volumes, 4to., 1775-83. The last volume contains the author's biography. Arnauld was one of the most learned men of his age, a sincere but enlightened Catholic, pious without superstition or hypocrisy, exemplary in his conduct, and disinterested and simple in his habits and manners. Although frequently at variance with Rome, he was esteemed there, and had friends among the cardinals. While he was persecuted in France, Pope Innocent XI. offered him an asylum at Rome. He had, likewise, many friends among the Protestants, in Holland and elsewhere. Arnauld was one of the first to extricate theology from scholastic subtleties; he adopted in his exposition of theological subjects a clear logical method, and supported himself by frequent references to the fathers and to the early councils, in the history of which he was deeply versed, as well as in the study of the Scriptures. He contributed to the French version of the New Testament published at Mons, and he was an advocate for having the Missal, or service of the church, translated into the vulgar tongue. His brother, Henri Arnauld, Bishop of Angers—where he died in 1694, at the age of ninety-five—bore the character of a most benevolent and diligent pastor. Another and an older brother, Robert Arnauld d'Andilly, filled several offices at the French court, but at the age of fifty-five retired to Port Royal, where he died in 1674. He wrote several religious works. Robert's son, Simon Arnauld, Marquis of Pompone, was employed in several diplomatic missions under Louis XIV., and was made Secretary of State for Foreign Affairs in 1672. He died in 1699. [See PORT ROYAL.]

ARNDT, JOHN, was born in 1555, at Ballenstadt, in the duchy of Anhalt. He first studied medicine, but afterwards applied himself to theology, and became a clergyman of the Lutheran church. Being grieved at the relaxed state of morals among the Protestants of Germany, he wrote a book 'on true Christianity,' with the object of giving the study of religion a practical influence on the moral conduct of its followers. 'Divinity,' says he, 'is not a mere speculative science, a branch of polite learning, but a living experience, and a practical exercise of the mind. We must not content ourselves with a dead and barren faith; true faith ought to be preceded by repentance, accompanied by love, and followed by a renewal of the soul.' This work, first published in German, has been translated into Latin, French, Danish, Flemish, Bohemian, and English, and has been highly praised by Mosheim, Professor Frank of Halle, Dr. Spener, and other distinguished divines. John Wesley, in his Christian Library, gives a copious extract from it. It has been called the Protestant à Kempis. Arndt was a great promoter of practical religion, or that which, in ecclesiastical history, is called *pietism*. He was accused by the exclusive partizans of the doctrine of grace of attributing too much to the strength and ability of man in the work of conversion. Osiander of Tübingen wrote against him his *Judicium Theologicum*. Yet Arndt's book is still considered one of the best treatises of Christian morality ever written. An English translation was published in 1815 by William Jaques—*True Christianity, or the whole Economy of God towards Man, and the whole Duty of Man towards God.* 2 vols. 8vo. London. Arndt was minister at Quedlinburg, and afterwards at Brunswick. In the latter place, his success as a preacher made him enemies, and he was obliged to leave the town and to withdraw to the village of Isleb, where he remained for some years. In 1611 George Duke of Lunenburg presented him to the church of Zell, and afterwards appointed him general superintendent of all the churches of the duchy. Arndt died at Zell in 1621. He had preached a sermon the day before, and on returning home he said to his wife that he had delivered his funeral sermon. He bore the attacks and persecutions of his enemies with the greatest meekness; his charity to the poor was very extraordinary for his limited means, and it made ignorant people suppose that he had discovered the philosopher's stone. Arndt's favourite authors were St. Bernard, Thomas à Kempis, and Tauler. He must not be confounded with Josiah Arndt, also a Lutheran clergyman, born in 1626, who was professor at Rostock, and who published several works on philosophy, divinity, and history; among others, *Lexicon Antiquitatum Ecclesiasticarum*. 4to. Greifswald, 1669. He died in 1685.

ARNE, THOMAS AUGUSTINE, Doctor in Music, born in 1710, was the son of an upholsterer in King Street, Covent Garden, and educated at Eton, having been intended for the profession of the law; but his bias towards music was too strong to allow him to pursue his legal studies successfully, and after the usual struggles between duty and inclination, the latter, as commonly happens, prevailed. He secretly practised on the spinnet, and took lessons of Michael Festing, an eminent person in his day, on the violin, and the first intimation his father had of his musical progress was at an amateur party, in which young Arne was discovered playing the first fiddle most skilfully. Resistance was now worse than useless, and the resigned parent supplied his son with the means of continuing his favourite pursuit in an advantageous manner. He soon imbued his sister with a love of the vocal art, and qualified her to appear in Lampe's opera, *Amelia*, in which her debût was of so promising a kind, that her brother, though then only eighteen years of age, set for her Addison's *Rosamond*, in which she represented the heroine, and shortly after became the celebrated Mrs. Cibber. The success of this opera led of course to the composition of others, and in 1738 Arne produced his *Comus*, in which he evinced powers of the higher kind, and his reputation was at once established. In 1740 Arne married Miss Cecilia Young, a pupil of Geminiani, and a performer of eminence. In 1742 he went with her into Ireland, where both were engaged by the Dublin manager, the one to sing, the other to compose. There he produced his masques, *Britannia*, and *The Judgment of Paris; Thomas and Sally*, an afterpiece; and *Eliza*, an opera. In 1745 he acceded to the request of the proprietor of Vauxhall, who thus added Mrs. Arne to the list of his vocal performers, her husband at the same time becoming his principal composer. Subsequently, he wrote his two oratorios, *Abel* and *Judith*, after which the University of Oxford conferred on him the degree of Doctor in Music. His greatest work, or that which has most contributed to his fame, *Artaxerxes*, was composed in 1762, in imitation of the Italian opera, and to prove the English language not so repugnant to recitative as many had imagined. The attempt was bold, but triumphant; the decided approbation which crowned the composer's labours, and the judgment pronounced on it by posterity, prove beyond dispute its many and great merits. The drama is a translation, by Arne himself, of Metastasio's *Artaserse;* and when compared with many similar works, whether of his contemporaries or of professed authors of a later period, is entitled to the praise which cannot justly be bestowed on mediocrity. Dr. Arne also produced, in 1765, an entire Italian opera at the King's Theatre, Metastasio's *Olimpiade*, of which no notice is taken by any of his biographers. He afterwards composed *The Fairies*, the music to Mason's *Elfrida* and *Caractacus*, additions to Purcell's *King Arthur*, the dramatic songs of Shakspeare, the airs for the Stratford Jubilee, &c. *Love in a Village* is a *pasticcio*, or compilation from various composers, but many pieces in this still pleasing ballad-opera are by Arne, and among these 'Gentle youth, ah! tell me why?' can never become antiquated. In other departments of music he proved eminently successful. Warren's collection of canons, glees, &c., contains several of his compositions, of which 'Come, shepherds, we'll follow the hearse,' in Cunningham's elegy on the death of Shenstone, must charm as long as vocal harmony retains the power to please. His song and chorus, 'When Britain first at heaven's command,' or 'Rule Britannia,' need hardly be mentioned as the offspring of his genius; it may be said to have wafted his name over the greater half of the habitable world. Dr. Arne died in March, 1778, and was buried in St. Paul's church, Covent Garden, leaving an only son, who died, we believe, without issue.

ARNHEIM, ARNHEM, or AERNEM, the Roman Arenacum (though this is sometimes disputed), a fortified city on the right bank of the old Rhine, now the capital of Guelderland, and formerly one of the Hanse towns; it lies 50 Eng. miles S.E. of Amsterdam: 52° N. lat. 5° 52′ E. long. Arnheim is first mentioned under this name in a charter, or grant of privileges, from the emperor Otho III. A.D. 996. About two miles above Arnheim the canal of the Yssel branches off from the main river, and carries part of the waters of the Rhine to Doesburg, where this cut joins the Yssel, which flows into the Zuider Zee. This junction between the Rhine and Yssel was made by Drusus, the brother of the emperor Tiberius. Arnheim stands at the foot of a small range of hills, which are not of common occurrence in Holland, called the Beluwe, or Veluwe, running irregularly northward towards the Zuider Zee. There is at Arnheim a bridge of boats across the Rhine. The fortifications, which were improved and enlarged by Coehorn in 1702, defend the town on the land side. Arnheim was once the residence of the Counts and Dukes of Guelderland, whose monuments are to be seen in the principal church. Arnheim has four gates, a reformed Dutch church with a high tower, which contains the tomb of Duke Charles of Guelderland, a Roman Catholic church, a small Lutheran church, a handsome governor's residence, and a very old-fashioned statehouse. It is the market for the district of the Veluwe and part of the Betuwe; the latter of which is the name of the insulated fertile district between the Rhine, Waal, and Lek. [See Betuwe.] Coleseed, rye, oats, &c. are brought in great quantity to Arnheim. The trade is mostly a transit trade along the Rhine, and by land between Amsterdam and Germany. The neighbourhood of Arnheim contains many pleasant country residences of the nobility of Guelderland, who generally spend their winter in Arnheim. The town was taken from the Spaniards in 1585: in 1672 it was taken by the French, on the invasion of Holland in the reign of Louis XIV., from whose extortion and tyranny the inhabitants suffered severely: in 1674 the French left it, after destroying the fortifications. In 1813 the Prussians took it from the French, which contributed materially to the change of affairs in Holland at that time. The population on Jan. 1, 1830, was 7194 males, and 7315 females. (See Kampen, *Beschrijving van het K. der Nederlanden*, 1827: Halma's *Tooneel*, &c.)

ARNI, the native Indian name of the wild buffalo. [See Buffalo.]

ARNO, called by the Romans Arnus, the principal river of Tuscany, rises on the southern slope of Mount Falterona, which is a high western projection from the central ridge of the Apennines, about twenty miles N.E. of Florence, in 11° 39′ E. long., and 43° 52′ N. lat. On the opposite or north-eastern side of the same ridge are the sources of the Ronco and of the Montone, two rivers which enter the Adriatic below Ravenna. The sources of the Tiber which several writers have erroneously stated as issuing out of the same mountain, are more than twenty miles farther east, and separated from those of the Arno by the mountains of Camaldoli and La Vernia. The Arno descends by the village of Stia into the long and deep valley called Casentino, one of the higher regions of Tuscany, running in a S.S.E. direction between the great central ridge and an offset from the same, which, detaching itself from the Falterona, divides the Casentino from the Mugello or valley of the Sieve, and afterwards from the Valdarno, forming the mountains of Crocicchie, Gualdo, Consumi, Vallombrosa, and Pratomagno. The Arno receives in its course numerous torrents from both ridges—'the cool streams flowing down the verdant slopes of Casentino's hills,' which Dante mentions in Canto 30 of his *Inferno*.

Having passed the large village of Poppi and the town of Bibbiena, the direction of the valley, and consequently the course of the Arno, change to a more southern course, being confined to the eastward by another offset from the central ridge, which, detaching itself from the Alpe de Catenaja to the east of La Vernia, runs southwards by Chiusi and Monteacuto towards Arezzo, and divides the waters of the Arno from those of the upper Tiber. Issuing from the lower Casentino, the Arno enters the plain of Arezzo, and running in a south direction by Quarata, receives the waters of the northern Chiana, and then suddenly turns to the westward, entering a deep mountain gorge, appropriately called l'Imbuto, or 'funnel.' Passing through the small valley of Laterina, it issues out of it by another narrow and wild pass called Valle dell' Inferno, which is three miles in length. The Arno next enters the beautiful region called the Upper Valdarno, one of the most delightful rural spots in Tuscany and perhaps in the whole world. It is a valley about fourteen miles in length, and from three to five in breadth, bounded by two ranges of hills, and sheltered on the northeast by the lofty and rugged Apennines, among which the wooded summit is distinguished that overhangs the convent of Vallombrosa. The valley itself is a continued succession of gardens and orchards, and the hills are covered with vineyards or verdant pastures. Several neat towns and villages are scattered about, besides numerous hamlets and cottages on the hill slopes. Through this valley the Arno runs in a N.N.W. direction, its course being nearly parallel to that which it followed higher up in the Casentino. At Incisa the mountains close again on both sides, and the Arno runs through a deep channel excavated in a ridge of limestone rock which is a continuation of the mountains of Vallombrosa, and extends far to the south towards Siena. The river runs here in a direction nearly due north, until it passes Rignano, beyond which, in the mountains on the right bank, a valley opens, through which the Sieve, a large stream coming from the district of Mugello north of Florence, flows into the Arno. Here the Arno, after a circuitous course of more than sixty miles, is only thirteen or fourteen miles direct distance from its source. It now turns westwards by Varlungo, and enters the plain of Florence, dividing that city into two unequal parts. About ten miles below Florence, and beyond the bridge and village of Signa, the Arno runs in a deep channel excavated through the base of Mount Golfolina, which is said to have been cut by the old Etruscans. A wider passage being thus opened for the river, the plain of Florence, which was a marsh before, was drained. The course of the river here diverges one or two points towards the south. Ten miles farther the hills on the left bank recede, and leave a plain between them and the river, in which are the towns of Empoli and San Miniato. Here the Arno receives the Elsa, a considerable stream coming from the south, which has its source in the high lands near Siena that divide the basin of the Arno from that of the Ombrone. On its right bank the Arno receives several streams which come from the northern Apennines above Pistoja, and the waters from the lake or marsh of Fucecchio, and from that of Bientina. About ten miles below San Miniato the Arno, after receiving the Era, a large stream from the south, enters the plain of Pisa, through which it makes several considerable windings, passes through the town of Pisa, and enters the sea about five miles westward of it: 43° 41′ N. lat., 10° 15′ E. long. Formerly the mouth of the Arno was some miles more to the south, but it having become obstructed, partly by the Genoese sinking many ships in it in their wars against Pisa, and partly by the sand thrown up by the sea during the frequent storms from the S.W., a new cut in a N.W. direction was excavated at S. Pietro in Grado, about three miles below Pisa, through which the waters of Arno were made to run in 1606. The antient port of Pisa was not at the mouth of the Arno; it was a natural bay formed by the sea, to the southward of the old mouth of the river, at the place where the stream called Calambrone now runs into the sea, and between that and Leghorn. It is now filled up, and hardly any traces remain of it; but Targioni Tozzetti, in his *Relazione di Viaggi in Toscana*, gives a plan of the harbour as it was, from old documents and drawings. A canal for the *navicelli*, or barges, connects Leghorn and Pisa, and runs partly through the site of the former Porto Pisano. From Pisa barges ascend the Arno to Florence; but the navigation is often interrupted in summer owing to the shallowness of the water. In the time of Strabo (p. 222), and even as late as the fifth century of our æra, the Serchio, or river of Lucca, then called the Ausar, instead of discharging itself into the sea, as it now does, entered the Arno below Pisa, and that city stood between the two rivers. How and when the Serchio altered its course is not known, but in the twelfth century it had already assumed its present channel. Still it approaches very near Pisa, to the northward of that city, and in times of inundations its waters mix with those of the Arno. [See Pisa.]

The Arno, like all the rivers which descend from the Apennines, is subject to sudden overflowings. The quantity of earth and stones which it then carries down from the mountains has raised its bed in many places nearly as high as the adjacent fields. Embankments have been made along the greater part of its course, and are kept up at a considerable expense. But in cases of extraordinary rains and storms in the highlands where it has its source, the Arno rushes down with such fury as to overcome all obstacles and inundate a great part of the country. Among the more disastrous inundations, that of September, 1537, is recorded, when the Valdarno and the whole plain of Florence were overflowed, and trees, mills, cattle, and even houses, were carried away. Two-thirds of the city of Florence were inundated, the water being in some places eight feet above the pavement; and two of the bridges of Florence were carried away. It took several months to clear the mud from the streets and houses. In November, 1740, another great inundation occurred, owing to the prevailing scirocco wind, which melted the snows that had fallen on the Apennines. The confluence of the Sieve, just above Florence, a river which swells from the same causes and generally at the same time as the Arno, greatly contributes to these inundations.

It appears that in remote times the waters of the Arno divided near Arezzo, and part of them flowed southwards by the valley of the Chiana into the Tiber. (Fossombroni, *Memorie Idraulico-Storiche sopra la Val di Chiana.*) A communication by water existed between Arretium and Rome. But the bed of the Chiana becoming raised by deposits of earth, the declivity towards the south, which was already slight, was destroyed, and the whole waters of the Arno turned towards Florence. The northern part of the Val di Chiana then became a marsh, the streams that formerly ran into the Arno remaining stagnant in various places; and it was only in the southern part of the same valley that the waters continued to find their way into the Tiber, after joining the river Paglia near Orvieto. At last the people of Arezzo, in the fourteenth century, cut a canal, which carried part of the waters of the northern Chiana into the Arno. This canal has been since repeatedly enlarged and lengthened by the Tuscan government, and has been the subject of many interesting hydraulic works and experiments. [See Chiana, Val di.]

The whole course of the Arno, with its numerous windings, cannot be less than 140 miles, although in Malte Brun's geography it is stated at 105. Its breadth varies greatly: near Florence it is about 400 feet, but the waters are very low in summer, and the river is then fordable. Within the city of Florence the bed of the Arno is considerably narrower, being confined by the walls of the quays. At Pisa, however, it retains always the appearance of a considerable river. The tract of country watered by the Arno, especially between Florence and Pisa, constitutes the most populous, most productive, and most thriving part of Tuscany. In the upper valleys of the Arno, between Arezzo and Florence, a vast quantity of bones and whole skeletons of the largest quadrupeds of other climates, the mastodon, elephant, rhinoceros, and hippopotamus, are found, as well as beds of lignite. [See Apennines, Geology of.]

ARNO'BIUS, according to Hieronymus (*de Viris Illustribus*, c. 79), was a rhetorician and afterwards a presbyter of Sikka in Numidia, in the reign of the Emperor Diocletian. His work *de Rhetorica Institutione* is not extant. Lactantius, the Cicero of the fathers, was the most distinguished disciple of Arnobius, the Varro of the ecclesiastical writers. Arnobius was as much superior in genius to this pupil as he was surpassed by Lactantius in elegance of diction. Hieronymus informs us, in his *Chronicle*, that Arnobius was in the habit of attacking Christianity, until he had some remarkably impressive dreams, which induced him to wait upon the bishop of Sikka, who, however, did not trust him, knowing his former enmity to the gospel. Arnobius wrote his seven books of 'Disputations against the Heathen' in order to convince the bishop that he was really converted. But the statement of Hieronymus, who refers it to the twentieth year of Constantine, A.D. 326, contains a manifest anachronism. Arnobius appears in his 'Disputations' not like a man recently changed by dreams, nor as a novice; but rather as a man of a ripe conviction, although without ecclesiastical orthodoxy. It may be that the dreams gave the first impulse to his subsequent conversion, or that he was secretly convinced of the truth, without openly professing it, until the dreams induced him to wait upon the bishop, who, in those days of persecution, would be cautious about receiving a man who, as a public character, was known to have been hostile to Christianity, lest he should prove a spy. The caution of the bishop induced Arnobius to declare, in his famous 'Disputations,' his confession of faith and its defence. In this work Arnobius shows a thorough acquaintance with the literature of his age, and thus describes (l. i. c. 39) his change:—'O, blindness! A short time ago I worshipped images coming out from the furnace, and gods made with the hammer on the anvil. When I saw a smooth and anointed stone I spoke to it as to a living power, and prayed to the senseless stone for benefits; and thus unwittingly blasphemed even the false gods, by taking them for stocks, stones, and bones, or fancying that they inhabited such things. Now, I know what all those things are, since I am led by a great teacher into the ways of truth.' It appears that Arnobius came to a knowledge of the truth by carefully reading the New Testament, especially the Gospels, and that he was not biassed by the ecclesiastical orthodoxy of the North African church. Arnobius himself mentions the time when he wrote his 'Disputations' (l. ii. c. 71), saying that Rome had then been built about 1050 years. This would bring us, according to the æra of Varro, to A.D. 297. But it appears that Arnobius either used another æra, or only mentioned a round number. His work contains allusions to the persecutions by Diocletian, which commenced A.D. 303. This observation applies also to Arnobius, when he says (l. i. 13), 'Nearly 300 years have elapsed since our Christian community began to exist, perhaps somewhat more or less.' It may be, that Arnobius wrote his work at different periods.

Without these dates we might ascertain generally the time in which Arnobius wrote his 'Disputations' from their contents: he refutes that accusation which had excited the Diocletian persecution, namely, that the public calamities of the empire were a consequence of the spread of the Gospel, which caused a general neglect of the gods. Arnobius replies to this accusation:—'If men, instead of relying upon their prudence, and following their own propensities, would try to obey the doctrines of Christ, which bring peace and salvation, the whole world would be soon changed, and the iron taken from the service of war would be employed in the works of peace.' (l. iv. c. 36.)

Arnobius thus addresses the heathen (l. iv. c. 36):—'If you were actuated by pious zeal for your religion, you should have burned those books, and destroyed the theatres in which the dishonour of the gods is daily proclaimed in indecent exhibitions. Why should our books be cast into the fire, and our places of assembly destroyed, in which the highest God is adored, and implored to give grace and peace to the magistrates, the armies, the emperor?—joy and tranquillity to the living and to those who have been released from the bonds of the body,—books and places in which nothing is heard but what is calculated to make men humane, mild, modest, chaste, liberal in dispensing their property, and relatives of all who are united by one bond of brotherhood.' (See *Allgemeine Geschichte der Christlichen Religion und Kirche von August. Neander*, ersten Bandes dritte Abtheilung, p. 1160-1165.)

Only one manuscript codex of Arnobius is known to exist; this is now at Paris. The first edition of the 'Disputations' of Arnobius is that by Faustus Sabaeus, Rome, 1542, fol. The editor has subjoined the *Octavius* of Minutius Felix as an eighth book, mistaking Octavius for Octavus. Subsequent editions were published at Basle, 1548, 1560, 8vo.; at Paris, 1580, 1603, 8vo,; at Antwerp, 1582, 1586, 1604, 8vo. at Rome, 1583, 4to.; at Geneva, 1597; at Leyden, 1598; at Hanau, 1603, 8vo.; at Paris, 1605; at Hamburg, 1610, fol.; at Douay, 1634, 8vo.; Opera cum commentariis variorum, Leyden, 1651, 4to.; this edition contains many inaccuracies: at Paris, 1666, fol.; at Leyden, 1677, fol.; at Paris, 1715, fol. Venetiis in Gallandi Bibl. Vet. Patrum, tom iv.; at Würtzburg, 1783, 8vo.; more recently by Oberthür, and last by Conrad Orelli, Leipzig, 1816, in two volumes, 8vo.: this is the best edition of Arnobius. The 'Disputations' of Arnobius were translated into Dutch by Joachim Oudaer, Harling, 1677, 8vo.

The works of the Semi-Pelagian Arnobius of Gaul have sometimes been erroneously ascribed to Arnobius Afer. Arnobius of Gaul wrote, about A.D. 460, a commentary on the psalms, edited with a preface by Erasmus, at Basle, 1537; at Paris, 1539; at Basle, 1560. The 'Annotationes in Locos Evangelistarum e recognitione Andreæ Schotti' were printed with the preceding. He wrote also the following: Conflictus cum Serapione, de Deo trino et uno; de Duobus Substantiis in Unitate Personæ et de Concordia Gratiæ et Liberi Arbitrii, cum Notis Feuardentii, Col. Agrippinæ, 1596.

ARNOLD, BENEDICT, was born in Connecticut in North America, of parents in very humble life. He is said to have received little education, and to have been at first a dealer in horses. Having been unfortunate in business, he was the more ready, when the revolutionary war broke out, to take up arms, for which he was well fitted both by inclination and capacity. He threw himself into the contest with great ardour, and raised a company of volunteers at Newhaven, in his native state. His activity, boldness, and skill, soon brought him into notice; and when in the summer of 1775 it had been determined to attempt the capture of Quebec, he and General Montgomery were fixed upon by Washington to conduct the expedition. The march of Arnold across a then unknown and pathless region at the close of the year, is one of the boldest military exploits on record. The troops, consisting of about 1100 men, set out about the middle of September from Boston for Newbury Port, at the mouth of the Merrimack; from which point they were conveyed by water to the mouth of the Kennebeck in New Hampshire, a distance of forty leagues. On the 22d they embarked in 200 boats on the Kennebeck at Gardener's Town, and made their way up the river in the face of such a variety of difficulties, that their progress was never more than ten, and sometimes not more than four miles a day. After reaching the head of the river, they had a work of nearly as great fatigue and difficulty still before them—the passage of the mountainous ridge which now divides the territory of the United States from Canada. It was only after crossing these desolate heights that they reached the river Chaudière, down which they proceeded to the St. Lawrence, into which it falls. When they at length reached a house, on the 3d of November, they had been thirty-one days without the sight of a human habitation.

Arnold distinguished himself greatly in the military operations that followed; and was severely wounded in the leg in the unsuccessful assault upon Quebec on the 31st of December, in which General Montgomery fell. On his return from this enterprise he continued in active service, and gave on many occasions the highest proofs of bravery and military talent. In one of the actions which immediately preceded the surrender of General Burgoyne at Saratoga on the 16th of October, 1777, his wounded leg was struck, while he was on horseback, by a cannon-ball; and this accident rendering him unable for some time to take the field, he was appointed by Washington to the command of Philadelphia, which the English had recently evacuated. In this situation the vices of his character soon began to display themselves; and he was guilty of such acts of rapacity and oppression, in order to support the ostentation and luxury in which he indulged, that on a representation being made to congress he was ordered to be tried by a court-martial. The result was, that on the 20th of January, 1779, he was sentenced to be reprimanded by the commander-in-chief. On this dishonour Arnold threw up his commission. The embarrassment of his affairs, however, was so great, and the demands of his creditors became so pressing, that he soon found it necessary to attempt something to repair his broken fortunes. In these circumstances he appears to have formed the deep and atrocious design for which his name is now chiefly remembered, and by which it has been covered with infamy. He resolved to make an offer to the British General, Sir Henry Clinton, of his services in betraying his country and the cause for which he had hitherto fought. His proposals were accepted, and it was agreed that he should employ all his art and interest in order to obtain the command of the important fort of West Point on the Hudson, with the view of delivering it up to the enemy. By a show of strong patriotism, which he resumed, he was not long in accomplishing this object. Washington, generously forgetting his former delinquencies, was prevailed upon to appoint him to the station in question. This was in July, 1780. We refer to the article ANDRÉ, for an account of the manner in which this treasonable scheme miscarried. Major André was the person intrusted by Clinton with the active management of the negotiation with Arnold; and the British officer having been sent up the Hudson in a sloop of war from New York, the head-quarters of the army, had an interview with the American General on the bank of the river, near West Point, on the morning of Friday the 22d of September. The next day, on his return to New York by land, he was taken by two Americans when he had nearly reached the British lines, and the plot was detected by the discovery in his boots of the plans and other papers which he had received from Arnold. By the irresolute and inconsiderate conduct of Colonel Jameson, the officer to whom André was carried, he found means to convey an intimation of his capture to Arnold, by whom it was received on the morning of the 25th, just in time to permit him to make his escape. Taking a hurried leave of his wife and infant child, he instantly rushed to the river, and leaping on board a barge which he had in readiness, he ordered himself to be rowed to the English sloop, which he reached in safety. A minute and interesting account of all the circumstances of this affair may be found in the notice of Arnold in the *Encyclopædia Americana*. He was allowed to retain in the British army the rank of brigadier-general, which he had held in that of the United States; but it is asserted by the writer to whom we have just referred, that he did not receive the whole of the sum (30,000*l.*) which was promised him as the reward of his treachery. He attempted to do something to deserve what he got by publishing certain addresses and proclamations, with the view of inducing his countrymen to lay down their arms; but these attempts were not more successful than one of a different description by which they had been preceded. In the beginning of the following year he was sent with an expedition into Virginia, where he committed great devastation. After this he made a still more destructive incursion into Connecticut, his native state. Having taken Fort Trumbull, near New London, he barbarously put the unresisting garrison of the fort to the sword, and set the town on fire. He served afterwards in Nova Scotia, and also in the West Indies, where he was taken prisoner by the French, from whom, however, he made his escape. After the conclusion of the war he took up his residence in England. We find pensions to the amount of 400*l.* granted in 1792 to the children of a Benedict Arnold, whom we presume to be the subject of the present notice. In July of that year a duel was fought near Kilburn Wells, between General Arnold and the present Earl of Lauderdale, in consequence of certain expressions which the latter had used at a public meeting, and would not retract. Arnold was attended by Lord Hawke, and Lord Lauderdale by Mr. Fox. His lordship declined to return his adversary's fire, but said, that if he was not satisfied he might fire on till he was. On this the parties separated. Arnold died in Gloucester Place, London, in 1801.

ARNOLD, SAMUEL, Doctor in Music, was born in 1740, and patronised from his birth by the princess Amelia, daughter of George II., who placed him among the choristers of the royal chapel, under Mr. Bernard Gates: he afterwards completed his musical studies under Dr. Nares. His first production was an air, 'If 'tis joy to wound a lover,' which immediately spread itself far and wide, and, though a mere trifle, at once made the author popular. At the early age of twenty-three he became composer to Covent-garden theatre, and in 1766 also undertook to fill the same office at the Haymarket, then the property of the senior Colman. In the discharge of these duties, he produced about forty musical pieces, the most popular of which were, *The Maid of the Mill*, *The Son-in-law*, *The Castle of Andalusia*, in which are 'Flow, thou regal purple stream,' and 'The hardy Sailor:' *Inkle and Yarico*; *The Battle of Hexham*; *The Surrender of Calais*; *The Children in the Wood*; *The Mountaineers*, &c.; each containing beauties that never can be entirely forgotten. Of music of the graver cast, he composed Dr. Browne's sacred ode, *The Cure of Saul*, which was allowed to be the best work of the kind since the time of Handel. This was followed by the oratorios of *Abimeleck*, *The Resurrection*, and *The Prodigal Son*, which were performed at Covent-garden and the Haymarket theatres for several years, during Lent. The latter was chosen for performance at the installation of Lord North, as chancellor of the University of Oxford, when the composer was honoured with the degree of Doctor in Music. In 1769 an enterprising spirit led him to purchase Marylebone Gardens, then a place of very fashionable resort, for which he wrote many songs, &c.; but, confiding too much in the honesty of those whom he employed, he abandoned this speculation with the loss of ten thousand pounds. In 1783 he was appointed organist and composer to the King. In 1789 he succeeded Dr. Cooke as conductor of the Academy of Antient Music; and in 1793 became organist of Westminster Abbey, on the presentation of his friend, Dr. Horsley, Bishop of Rochester. In 1786 Dr. Arnold commenced publishing an edition in score of Handel's works, encouraged by George III., who liberally supported him in his arduous undertaking, which proceeded to the extent of about forty volumes. He also printed, in four large volumes, a collection of sacred music, as a continuation of Dr. Boyce's admirable work, to which it has proved a most valuable addition. During many years he carried on the oratorios at Drury-lane theatre, and while these were in his hands, he produced *The Redemption*, a compilation from Handel's works, which met with the greatest success; and *The Triumph of Truth*, selected from various composers, but which has not kept its ground so well as the former, though by no means inferior in point of effect. Dr. Arnold died in 1802, and was interred in Westminster Abbey, with more than usual marks of respect. A simple tablet, near Purcell's monument, marks the place where lie his remains. He married a lineal descendant of the illustrious Baron of Merchiston, and left a son (who has distinguished himself by his dramatic productions, and by his able management of the English Opera House), and two daughters.

ARNOTTO, or ARNATTO, the inspissated extract from the fruit of the *Bixa Orellana* [see BIXA], is used by dyers principally to give a bright orange colour to silk goods. It is also employed as an auxiliary to give a deeper shade to simple yellow colours. It is further used in many of our dairies to give a reddish colour to cheese, which it does without adding any disagreeable flavour or unwholesome quality.

The Arnotto of commerce is brought to us from South America. It is moderately hard, brown on the outside, and of a dull red within. It comes in cakes of about two or three pounds weight each, and is generally enveloped in large flag-leaves previous to being packed in casks. In this state it receives the name of flag arnotto, to distinguish it from another preparation which is a harder and more concentrated extract from the fruit pods of the same plant, and which contains a larger proportion of colouring matter than flag arnotto. This superior description, of which but little is imported, is known as roll arnotto.

Arnotto is with difficulty dissolved in pure water; it is usual, therefore, to add some alkaline substance, usually potass, which not only facilitates the solution of the extract but improves the quality of the colour. The liquid sold under the name of Nankin dye is a solution of arnotto in potass and water. A solution is also sometimes made in alcohol, which is used for lacquering and by varnishers.

It is believed that the method employed for making this extract in the country of its production, which is by the application of a high degree of heat in combination with a process of fermentation, is injurious to its colouring properties, an opinion which is confirmed by the fact of the superiority of the colouring matter when procured from the fresh pods. There is reason to suppose that means might be used for precipitating the colouring matter without subjecting it to so great a risk of carbonization by heat as it is usually made to undergo, and without having recourse to the process of fermentation. Some experiments made with this view by Vauquelin seem to confirm this supposition.

The consumption of arnotto has been much increased in this country of late years. In 1820 the quantity brought to use but little exceeded 50,000 pounds. We now use more than three times that quantity. It pays a duty on importation of 2*d.* per pound, and sells, including the duty, at from 10*d.* to 20*d.* per pound, according to its quality. (*Ann. de Chimie*, tome 47; Berthollet, *Elémens de l'Art de la Teinture*, tome ii.; *Library of Entertaining Knowledge* (Vegetable Substances, Materials of Manufacture); *Government Statistical Tables.*)

ARNSBERG (or Arensberg), the largest of the three circles, or governments, which form the Prussian province of Westphalia. In 1803, subsequently to the dissolution of the electorate of Cologne, it was united with the territory of Hesse Darmstadt, from which it was transferred to Prussia in the year 1813. It is bounded on the north-west by the circle of Münster, and on the north-east by that of Minden; on the east, by the principality of Waldeck, and Hesse Darmstadt; on the south-east and south, by the duchy of Nassau; on the south-west by the circle of Coblenz; and on the west, by those of Cologne and Düsseldorf. According to the latest measurement, its superficial extent is 2952 square miles; and its population, which the census of 1818 stated to be 383,405, amounted at the close of 1831 to 462,065 souls, of whom the majority are of the Protestant faith; the number of Catholics being in the proportion of 17 in 39 individuals. It contained, at that period, 38,147 horses and colts, 171,536 oxen and cows, and 160,938 sheep and goats. Arnsberg comprehends the mediatized sovereignties of Witgenstein-Berleburg, Witgenstein-Witgenstein, and Hohen-Limburg; and, according to Schlieben's statement, 55 towns, 3420 villages and hamlets, 60,420 houses, 854 churches, chapels, and synagogues, and 5129 manufactories, mills, &c.

ARNSBERG, a minor circle in the government of Aa, 252 square miles in superficial extent, which had a population of 27,397 souls at the close of 1831, and contains 7 towns and 122 market-towns, villages, &c. The northern part of the circle, a considerable portion of which is occupied by the great forest of Arnsberg, consists of valleys hemmed in by high hills and mountains; but its southerly districts have a more even surface. The soil is stony, but produces a sufficiency of grain, flax, and potatoes, for the consumption of the inhabitants; its more lucrative growth is the timber, which is felled in the forest of Arnsberg, and exported in considerable quantities to the adjacent provinces, particularly the circle of the Mark, which has little wood of its own. The principal river in the circle of Aa, is the Ruhr, which rises at Winterberg, within its borders, and flows into the Rhine between Duisburg and Ruhrort. Its mineral resources consist of iron, marble, salt, and brick-earth; but its manufacturing industry is limited to the production of inconsiderable quantities of linens and woollens, together with utensils and articles of wood.

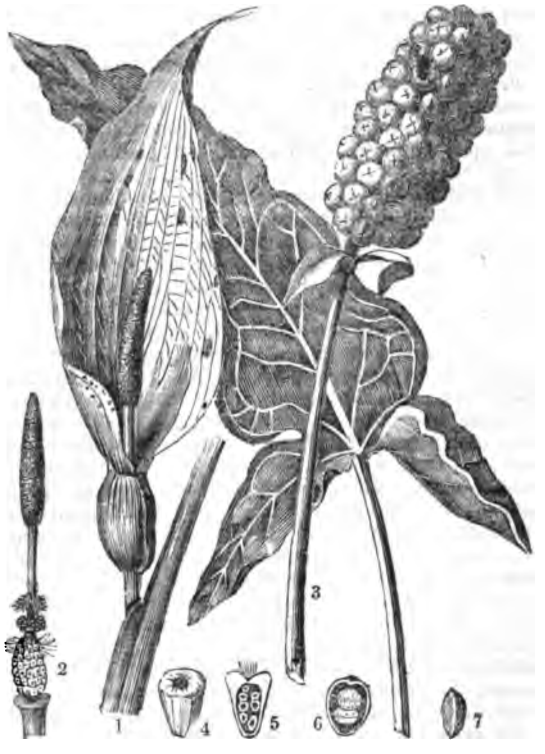
ARNSBERG, the capital both of the larger and lesser circle, is situated on a hill, surrounded on almost every side by the Ruhr; it commands a delightful prospect of the mountainous and picturesque scenery around it, in which the ruins of the ancient castle in the old town, where the Westphalian barons used to meet in secret tribunal, form a striking feature. Arnsberg is ill provided with water, its whole supply being derived from an hydraulic work which forces it up to the town from the river. It was a more thriving place in former times, when it was associated with the Hanseatic League; at the present day its chief dependence is on the production of potashes, and the manufacturing of brandy, beer, and a few linens and woollens. The principal buildings in the town are the government offices, two Catholic churches, a Protestant seminary for teachers, and a Catholic gymnasium: it has also an agricultural society. At the close of 1831, the number of inhabitants was 3805: which gives an increase of 1172 since the year 1817. 51° 22′ N. lat. and 8° 2′ E. long. of Greenwich; about forty miles in a direct line S.W. of Paderborn.

ARNSTADT, a seigniory in Thuringia, forming part of the principality of Schwarzburg-Sondershausen. It contains 216 square miles, two towns (Arnstadt and Plauen), forty-two villages, and 23,000 inhabitants. Arnstadt (in 50° 49′ N. lat., and 10° 57′ E. long.) is the chief town and seat of government of the seigniory, and is situated on both banks of the Gera, in the heart of a highly picturesque country, eleven miles south of Erfurt. It was formerly the residence of the earls, afterwards princes of Schwarzburg-Anhalt, but upon the extinction of the last of that line in 1716 it fell into the hands of its present possessors. It is embellished with a palace, in which are a valuable cabinet of porcelain and a small picture-gallery. There are four churches in the town, the oldest of which goes by the name of the 'Early Church' (Früh-kirche), the service being performed in it at an earlier hour in the morning than in any other place of worship in the neighbourhood. The other public buildings consist of the ruins of a palace built in 1557, the government offices, a cemetery chapel, an orphan and a lunatic asylum, a gymnasium or grammar school, a seminary for the townsmen's sons, a house of correction, and several woollen and brass-ware manufactories. Its inhabitants, who are Lutherans, and in number nearly 5000, are actively engaged in trade: beer, leather, and linen are its staple. It is one of the most considerable marts for fruit, grain, and timber, in this quarter of Germany, and abounds in oil and flour mills, one of which, the 'Günther-mill,' has thirty sets of grindstones. A profusion of gardens and orchards lie scattered round the town; and the remains of two antient burgs, the Käfernburg and Altenburg, are striking features in its environs. The latter, which stands upon a hill commanding the delightful valley that spreads from its base, is said to have been the spot on which a Thuringian nobleman erected a house for the residence of our fellow-countryman, St. Boniface, the 'Apostle of the Germans,' in the seventh century. Plauen is a small town lying on the Gera, in the bosom of a beautiful valley. Its population is under 800.

ARNSWALDE, in the New-Mark, one of the eighteen circles of the Prussian government of Frankfurt, in the province of Brandenburg. Its area is 487 square miles, and its population at the close of the year 1831 was 28,185 souls. At that period it possessed 3,515 horses, 10,044 horned cattle, and 78,930 sheep and goats. It is bounded on the north and north-west by Pomerania, is watered by the Drage and some smaller rivers, and contains several small lakes. It has an abundance of forests, and a sandy soil, the poverty of which has been overcome by the industry of its possessors, and yields much grain and timber, besides feeding numerous herds and flocks.

ARNSWALDE, the capital of this circle, lies about 120 miles N.E. of Berlin, contains 3,550 inhabitants, a parochial church and two hospitals; it manufactures linens and woollens. It stands between three lakes, which are well-stocked with fish.

AROI′DEÆ, an order of monocotyledonous plants, which approach dicotyledons in the form and veining of their



Arum maculatum.

1. A spatha with the point of the spadix seen within it; 2. the spadix separated; 3. the ripe fruit; 4. an ovarium; 5. the same cut perpendicularly; 6. one of the little fruit cut perpendicularly; 7. a seed.

leaves, but agree with the former in everything else of importance. They are readily known by their flowers being placed very closely upon a cylindrical, or lengthened, axis, called technically a spadix (*fig.* 2), which is itself enclosed in a leaf of a peculiar figure, the edges of which are curved inwards till they meet, forming a sort of hollow sheath, which botanists name *spatha* (see *fig.* 1 in the accompanying cut).

The fruit is generally a cluster of little berries, each of which contains a small number of seeds. The flowers themselves are extremely variable in structure; sometimes having neither calyx nor corolla, and sometimes possessing both these parts; sometimes furnished with anthers opening in a singular manner by little lobes, or having anthers of the commonest construction. Many of the species grow upon the trunks of trees, clinging to them, in tropical countries, like ivy; a very few are found in Europe, and those are always little stemless herbs; a small number are small erect shrubs. They are all acrid in a high degree, some of them so much so as to be dangerous poisons, as, for example, the dumb-cane of the West Indies, which paralyses the mouth if only chewed. Nevertheless this acrid principle is so far removed by roasting or boiling, that the underground stems may, in some cases, be used as food. The colocasia of the tropics, and some other species, are common articles of food among the negroes; but they are said not to agree very well with Europeans. In this country only one kind of aroideous plant, the *Arum maculatum*, represented in the wood-cut, is found wild. The root of that species, which is vulgarly named the cuckoo flower, is eatable when properly prepared, just as those which have already been mentioned; but it is never used except by the poor in times of famine.

Aroideæ are also remarkable for the heat which some of the species give out when flowering (see Lindley's *Introduction to Botany*, p. 259), and for the exceedingly offensive odour of others at that time.

AROLSEN, on the Aar, twenty-three miles S. of Cassel, is the residence of the princes of Waldeck, who are among the oldest constitutional sovereigns in Germany. The town is regularly built, possesses woollen, leather, and iron-ware manufactories, a grammar-school, three churches, and about 2000 inhabitants. The palace is a handsome structure of spacious dimensions; it contains a gallery of choice paintings (amongst which is West's 'Death of General Wolfe'), a numismatic cabinet, which is richer in the series of Greek coins than almost any other in Europe, a valuable museum of antiquities from Herculaneum and Pompeii, collected in Italy by the uncle of the present prince, and a library of 30,000 volumes, besides some very rare MSS. The surrounding country is well-wooded, and there is a handsome avenue of six rows of antient oaks, 2000 paces in length, close upon the town. Stein states the latitude to be 51° 25′ 17″ N.

ARO'MA is the supposed principle of odour in plants, formerly called by Boerhaave *Spiritus Rector*. This quality generally resides in the essential oil; but there are some vegetables that have a strong odour which yield but little or no essential oil, as the jessamine and the violet; or when an oil in small quantity is procured from them, it has not the powerful smell which, considering the smallness of its proportion compared with the fragrance of the plants, it might be expected to possess. As plants exhale their odour when exposed to the air, and communicate it to water at a lower temperature than that at which it could be distilled, it has been imagined that some principle of a more subtile nature exists, in which the odour resides, and that it is this which imparts smell to the oil. In fact, however, the property of odour belongs to proximate vegetable principles of different kinds, in which there is no reason to suppose the existence of any common principle; essential oil is unquestionably the most usual cause of its production, and it is capable of being volatilized in small quantity at a low temperature, and thus diffused through the atmosphere or communicated to water.

AROMATARI, JOSEPH OF, a learned physician and naturalist, was born about the year 1586 at Assisi, a town of the duchy of Spoleto, in the ecclesiastical states. His father was a physician, and was competent to determine, as well as eager to bestow on his son, the kind of education most suited to fit him for the same profession. His studies were begun at Perugia, and continued at Padua, where he studied successively logic, philosophy, and medicine. He obtained his degree of doctor of medicine in his eighteenth year, and immediately afterwards established himself as a physician at Venice, where he remained practising for fifty years; nor could he be prevailed upon to quit it by the most tempting offers and solicitations made to him by the Duke of Mantua, the King of England, and Pope Urban VIII. He died at Venice on the 16th of July, 1660.

During this long period he devoted himself to his profession, to the study of the mode of generation or re-production of plants and animals, and to polite literature. He accumulated an immense library, extremely rich in manuscripts. His only publication connected with polite literature was, *Riposte alle Considerazion di Alessandro Tassoni sopra le Rime del Petrarca*. Padua, 1611, 8vo. To which Tassoni having replied under the assumed name of Crescenzio Pepe, Aromatari answered under a fictitious name, in the following work: *Dialoghi di Falcidio Melampodio in riposta agli Avvertimenti dati sotto nome di Crescenzio Pepe a Giuseppe degli Aromatari*. Venice, 1613, 8vo. His contributions to medicine and natural history consist in *Disputatio de Rabie Contagiosa, cui præposita est Epistola de Generatione Plantarum ex Seminibus*. Venice, 1625; and Frankfort, 1626, 4to. The Epistle has been repeatedly reprinted; 1st, in *Epistolæ Selectæ* of Richt, Nuremberg, 1662; 2nd, in the *Philosophical Transactions*, vol. xviii. p. 150. Lond. 1694; and at the end of Jungius's *Opuscula Botanico-Physica*, at Saxe-Cobourg, in 1747.

This Epistle, addressed to Dr. Bartholomew Nant, gave only the outline, or heads of chapters, of a large work which he intended to write on generation, but which his numerous professional engagements and delicate health prevented his accomplishing. The views, however imperfectly developed, are more in accordance with those held in the present day by our most distinguished vegetable anatomists and physiologists, than many of those entertained for a long period subsequent to the time in which he lived. He taught that the so-called seeds of plants were not, as a whole, the new plant, but that a very small portion of a seed possessed the principle of life, the rest being intended for the nourishment of this part. This corresponds to the embryo and albumen of modern writers. The existence of this embryo in a seed rendered it fertile; its absence caused it to be unfertile. The development of this embryo took place in a two-fold direction, a portion of it ascending, and constituting the *plumule*, the other descending, and constituting the *radicle*.

He asserted the analogy between seeds and the eggs of animals, and even designated seeds the *eggs of plants* both in the early stages of their growth receive their nourishment from the albumen by which they are surrounded, but afterwards the chicken takes up its nourishment by its mouth, a plant by its roots. In both cases the young embryo existed previous to hatching or germination, being by these processes only developed, and not then formed.

His principles respecting the generation of animals were known to, and adopted, and promulgated at full length by Harvey in his treatise *De Generatione*. His views respecting seeds would appear to have been overlooked, except by a very few. It is right, therefore, that the well-founded claims of this learned physician should be brought fairly and distinctly forward.

AROMATICS are agents obtained from the vegetable kingdom, exercising a peculiar influence over the digestive powers, and possessed of more or less odour or fragrance. Of this odour, by which they can at all times be recognized, the most usual vehicle is an essential or volatile oil, as stated in the article AROMA. Indeed volatile oil exists in all aromatic plants, and in every part except the cotyledons, save in the nutmeg and a very few other seeds; but this aromatic oil does not reside in the same part in every kind of plant. In umbelliferous plants we find it mostly in the fruits (and chiefly in the *vittæ* of them), yet in angelica, celery, and parsley, it is diffused through the whole structure. Labiate plants, such as mint, balm, rosemary, and lavender, have it in the leaves and stem; cinnamon in the bark; all terebinthinate plants in their young branches. The iris florentina (*orris*) and others have it chiefly in the root; the scitamineæ equally in the root (ginger) and the seeds (cardamoms): the rose and chamomile have it in the petals; yet it is not equal in all the petals of the chamomile, being greatest in the yellow florets of the disk; hence, doubling the flowers of the chamomile, by which the yellow florets of the disk are diminished, and the white florets of the ray increased, lessens the virtues of the flowers.

The power of medicines is frequently judged of by their sensible qualities, that is, by the impression which they make on the organs of smell and taste; aromatics affect both of these senses in a very perceptible and sometimes extraordinary manner. Scarcely any one is insensible to the odour of particular flowers, and some are affected by them to an extraordinary degree. The approach to Ceylon can be determined by the fragrance of the air, at the distance of many miles; the *magnolia glauca* (beaver-tree or swamp magnolia) diffuses an odour, by which it can be recognized at the distance of three miles, among the swampy districts, and consequently moist atmosphere, in which it grows. This powerfully affects many persons while travelling or hunting; and the magnolia tripetala causes sickness, headach, and an aggravation of fevers or rheumatism, among those near it who are labouring under these complaints. The odour of the jonquils and other fragrant plants raised in Holland is so great, when brought into a room or close apartment, as to be quite overpowering. In such countries or places as have a very humid atmosphere, the odour of plants is most readily diffused as well as most potent; of this we may satisfy ourselves by calling to mind the greater fragrance of flowers early in the morning, in the evening, or after a shower. This accounts for the violent action of the plants in the countries just mentioned; but even many plants of Britain affect some individuals, endowed with a peculiar and excessive sensibility, to an extreme degree. The sweet-scented violet has such an effect on certain persons as to occasion headach, convulsions, and apoplexy. (See Triller, *Dissertatio de Morte Subita ex nimio Violarum Odore.*)

Aromatics are seldom applied to the organ of smell for the purpose of influencing the system in a remedial manner, except in the form of aromatic vinegar, in threatened or actual fainting: we shall therefore proceed to consider their action upon the palate and stomach. As all aromatics contain volatile oil, their action is generally referred to this principle; but there cannot be a doubt that the more fixed principles which they contain contribute greatly to their effect. Volatile oils, when separated, act chiefly on the nervous system; but aromatics influence more particularly the digestive organs, the function of assimilation, and the generation of animal heat. They are themselves digested, but previous to this process commencing, or going any length, they produce, by direct contact with the internal surfaces, a peculiar effect, which we perceive beginning at the lips and palate, and accompanying them in their progress to the stomach. They scarcely excite any general action of the system, but expend their power chiefly upon the stomach, and, in a less degree, upon the intestinal canal; increasing the vital force of the former, and quickening the muscular action of the latter. They also communicate to the stomach a greater power of resistance to unpleasant sensations, as under their influence many articles can be borne by it which would otherwise be rejected; and this happens equally with regard to food and medicines.

The mixture of aromatics renders them more agreeable than when given singly; and this is exemplified both in their medical and culinary employment, as no good cook will use only one spice if she can procure more. The *aromatic powder* and *aromatic confection* are compounded on this principle for medical use, and Dr. Kitchener's Zest for culinary purposes.

The necessity for the employment of aromatics is greater in warm climates and weather than in cold; and we find the plants which furnish them grow in the greatest abundance in hot countries. The pepper tribe (piperaceæ), for example, is confined to the hottest parts of the world; such as tropical America and the Indian Archipelago; forty species of pepper are met with in the island of Java alone. Throughout the East Indies the natives restore the powers of the stomach by chewing betel, which consists of slices of the areca nut, sprinkled with fresh lime, wrapped up along with some other aromatic in a leaf of the *piper betel*. The Indians of South America use the *erythroxylum Peruvianum* (called *cocca*) along with the leaves of the *chenopodium Quinoa*, mixed with quick-lime, to stimulate the impaired powers of the stomach during their long and toilsome journeys over the heights of the Andes. (See Humboldt, *Tableau Physique de la Nouvelle Espagne.*) On the same principle, the Europeans who visit tropical countries use curry and other hot dishes. But in every quarter of the globe we find condiments used along with all articles difficult of digestion, especially vegetables, fish, and young meats, such as veal. Aromatics are therefore employed both to prevent and cure diseased states of the stomach, and to assist the action of other remedies.

In simple loss of appetite, without any other obvious disease, or in slow digestion, they may be employed in the form of the warmer pickles during dinner, or preserved ginger after dinner.

In many cases of fever in warm climates, the stomach is so powerless that it cannot extract from cinchona bark, or other febrifuge medicines, the principles fitted to cure the disease, unless aided by aromatics. Hence Cayenne pepper is added to them; and indeed Cayenne pepper will often cure the fever without any bark. Lately piperin (the active principle of pepper) has been recommended as a means of curing fevers in Europe; and certain it is that some lingering fevers, of the intermittent character, occurring in old or feeble persons, cannot be cured without the assistance of aromatics. [See AGUE.] It may be stated, however, that piperin when pure has no aromatic property.

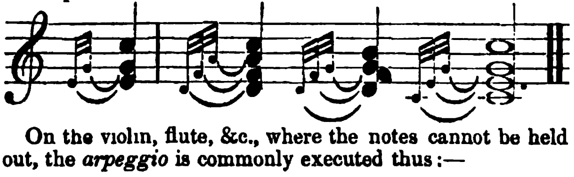
The preparation of iron (carbonate) which is found to be so useful in curing tic-douloureux, can rarely be borne by the stomach for such a length of time, or in such large doses, as are necessary, without adding aromatics to it. They are also very beneficially added to aloëtic purgatives, for the treatment of indigestion and constipation, occurring in literary and sedentary persons. Aromatics are frequently used to disguise the unpleasant taste of many medicines. The disagreeable taste of aloes is concealed by adding the aromatic or compound spirit of lavender, and the intensely bitter taste of the sulphate of quinia is nearly covered by mixing one part of it with ten or fifteen parts of powdered valerian, fennel, aniseed, or orange-peel.

Aromatics are most suited to persons of a phlegmatic constitution, or those advanced in life; less so to the young, or those of very irritable constitutions. They are to be altogether prohibited in certain states of the stomach, or system generally. When there exists any inflammatory condition of the stomach, they would be very improper. And it is necessary to observe, that in all degrees and stages of inflammation of the stomach, debility more or less is felt by the patient, which might seem to indicate their use; but under such circumstances they are extremely hurtful. The same observations apply to the aromatic teas, such as balm and sage, in common use among the people.

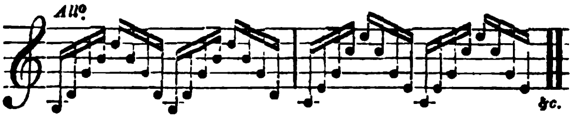
In certain affections of the brain, such as when there is a tendency to apoplexy, they are improper. Cullen mentions the case of a gentleman, who having taken by mistake two drachms of powdered nutmeg, in about an hour became drowsy, and fell from his chair. Being laid in bed, he dropped asleep, but awoke from time to time, and was quite delirious. He thus continued alternately sleeping and delirious for several hours: even the following day he still complained of headach and drowsiness. In the East such cases are of frequent occurrence. Persons predisposed to affections of the brain should abstain from such articles, especially mulled wine at bed-time.

ARO'NA, a town of Piedmont, in the division of Novara, on the western shore of the Lago Maggiore, and near its southern extremity. It stands on the Simplon road from Switzerland to Milan, from which another post-road branches out at Arona, leading to Novara, Vercelli, and Turin. Diligences and mails are established on both roads. Arona is seven miles from Sesto Calende, which is the frontier town of Austrian Lombardy, on that side. The river Ticino forms the boundary between the Austrian and the Sardinian States. Arona is a neat and bustling little town, with a small harbour on the lake; it carries on a considerable transit trade between Piedmont and Switzerland. Goods coming from Genoa and Turin are embarked at Arona, and sent across the lake to the Swiss canton of Ticino, from whence they pass by the new road over Mount Bernardin into the Grisons, and thence into Germany. The population of Arona is between two and three thousand inhabitants. Its situation is delightful, just within the last range of hills above which the snowy Alps are seen towering, and at the opening of the wide plains of Lombardy. The country near Arona produces good wine. S. Charles Borromeo, the celebrated archbishop of Milan, was born in the castle adjoining Arona, which is now in ruins. An enormous colossal statue was raised to him, on a hill above the town, in 1697. It is sixty-six feet high, and stands on a granite pedestal, forty-six feet in height, and is a conspieuous object for miles around. The head, hands, and feet, are cast, the body is made of large stones, and is covered with sheets of hammered copper. (Bertolotti, *Viaggio da Milano à Ginevra.*) The proportions of the statue are very good. The Saint appears holding his breviary under his left arm; the right is extended, in the act of bestowing his benediction on the country. A staircase is made through the inside of the colossus leading into the head of the statue. Arona lies thirty-six miles N.W. of Milan, in 45° 47′. N. lat. and 8° 28′. E. long.

ARPEG′GIO, in music (Ital. *to play on the harp*), is, when applied to keyed instruments, the striking the notes of a chord in rapid succession, as in the manner of touching the harp; instead of playing them simultaneously, the notes, when struck, being held out the full remainder of the time. Example—



On the violin, flute, &c., where the notes cannot be held out, the *arpeggio* is commonly executed thus:—



ARPI′NO, the Roman **ARPI′NUM**. This very antient city is situated near the confines of the Neapolitan kingdom, in the province of Terra di Lavoro, about sixty-eight miles S.E. of Rome, and sixty-five from Naples. It stands on a bold rugged eminence to the left of the river Garigliano, and near the confluence of the Fibreno, or Fiume della Posta (the antient Fibrenus), with the Garigliano (the antient Liris).

The old town, which before the extension of the power of the Roman republic formed part of the territory of the Volsci, was built on the summit of a steep rock. An antient arch (constructed like the false arch of which a cut is given, p. 263), which is not circular, but acuminated, presenting a sharp arrow-head, in the style of the Gothic arch; a considerable extent of walls composed of large stones, put together without any kind of cement; an antient cistern, four subterranean arches, and other traces, still remain. The place is called by the natives Civita Vecchia and Arpino Vecchio. Arpinum, in alliance with Rome, withstood the arms of the Samnites, for which it was rewarded with some of the privileges of a Roman municipium B. C. 302. (Livy, x. i.) About B. C. 188 the inhabitants of Arpinum received the full privileges of Roman citizens, and were enrolled in the Cornelian tribe. (Livy, xxxviii. 36.) It afterwards became celebrated as the birth-place of Caius Marius and Cicero. Though Arpinum partook in the horrors consequent on the overthrow of the Roman power, and in the desolation of the middle ages, it was never wholly obliterated as a city, but has continued, like Aquinum (the birth-place of Juvenal and St. Thomas Aquinas), and like other antient places in the neighbourhood, to be of comparative importance. It once owed its preservation to the fame of Cicero and Marius. In the wars between the houses of Aragon and Anjou for the possession of the Neapolitan kingdom, Arpino took part with the French against the Aragonese and the pope. The pontiff (Pius II.) generously commanded Napoleone Orsini, his successful captain, to 'spare Arpino, for the memory of Caius Marius and Marcus Tullius.'

The town of Arpino, like most others in Italy, gradually descended, as peace and tranquillity were established, from the lofty hill top to lower ground, and it now stands on an inferior ridge nearer to the Liris.

The present population rather exceeds 12,000; manufactories of the best cloth made in the kingdom of Naples, of parchment, paper, and leather, are briskly carried on in the town and its vicinity. From the mountainous nature of the district, and its contiguity to the great sheep and cattle breeding provinces of the Abruzzi, a pastoral air, however, prevails. The surrounding scenery, the picturesque beauty of which is scarcely surpassed in any part of Italy, is woodland and very mountainous. The soil in the valley of the Liris, or Garigliano, is alluvial and productive; and a rich, deep, and black loam, that gives nourishment to extensive woods of the largest oak trees in the peninsula, with the exception of those on Mount Garganus, extends far up the mountains' sides. The river Liris runs in a deep bed its full, clear, rapid stream, very different from the muddy, sleepy character it assumes in the flat country nearer to its mouth, has formed some curious little islands, and a number of cascades, the soothing noise of which is constantly heard in the town of Arpino. The Fibrenus, a deep, rapid, pellucid, and excessively cold mountain stream, which has its sources in a part of the Apennine chain that separates the vale of the Liris from the Fucine lake (now the lake of Celano), joins the Liris by a gentle water-fall, about three miles above Arpino. The banks of both rivers are shaded with poplar trees of exceedingly fine growth. Near its mouth the Fibrenus forks into two branches, between which and the Liris, whose waters wash its base, there is a beautiful little island of a triangular shape. This islet, now called 'L' Isola di San Paolo,' or, more frequently, simply 'L' Isola,' is supposed to be the 'Amalthea' of Cicero, which was one of the orator's favourite retreats. (Cicero *to Atticus*, i. 16, ii. 1.) Opposite to the island, and in an angle formed by one of the branches of the Fibrenus and by the main stream of the Liris, there stands a building called La Villa di San Domenico, which was built for the accommodation of some monks of the Dominican order in the middle ages, on the site and mainly out of the ruins of the great orator's Arpine villa, and which, in its turn, is deserted, and almost a ruin.

The monks seem to have also occupied the site of the habitation of Marius. At the distance of a few miles from the town of Arpino, on the right bank of the Liris, there is a religious house occupied by Trappists (the only monks of that severe order in Italy), which has always borne the name of 'Casamari.'

The antient remains, in addition to those already mentioned, existing in and about Arpino, are neither numerous nor very important. The most interesting are those of the cloacæ, or common sewers of the city, which, like those of antient Rome, are capacious, and built in the finest manner, and the ruins of a Roman bridge across the Liris, between Arpino and Sora. This bridge, which the people, who fondly assign almost every vestige of antiquity to their great countryman, have always called 'Il Ponte di Cicerone,' was thrown over the Liris, not in a straight but in a very oblique line. This was evidently done in order to take advantage of several small islets, on which the piers of the bridge were built, and which lie across the bed of the river in that direction. Only one arch, which is of very good Roman construction, remains entire, but, as well as can be judged, there were three other arches.

Within the town there are some fragments of old Roman roads, or paved streets, and of some inscriptions and broken statues. Two rude and evidently modern busts of Marius and Cicero stand in the piazza, or market-place, where a townhall has been built of late years, with niches for the statues of those two great ornaments of Arpino. The public school is called the Tullian College, and the humble play-house the Tullian Theatre. The initials (M. T. C.) of the orator's name are seen in all directions, and they alone form the insignia or arms of the city. The cloth-manufacturers of the place, more especially, boast that Arpinum was famous in the time of the Roman republic for its woollen goods and the art of dyeing them, and that the father of the immortal Cicero was a fuller.

On each bank of the Liris, or Garigliano, there are numerous sources of mineral waters. Iron abounds in some and fine marble in all of the neighbouring Apennines. Breccia, white marble, *schizzato rosso*, or spotted red, and marble of a beautiful warm yellow hue, are found in inexhaustible quantities, but are very rarely quarried.

In modern times Arpino has given birth to a painter, who, though scarcely to be ranked in the third class of Italian artists, may deserve to be mentioned, because he enjoyed much celebrity in his day, filled many churches both in the Neapolitan and Roman states with his frescoes and pictures, and took his name from the place of his birth. This was Giuseppino di Cesare, always called 'Il Cavalier d'Arpino,' where he was born in 1560; he died at Rome in 1640.

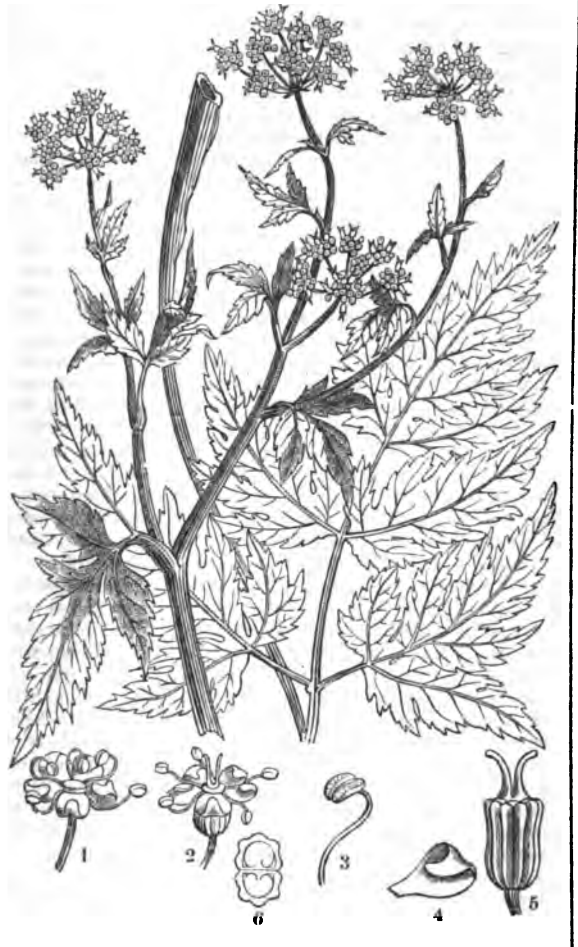
ARQUEBUS. See Arms (Weapons).

ARQUES, a small town in France, about four miles S.E. of Dieppe, in the department of Seine Inférieure. It is upon the little river Arques, or Bethune, which falls into the sea at Dieppe. The town is of little importance. It has a handsome parish church, and a castle now in ruins.

This spot was signalized by the battle fought here on St. Matthew's day, September 21, 1589, between the army of Henry IV. of France and that of the League under the Duke of Mayenne. The engagement was not remarkable either for its fierceness or for the heavy loss sustained by the defeated party; but Henry's success at so critical a period was of the greatest importance to him, and perhaps he might ascribe his subsequent settlement on the throne in no small degree to the victory at Arques.

ARRACA'CIA is a genus of umbelliferous plants which comprehends a species of as much importance in the tropical parts of America as the parsnip and carrot are in Europe. This plant, the *Arracacia esculenta* of botanists, is cultivated in great quantities in the neighbourhood of Santa Fé de Bogota, in the cooler districts among the mountains, and in other parts of the state of Colombia, where it is called Arracacha. It resembles the common hemlock in appearance, but the leaves are much broader, the stems are not spotted, and the flowers are of a dingy purple colour; it is also of smaller stature.

The root is of the same nature as the tuber of a potato, only it is forked, or divided into several lobes, each of which is about the size of a large carrot. These, when fit for eating, are boiled like the potato, and become of a firm but tender consistence, not at all mealy, and have a flavour intermediate between a chestnut and a parsnip. It appears that an immense produce of arracacha is obtained in the South American provinces, where it has long been as much the staple nutriment of the population as the potato or the yam in other places; and as it will only thrive in the colder districts, it was once expected to form an important agricultural plant in Europe. It has, however, been found upon trial unable to accommodate itself to our uncertain climate, and to perish as soon as the cold nights and damp weather of autumn approach, without having been able during the summer to perfect its tubers. It is therefore only cultivated now in botanical collections. For an excellent account of this plant, see Hooker, in *Botanical Magazine* tab. 3092.



Arracacha.

1. A barren flower; 2. a fertile flower; 3. a stamen; 4. a petal; 5. a ripe fruit; 6. the same cut across.

ARRACK. [See ARACK.]

ARRAGON. [See ARAGON.]

ARRAGONITE, called by Mohs the prismatic limehaloide, is a mineral substance, admitting of cleavage in planes parallel to the faces of a right rhombic prism of 116° 5′ and 63° 55′, which may therefore be considered as its fundamental form (*fig.* 1). The most general modifications which occur, consist either in the removal of the four acute angles at A by planes *a* intersecting each other in the short diagonal B B, and inclined to each other at an angle of 108° 18′, by which the face P being entirely removed, the form of *fig.* 2 is produced; or the change may be effected by the truncation of the acute lateral edges of the prism by planes parallel to the axis of the crystal, and therefore inclined to the faces, L, at 121° 57′, giving rise to the form seen in *fig.* 3. These modified forms usually present themselves in twin crystals, in which the short diagonals of the prism B B are placed at right angles to one another, when only two crystals are present, thus producing a very simple cross. It is usual, however, that three of the crystals of *fig.* 3 cross each other, producing a crystal of the appearance of *fig.* 4, which, at first sight, may be mistaken for an hexagonal prism, but on a closer inspection it will be found that what appeared to be a single face, is really composed of two planes, making a reentrant angle.

The intersections of the individual crystals with each other are visible both in the lateral and terminal faces, and are indicated in *fig.* 4 by the dotted lines. These crystals have been found abundantly in a ferruginous clay in Aragon in Spain, where they occur accompanied by sulphate of lime. From this circumstance the mineral has derived its name. It has also been found very beautifully crystallized in a vein of a massive variety of the same mineral traversing basalt at Bilin in Bohemia. (Mohs.) Fine specimens have been found at the following places in England —in the Dufton lead-mines; in a cavern of grauwacke near Merridge, Somersetshire; and also in several parts of Devonshire, &c

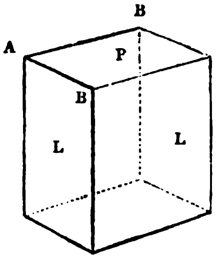
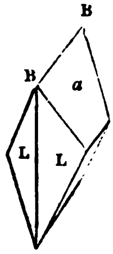


Fig. 1.

Fig. 2.



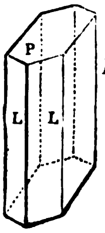
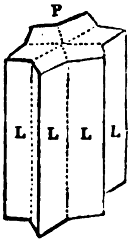


Fig. 3.

Fig. 4.



In an old coal-mine six miles south-west of Cockfield, Durham, it is remarkable as occurring depending from a roof of clayslate and accompanied by tubular calcareous stalactites. (Phillips.) Varieties of this mineral are also common in beds of iron-ore in the mines of Eisenerz in Styria, and in several other iron-mines of Hungary, of Transylvania, &c., consisting of numerous fibrous crystals, of a satin-like lustre, radiating from a centre, and to these the name of *flos ferri* has been applied.

In a chemical and crystallographical point of view, Arragonite is peculiarly interesting, as presenting to us carbonate of lime differing in its system of crystallization from that of the common Calc-spar, and thus affording us an instance of the influence of any difference in the aggregation of matter in changing its physical properties, as will be seen by comparing this substance with the rhombohedral Calc-spar, with which it agrees in chemical constitution. In the scale of Mohs, its hardness (see HARDNESS) varies from 3·5 to 4, while that of Calc-spar is 3. The specific gravity of

Arragonite is	2·931
Calc-spar	2·721

They act also differently on light, the index of ordinary refraction of

Arragonite being	1·693
Calc-spar	1·519

Attempts have been made to account for these differences by considering them the effects of small quantities of carbonate of strontia, which Professor Stromeyer first discovered to be contained in many specimens of Arragonite; but the conclusion is unfounded, as will be seen by the results of two analyses given by Stromeyer.

	First.	Second.
Carbonate of lime	95·2965	99·2922
Carbonate of strontia	0·5090	4·1043
Water	0·1544	0·5992

where the carbonate of strontia is in small and varying proportion, and must therefore be considered as an accidental impurity.

ARRAIGNMENT. This word is derived by Sir Matthew Hale from *arraisoner, ad rationem ponere*, to call to account or answer, which, in antient law French, would be *ad-resoner*, or, abbreviated, *a-resner*. Conformably to this etymology, arraignment means nothing more than calling a person accused to the bar of a court of criminal judicature to answer formally to a charge made against him. The whole proceeding at present consists in calling upon the prisoner by his name, reading over to him the indictment upon which he is charged, and demanding of him whether he is guilty or not guilty. Until very lately, if the person accused pleaded that he was not guilty, he was asked how he would be tried; to which question the usual answer was, 'By God and my country.' But by a late statute (7 and 8 Geo. IV. c. 28. sec. 1) this useless form was abolished; and it was enacted, that 'if any person, not having privilege of peerage, being arraigned upon an indictment for treason, felony, or piracy, shall plead "Not guilty," he shall, without any further form, be deemed to have put himself upon the country for trial, and the court shall, in the usual manner, order a jury for the trial of such person accordingly.'

The arraignment of a prisoner is founded upon the plain principle of justice, that an accused person should be called upon for his answer to a charge before he is tried or punished for it. That this was a necessary form in English criminal law at a very early period appears from the reversal in parliament of the judgment given against the Mortimers in the reign of Edward II., which Sir Matthew Hale calls an 'excellent record.' One of the errors assigned in that judgment, and upon which its reversal was founded, was as follows: 'that if in this realm any subject of the king hath offended against the king or any other person, by reason of which offence he may lose life or limb, and be thereupon brought before the justices for judgment, he ought to be called to account (*poni rationi*), and his answers to the charge to be heard before proceeding to judgment against him; whereas in this record and proceedings it is contained that the prisoners were adjudged to be drawn and hanged, without having been arraigned (*arrenati*) thereupon, or having an opportunity of answering to the charges made against them, contrary to the law and custom of this realm.' (Hale's *Pleas of the Crown*, book ii. c. 28.)

The ceremony of the prisoner holding up his hand upon arraignment is merely adopted for the purpose of pointing out to the court the person who is called upon to plead. As it is usual to place several prisoners at the bar at the same time, it is obviously a convenient mode of directing the eyes of the court to the individual who is addressed by the officer. In the case of Lord Stafford, who was tried for high treason in 1680, on the charge of being concerned in the Popish plot, the prisoner objected, in arrest of judgment, that he had not been called on to hold up his hand on his arraignment; but the judges declared the omission of this form to be no objection to the validity of the trial. (Howell's *State Trials*, vol. vii. p. 1555.)

ARRAN, an island of Scotland, forming part of the shire of Bute. It lies in the bay formed by the peninsula of Cantire [see ARGYLE] and the Ayrshire coast; and is separated from the former by the sound of Kilbrannan, and from the latter by the Firth of Clyde. The distance between the nearest points of Arran and of the island of Bute is above five miles; and from the nearest point in Arran to Skipnish Point in Cantire is about four. From the Ayrshire coast the least distance of the island is about eleven miles. (*Map of Scotland*, published by the Society for the Diffusion of Useful Knowledge.) The greatest length, measured from near Loch Ranza in the N.N.W. to Kildonan in the S.S.E., is more than twenty miles, and the greatest breadth from Drumodune Point to the headland between Brodick and Lamlash bays, about twelve*. The coast is less broken by lochs than that of most of the Hebrides. Loch Ranza on the north side, and on the east the bays of Brodick and Lamlash, are the chief inlets. Lamlash Bay is sheltered by Lamlash or Holy Island, which lies across the entrance, and is nearly two miles long from north to south, with an average breadth of half a mile. The cliffs of Lamlash Island are chiefly basalt, in rude columns, resting on sandstone, and some parts of the island rise to the height of above 1000 feet. The harbour thus enclosed has good holding-ground, sufficient depth for the largest vessels, and room enough for the largest navy to ride at anchor. Brodick Bay is a little to the north of Lamlash Bay (from which it is separated by a headland), and is of an irregular shape, having on the north side an old ruinous castle (Arran Castle) inhabited occasionally by the duke of Hamilton. Behind this castle rises Goatfell, the highest eminence in the island. The bay affords good anchorage-ground and has about five fathoms water; but it is only in moderate weather that vessels can ride in safety. Loch Ranza extends perhaps a mile inland, and has three fathoms water even at the lowest ebb. The approach to the island at this point is striking; at the extremity of a small point of land jutting into the loch are the ruins of a castle of some magnificence, said to have been inhabited by the kings of Scotland when they came to hunt in Arran; beyond is a little plain, or glen, embosomed in hills, watered by a stream, and inhabited by the people of a small village. Besides the island of Lamlash already mentioned, another small island, called Pladda, lies off the south coast of Arran, about a mile distant; it is low and flat, about a mile long, with ten acres of excellent pasture. There is a lighthouse upon it.

The surface of Arran is in general high, particularly towards the north end, where the scenery is terrific and sublime. The mountains here present peaked summits, and are arranged in groups. Goatfell, the highest, is estimated by Professor Playfair to be 2945 feet high; but in the Society's *Map of Scotland* it is marked at 955 yards or 2865 feet; which is also Dr. Macculloch's statement. The lower part of the mountain is composed of red sandstone, but after an ascent of several hundred feet, mica-slate, separated from it by a bed of breccia, rises from under it, and continues till it reaches a kind of irregular plain, from which arises a mass of granite, different from that of the central highlands, in the form of an obtuse pyramid. The side of the mountain is covered with debris of mica-slate and granite, and towards the summit by large blocks of granite, which materially impede the ascent, and the rude appearance of which is increased by the absence of all vegetation, excepting a few lichens. The view from the summit is very extensive, comprehending the south part of Arran, the island of Bute and the Cumbray islands, backed by the mainland of Scotland; the peninsula of Cantire; the mountains of the far-distant Isla, Jura, and Mull; and the coast of Ireland from Fairhead to Belfast Lough. The name of this mountain in Gaelic is *Gaodh Bhein*, 'Mountain of Winds.' The name of Goatfell has been given by the strangers who have visited the island. It is sometimes incorrectly called Goatfield.

The geology of Arran, from its interesting character, has attracted much attention. The prevailing line of the coast is low, although it occasionally rises into precipitous cliffs. Red sandstone is the predominant rock, extending with little interruption from near Loch Ranza on the north side of the island, along the eastern and southern shore, to Sliddery water, near the S.W. extremity of the island. From hence it occurs alternating with claystone and porphyry to Drumodune; and extends, with one interruption, from Drumodune to the river Iorsa, where it finally disappears. Schistose rocks, mica-slate on the west and clay-slate on the north coast, occupy the remainder of the circuit to the point where the sandstone commences.

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* It is surprising to observe the difference in the statements given by different writers of the dimensions of this island, an integral part of Great Britain, and a place which, from its geological features, has attracted much notice. The measurements given above are from the Society's Map of Scotland. In Headrick's *View of the Mineralogy, &c. of Arran*, the length is given at 34 or 35 miles and the breadth at from 15 to 20. Jameson's *Outline of the Mineralogy of the Shetland Islands and of the Island of Arran*, gives 23 miles and 12.

The interior of the island may be mineralogically divided into two parts, separated from each other by an irregular line drawn from Brodick Bay to the mouth of the river Iorsa. North of this line, mica-slate, clay-slate, and granite occur. The schistose rocks rise from beneath the sandstone on the eastern coast, and form, as already noticed, the western coast north of the Iorsa. The centre is occupied by the granite, which forms the lofty and craggy mountains of Goatfell and Kidvoe towards the east; of Caime-na-Caillich, Ben Huish, and Ben Breach, in the centre; and Ben Vearau on the west. The granite approaches the sea so nearly on each side as to reduce the space occupied by the clay-slate and red sandstone on the east, and the mica-slate on the west, to narrow belts. The granite rises into spiry forms, frequently bare of vegetation, and is intersected by deep and rugged hollows, through which mountain-torrents, almost perennial, take their course.

The districts occupied by the different kinds of rock in the southern division of the interior are not so easily determined, owing to the nature of the rocks themselves, and the accumulation of soil on the surface, which renders it difficult to ascertain or lay down their position with any accuracy. All those which are not sandstone are varieties of trap, syenite, porphyry, and other unstratified rocks of the same family, overlying the sandstone. Veins of claystone, clinkstone, or porphyry, traverse the sandstone, and even in some places the granite. (M'Culloch's *Description of the Western Islands of Scotland.*)

The island, from its small dimensions, cannot be supposed to have any extensive lake or important river. Loch Tana or Tannoch or Tanadh (the length of which is vaguely estimated at a mile or a mile and a half, and its breadth at a quarter or half a mile) is several hundred feet above the level of the sea. A small stream, the Iorsa (pronounced Eersa), flows from it into Machry Bay on the west coast. Other rivulets, some of them forming cascades, flow from the hills and through the deep glens into the sea. These are more numerous and more permanent than the size of the island and their character of mountain-torrents would lead us to expect. One, bursting from an orifice in the Dipping Rocks, which are rudely columnar basaltic cliffs about 300 feet high, near the south-east corner of the island, falls into the sea at some distance from the base of the rocks.

At Cory or Corry, on the north-east coast, are quarries of sandstone of a beautiful white colour, well suited for building. The stone from them was used in the construction of the Crinan Canal. [See ARGYLESHIRE.] Slates were once procured near 'the Cock of Arran' (an enormous mass of sandstone lying loose on the north shore of the island, and forming a well-known sea-mark), and some vain attempts to work coal were made many years ago in the same neighbourhood, and also near the bay of Lamlash. Transparent stones, known to the jewellers as Arran stones, Cairngorms, and Scotch topazes, are found on Goatfell.

The climate of Arran is temperate. There is no sultry heat in summer, and the snow-storms in winter are not heavy. Snow lies long on the granite mountains, but only a few hours on the lower lands, and on the sea-shore it is speedily dissolved. The height of the mountains and the position of the island render it very subject to rain.

The island was originally a royal domain mostly clothed with wood; stocked with roes, red-deer, wild-boars, and other animals of the chase, and used much by the kings for hunting. Marks of the antient woods still remain, and extensive coppices of birch, ash, and oak, spring up amidst the cliffs. The earliest creations of private property were in favour of monastic establishments, from which, upon the dissolution of the religious houses, the lands came to the dukes of Hamilton as chiefs of the island, and have continued ever since in that family, by which the greater portion of the island is still possessed. The land which admits of cultivation is not fertile, and is of small extent compared with the surface of the island. Oats, bear or big, potatoes, peas, and beans, are grown. Till of late years the farmers were in a wretchedly depressed condition, owing to the nature of the tenure of land, and the consequent bad methods of farming.

The native breed of horses is small, patient of hunger and fatigue, and remarkably sure-footed. Horses of a larger size are imported from Argyleshire. Hogs were only introduced about 1770. Of wild animals the island produces hares and rabbits: Mr. Pennant, in his *Tour to the Hebrides*, adds the otter and wild cat. The birds are blackcocks, grouse, ptarmigans, plovers, &c. The red-deer and wild goat, formerly abundant, are now nearly if not quite extinct. The eagle and other birds of prey have been nearly extirpated, from the care taken to preserve the game. Serpents, including the common adder, and toads, are found in Arran.

Kelp, till of late, was made in considerable quantity. Most of the woollen cloth used in the island is made by the women. The herring fishery is the only one in which the natives engage. Shoals of these fish often frequent the coast, or the fishermen repair to Loch Fyne [see ARGYLESHIRE], or other places. The basking shark or sail-fish is occasionally taken: they are sometimes near forty feet in length, and yield a good quantity of oil. The roads in the island owe their origin to Ann, duchess of Hamilton, in the seventeenth century, and little seems to have been done from her time till about twenty years since, when roads were made, partly at the expense of government, from Lamlash to Brodick Bay, and from the last to Blackwater on the south-west coast.

The population of Arran, which contains two parishes, Kilmory and Kilbride, was, in 1831, 6427. It had rather declined during the preceding ten years. Most of the people understand English, though the spoken language is Gaelic. Arran, the island of Bute, and the Cumbray islands, make up the shire of Bute. It is in the presbytery of Cantire and the synod of Argyle. Brodick is the principal village.

This island was early subdued by the Norwegians, and it afterwards formed part of the domains of the Lords of the Isles, vassals of the Scotch king. It subsequently formed an earldom, which was held successively by the families of Boyd and Hamilton, and it was not till the reign of James V. (in the sixteenth century) that it was really reduced to obedience to the Scottish crown. It afforded a temporary asylum to Robert Bruce in his adversity, and there is a cave on the west side of the island in which he sought refuge.

Immense cairns, rough obelisks, monumental stones, and other antiquities, supposed to be Druidical, are found in different parts. There are two or three Danish forts, and the remains of a mound of doubtful origin at Drummodun, or Drumodune, on the west side. On Lamlash island are some vestiges of a religious house. Besides Arran Castle and Loch Ranza Castle, there are the ruins of another old castle (Kildonan) on the south coast. A garrison of eighty men, which had been placed in Arran Castle by Oliver Cromwell, having provoked the indignation of the islanders, was massacred by them. (Headrick's *View of the Mineralogy, &c. of Arran*; Jameson's *Outline of the Mineralogy of the Shetland Islands and the Island of Arran*; Pennant's *Voyage to the Hebrides*; *Transactions of the Geological Society*, &c.; Macculloch's *Highlands and Islands of Scotland.*)

ARRAN, ISLES OF, a cluster at the entrance of Galway Bay on the west coast of Ireland, sometimes called the South Isles of Arran, to distinguish them from the island of Arranmore off the coast of Donegal, which is sometimes called North Arran.

These islands are three in number, lying in a line N.W. and S.E.; Arranmore, the largest, being to the N.W., that of Inismain next to it, and then that of Inishere. Arranmore is between six and seven English miles long, and about two miles across in the broadest part. The N.E. coast of these islands presents a sloping shingly beach; the opposite side has fine romantic cliffs, abounding with puffins, on whose eggs, in time of scarcity, the inhabitants subsist. They contain about 7000 acres, are very fertile, and produce a small kind of oat without any husk. The stoutest calves in the county of Galway (in which these islands are included) are reared here.

Each island is an ecclesiastical parish, and forms part of the extensive union of Ballinakill in the archdiocese of Tuam. The population, in the year 1821, was 3979. Many, or indeed most, of the inhabitants are engaged in fishing, and use a *corragh*, or boat made of a frame-work of willow covered with tarred linen, and provided with a rudder. In these rude vessels three or four hardy sailors embark, and trust themselves out far from the shore. A pier, nearly 245 feet long, and a landing quay, 326 feet in extent, have been erected under the direction of the late board of commissioners for the Irish fisheries, at Killeeny, in Arranmore, the largest village in this group of islands, which has a population of 974 persons. This has caused an extension of the number and an improvement in the class of the fishing vessels. A number of vessels rendezvous here during the herring season. The number of pupils at school in the year 1821 in these islands was 214, viz. 161 boys and 53 girls.

Arranmore was also called *Arran a Noim* or *Arran Naomh*, i.e. 'Arran of the Saints,' a number of churches having been erected in it, in which the bodies of many Irish saints repose. It is said that there were antiently on this island ten churches, and five on the two smaller ones. On a high cliff in Arranmore, over the sea, is Dun-Angus, a large circle of huge stones, formed without cement, and capable of holding two hundred cows. A Franciscan friary was founded on one of these islands in 1485.

The inhabitants long retained, and perhaps still retain, the persuasion, that, on a clear day, they can see from this coast *Hy Brasail*, or the Enchanted Island, the paradise of the pagan Irish.

In 1334, these islands, with the neighbouring island of Boffin, were plundered by Sir John D'Arcy, Lord Justice of Ireland. They give the title of earl to the family of Gore. (Seward's *Topographia Hibernica; Letters from the Irish Highlands*, &c.)

ARRAS, a strong and important town in France; the capital formerly of the province of Artois, and now of the department of Pas-de-Calais. It is on the south bank of the river Scarpe, 108 miles N. by E. of Paris through Senlis and Peronne, or 113 miles through Beauvais and Amiens. 50° 17′ N. lat., 2° 45′ E. long.

Arras may be regarded as consisting of three parts. The *Cité*, or what may be termed the old town; the *Ville*, or the new town; and the Citadel, which was erected by Vauban, and is one of the strongest in this part of France. Modern authorities separate the town into upper and lower, but it is not clear whether these divisions correspond respectively to the Cité and Ville of older writers, though it is probable they do. The Cité and Ville were formerly separated by a ditch and wall; there was also between them a narrow valley, through which the little stream, the Crinchon, flowed. The handsome stone houses and large *places* (squares) of Arras entitle it to rank among the finest cities in France, as far at least as regards the lower town, which is comparatively of modern erection. The cathedral, a Gothic edifice in a bold style of architecture; the town-hall, another Gothic building: and extensive barracks, contribute to adorn the city. The *Petite Place*, of which the town-hall forms one side, is surrounded with a colonnade, as well as the *Grande Place*. In some of the highest spots in the city, chalk-pits have been excavated, some of the hollows of which serve as wine-cellars. Part of the surrounding country can be laid under water in case of need.

Arras appears in the Roman writers under the name of Nemetacum, but it afterwards took that of Atrebates, from the people who possessed the town with the surrounding territory. From this name Atrebates, both the town (Arras) and the country (Artois) receive their designation. It appears from the writings of St. Jerome, who lived during the close of the fourth century and the beginning of the fifth, that in his time it was a manufacturing town, and had been pillaged by the barbarians.

When the Franks first established themselves in the N.E. part of France, Arras formed part of their dominions; and, by the earlier kings of France, the lordship of the town was placed in the hands of the bishops of Arras, who retained it till the time of the Emperor Charles V., notwithstanding the power of the dukes of Burgundy, who were counts of Artois. Charles V., having compelled the kings of France to give up the right of sovereignty over that part of the Burgundian dominions which had come to him by inheritance, made them yield at the same time the city of Arras, which he then subjected to the temporal power. It came again under the dominion of France by the treaty of the Pyrenees, in 1659; and the bishops seem to have been re-established in their seignorial rights. The magistrates of the Cité were still nominated by them in the early part of the eighteenth century.

Arras is the see of a bishop, whose diocese comprehends the department of Pas-de-Calais. The population, in 1826, was about 22,000. The Scarpe is navigable from this town; the trade consists both in the agricultural produce of the neighbourhood and in the manufactures of Arras itself, which are cottons and woollens, lace, soap, and beet-root sugar. There are also many oil-mills.

Among the literary and scientific institutions are the High School, the Royal School of Fortification and Military Engineering (*Ecole Royale du Génie*), the Drawing School, the Deaf and Dumb School, the Secondary School of Medicine, the Societies of Agriculture, Commerce, Science, and Arts, a public library of 34,000 volumes, a collection of paintings and antiquities, and a botanical garden.

Arras was the birth-place of Francis Baudouin, a writer of repute on politics, law, history, and divinity, who died in 1573; and of the two Robespierres and Joseph Lebon, of revolutionary notoriety. (Balbi; Malte-Brun; Martinière *Dict. Universel de la France.*)

Two treaties were concluded at Arras in the fifteenth century: one in 1435, between France and Burgundy, by which several towns were annexed to the latter; and one in 1482, between Maximilian of Austria and Louis XI. of France, whereby Margaret, daughter of Maximilian, was to have been given to the dauphin, with Artois and Burgundy, as a dowry.

The arrondissement of Arras contains 218 communes, and 143,615 inhabitants.

ARREOY, a remarkable institution, which formerly subsisted in Otaheite, and the other islands of the Society group. The first notice of the existence of this institution was brought to Europe by Cook, on his return from his first voyage in 1771. The account given in the narrative of the voyage published the following year was however generally supposed to have received a colouring from the florid pen of Hawkesworth, by whom the book was written. In the narrative of his second voyage, which he wrote himself, Cook appears inclined to soften down certain of the features of the former representation. Subsequent statements were given by Dr. Forster and others, for the most part differing from each other in important particulars. The fullest account, we believe, that has appeared, and at the same time the latest, is that given in Ellis's *Polynesian Researches*, vol. i. pp. 311-344.

Hawkesworth's account would lead us to suppose that the distinguishing characteristic of the Arreoy societies was, a community of women among the members. Upon this point it appears clearly that he was mistaken. Forster thinks that a rigid celibacy was the original law of the institution; and this notion receives considerable countenance from the mythological tradition of its origin which is given by Mr. Ellis. To the last, according to Ellis, each member continued to have his own wife, who was watched with extreme jealousy. It is certain, however, that these societies sanctioned and encouraged the greatest licentiousness of manners.

It is now understood that the fundamental law of the Arreoy institution was that no children born to any of the members should be suffered to live. Even upon this head, however, there is a great deal of contradiction in the various accounts, and the information we have is upon the whole very unsatisfactory. Forster states that it was a rare thing for a child ever to be born to a member of the Arreoy, and that consequently infanticide was very seldom resorted to. They chose their wives, he intimates, from among a class of females whose habits rendered it unlikely that they should have families. This however does not appear to be very consistent with the statements of other authorities as to the jealousy with which they were accustomed to preserve the honour of their wives. It appears also that infanticide used to be commonly practised in these islands by all classes of the people, and quite as much by those who were not, as by those who were, members of the Arreoy. Mr. Ellis gives it as his opinion, founded upon all the facts which he had been able to learn, that two-thirds of all the children born used to be thus sacrificed; and, according to his account, the murder was almost always committed by the parents themselves, neither of whom, as a general rule, evinced the least repugnance to the horrid act, or the least shame in acknowledging it. Forster, again, was told by Omai that the mother generally endeavoured to save her offspring, and that the deed was always perpetrated in such a manner as to show the general feeling to be, that it was one which ought to be hidden from the light of day. Without attempting to reconcile these contradictions, we may here merely remark that it seems at any rate difficult to understand how a practice, which thus appears to have prevailed universally, should have been at the same time, as we are told it was, the chief bond of the particular association we are now considering.

The persons who formed this society are described as having been held in the greatest honour by their countrymen, and as having been accustomed to spend their time in the enjoyment of all the abundance and luxury which the general admiration could shower upon them. They travelled about in companies consisting of many hundreds; and wherever they made their appearance, gaiety and dissipation became the order of the day. From some of the accounts it might almost be supposed that they were really an order of public players. They appear to have collected large audiences around them, whom they amused with dances and other exhibitions. Another conjecture, for it can scarcely be called more, is, that the members of the Arreoy were the body of the national soldiery, and that the privileges they enjoyed, and the high estimation in which they were held, were the inducements offered by the state to engage them to defend their country. In general these associated libertines certainly appear to have been among the most eminent warriors of the nation.

Some accounts make these societies to have consisted exclusively of members of the chief families in the country; but, according to Mr. Ellis, they comprehended persons of all classes. If so, there must have existed some barrier against indiscriminate intrusion, the nature of which has not been stated. For if we are to believe the descriptions given of the advantages enjoyed by the members of the Arreoy, it is plain that nothing but the impossibility of obtaining admission into the association could have induced any person to decline entering it. Besides the ease, enjoyment, and honour, which were the lot of its members in the present life, their religion, we are informed, promised them the continuance of the same superiority over their fellow-countrymen in the next. There is no reason to suppose that the necessity imposed upon the members of destroying their children would alone have operated with any material effect to deter persons from seeking the high and tempting privileges which the association conferred; for, as we have seen, infanticide was a custom of universal prevalence among the inhabitants of those islands. It is probable either that the number of the members and the description of the individuals eligible were regulated by some law of the state, or at least that there was some form of election which gave the power of admission and rejection to the society itself. A circumstance which favours this last supposition is, that there are known to have been different classes of the initiated, rising above each other in rank, from one to another of which an individual could only raise himself by his meritorious conduct, and after having belonged for a certain time to the inferior class. Mr. Ellis enumerates seven of these classes. It is not likely that, while each subsequent step was thus made the reward of service and exertion, the attainment of the first degree should have been a matter of course and open to all. It is stated that the more fatiguing work of the public exhibitions was usually left to the novices, or at least to the younger members.

Women as well as men were members of the Arreoy. When it happened, as it sometimes did, that a child born to any of the members was spared by the pity of its parents, both were expelled from the society, and the mother received the reproachful name of *whannownow*, signifying 'bearer of children.' The children are said to have been commonly destroyed by suffocation; but various other methods were in use.

One of the happy consequences of the introduction of Christianity into the island of Otaheite has been the entire abolition of those profligate associations, as well as of the practice of infanticide generally. What effect this change may have upon the progress of population remains in great part still to be ascertained. Mr. Ellis states, that when the missionaries arrived at the islands, the natural proportion of the sexes had been so deranged, that there were four or five men to one woman. Mr. Malthus has given it as his opinion that the Arreoy was in all probability originally instituted with the view of preventing the inconvenient increase of population; and he seems to think that, from the unsparing rigour with which the fundamental law of the association appears to have been observed, it probably had that effect. But this opinion is in opposition to the general fact which, as he notices, had been before remarked by Mr. Hume, that the existence in any country of a law permitting infanticide had usually, from its tendency to promote marriages, by diminishing the fear of their consequences, been attended with the opposite result.

ARREST is the apprehending or restraining a man's person by authority of law.

In criminal matters the object of an arrest is to secure the person of one who has, or is supposed to have, committed an offence, in order that he may be brought before a magistrate; and then, if there appears sufficient ground of suspicion against the party to justify his being put upon his trial, the magistrate takes measures for securing his presence before the proper court, either by committing him to prison, or by taking bail for his appearance.

An arrest may be made either by virtue of a warrant, or, where the law authorizes it, without warrant. A warrant may be granted in extraordinary cases by the privy council, the secretaries of state, and some other public officers; but the only warrants which occur in the ordinary administration of the law are such as are issued by justices of the peace.

When a charge is made before a magistrate, it is his duty to examine the witnesses upon oath, and to take down their statement in writing; and then, if he see any probable ground of suspicion against the party charged, he issues a warrant for his apprehension. The person to whom the warrant is directed,—generally some constable or other peace-officer,—is bound to execute it as far as the magistrate's jurisdiction and his own extends, but if the party to be arrested escapes into another county, the warrant cannot be executed without being *backed*, that is, signed by a justice of the peace for that county. [See WARRANT.]

But in many cases an arrest may be made without a warrant; particularly by officers connected with the administration of justice. A constable, for instance, may arrest, in case of felony, if there is reasonable ground of suspicion; and for any breach of the peace actually committed in his view.

An officer may, upon a criminal charge, break open doors, if, upon demand of admittance, it cannot be otherwise obtained; he may likewise, in apprehending a person charged with felony, use any degree of force that may be necessary; and if the person charged attempt to save himself by flight or resistance, and is killed by the officer (there being no other means of preventing an escape), the homicide is justifiable; but if he kill the officer with the intent to oppose him in the execution of his duty, it is murder.

Private persons also are not only authorized, but required, to apprehend any person who commits a felony in their presence; and in pursuing such felon, they will be justified in breaking open doors and in using force, as much as an officer. A private person may likewise arrest upon reasonable suspicion of felony; but inasmuch as this is not a duty enjoined by the law, he is not armed with the same privileges as where he saw the offence committed: he cannot justify breaking open doors, or using the same degree of force; if he kill the supposed offender, he will be guilty of manslaughter; and if he be killed, the offence will be the same, and not murder: besides this, he acts at his own peril, and is liable to an action unless he can show that a felony had been actually committed, and that there was reasonable ground to suspect the person whom he arrested.

There are also several cases where private persons have the power of arresting given them by act of parliament. Any person whatsoever is authorized to apprehend for any offence against the Vagrant Act, 4 and 5 Geo. IV. c. 83. And where persons are found committing any offence against the Larceny Act, or the Malicious Injuries Act, 7 and 8 Geo. IV. c. 29 and 30, they may be apprehended, without warrant, by any peace-officer, or by the owner of the property, or by his servant, or any person authorised by him.

When an officer has arrested any one, he ought to take him before a magistrate to be examined as soon as possible. Where a private person has made the arrest, he will in general be justified either in taking the party arrested before a justice of the peace, or delivering him over to a constable of the place, and this alternative is expressly given him by the Vagrant Act; but the Larceny Act and the Malicious Injuries Act require that the person arrested should be forthwith taken before a justice of the peace. But if a person be apprehended in an attempt to commit a felony at night, he may lawfully be detained, even by a private person, till he can be carried before a magistrate.

There is likewise another mode of arrest for felony, and that is upon *hue and cry* raised; but though this was once in ordinary practice, it has now fallen into disuse. [See Hue and Cry.] Hale's *Pleas of the Crown*, vol. i. p. 575, vol. ii. p. 72-120; Stephen's *Summary of the Criminal Law*, p. 239-244.

Arrest in civil cases is of two kinds: 1. that which takes place before trial, and is called arrest on mesne process; 2. that which takes place after trial and judgment, and is called arrest on final process, or arrest in execution. [See Process.]

The primary object of arrest on mesne process is to secure the defendant's appearance in court, so as to enable the plaintiff to proceed with his action against him. This compulsory mode of proceeding, being penal in its nature, was originally allowed by our law in such injuries only as are accompanied by force: its use, however, was gradually extended, partly by Acts of Parliament, partly by the fictitious proceedings of the courts, to almost every species of complaint; and by later regulations it has nearly been confined to cases of debt.

When it is intended to proceed by arrest, the plaintiff, after making an affidavit that the cause of action amounts to 20*l*., which by stat. 7 and 8 Geo. IV. c. 71, is now the lowest sum for which a party can be held to bail, commences his action by suing out a writ, called *a capias*, directed to the sheriff, who, on its being delivered to him, grants a warrant to his inferior officers or bailiffs to execute it on the defendant. Upon making the arrest, the officer is required forthwith to deliver to the defendant a copy of the writ, and is not allowed to take him to gaol within twenty-four hours, unless, upon request made, he refuses to go to any place of safe custody. He is in general taken to the house of the officer (vulgarly called a 'spunging-house'), where (if not sooner lawfully discharged) he may be confined until the expiration of the eight days limited for the putting in of special bail.

When arrested, the defendant is in custody of the sheriff; but by stat. 43 Geo. III. c. 46, s. 2, he may obtain his discharge by depositing with the sheriff or his officer the sum sworn to, together with 10*l*. to answer for the costs, or by giving bail for his appearance to defend the action: this being what most commonly occurs, the process upon which an arrest is founded is called *bailable* process. For further information on this subject, see Bail.

Arrest on final process, or arrest in execution, is one of the means by which a party who has succeeded in an action may compel performance of the judgment.

Arrest in execution may in general be resorted to in any case where, before trial, bailable process might issue; when execution has been taken out against the property, and there is not enough to satisfy the judgment, execution against the person may afterwards be resorted to; but if the person has once been taken in execution, no process can in his lifetime issue afterwards against the property. [See Execution.]

An arrest is made by seizing or touching the defendant's person. The officer is not justified in breaking open the defendant's house in order to arrest him; but, when once the arrest is made, he may break into any house in pursuit of him.

In France, imprisonment seems to have existed from the earliest ages as a means of execution to compel the payment of a debt, though its application was originally restricted to cases where the property of the debtor had been previously seized and found insufficient. In the reign of Louis XIV. a principle was introduced, which at the present day constitutes one of the characteristics of French jurisprudence; debts of a commercial nature being distinguished from debts purely civil, and arrest being allowed as of course in the former, but, in the latter, only in a few specified cases.

An arrest, by the law of France, cannot take place without being authorized by the sentence of a court. The cases in which this authority is exercised in matters not of a criminal nature may be classed under four heads:

I. In all cases of commercial debt to the amount of 200 francs (8*l*. sterling), arrest forms part of the sentence as a matter of course. The object of imprisonment is to compel the debtor to give up any property which he may be supposed to have concealed: after a certain length of confinement, it may be presumed that, if he has given nothing up, it was because he had nothing to give; and thus the reason for detaining him ceases to operate. The debtor is, therefore, in all cases discharged from prison, after a certain length of time, varying according to the amount of the debt. In commercial cases, the length of imprisonment varies from one year to five.

II. In actions of a purely civil nature, arrest takes place only in those cases which are specified by the laws. The civil code (*Arts*. 2059, 2060) contains an enumeration of the cases in which it is pronounced as a matter of course. They are chiefly such as imply either gross fraud, or a breach of official duty. The length of imprisonment varies from one year to ten.

There are other cases in which the court have a discretionary power to pronounce sentence of imprisonment if they think fit; the length of confinement varies in this instance from one year to five. In all civil cases, 300 francs, or 12*l* sterling, is the lowest sum for which a person can be arrested.

III. All public servants are liable to arrest in respect of any sum of money to the amount of 300 francs, 12*l*. sterling, due, by virtue of their office to the state, or any public establishment. The duration of imprisonment varies from one year to ten.

IV. With respect to foreigners not domiciled in France the law is peculiarly severe. As their property is presumed to be in their own country, the confinement of their persons is considered to be the only means by which they can be compelled to satisfy their creditors; they are, therefore, liable to arrest for all debts, whether civil or commercial, provided the sum amounts to 150 francs, or 6*l*. sterling. And for this sum a foreigner may be arrested, not only after final judgment, but as soon as the cause of action has arisen. In the latter case, however, he may obtain his discharge by finding sureties, or by proving that he is possessed of sufficient property in France to pay the debt: when arrested on final judgment, the duration of his imprisonment varies from two years to ten.

A debtor who has entered his 70th year cannot be arrested on final process, except in the case *stellionat*, the *stellionatus* of the Roman law, a fraud committed by a party in falsely representing property as being his own or as being free from incumbrance. And with the same exception, a debtor who is in prison is, on entering his 70th year, entitled to be discharged. The debtor likewise obtains his discharge in the following cases:—1. If the creditor give his consent thereto; or 2. If he neglect to advance the sum which the law requires him to pay for the support of the debtor. This sum is now fixed at 25 francs, 1*l*. sterling per month, except in Paris, where it is 30 francs; 3. By payment of the debt, costs and expenses; or, in cases not commercial, by payment of one-third thereof, and finding sureties for the remainder; or 4. By being allowed the benefit of cession, answering to a discharge under the Insolvent Act in English Law. [See Cessio Bonorum.]

See *Côde Civile, Arts*. 2059-2070; *Code de Procédure Civile, Arts*. 780-805; law of 17th of April, 1832; Fœlix, *Commentaire sur la Contrainte par Corps*.

ARRHIDÆUS, a bastard son of Philip III. of Macedonia, who, on the death of his half brother Alexander (B.C. 323) was named his successor by acclamation of the Macedonian troops (Diod. xviii. 2) and consent of Alexander's generals. His title was strengthened by marrying Eurydice, grand-daughter of Perdiccas, Philip's elder brother. Being of weak intellect, he was a mere tool in the hands first of Perdiccas, then Antipater, and finally of Polysperchon, who, in conjunction with Olympias, set up as a rival to him Alexander, son of Alexander the Great by Roxana, who was born after Alexander's death. Eurydice called in the assistance of Cassander; but falling into the hands of Olympias, was, with her husband Arrhidæus, put to death, B.C. 317. [See Antigonus, p. 102. Antipater, Perdiccas.]

ARRIA'NUS, FLA'VIUS, a native of Nicomedia in Bithynia, and one of the most prolific Greek writers of the second century. The date of his birth is unknown, though it was probably during the reign of Domitian, or of Nerva, but we can only infer it generally from the following fact. In the twentieth year of the reign of Hadrian B.C. 136, the successor of Trajan, Arrian was governor of Cappadocia, and in this capacity he addressed a letter to the emperor, containing an account of his voyage from Trapezus (Trebisond) on the Black Sea, along its eastern coast as far as Dioscurias or Sebastopolis. The chief object of the voyage was to inspect the garrisons on this coast. The letter of Arrian to Hadrian is written in Greek, and contains, besides an account of the governor's own voyage, a complete Periplus, or description of the chief places all round the coast of the Black Sea.

(See Hudson's *Minor Geographers*, vol. i.) We cannot well suppose Arrian to have been under forty years of age at this time. Dodwell is inclined, for various reasons, to suppose that he might have been more than fifty when he was governor of Cappadocia. (See his *Dissertation.*) This is the only date in his life that can be fixed with any probability, and such as it is, must be used for his previous and subsequent life. In his youth Arrian was a pupil of Epictetus, who then resided at Nicopolis in Epirus, having been banished from Rome in the reign of Domitian, together with the whole body of philosophers. Epictetus died probably in the earlier part of Hadrian's reign, and Arrian commenced his career as a writer by publishing the *Encheiridion*, or 'Manual,' which is still extant, and contains the moral doctrines of his master. [See Epictetus.] He wrote also eight books, of which four are extant, entitled 'The Philosophical Disquisitions of Epictetus,' which, as he tells us in his preface, addressed to L. Gellius, contain the very words of his master. In addition to these he wrote a work entitled 'Dialogues of Epictetus, and another, 'On the Life and Death of Epictetus,' both now lost. Hadrian, who aspired to the character of a philosopher, was on terms of intimacy with Epictetus, and probably saw him during his stay at Athens in A.D. 123 and 124; and it is not an unlikely conjecture that Arrian, the favourite pupil of Epictetus, was introduced by him to the emperor. Arrian, in his 'Life of Alexander,' seems to attribute his own rise in the world to his literary reputation. After the death of Epictetus and the publication of his philosophical works, Arrian acquired the privileges of a Roman citizen and the Roman name of Flavius; we may presume also the rank of senator, as he was the governor of so important a province as Cappadocia: whether he ever enjoyed the consular dignity does not appear quite certain. Suidas (Ἀῤῥιανὸς) says, on the authority of Heliconius, that he attained the consulship. That he was governor of Cappadocia with full powers is evident from the Periplus of the Euxine Sea and other authorities. Honours and emoluments in his native city of Nicomedia were also conferred upon him, for we learn from Photius, that he held the priesthood of Ceres and Proserpine, a function to which, no doubt, considerable profits were attached, as we may see from other similar examples.

In A.D. 137 a disturbance broke out in the neighbourhood of Trapezus, Arrian's head-quarters, headed by a chief called Pharasmanes. (Dion. Cassius, lib. 69, cap. 15.) The activity of the governor appears to have checked this rising without any further measures than a vigorous display of force; and the war, such as it was, is only curious from the name of the people headed by Pharasmanes. They are called Alani, possibly a mistake for Albani. (See Dion.) We still possess a fragment by Arrian, entitled 'The Order of Battle against the Alans,' probably a part of a larger work on the Alan war; and also a Treatise on 'Military Tactics,' written in the 20th year of Hadrian. (See the conclusion of the *Tactike.*) Gibbon's remark (note, chap. i.), 'that with the true partiality of a Greek, Arrian rather chose to describe the phalanx of which he had read, than the legions which he had commanded,' is not correct, if the fragment on the Alan war was written by him.

After the death of Hadrian (B.C. 138), Arrian probably retired from public life, but he was by no means idle. He wrote a history of 'Trajan's Parthian wars,' in seventeen books; the 'History of Dion of Syracuse;' the 'History of Bithynia,' his native province, in eight books; and, to give a little variety to his occupations, he favoured the public with the biography of the robber Tilliborus, a fellow who for some time annoyed the neighbourhood of Mount Ida. (Lucian, *Alexander.*) A work on comets and meteors, known only by some extracts in Stobæus, is attributed to an Arrian; but whether the author was Arrian of Nicomedia cannot be determined. The work by which he is now best known to us is the 'History of Alexander's Campaigns in Asia,' in seven books, founded principally on the histories of Ptolemy the son of Lagus, King of Egypt, and Aristobulus the son of Aristobulus, both of them the companions of Alexander in his wars. This is almost the only source for the history of Alexander's conquests that we can now use with any confidence, and, indeed, without it we should be utterly unable to form any judgment at all on the military operations of the Macedonian king. Arrian's narrative, however, is often incomplete, and occasionally obscure; the obscurity sometimes, though rarely, arises from the language of the writer, but mainly from the difficulties which he must have experienced in reconciling conflicting authorities (see Arrian's *Preface*). Arrian's history, however, is often the best source that we can appeal to for illustration of the comparative geography of Asia. A general tone of good sense is found all through, but, as was usual with those who undertook to write the Life of Alexander, the faults and vices of his hero are touched with a lenient hand. There is no absolute proof to show at what period Arrian wrote this work. St. Croix tells us, on the authority of Photius, that he wrote it when very young: Dodwell believes it was one of his later productions, written during his retirement and the decline of his life. The following passage in his History of Alexander may help to decide:—he speaks of himself as well known (i. 12), and makes allusion to his honours; but he prides himself still more on his literary labours, which he had prosecuted from his youth upwards. He concludes by telling us, that as Alexander was the best captain, so he himself was the best master of the Greek language, and the fittest person to write about him.—All this savours more of an old than a young author.

As a continuation to his History of Alexander, he wrote a little work, still extant, entitled 'On India,' which contains a great deal of curious matter on the natural productions of that country, and the manners of its inhabitants. It contains also an extract from the 'Voyage of Nearchus,' (cap. 20, &c.) who conducted the fleet of Alexander from the Delta of the Indus to the Euphrates. Arrian's work on the History of Alexander's successors, in ten books, would have formed a valuable commentary on that busy but obscure period; it is now only known by an extract from Photius.

Another valuable little treatise, which bears the name of Arrian, is entitled 'The Periplus of the Erythrean Sea,' that is, the coast description of part of eastern Africa, Arabia, Persia and India: it is by some critics assigned to a period somewhat later than that to which Arrian's life can with reasonable probability be extended. This interesting monument of the early commerce of the Indian Ocean has been illustrated by Dr. Vincent. (*Periplus of the Erythrean Sea.*)

Arrian in general affected to imitate the Attic Greek of Xenophon, but the little treatise on India is written in a kind of Ionic dialect.

Arrian, as we may see from his letter to Hadrian, was no unskilful courtier, and from the rest of his works we may judge him to have possessed a large share of vanity. The model that he proposed to himself was Xenophon the Athenian, and certainly the pains which he took to assimilate himself to his prototype are not a little curious and amusing. Xenophon was an Athenian by birth; Arrian contrived to get himself made one. Xenophon wrote on the philosophical doctrines of his master, Socrates; so did Arrian on those of Epictetus. Xenophon wrote an account of the Expedition of the younger Cyrus, and gave it the appropriate name of the Anabasis or Ascent; Arrian also gave to his History of Alexander, the less appropriate name of the Anabasis of Alexander. Xenophon wrote his Hellenica, or History of Grecian Affairs, a kind of supplement to the Peloponnesian War; Arrian wrote a History of Alexander's successors. Xenophon wrote a Treatise on Hunting; so did Arrian. Both works still remain. Finally, Arrian very modestly calls himself the younger Xenophon, and sometimes simply Xenophon. It is unnecessary to pursue the parallel farther; the following quotation from his book on Hunting will show his character:—'This I shall say, being of the same city with Xenophon, and having the same name, and from my youth up having had the same pursuits —hunting, military science, and philosophy.' Xenophon was a good judge of a horse and a dog, and Arrian also shows by his remarks that he was a true lover of field sports, and had practical knowledge on these matters. He endeavours to supply some of Xenophon's omissions, which he says 'were not caused through any negligence on the part of Xenophon, but from his being unacquainted with the Celtic breed of dogs, and with the Scythian and Libyan breeds of horses.' Arrian's description of his favourite dog Horme (Ὁρμή), his constant companion and friend, is written with the feeling of a sportsman, and gives us also a favourable opinion of his character. How long the second Xenophon, huntsman, general, historian, and philosopher lived, we do not know; it is possible that he lived till the beginning of the reign of Marcus Aurelius, B.C. 161, which would fail to complete the parallel between him and Xenophon, who lived to be above ninety years old. (Lucian, *Macrobii.*) Dion Cassius (see Suidas) is said to have written a life of Arrian. (See St. Croix, *Examen Critique*, &c.; Dodwell's *Dissertations* in vol. i. of Hudson's *Minor Geographers.*)

There are many editions of separate parts of Arrian, but only one, as far as we know, of all his works; that by Borheck, 3 vols. 8vo. Lemgo, which is very incorrect. The latest edition of Arrian's History of Alexander and his India that we have seen, is by Schmieder, Leipzig, 1798. The Periplus of the Euxine and Erythrean seas is in Hudson's *Minor Greek Geographers*, vol. i. A translation of Arrian's book on Coursing was published by J. Bohn, London, 1831, with classical and practical annotations, and with an appendix and twenty-four embellishments from the antique: only 250 copies were printed. Dr. Dibdin calls this book a 'dear delight.' An English translation was published in 1729, in 2 vols. 8vo., by Mr. John Rook, of the History of Alexander's Expedition, with notes, historical, geographical, and critical. To this translation is prefixed, M. Le Clerc's Criticism upon Quintus Curtius; Arrian's Indian History; his Account of the Division of the Empire after Alexander's Death; Raderus' Tables; a Catalogue of the Authors who have written upon his History; a Chronology of the whole; and a complete Index. There is also a translation of the Periplus of the Euxine Sea, by Dr. William Falconer, published in London, in 4to. in 1805. The latest translation of the Anabasis that we have seen noticed is, *Histoire des Expéditions d'Alexandre*, par P. Chaussard, 3 tom. 8vo., Paris, 1802.

ARRIE'GE, or **ARIE'GE**, a river in France, one of the tributaries of the Garonne. It rises deep in the recesses of the Pyrenees, in the ridge which separates France from the valley of Andorra in Spain. It flows N.E., N., and N.W., forming an arc, to the town of Tarascon, receiving on both sides a number of streams, which descend from the lofty ridges, and drain the secluded valleys of the Pyrenees. From Tarascon, which is thirty-one miles from its source, it flows due N. about thirty-one miles farther, by Foix and Pamiers, to near Saverdun; from thence its course is N.N.W., by Cintegabelle (where it receives the Lers, its principal tributary, which falls into it on the right bank), to Auterive, about eleven miles. Here the navigation commences, and the stream flows, still in the same direction, about twelve miles, to its junction with the Garonne, about six miles above Toulouse. Its whole course is about eighty-five miles.

This stream is noted for the excellence of its fish, especially salmon-trout; and also for the gold which is found in its bed. This first occurs at Crampagnac, about four miles and a half N. of Foix, in small quantity; but, following the course of the stream towards the north, it becomes more abundant, and the village of Varilhes, which is nearly two miles below Crampagnac, serves as the southern limit of the gold-searchers; Pamiers may be considered the centre. It is between Varilhes and Pamiers that the largest grains are found; these have, in some very rare instances, weighed half an ounce troy. The gold district continues as far down as Saverdun, fourteen or fifteen miles below Crampagnac, at which it commenced. The subsoil of the neighbourhood and the banks of the river in this district consist of pebbles of all sorts and sizes, more or less firmly united by a softish, easily crumbled, calcareous cement. The gold, however, is found detached from the pebbles with which it is intermingled. The soil above the pebbly stratum produces excellent crops.

The brooks which fall into the Arriège within the limits above described have gold in their channels, but the whole quantity gathered, whether in the river itself or its feeders, is at present inconsiderable.

Some have supposed that this stream derived its name from the gold found in it, asserting that it was antiently called *Aurigera* (gold-bearing); but we are not aware that any antient author gives support to this assertion, and the etymology itself is disputed. (*Encyclopédie Méthodique; Piganiol's Descript. de la France;* Malte-Brun.)

ARRIE'GE, a department of France on the Spanish frontier, comprehending the former county of Foix, and parts of the province of Languedoc, and of the district of Couserans in the province of Gascony. It includes a considerable part of the range of the Pyrenees, which form its southern boundary. On the N. and W. it is bounded by the department of Haute Garonne (Upper Garonne), on the N.E. and E. by that of Aude, and on the S.E. by that of Pyrénées Orientales (Eastern Pyrenees). Its greatest length is, from W.N.W. to E.S.E., 67 miles, and its greatest breadth is 48 miles. Its superficial contents are 2169 squar miles, according to M. Balbi; or 2193, according to M Malte-Brun. The population is 248,000, giving 114 inhabitants to the square mile, according to the first mentioned calculation of surface; or 113, according to the second.

This department is traversed by numerous streams which descend from the Pyrenees, and which flow northward forming by their union the Salat, the Volp, the Arize, and the Arriège, which fall successively into the Garonne. O these the Arize is remarkable for its waters passing unde ground in two places. The Leze and the Lers, streams o considerable length, are feeders of the Arriège. Several o the brooks westward from the Arriège yield gold; they traverse a soil similar in its nature to that through whi the Arriège flows in the gold district.

The mountains are very lofty. The following are the principal summits, with their altitude in English feet. Montcalm, 10,663; Peak of Estats, 10,611; both near the head of the valley of the Vic-de-Sos, a feeder of the Arriège. Peak of Serrere, 9646; Peak of the Port (or Pass) de Siguier, 9613; Peak Pedrons, or Pedrous, 9511; Peak of Mountouléon, 9492; Peak of Fonte Argente, 9370; Peak Lanoux, 9370; Peak of Monvallier, 9249; Prigue, or Peyrie, 9121; Mount Carbere, 8655; and Roc-Blanc, 8320. The Port-de-Rat, at the head of the valley of Vic-de-Sos, is 7473 feet high; that of Puy Moreins, to the east of the last, is 6299 feet.

The mineral wealth of the department is considerable. Iron, lead, copper, and silver, are procured; the last, however, not in any great quantity. There are mineral waters at Ax, a little town on the Arriège near its source; and coal, slates, marble, and jasper are wrought. Turquoises are found in some places.

The southern part of this department is of great elevation, and therefore very cold. It affords fire-wood and pasturage. A considerable quantity of cattle is reared. Medicinal plants are numerous, and the vivid colours of the flowers add to the beauty of the country; a century ago the tulips were in high esteem with the florist. The northern and lower part of the department has a far higher temperature, and great fertility of soil; suited, however, for corn rather than for the vine. The fruit is excellent.

The chief trade of the department is in iron—which is wrought in considerable quantity, especially in the valley of Vic-de-Sos—cork, resin, and wool; and in mules, which are in estimation for their strength. Some manufactures are carried on, as of hats and hosiery, at Foix and Pamiers; of cottons, woollens, and linens, in the latter town; and of woollens, hats, leather, and paper, at St. Girons. The inequality of the ground forms a great obstacle to the transport of goods, which is chiefly effected by means of horses and mules.

The chief towns are Foix, the capital, on the Arriège (population 5000); Pamiers, also on the Arriège below Foix (population 6000); and St. Girons on the Salat (population 4500). Pamiers is a bishopric, and comprehends the whole department in its diocese. It is under the jurisdiction of the archbishop of Toulouse and Narbonne. [See FOIX, GIRONS, ST., and PAMIERS.] Ax, on the Arriège, near its source, has a lead-mine (in the town), and some warm springs, much recommended in some diseases. The population of Ax, at the beginning of the present century, was about 1500. Mirepoix, on the Lers, about fifteen miles east of Pamiers, and Tarascon on the Arriège, had each nearly double the population of Ax at the same period.

The department sends three deputies to the chamber. It is judicially subject to the *cour royale* (assize court) of Toulouse.

ARRIS, in French *Areste* and *Arête*, is a term employed in building. It may be defined as the intersection or line in which the two straight or curved surfaces of a body, forming an exterior angle, meet each other. The term arris, synonymous with edge, is constantly employed by workmen engaged in buildings, especially in the formation of mouldings, whether of stone, wood, or plaster. In parallelopipedal bodies, on which the length and thickness may be measured, as in planks, bond timbers, shutters, &c., the term edge only is used. In Gothic architecture, owing to the numerous lines and angles, the arris is of frequent occurrence; for example, in the mullions and transoms (see MULLION and TRANSOM) of windows, where there are many mouldings, every edge is an arris, whether formed by square mouldings or by the intersection of curves. In Grecian architecture, the raised edge between two flutes of a Doric column, and in both Grecian and Roman architecture, the lines bounding every flat moulding are so many examples of the arris.

ARRIS FILLET, a small triangular piece of wood, used to raise the slates of a roof against the shaft of a chimney or a wall, to throw off the rain more effectually; it is used for the same purpose also in forming gutters round skylights, which have the same inclination as the roof, and are slightly raised above it.

ARROBA, a Spanish measure, both of weight and of capacity, and used as one or other both in Portugal and the Canaries. It exists in Morocco, under the name of Kroba, but with great local variations of value. It is also found to be different in different parts of Spain.

Weight Arroba in Pounds Avoirdupois.

Spanish standard	25·36
Alicant	27·38
Valencia	28·25
Aragon	27·76
Majorca	22·93
Lisbon	32·38

Measure Arroba in Imperial Gallons.

Spanish standard	Greater Arroba	3·54
	Lesser Arroba	2·78
Malaga		3·49
Valencia		2·59
Canaries		3·54

The standard greater arroba (used for wine) is also 981 cubic inches, and the lesser (used for oil) is 771 cubic inches.

ARROE is a Danish island off the eastern coast of Schleswig, due south of the island of Funen, and at the southern entrance into the Little Belt, from which it extends in an oblong form about fourteen miles from N.W. to S.E. Its superficial area is thirty-two square miles; it is divided into five parishes, contains a town and market-village, and has between 7000 and 7600 inhabitants. The surface of the island is a continued level, interrupted only by a lake called the 'Wilt-See;' the soil is very rich and productive, but has no wood. The inhabitants breed considerable quantities of cattle, and raise grain, peas and beans, vegetables, aniseed, and cummin seed: they are actively engaged likewise in fishery and navigation. The landvogt, or bailiff, exercises the executive and judicial powers in all but civil causes, the latter of which are under the cognizance of a local tribunal. Arröeskioebing, at the eastern side of the island, in 54° 53′ N. lat. and 10° 35′ E. long., is the capital; it has a convenient harbour, formed by the opposite shore of the island of Deyerbe, with which Arröe is connected by a bridge. The town consists but of four streets, and has a church, three schools, two of which are for the education of navigators, and 1400 inhabitants, who are the owners of above fifty vessels, and depend chiefly upon trade and shipping for their maintenance. The market-village is called Marstall; it is situated on the western side of the island, and contains about 1480 inhabitants, wholly mariners and fishermen. The island itself forms part of the Duchy of Schleswig.

ARROO, a large island, or, more strictly speaking, a group of islands, in the eastern seas, situated to the south and west of Papua or New Guinea, and north-east from Timor-laut island. The cluster consists of five islands, divided from each other by such narrow channels that the whole have been sometimes considered as one island. The centre lies nearly in 6° S. lat. and 135° E. long. The length of the whole from north to south is about 140 miles, and the average breadth about one-fourth of that measure.

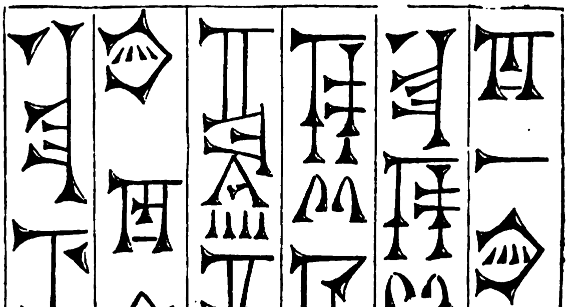
Arroo has never been explored by Europeans, and little or nothing is known of either the interior of the country or the character of the inhabitants. What little knowledge we have of the place has been obtained through the report of Chinese merchants settled at Banda, who carry on a traffic between the islands, procuring from Arroo pearls, tortoise-shell, edible birds'-nests, and an aromatic bark named missoy, which resembles cinnamon, and is much used among the Eastern islands, although never, or but very rarely, imported into Europe.

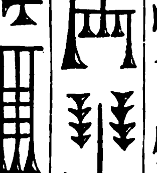
This cluster of islands is likewise remarkable as being much resorted to by birds of Paradise, which breed here in large numbers. These birds are caught for the sake of their beautiful plumage by the natives, who first cut off their legs, and then drawing their entrails, preserve the remainder by means of fumigation. Valentyn has described seven varieties of these birds, of one of which specimens are sometimes found thirty inches in length. In this dried state these birds likewise form an article of commerce between the natives and the Chinese traders. (See Malham's *Naval Gazetteer*, and Hamilton's *East India Gazetteer*.)

ARROW, see ARCHERY and ARMS (Weapons).

ARROW-HEAD. [See SAGITTARII, Constellation.]

ARROW-HEADED CHARACTERS, a name particularly given to those marks which have been found stamped on the bricks of Babylon, and cut upon the marble monuments at Persepolis. They have been found also at Nineveh, on some rocks near Argish on the lake Van in Armenia, at Shus (the site of the antient Susa), and more rarely in Egypt. The arrow-headed characters have also been called in Latin *cuneiformes*, and in German *keilformig*, or *die Keilschrift;* meaning wedge-shaped, and wedge-shaped characters. The arrow-headed character is formed from a very simple element, an isosceles triangle or wedge. Two of these are sometimes joined so as to form a figure not unlike an extended pair of compasses, or very open barbed arrow-head. Some writers on this subject have considered that the characters of Babylon differ essentially from those of Persepolis; but more accurate observation has led others to the conclusion that the cause of the variation lies merely in the difference of the materials on which they occur. Those of Babylon are coarsely stamped upon brick; the Persepolitan inscriptions are sculptured upon marble. The Babylonian characters on account of their ruder shape, are often called nail-headed.





The Persepolitan have a more distinct form, and therefore the term arrow-headed more peculiarly applies to them.

The tablet given in p. 397 is a copy, somewhat reduced, of one of the bricks brought from Babylon, and now in the museum of the East India House. Beneath is a representation very much diminished of one of the bricks: the inscription is on the upper side, and surrounded by a broad plain margin.

It is remarkable that neither the Greek nor Latin classical writers make any very distinct mention of the arrow-headed character, though it has been conjectured that the *'Ασσύρια γράμματα* of Herodotus, iv. 87, and of Thucydides, lib. iv. 50, as well as the *Litteræ Assyriæ* of Plinius, lib. vii. c. 56, refer to Babylonian inscriptions in this character.

Sir William Ouseley, in his *Oriental Collections*, has communicated from a Mohammedan manuscript what professes to be a Persepolitan alphabet; but, like other alphabets which that manuscript contains, it is a mere fiction.

Della Valle saw the supposed ruins of the tower of Babel in the year A.D. 1616. Pietro Della Valle (*Voyage*, Paris, 1747, tome v. p. 320, &c.) and Figueroa, ambassador to the court of Spain, were the first European travellers who are known to have formed any conjecture respecting the interpretation of the arrow-headed characters. They supposed that the direction of the wedges and angles on the Persepolitan monuments favours the conclusion that the inscriptions are to be read from left to right. Chardin inclined to the same view, but added, that they might also be read perpendicularly.

Mandelslo, one of the most intelligent early travellers, who visited the ruins of Persepolis about A.D. 1638, describes the characters which he found there as *triangular*, *pyramidal*, or *like obelisks* (i. p. 11, Leyden ed.)

Chardin, Le Brun, and Kämpfer, towards the close of the seventeenth century, visited the magnificent ruins of Tchilminâr or Tchelminar, which is the modern name of Persepolis. But the travellers of that age seldom took the trouble to copy inscriptions which they did not understand; or, if they attempted a transcript, it was generally inaccurate.

Hyde (*de Relig. Vet. Pers.* pp. 527, 528) and others supposed that the arrow-headed characters at Persepolis owed their origin merely to the capricious whim of the architect, and were placed as mere ornaments round the doors and windows. Others took them for talismans and charms.

In the *Archæologia* (vol. xiv. p. 55) of the London Society of Antiquarians, there is an account, by Dr. Hulme, of a sun-baked Babylonian brick which has the figure of a lion impressed upon it, with an inscription in a different, probably a later, character, of which Mr. Henly, in the same volume, p. 206, discovered the meaning to be עגה אז, *a brick baked in the sun.*

Niebuhr, after his return from the East, published the earliest exact copies of the arrow-headed inscriptions; and thus gave rise to some attempts to explain them; although, owing to the silence of antient writers, little or no external help could be obtained.

Olaus Gerhard Tychsen of Rostock published in 1798, his *Lucubratio de Cuneatis Inscriptionibus Persepolitanis*, and was followed by Münter at Copenhagen (who lately died Archbishop of Zeeland) in an Essay published in Danish in the year 1800, and in German in 1802. Tychsen and Münter thought they had ascertained that the arrow-headed characters are alphabetical, that the words are separated by a character placed obliquely, and that they are to be read from right to left, like the Indian and European alphabets. They endeavoured to prove that a certain group of arrow-headed characters frequently recurring must signify 'king.'

Dr. Joseph Hager published in the *Monthly Magazine* for August, 1801, a fac-simile of one of the bricks stamped with arrow-headed characters, which had been sent to the East India Company; and, in the same year, a dissertation on the newly-discovered Babylonian inscriptions. Dr. Hager supposed the characters to be monograms, formed and combined arbitrarily, and designed to express, not letters or syllables, but either whole sentences or whole words. (Dr. Hager, *Dissertation on the Babylonian Inscriptions*, London, 1801, 4to.) He was of opinion that the characters on the bricks indicated the brick-maker's name. The fac-simile published by Hager excited the inquiries of Lichtenstein. Lichtenstein maintained these characters to be a variety of the antient Arabic or Cufic character, which is derived from the Syriac Estranghelo, and is, with few alterations and modifications, still used in Africa, principally in the empire of Morocco. Led by this supposition, Lichtenstein read, or fancied that he read, some passages of the Koran, or at least imitations of the Koran. He then proceeded to form an alphabet from the fac-simile, which he applied to some Persepolitan inscriptions given by Niebuhr on plate xxiv. under C. E. and L.; and he produced as the result some Persian words, the Persian characters being, he believed, exchanged for the corresponding signs in the Persepolitan alphabet. Several other arrow-headed inscriptions he has declared to be convertible, by the substitution of the Persepolitan signs for the alphabetic letters which they represent, into pure Arabic words. One inscription he considers to be, by a similar process, reducible into words in the Chaldee, or rather in the Aramaic language. Several other arrow-headed inscriptions he has declared to be in pure Arabic, and one in Chaldee, or rather in Aramaic. This writer asserts that the arrow-headed characters are to be read from left to right. He refers the inscriptions in the ruins of Babylon to the seventh or eighth century after Christ.

The interpretations of Lichtenstein are made upon the supposition that in the various combinations of arrow-headed characters one only is essential, and that the rest are added without either necessity or rule. Thus various groups of characters, however different, obtain the same value, according to his interpretation. The resemblance of some strokes of the arrow-headed characters to the Cufic is the only ground for the interpretation which he has offered.

The present director of the gymnasium at Hanover, Dr. Grotefend, has published several treatises on cuneiform characters. It is said that he was led to make it the object of his peculiar attention in consequence of a trifling dispute with one of his friends; in the course of which he laid a wager that he would decipher one of the Persepolitan inscriptions. His dissertation under the title *Prævia de Cuneatis, quas vocant, Inscriptionibus Persepolitanis legendis et explicandis Relatio*, was read before the Royal Society of Göttingen in the year 1800; it was reviewed by Tychsen in the forty-ninth number of the *Göttingischen Gelehrten Anzeigen*, September 18, 1802; and the manuscript, revised and improved by the author, is now in the possession of the London Asiatic Society, and will soon appear in an English translation. Grotefend has also published dissertations on the same subject in various numbers of the *Fundgruben des Orients*.

The leading points of Grotefend's views are,

1. That the arrow-headed characters are not simple ornaments or numerical figures, but real alphabetic characters.

2. That there are on the inscriptions of Persepolis three different systems of arrow-headed or cuneiform writing; that every inscription is triple, so that whosoever is able to decipher one will know the sense of the two others. This triplication of inscription Grotefend finds also on a vase belonging to the National or Royal Library at Paris. In this opinion the late Professor Tychsen of Rostock agreed.

3. That the arrow-headed characters are not syllabic; otherwise there would be words of ten syllables.

4. That all the Persepolitan arrow-headed inscriptions are to be read from left to right.

5. That in the first of the arrow-headed systems there are forty signs; that among these signs are included separate characters representing both the long and the short related vowels. This opinion Grotefend supports by the analogy of the Zend. Tychsen and Münter say nearly the same.

6. That the inscriptions of Persepolis are in Zend.

7. That these inscriptions belong to the period between Cyrus and Alexander. Grotefend thinks that he has discovered in every inscription which he has examined the name of either Darius Hystaspis or Xerxes.

In the *Lettre de M. Silvestre de Sacy à M. Millin sur les Inscriptions des Monumens Persépolitains, extraite du Magasin Encyclopédique, Année VIII.* (1803), tome v. p. 438, this great orientalist points out the inconsistencies in Lichtenstein's statements published in the *Braunschweigischem Magazin*. De Sacy expressed his doubts if Lichtenstein would be able to substantiate his assertions in the more elaborate work which he had promised. This work appeared in quarto under the title *Tentamen Paleographiæ Assyriæ*, 1803, and fully confirmed the predictions of De Sacy. Though De Sacy was more inclined to favour the system of Grotefend, he objects to the grounds on which he maintains that the characters are not syllabic; for De Sacy observes, that in the Sanscrit, Basque, and Greenland languages there are words of more than ten syllables. To the opinion of

Grotefend that the forty signs must contain long and short vowels, because there would otherwise be too many for the purposes of an alphabet, De Sacy objects that the Sanscrit has more than forty consonants, and that in various Shemitic alphabets the shape of the characters is altered according to their position, so that there seem to be more consonants than actually exist. Compare the Arabic and Syriac alphabets.

Dr. Hager, professor of Oriental languages in the University of Padua, published at Milan in 1811, his *Illustrazione d'un Zodiaco Orientale*, which contains matter bearing upon our present subject. The work of Maurice on the *Ruins of Babylon and Persepolis*, London, 1816, contains some observations which coincide with those lately published in the *Morning Watch*, which will be noticed at the conclusion of this article. Proceeding in chronological order, we have next to notice an 'Account of the Progress made in Decyphering Cuneiform Inscriptions,' by Mr. C. Bellino, read on the 13th June, 1818, and published in the *Transactions of the Literary Society of Bombay*. Sir William Ouseley's *Travels*, 1819-1823, as well as the second volume of Ker Porter's *Travels*, 1822, p. 418-426, contain remarks on cuneiform characters, and several fac-similes of them. Several arrow-headed inscriptions are exhibited and explained in *A Dissertation upon the Antiquities of Persepolis*, by William Price, F.R.S.L., Assistant-secretary to Sir Gore Ouseley, Ambassador to the Court of Persia, London, 1825. One of these inscriptions contains a combination of hieroglyphics and arrow-headed characters on a scroll, found in the case of an Egyptian mummy. The *Mémoire relatif aux Antiques Inscriptions de Persépolis lu à l'Académie des Inscriptions et Belles Lettres*, by M. J. St. Martin, 1823, contains some modifications of the opinions of Grotefend. Kenrick's treatise on the 'Antient Inscriptions of Persepolis,' in the *Philosophical Magazine*, 1829, gives an historical survey of the explanations attempted up to that time, and communicates the fact of Schulze having found more than forty arrow-headed inscriptions near the lake Van in Armenia. This has been confirmed by Colonel Monteith's tour through Azerdbijan, &c. (*London Geog. Journ.* 1833). He remarks, that five miles from the fortress of Argish, on the banks of the lake Van, are some remarkable rocks covered with arrow-headed inscriptions. This place is frequented by pilgrims of all religions. The Mohammedans even consider them sacred, though they allow their date to be anterior to the existence of their religion. Colonel Monteith procured an impression of some of the arrow-headed characters on the rock, but they are not given in the *Geographical Journal*

In each of the last four numbers of the *Morning Watch* there is a dissertation by the editor, on the 'Records and Science of Babylon' in general, and on the arrow-headed characters in particular. These dissertations treat principally of the Babylonian inscriptions, and of the bricks found in the ruined buildings more especially; but we understand that the writer has since directed his attention to the Persepolitan remains; and proposes to give a further development of his system. He considers that the arrow-headed characters were first used to symbolise the heavenly bodies; that they are neither alphabetic nor syllabic in their nature, or primary application, though there are instances of their occasional employment to express proper names, as they would be written by an alphabet; that they are not intended, like the Egyptian hieroglyphics, as representations, but simply as symbols.

The editor of the *Morning Watch* believes that the specimens of cuneiform writing found at Nineveh, Persepolis, and Babylon, differ from each other in the individual characters; the elementary characters in the Ninevite inscriptions being different from those of Persepolis; and the Babylonian writing, including the characters of the two others, with some in addition peculiar to itself; that they differ also in the modes of combination; the characters of Persepolis always stand detached and never come into contact, being grouped by juxta-position only; while the Babylonian characters are scarcely ever combined without contact, forming stars, crosses, squares, and triangles in great variety.

This writer divides the Babylonian inscriptions into four classes—calendal, astronomical, genealogical, and magical, or talismanic; noticing a difference either in the elements, or the use, according to the class. He considers that the first two classes have the same elements, but that they differ in the length and arrangement of the series; the calendal inscriptions, containing at the most thirty-five, and usually only thirty groups, arranged in either ten, seven, six, four or three lines, and that the astronomical series contain a indefinite number both of lines, and of groups in each line and in the whole. The inscription on the stone in the museum of the East India Company, which was obtained by Sir Harford Jones, and presented to the Company by Sir Hugh Inglis, contains nearly 600 lines, and more than 680 varieties of grouping. The calendars, for such he has been led to consider the bricks to be by arguments deduced from the order and recurrence of the signs, he states to have contained inscriptions corresponding to the periods of solar and lunar time, so arranged as to admit of a ready comparison of the two; the character employed for these two classes of inscription nearly resembled a straight horn.

'The genealogical character,' he says, 'avoids the horn-shape, and is made up of combinations of two elementary characters; one of which is very narrow, the other very broad; one like a mace or the handle of a lance, the other like a funnel or a pyramid hollowed out to make its point more taper. A series of such combinations runs along the top of these inscriptions in regular order as long as a dynasty lasts, and clusters of such characters hang down to indicate the descent or passage to another dynasty; indications of the date or period seem to occur at the bottom.' The talismanic, or magical character, he states to be 'very uniform, though very abundant, and never designed to have a meaning, being merely a confused medley of forms somewhat similar to those which were known, but so arranged as to be wholly unintelligible. The form of known characters was so far preserved as to have the appearance of a meaning in order to keep alive interest and induce the belief of hidden mystery; while the disorderly clustering and crowding of random forms and the monotonous repetitions of the same form from the very same stamp, demonstrate the design to mystify and deceive by opposite means. The talismans or amulets themselves are found in great abundance, and are of two descriptions; one kind has *indented* characters, the other *raised* characters. 'These,' he says, 'must not be confounded with the seals, whether cylindrical or flat, as these last contain seal characters which threw light on the other inscriptions.'

This writer entertains expectations that the interpretation of the Babylonian inscriptions according to his system will throw much light both on the history of astronomical science and on the dates of antient chronology.

ARROW-ROOT. An article of commerce, which is imported in considerable quantities from both the West and the East Indies. It is a farinaceous substance, prepared from the roots of certain plants. That which is brought from America is made from the root of the *Maranta Arundinacea;* the arrow-root imported from Asia is extracted from the tubers of the *Curcuma Angustifolia.* [For the botanical descriptions of these plants, see MARANTA and CURCUMA.]

The English name of this preparation is derived from the use to which the Indians of South America were accustomed to apply the juice extracted from another species of *Maranta*—the *Maranta galanga*, which was employed as an antidote to the poison in which the arrows of hostile tribes were dipped.

The method of preparing the arrow-root of commerce is the same from whichever of the two plants it is extracted. The root, or tuber, as the case may be, must first be carefully washed, in order to remove the adhering particles of earth, and then it is either grated or beaten to a pulpy consistence in a mortar, which should be formed of wood. The pulp is next intimately mixed with a considerable quantity of pure water, by which operation the fibrous portion is separated from the farina, which remains mechanically suspended in the water. This fibrous portion is then removed, the larger parts by the hand and the minuter parts by straining through a hair-sieve. The remaining milk-like fluid is then left for subsidence, after which the water is drawn off A second and sometimes a third washing in fresh water, and straining through finer sieves of the pulpy residuum, are then employed; after which the starchy matter is collected in a state of purity, and its moisture thoroughly evaporated by exposure to the sun and air. When perfectly dry it is packed in casks or boxes, and will retain its nourishing property unimpaired for many years.

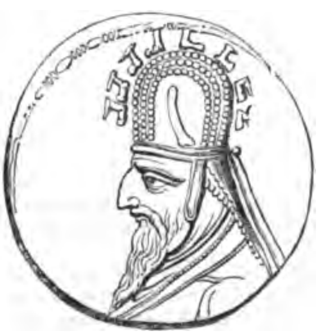
Arrow-root may be used with advantage as the food of young children or of persons in delicate health, since its nutritive property is great, and it is of very easy digestion. It is used either mixed with hot water or boiling milk, or in the form of puddings. The powder is frequently adulterated by the admixture of common starch or the farina of potatoes, and it is therefore advisable to purchase it in the package in which it is imported, or from some dealer of respectability. That which is the most esteemed for purity is imported from the Bermudas and New Providence; but within the last few years the arrow-root of Ceylon has acquired some celebrity: this is made from the American plant the *Maranta Arundinacea*, which was conveyed from the West Indies to Ceylon.

When imported from any British possession arrow-root is subject to the merely nominal duty of one shilling per hundred weight. The quantity consumed in the United Kingdom is about 400,000 pounds weight in the year. (*Library of Entertaining Knowledge, Vegetable Substances*, vol. ii.; Porter's *Tropical Agriculturist; Government Statistical Tables.*)

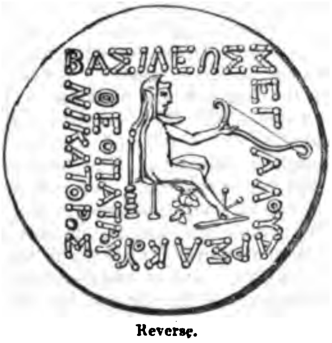
ARROW-ROOT. [See Maranta.]

A'RSACES, the founder of the great Parthian monarchy, which afterwards proved the most effectual bar to the extension of the Roman empire in the East. His birth is doubtful; and it is probably the flattery of courtly writers which traced it to the royal and antient Persian family of the Achæmenidæ. Justin speaks of him as being ‘of doubtful origin, but tried valour, used to live by robbery; who, in the belief that Seleucus (Callinicus) was conquered by the Gauls in Asia, attacked Andragoras, the governor of the Parthians, and took possession of the empire of the nation.’ (xli. 4.) According to Arrian (ap. Phot. *Bibl.* No. 58), a personal and family quarrel led him to raise the standard of revolt from the Syrian empire, B.C. 250, during the reign of Antiochus Theos, father of Seleucus, who, busied with his Egyptian wars, neglected this new source of disturbance until Arsaces had gathered a sufficient party to resist him successfully. Nor was Seleucus Callinicus more fortunate. He made two expeditions into Parthia: the first failed, and the second was still more unfortunate; for he was defeated in a great battle, taken prisoner, and died in captivity. The day of that defeat was long observed by the Parthians as the commencement of their independence. This is the reason that some writers have set down the revolt as first occurring in the reign of Seleucus; but it is certain that it took place under Antiochus.' Arsaces reduced the neighbouring district of Hyrcania, and died, according to Justin, in a ‘ripe old age.’ He seems, from the very meagre accounts which we possess, to have been a successful, and probably, therefore, a prudent and able prince; and, as a token of respect, the Parthian monarchs, to the end of their empire, assumed from him the general title of Arsacidæ. He is said, in the *Anc. Un. Hist.*, to have been killed in battle against Ariarathes IV., king of Cappadocia; which may be true for anything we know to the contrary, but is not warranted by the authorities there quoted.

The small coin which we here give must rather be considered as a specimen of the coinage of the dynasty than as one which can with certainty be referred to any individual of the Arsacidæ. Eckhel (*Catalog. Mus. Cæsar Vindob.* &c. i. p. 253) attributes this small coin to Arsaces I. or II.; Frölich assigns it to Arsaces I. Visconti (*Iconographie Grecque*) assigns the large silver medal (which is magnified to twice its linear measure) to Arsaces VII., and the small one to Arsaces II. The inscription which Eckhel gives on the reverse of the large coin differs from that in the British Museum, in having Θεοπατρος instead of Θεοπατρου.



Obverse.



Reverse.
[British Museum. Silver.]

[From Visconti.]

ARSA'CIDÆ, a name given to the Parthian kings from Arsaces, their progenitor. [For their history, see Parthia.]

ARSENAL, a public establishment where naval and military engines, or warlike equipments, are manufactured or stored. Toulon, Marseilles, Rochefort, and Brest, are naval arsenals.

In the arsenal of Paris, great guns or cannons are cast: in that of Woolwich, all the brass guns used in the British service are manufactured; gun-carriages, Congreve-rockets, all sorts of ammunition, and numerous articles of military equipment, are also both made and warehoused there.

ARSENIC. The term Arsenic is derived from the Greek ἀρσενικόν, which is found first in the works of Dioscorides, and of some other authors who wrote about the beginning of the Christian æra. It denotes, in their works, the substance called σανδαράκη by Aristotle, and ἀῤῥενικόν by Theophrastus (although Pliny, lib. xxxiv. 18, seems to make a distinction between σανδαράκη and ἀρσενικὸν), and is said to be the *auri pigmentum*, the well-known paint, orpiment.

Arsenic is a peculiar metal, which, though long known was first examined with tolerable precision by Brandt in 1733; it is very frequently met with in nature; sometimes in its pure metallic state, but more commonly combined with other metals, as iron and cobalt, or with sulphur, and frequently united with oxygen. It may be artificially obtained from its natural compounds in a mode which will be presently pointed out.

Arsenic has a steel gray colour and considerable brilliancy; its density is 5.700 according to Berzelius, and 5.884 by Turner's experiments; when sublimed, Dr. Thomson states that its density is only 5.235; the native metal is granular, and the artificial crystalline; it is extremely brittle, and consequently easily powdered. When arsenic is exposed to the air, it soon loses its lustre, and becomes black on the surface; the artificially obtained metal not only suffers these changes, but falls to powder by the action of the air: in this state it is known on the continent by the name of *fly-powder*, and is supposed by Berzelius to be a peculiar oxide of arsenic; most chemists, however, regard it as a mere mixture of arsenious acid and the metal. When kept under water, arsenic undergoes no change; if heated to 356° Fahrenheit, it is volatilized, without previous fusion; the vapour has a strong smell, resembling that of garlic and this, to a certain extent, is relied upon as proof of its presence; the vapour readily condenses in small brilliant crystals of metallic arsenic, the form of which it is difficult to determine.

Arsenic and oxygen combine in two proportions, and both compounds possess acid properties; that which contains the smaller quantity of oxygen is termed *arsenious acid;* according to Berzelius it consists nearly of—

2 atoms of arsenic	$38 \times 2 =$	76	or	1 atom . .	=38
3 atoms of oxygen	$8 \times 3 =$	24		$1\frac{1}{2}$ atom . .	=12
atomic weight . .		=100		combining weight	=50

As a natural product, arsenious acid is extremely rare;

it may be artificially prepared by heating the metal in atmospheric air, when, being very combustible, it burns and combines with oxygen; the white vapour of arsenious acid formed, speedily condenses, and frequently in the form of the regular octahedron; this acid may also be procured by heating the metal in very dilute nitric acid, which being decomposed yields oxygen. These processes are, however, needless, for arsenious acid is met with abundantly, and very pure, as an article of commerce; being formed and volatilized during the roasting of cobalt ores, it is first condensed in an impure state, and purified by a second sublimation in an iron vessel. Arsenious acid (oxide of arsenic, the white arsenic of the shops, and of the *London Pharmacopœia)* has the following properties: it occurs in compact masses of various sizes, which are externally colourless and opaque, but internally, when recently broken, frequently yellowish and transparent, and of a glassy appearance and fracture; by exposure to the air the transparency is lost; the density of the opaque kind is 3.706, and that of the glassy 3.699. Arsenious acid is volatilized at 380° Fahrenheit; the vapour has not the garlic smell, like that of metallic arsenic. According to Dr. Christison, arsenious acid has little or no taste; it is well known as a most virulent poison, which does not appear to be the case with the metal. Arsenious acid is soluble in water; at about 60° Fahrenheit it probably dissolves about 1-100th of its weight, and when boiling nearly 1-13th; on cooling to 60°, a considerable portion is deposited in octahedral crystals, so that only about 3-8ths of that taken up remains dissolved; the solution reddens litmus paper but slightly, and though it acts feebly as an acid in this respect, and does not decompose the alkaline carbonates when cold, yet it expels their carbonic acid when they are heated together in solution. The nature of the saline compounds will be presently mentioned.

Arsenic acid, that containing the larger quantity of oxygen, exists in nature much more commonly than the arsenious acid; sometimes it is found combined with lime, and frequently with various metallic oxides, as those of copper, iron, and lead; the arseniates of copper constitute, indeed, a most beautiful and extensive variety of the ores of that metal. Arsenic acid consists of, very nearly, according to Berzelius—

2 atoms of arsenic 38×2= 76 or 1 atom . . =38
5 atoms of oxygen 8×5= 40 or 2½ atoms . . =20
atomic weight . . =116 combining weight =58

Arsenic acid may be formed artificially by heating either the metal or arsenious acid in nitric acid, or, which is preferred, in a mixture of nitric and muriatic acid; the mixture is to be distilled in a glass retort until it has acquired the consistence of a syrup; afterwards it is to be heated nearly to redness in a platina crucible, until all the nitric acid is expelled. The properties of arsenic acid thus prepared are—that it is of a milk-white colour; it contains no water, but when exposed to the air attracts it until a solution of specific gravity 1.935 is obtained; when water is added to the anhydrous acid it dissolves only a part of it for a long time, leaving a white powder, which is, however, eventually taken up; by evaporation a syrupy liquid of specific gravity 2.55 is obtained, which, when concentrated till the temperature rises to 248°, begins to deposit solid matter. The anhydrous acid has not a very strong taste, but the aqueous solution is extremely sour, acts strongly as an acid on litmus paper, and decomposes alkaline carbonates when cold. It is extremely poisonous. Its salts, termed arseniates, will be mentioned hereafter.

Arsenic and azote do not unite.

Arsenic and hydrogen combine; indeed it is one of the few metals which forms a permanent compound with this gas. Arsenuretted hydrogen may be prepared by fusing equal weights of arsenic and zinc, and dissolving the alloy in muriatic acid; the gas may be received in air jars filled with and inverted in water, in which it is insoluble. The properties of this compound are—that it is gaseous at the usual temperature of the air; but when subjected to intense cold, it is condensed into a limpid liquid resembling æther. The gas has an extremely fetid smell; its specific gravity is 2.695; it is fatal to animals when it forms only 1-10th of the air which they breathe. When exposed to atmospheric air, it is decomposed; metallic arsenic, mixed with some arsenious acid, is deposited, and water is formed. It is composed of 3 volumes of hydrogen gas, and 2 of the vapour of arsenic, condensed into 2 volumes, or

3 atoms of hydrogen . . . . = 3
2 atoms of arsenic . . . . . =76
atomic weight . . =79

There is also a solid compound of arsenic and hydrogen; it is obtained by employing arsenic as the negative conductor, when water is decomposed by electricity; the hydrogen of the water, instead of being evolved, combines with the arsenic, and the compound is detached from the metal in brown-coloured flocks. It is probably composed of 1 atom of hydrogen = 1 + 1 atom of arsenic = 38: its atomic weight is therefore 39.

Arsenic and chlorine combine to form chloride of arsenic. When the metal in powder is thrown into chlorine gas, it burns, owing to the rapidity of the combination; when also a mixture of 1 part of arsenic and 6 parts of perchloride of mercury is distilled, a thick, smoking, colourless liquid condenses in the receiver; it is very volatile, and does not become solid at a low temperature. If water and chloride of arsenic are mixed, both are decomposed, and arsenious and muriatic acids are formed. When heated, chloride of arsenic dissolves sulphur and phosphorus, but they separate on cooling; it combines with oil of turpentine and of olives. Chloride of arsenic is probably composed of—

3 atoms of chlorine . . 36×3=108
2 atoms of arsenic . . . 38×2= 76
atomic weight . . . . =184

Another method of preparing chloride of arsenic is, to put 1 part of arsenious acid and 12 parts of sulphuric acid into a retort, heat the mixture nearly to 212°, and then gradually add small fragments of fused common salt; pure chloride of arsenic, which is to be condensed by artificial cold, passes over into the receiver. A little water frequently comes over with the chloride towards the end of the operation, and this hydrated chloride does not mix with, but floats on, the anhydrous chloride first distilled.

Arsenic does not appear to unite with carbon; it combines with bromine, iodine, fluorine, selenium, and phosphorus; but the resulting compounds are not important.

Arsenic and sulphur may be made to combine in four different proportions; two of these sulphurets, and the more important, exist in nature, and these only will be described at any length. The first is the red sulphuret of arsenic, commonly called *realgar;* this is found native in several parts of Europe, and sometimes crystallized. It is of a deep-red colour, brittle, easily reduced to powder, inodorous, tasteless, and insoluble in water: its specific gravity is about 3.338. It may be artificially formed by melting a mixture of arsenic and sulphur in a covered crucible, or the arsenious or arsenic acid may be used. In the latter cases, sulphurous acid is formed and evolved, owing to the oxygen of the acid combining with a portion of the sulphur. In close vessels, it sublimes unchanged. It appears to be poisonous, but less so than arsenious acid. It is sometimes used as a paint, and is composed of—

1 atom of sulphur . . . . . . = 16
1 atom of arsenic . . . . . . = 38
atomic weight . . . . = 54

The second is the yellow sulphuret of arsenic, usually called *orpiment.* This sulphuret is also a natural product, occurring rarely crystallized: it is commonly composed of thin plates, which are of a very fine yellow colour, and flexible to a considerable degree: its specific gravity is 3.452. It is insoluble in water, and inodorous. Acids do not dissolve it, but nitric acid and chlorine decompose it. When heated in close vessels, it melts, and then sublimes; when heated in the air, it burns with a pale blue flame, and gives a white smoke, and a smell of sulphurous acid. It may be formed artificially by passing a current of sulphuretted hydrogen gas into a solution of arsenious acid. It is sometimes used as a pigment, and is a sesquisulphuret composed of—

3 atoms of sulphur . . . . 16×3=48
2 atoms of arsenic . . . . 38×2=76
atomic weight 124

The two other sulphurets of arsenic are unimportant.

Arsenic and metals in general combine with great facility: those which are malleable it renders brittle, and those which are difficult to melt, it renders fusible.

The combination of arsenic with potassium and sodium is attended with the disengagement of much heat. The resulting arseniurets are decomposed by water, the potassium and sodium are oxidized, while the hydrogen of the water converts the arsenic into the brown arseniuret of hydrogen already noticed.

The metallic arseniurets are not of sufficient importance to require a more minute description.

We have now to notice the salts that contain the arsenious acid, and which are termed *arsenites*.

Arsenite of ammonia may be prepared by dissolving arsenious acid in solution of ammonia. It cannot be obtained in a solid form, for by evaporation the salt is decomposed, ammonia is evolved, and octahedral crystals are obtained, which are mere arsenious acid, without a trace of ammonia.

Arsenite of potash is procured by digesting the acid in a solution of the alkali. By evaporation, a saline mass is left, but no crystals of the salt are formed. This compound is employed in the preparation of arsenite of copper, sometimes called *mineral green*. It is also the basis of the *liquor arsenicalis* of the *London Pharmacopœia*.

Arsenite of soda is prepared as the last mentioned. By evaporation, a viscid mass is obtained; and when the evaporation has been continued till the solution has acquired the consistence of a syrup, small granular crystals are obtained as it cools.

Arsenite of lime may be readily procured by mixing an aqueous solution of the acid with lime water; the arsenite being nearly insoluble in water, is precipitated in the state of a white powder: it contains water, is soluble in acids, and even in some saline solutions.

Arsenite of barytes is a white powder, slightly soluble in water.

Arsenite of strontia is soluble in water.

The *metallic arsenites*, strictly so termed, are not in general an important class of salts. We shall notice only two of them.

Arsenite of copper.—This compound was first prepared by Scheele, and by him proposed as a pigment; and it has been long and extensively used as such, under the name of *mineral green*. It is formed by adding a solution of arsenite of potash to one of bipersulphate of copper (blue vitriol). By double decomposition, arsenite of copper is formed, and is precipitated of a fine green colour. The exact composition has not been determined: indeed, it is probable that more than one compound may be formed, or one may be mixed with variable quantities of hydrate of copper.

Arsenite of silver may be made by mixing a solution of nitrate of silver with one of arsenite of ammonia, potash, or soda. It is of a fine yellow colour; and the soluble salts of silver, like those of copper, are occasionally used to afford corroborative evidence in cases of poisoning by arsenic.

The *arseniates* are in several cases presented to us by nature. Thus, in Cornwall, arseniate of iron occurs in small green cubic crystals, and also several beautiful varieties of arseniate of copper. Arseniate of lime, called pharmacolite by mineralogists, is sometimes, though rarely, met with.

The alkaline and earthy arseniates are generally procured either by direct combination or by double decomposition; and the metallic arseniates usually, if not always, by the latter method. We shall describe the arseniates in the same order as the arsenites.

Arseniate of ammonia.—This salt is prepared by adding the alkali to a rather concentrated solution of the acid, until a precipitate appears. If this and the solution be exposed to spontaneous evaporation, large rhombic crystals are obtained. These crystals, when exposed to the air, lose half of their base, and are converted into *biarseniate of ammonia*. When subjected to distillation, the arseniate of ammonia decomposes as it becomes dry, ammonia, water, and azotic gas, are obtained, and the arsenic is reduced.

The *biarseniate of ammonia* may not only be obtained, as above-mentioned, by exposing the neutral salt to the air, but also by adding acid to it. By slow evaporation, large octahedral crystals are formed: when heated, it yields arsenious acid, but no ammonia.

Arseniate of potash.—It may be procured by saturating the acid with the alkali. It is an uncrystallizeable deliquescent mass, and may also be obtained by fusing a mixture of arsenious acid and hydrate of potash. The arsenious acid acquires oxygen from the decomposed water, hydrogen gas being evolved, and sometimes a portion of the arsenious acid is reduced.

Biarseniate of potash may be formed by adding arsenious acid to the neutral arseniate. It is usually prepared by heating a mixture of arsenious acid and nitrate of potash. The nitric acid yields oxygen to the arsenious, so as to convert it into arsenic acid, which uniting with the potash, the biarseniate is formed. The mass, when dissolved in hot water, yields transparent crystals of the salt. The solution reddens litmus paper, showing the excess of acid. The salt suffers no change by exposure to the air: its taste is cooling and saline, somewhat like that of nitrate of potash. It consists of two atoms of arsenic acid, and one atom of potash. The crystals contain water.

The *arseniate* and *biarseniate of soda* are crystallizeable salts, but which do not require any particular notice. The *earthy arseniates* are not of importance.

Arseniate of barytes and *arseniate of strontia* are both soluble salts: they are entirely artificial compounds, and applied to no use. With respect to the metallic arseniates, we have already stated that the arseniates of iron and copper occur in Cornwall: they may also be formed artificially. The *arseniate of silver* is of a brick-red colour, while, as already noticed, the *arsenite* is yellow. Some use is made of this difference in processes for detecting the presence of arsenic. Most metallic arseniates are insoluble in water, but dissolved by acids. As to the general properties of arsenical acids and salts, we shall merely remark that both the acids are precipitated yellow by sulphuretted hydrogen; the arsenites are precipitated yellow by the salts of silver, and green by those of copper; while the arseniates are thrown down red by the silver salts, and blue by the copper ones.

ARSENIC, DETECTION OF. Of all substances, arsenic is that which has most frequently occasioned death by poisoning, both by accident and design; we shall therefore briefly state the methods of ascertaining its presence.

Supposing a white powder to have been found under suspicious circumstances, the process to which it is to be subjected is that of reduction to the metallic state and sublimation, and for this purpose we employ a small glass tube, a spirit lamp and black flux, or fresh burnt and powdered charcoal. The tube should be thin, closed at one end, about one-fourth of an inch in diameter, and three to four inches long; those known by the name of *test tubes* answer the purpose extremely well. Black flux is a mixture of charcoal and carbonate of potash, prepared by deflagrating two parts of bitartrate of potash and one part of nitrate in a crucible. It is to be powdered, and immediately put into a well-stopped bottle to prevent its acquiring moisture from the air; the charcoal which it contains is derived from the decomposition of the tartaric acid, and the potash from that of the bitartrate and nitrate. Mix a small portion, a grain or two, or even less, of the suspected powder with twice its quantity of the black flux, and convey the mixture to the bottom of the tube by means of a trough of smooth writing paper, taking care that none remain adhering to the sides of the tube. Put a paper plug loosely into the tube, and twist a piece of paper round the upper end of it, to serve as a handle; then expose the mixture to the flame of the spirit lamp. The potash of the flux retains the arsenious acid until it is sufficiently heated to be decomposed by the charcoal. If the quantity of arsenious acid be extremely small, then it is better to drop it into the tube, and to let fall a little powdered charcoal upon it. In a very short time the charcoal combining with the oxygen of the arsenious acid, the reduced metal rises in vapour, and condenses in the upper and cool part of the tube; it has a metallic appearance, and is of a brilliant dark steel-grey colour.

Although this effect may be regarded as evidence of the presence of arsenic, Dr. Turner has improved upon it by showing that the metal may be easily re-converted to arsenious acid, and exhibit the characteristic form and properties of that substance, although its weight may not exceed one-hundredth of a grain. This change is effected by holding that part of the tube which contains the arsenic about three-fourths of an inch above a very small flame of the spirit lamp; the metal again sublimes, re-combines with the oxygen of the air in the tube, and well-defined crystals of arsenious acid are formed.

If no solid arsenious acid should be found, but is suspected to exist in solution, either in the food or in the contents of the stomach, then a solution of sulphuretted hydrogen should be added to the suspected fluid, or a current of the gas should be passed into it. This gas is very easily procured by heating powdered sulphuret of antimony and muriatic acid in a flask furnished with a bent tube; or sulphuret of iron may be formed by melting in a crucible a mixture of equal weights of sulphur and iron filings; this sulphuret may be decomposed by diluted sulphuric acid, without heating the mixture. By the action of sulphuretted hydrogen on the arsenious acid a yellow solution is first formed, and by heat, or after exposure to the air, the excess of sulphuretted hydrogen is got rid of, and yellow sulphuret of arsenic is thrown down; this is to be collected, dried, heated in the tube with black flux, and metallic arsenic will sublime, as already described. The same treatment may be adopted with any substance which may be suspected to be either yellow or red sulphuret of arsenic (orpiment or realgar), supposing them to have occasioned poisoning.

If the suspected liquid be tolerably free from colour, then various fluid tests may be used to prove the presence of arsenic previous to the process of reduction just described; many of these tests have been proposed, but there are two only which require particular notice: these are the ammoniuret of copper and the ammoniuret of silver. The former is prepared by adding a solution of bipersulphate of copper (blue vitriol) to one of ammonia, nearly as long as the alkali continues to re-dissolve the oxide of copper at first precipitated; this compound is of a well-known azure-blue colour, and when mixed with a solution of arsenious acid, a green precipitate is formed, which is arsenite of copper. It is to be observed that arsenious acid, added to a solution of bipersulphate of copper, occasions no precipitate; it is requisite either that the arsenious acid should be combined with an alkali, or the oxide of copper with ammonia, and the use of the latter, which is in fact the ammoniuret of copper, is probably the best process.

Ammoniuret of silver is prepared by adding a pretty strong solution of nitrate of silver to a solution of ammonia, taking care that the ammonia is but slightly in excess; this ammoniuret is colourless, and when added to a solution of arsenious acid in water, a yellow precipitate is formed, which is arsenite of silver, and which becomes dark brown by exposure to light.

In the above methods of using sulphuretted hydrogen and the copper and silver tests, but little ambiguity can arise. It is, however, well known that the salts of cadmium give a yellow precipitate with sulphuretted hydrogen; but these can scarcely be confounded with or mistaken for a mere aqueous solution of arsenious acid. The ammoniuret of copper will also turn green when added to a yellow solution of most substances; there are, however, but few bodies which, when merely dissolved in water, will give a green precipitate with this test; the silver test may, under peculiar circumstances, give a precipitate with muriatic acid and muriatic salts; this, however, is colourless, and insoluble in nitric acid. If, therefore, any chloride of silver should have been thrown down with the arsenite, so as to mask the properties of the latter by diluting its yellow tint, add nitric acid to the suspected mixture of chloride and arsenite of silver; the former will remain unacted upon, while the latter will be dissolved, and may, by the cautious addition of ammonia to the nitric solution, be precipitated of its characteristic yellow colour.

It is to be understood that the arsenite of copper and of silver, obtained in the above-mentioned experiments, may, after drying, be reduced by the black flux in the mode already described.

It is to be observed that sulphuretted hydrogen does not precipitate arsenious acid when it is dissolved in alkali, as potash or soda; but on adding a little acetic acid, so as to saturate or supersaturate the alkali, precipitation readily occurs.

Arsenic acid and arseniates have been but rarely taken either by accident or design: sulphuretted hydrogen throws down from a solution of the former yellow sulphuret of arsenic, as with arsenious acid; but with ammoniurot of silver it gives a peculiar reddish precipitate of arseniate of silver, which may be reduced in the tube already mentioned, by means of black flux. The biarseniates give immediately arseniate of silver on the addition of the ammoniuret of silver; but the neutral arseniates require a little acetic acid to produce this effect.

ARSENIC, MEDICAL USES OF. As metallic arsenic has no effect upon the human system, we will confine our observations to the employment and mode of action of the white oxide or arsenious acid, and its compound, the arsenite of potash. The characters of arsenious acid have been given above, but one remarkable circumstance connected with these requires to be noticed here: the degree of solubility depends on the degree of transparency or opacity of the specimen or portion employed. For example, 1000 parts of boiling water dissolve 97 parts of the transparent acid, retaining only 18 parts when cold; but an equal quantity of water will dissolve 115 parts of the opaque variety, and retain 29 parts when cold, the remaining parts being precipitated. It is manifest, therefore, that the strength of a solution must vary with the kind of specimen employed.

The precise character of the taste of white arsenic is a matter of dispute; it is generally said to be acrid and corrosive, followed by an impression of sweetness; but Dr. Gordon states, that it is *at first* always sweet, but afterwards somewhat acid. (Gordon, *Dissert. Inaug. de Arsenico*, Edinb. 1814, p. 9; *Edinburgh Medical and Surgical Journal*, vol. xi. p. 134.)

The white oxide of arsenic being so often employed for the destruction of human life, a dread of it exists not only among the unprofessional part of the community, but even among medical men, which has caused it to be less tried, and its modes of action less studied, than most other medicinal agents of the *Materia Medica*. That it labours under a most unjust opprobrium cannot be doubted, for it is not so poisonous as many other articles frequently used, such as prussic acid and strychnia, while its curative influence is certainly very great. If a small quantity, such as $\frac{1}{30}$th or $\frac{1}{15}$th of a grain be swallowed, in about a quarter of an hour the individual experiences an agreeable sensation of comfort and warmth about the stomach, which gradually extends itself over the whole of the abdomen. The appetite and thirst are moderately increased, the secretion of urine becomes more abundant, and the evacuations from the intestines often more frequent, and of a pulpy or pappy character. From the intestinal canal the peculiar action propagates itself over the whole system. The heat of the surface is augmented, and the increased temperature is experienced particularly about the forehead and eyebrows, and the skin is bedewed with a breathing perspiration. At the same time an increased strength and frequency of pulse is felt. The whole muscular system acquires energy and elasticity; the involuntary muscles especially become more powerful and vigorous in their action; the respiration is gently accelerated. The nervous system partakes of the impulse communicated to the frame, and the spirits as well as the courage of the individual rise, liveliness and regularity characterizing the whole functions of the system.

That the white oxide of arsenic is a tonic, therefore, is sufficiently clear; and that its employment in such doses as we have stated is not only safe but beneficial, may be satisfactorily proved. Not only are old worn-out horses endowed with new vigour, improved appetite, &c. by its use, but pigeons to which this article is given show greater appetite and liveliness than others without it; and in Upper Styria the peasantry use it as a seasoning with many articles of food, such as cheese.

It will not, we trust, be supposed that, by bringing forward these facts and statements, we desire to lead any one to make a hasty or inconsiderate use of this very powerful agent. We only wish to show that much prejudice exists against it, in order that, when circumstances seem to require its use, medical men may not be deterred from employing it, from ignorance of its qualities, nor have to encounter unnecessary difficulties from the objections of others. That oxide of arsenic may accumulate in the system, or may give rise to slow poisoning, cannot be questioned; but if exhibited in appropriate cases, the morbid state of the system seems to act as an antidote to it, just as it acts as an antidote to the disease, health being the result of their neutralizing power. Every medical practitioner knows what large doses of opium may be given with safety and benefit in tetanus and some other diseases: it has been stated, under Antimony, that very large doses of tartrite of antimony can be borne in certain states of the system; and in the West Indies, during the state of insensibility following the bite of a snake called the *coluber carinatus*, eight grains of the white oxide of arsenic and eighty drops of tincture of opium have been given in the course of four hours, that is, one grain every half hour, with the best effect. (See Paper by Mr. Ireland, in *Medico-Chir. Trans.*, vol. ii. p. 393.)

White oxide of arsenic is not often given in the solid form, nor, owing to its variable solubility, is the solution frequently employed: the form most generally chosen is that of its combination with potass, or arsenite of potass; which is the basis of the *liquor arsenicalis* of the London Pharmacopœia, in the preparation of which the quantity of potass is scarcely sufficient to saturate the whole of the acid, some of which must consequently remain free in solution, or be deposited. Before the regular introduction of this into medical practice, it had long been employed in Lincolnshire for the cure of intermittents, under the name of the *Tasteless Ague Drops;* and from having been introduced into practice by Dr. Fowler, it is frequently called *Fowler's Solution.* It is never given in larger quantity than three or five drops, and should always be taken about half an hour after a meal, to prevent it coming into direct or immediate contact with the inner coat of the stomach.

Being considered eminently an anti-periodic [see Ague, vol. i. p. 226], it has been used in most diseases which partake of a periodic character; the chief of these we shall here notice, along with two or three others not possessed of a periodic character. It is most frequently employed in intermittent fevers: the greatest advantage is derived from it in the tertian and quartan forms, the quotidian often resisting this and all other remedies. Its beneficial effects may be increased by giving calomel first; cinchona bark may be given also during the employment of arsenical medicines, but it should rather be alternated with them than given at the same time; certainly they should not be given in the same formula or prescription, though, if the patient be very weak, other tonics may be given along with them. Opium is sometimes advantageously given along with them, but it should be employed in very small quantity.

It has sometimes been given in remittents, which approached nearly to the character of intermittents.

In rheumatic cases it has been used, and is most successful when the pains are markedly periodic, or true to a particular hour in their return. It is equally applicable whether these be general or local, as in some rheumatic affections of the eye. (See Travers *On Diseases of the Eye.*) In nodosities of the bones from rheumatism it is also very valuable.

In some affections, more especially of the nervous system, such as *tic doloureux*, and other neuralgic pains, it is useful. In *cardialgia*, or heartburn, when chronic, if combined with belladonna, it often affords speedy and lasting relief. It has sometimes been advantageously employed in hooping-cough, angina pectoris, epilepsy, and chorea, when tonics were required. In some chronic nervous affections of the mental faculties it has been found useful, such as melancholia and hypochondriasis. And in hydrophobia, tetanus, and the bites of serpents, it is certainly more valuable than any other means we are acquainted with.

In cancer it has been employed both internally and externally; the form generally used in the latter way is the *pâte arsenicale*, but it is not free from danger, and requires great caution. Its internal employment has been mostly in cases where it depends upon constitutional rather than local causes; but if hectic fever be present, it will do more harm than good. It seems to be of more service in cancer of the lip and face than in affections of the glands, as the mammæ or testicles. In cutaneous diseases, such as lepra and elephantiasis, it is often serviceable, and its beneficial action may be increased by giving *liquor potassæ* along with it.

We hold that the previous failure of other and more common remedies is a sufficient justification of the employment, with due caution, of arsenic in any of these diseases.

In case of an over-dose, or of intentional poisoning by arsenic, it is proper that we should indicate an antidote, and point out the mode of treating such a casualty. Both these are difficult. First then, in the case of a substance so sparingly soluble, we cannot see how the stomach-pump is likely to be of service; more especially as the white oxide either adheres firmly to the inner coat of the stomach, or gets imbedded in its substance. A more rational plan is to give a large quantity of lime-water, cold, as the arsenite of lime is almost insoluble, and nearly inert. After that, an emetic of sulphate of zinc (ʒi in a pint of distilled water); then copious draughts of oil (castor oil if possible) or milk. After which the case must be treated on general principles. [See Antidotes, Poisons.]

ARSENICAL MINERALS. Those minerals in which arsenic acts the part of the electro-negative element may be considered as forming a mineralogical family or class, according to the new chemical arrangement of Berzelius. This family comprehends four genera, a tabular view of the principal species of each of which is here given:—

First genus.
Species. Metallic, or native arsenic.
Second genus (metallic arsenurets).
First species. Octahedral cobalt pyrites: speiskobalt of the Germans.
Second species. Hexahedral cobalt pyrites: kobaltglanz.
Third species. Copper nickel arsenuret of nickel: prismatic nickel pyrites.
Fourth species Arsenical silver: octahedral antimony of Jameson: silberspeisglanz of Hausmann · antimonial silver of Phillips.
Fifth species. Arsenuret of bismuth.
Sixth species. Axotomous arsenical pyrites (Mohs).
Seventh species. Prismatic arsenical pyrites (Mohs) mispickel (Phillips): arsenikkies.
Third genus.
Species. White arsenic, or arsenious acid.
Fourth genus (compounds of arsenic acid).
First species. Pharmacolite · arseniate of lime.
Second species. Cobalt bloom.
Third species. Nickel ochre.
Fourth series. Scorodite: martial arseniate of copper from Cornwall.
Fifth species. Olivenite: of this there are two species, the one crystallized in the right, the other in the oblique, prismatic system.
Sixth species. Euchlore mica (Mohs): rhombohedral arseniate of copper (Phillips): kupferglimmer.
Seventh species. Cube ore: hexahedral liriconite: arseniate of iron.
Eighth species. Rhombohedral lead spar.

In addition to the minerals classed in the above genera, several other substances contain arsenic, acting, however, as the electro-positive element; consequently such compounds do not obtain a place here: of these there are but two particularly worthy of our attention, namely, orpiment and realgar, both of which are sulphurets of arsenic in definite, but different proportions. These minerals, a more particular description of which will be found in their proper place, are obtained of great purity from China and Persia, and afford a valuable and beautiful pigment.

The geological position of arsenical minerals is confined to primitive districts, where they occur in metalliferous veins, usually associated with metallic sulphurets, to which the arsenurets have considerable analogy. The only genus which has been found in any quantity is the second, the most abundant species of which are the arsenurets of cobalt, nickel, and iron, which are found both in veins and beds. The fourth genus appears to owe its origin to the action of the atmosphere on the arsenurets; they occur frequently in union with the phosphates, with which they are isomorphous; consequently the phosphoric acid is frequently more or less replaced by the arsenic, or the reverse.

The arsenic contained in any mineral may, in general, be readily detected by the blow-pipe, owing to the characteristic odour of the vapour of metallic arsenic. In performing this operation it is necessary to be careful to submit the mineral to the interior or deoxidizing flame, or, in order to ensure the reduction of the metal more completely, it is advisable to add a small quantity of the powder of charcoal: this reduction to the metallic state is essential, for it is the vapour not of the white, but only of the metallic arsenic, which possesses the peculiar smell of garlic. If the mineral be from its colour suspected to be orpiment or realgar, it must be mixed with a small quantity of black flux in a glass matrass and heated in the flame of a spirit lamp, by which the arsenic will be liberated, and a sulphuret of potassium formed.

Native arsenic is usually found in veins, accompanied by sulphur and sulphurets; it occurs massive, also in reticulated and stalactitic shapes, and of a curved lamellar composition, exceedingly like the layers of an onion. When fractured, the new surface presents a metallic lustre and a tin white colour, which, however, soon tarnishes, becoming a very dark gray. It is brittle, has the specific gravity 5.766, and its hardness is 3.5.

According to Mohs, it is frequently met with in the mines of Annaberg, Schneeberg, Marienberg, and Freiberg in Saxony; at Joachimsthale in Bohemia, at Andreasberg in the Harz, in the Black Forest, in Alsace, at Allemont in Dauphiny, at Kongsberg in Norway, at Kapnik in Transylvania, and in beds at Orawitza in the Bannat of Temeswar.

The second genus presents us with a very valuable series of minerals, owing to properties of the metals with which the arsenic is combined. The first three species will be described under the heads of Cobalt Pyrites and Copper Nickel. The arsenical silver, which constitutes the fourth species, has not been sufficiently investigated. Professor Hausmann considers it as a more or less intimate mixture of prismatic arsenical pyrites with antimonial silver, a compound, according to Klaproth, of 16 to 24 parts of antimony and 84 to 76 of silver. The same chemist states 96 parts of arsenical silver to contain of

Arsenic	35
Antimony	4
Silver	12.75
Iron	44.25

Many mineralogists, on the other hand, consider the antimonial and the arsenical silver varieties of the same species. The first of these occurs in crystals and in granular masses; the latter possesses a curved lamellar composition of thin crystalline plates. They both readily tarnish, and assume a dark gray colour. The specific gravity has been stated by Haüy at 9.446, by Klaproth at 9.82. The antimonial silver is found in veins at Altwolfach in Fürstenberg, and at Andreasberg in the Harz; the arsenical in various mines in the Harz, at Guadalcanal in Spain, and also in Herland mine, Cornwall, &c. It is scarcely necessary to mention that this mineral, when found in sufficient quantity, is highly valuable for metallurgic purposes.

Axotomous arsenical pyrites is a compound of arsenic and iron, occurring in beds of prismatic iron, and also in primitive mountains, accompanied by cobalt and nickel, at Schladning in Styria. Its specific gravity is 7.228.

Prismatic arsenical pyrites, described by some mineralogists under the name of mispickel, is composed, according to the analysis of Stromeyer, of

Iron	36.04
Arsenic	42.88
Sulphur	21.08

Berzelius considers it to be a definite chemical compound, expressed by the following formula:—

$$(Fe\,S^2 + Fe\,As^2)$$

on the supposition that the atomic weight of arsenic is 37·7, and in his own notation.

This mineral possesses a tin-white colour and a metallic lustre. The specific gravity is 6.127, and its hardness 6. It occurs massive, and also crystallized in the system of the right rhombic prism; crystals are seen in many modifications of this system; they admit of cleavage in planes parallel to the faces of a prism, whose angles are 111° 12′ and 68° 48′, which may, therefore, be considered as the fundamental form.

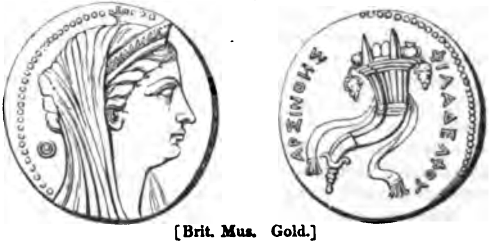
This mineral is found commonly in most of the localities of arsenical minerals, associated with ores of silver, lead, and tin, both in veins and beds. It is a product of almost every mine of Cornwall, as well as those of Saxony, &c. Some specimens contain silver, of which the principal are found at Braunsdorf near Freiberg, in veins of quartz, traversing mica-slate.

White arsenic, which constitutes the third genus, is found crystallized in octahedrons, and also in botryoidal and stalactitic forms, frequently pulverulent. It occurs in metallic veins, and probably is the product of the decomposition of other minerals. The lustre is vitreous, and colour white, with a slight degree of transparency. Its specific gravity is 3.698. It is readily recognised by its behaviour in the blow-pipe: if alone, being volatilized; if on charcoal, being volatilized with the production of the garlic odour.

The general characters of the fourth genus have already been given; the species will be described in their alphabetical order.

ARSE'NIUS, the son of Michael Apostolius, a Greek man of letters of the fifteenth century, who, being exiled from Greece, fled to Italy, where he enjoyed for some time the patronage of Cardinal Bessarion. Having lost his favour, he went to Crete, and gained his livelihood as a transcriber of manuscripts. Arsenius was born in that island towards the close of the fifteenth century. He lived at Rome in the pontificate of Leo X., who made him archbishop of Malvasia, or Monembasia, a town on the eastern coast of the Morea, not very far from the promontory of St. Angelo. He published a collection of Greek apophthegms of remarkable men. (*Praeclara Dicta Philosophorum, Imperatorum, ac Poetarum, ab Arsenio Monembasiæ Archiepiscopo collecta.* Rom. 1523. Calliergi.) He also published Scholia on the first seven plays of Euripides, taken partly from Moschopulus, Lascaris, and Thomas Magister—partly from earlier sources. Venet. 1534. This work was dedicated to Pope Paul III., whose friendship he possessed. The dates of his birth and death do not appear to be known. Having become a member of the Roman, he was excommunicated by the Greek, church, and his credulous countrymen believed that his dead body was taken possession of and animated by a demon. [Fabric. *Bibl. Gr.*, vol. i., p. 655, 6; vol. x., p. 222 and 491, &c. See Bayle also.]

ARSI'NOE, a daughter of Ptolemy I., son of Lagus, king of Egypt, and of Berenice, was married to Lysimachus, king of Thrace, then so far advanced in years that his eldest son, Agathocles, had already espoused Lysandra, the half-sister of Arsinoë. This marriage was by no means a source of happiness to Lysimachus. Arsinoë, fearing lest her children should be exposed to the violence of Agathocles on the death of her husband, prevailed on him to consent to the death of Agathocles, and Lysimachus found himself involved in war with Seleucus in consequence of this atrocious proceeding. One report was, that Arsinoë caused Agathocles to be put to death, because he had declined her proposals. (Pausan. i. 10. Justin. xvii. 1.) Lysimachus fell in battle in Asia, and his kingdom of Macedonia was taken possession of by Seleucus. Seven months afterwards Seleucus was assassinated by Ptolemy Ceraunus, the elder brother of Ptolemy Philadelphus, who also treacherously put to death the two children of his half-sister, Arsinoë, after he had inveigled her into a marriage with him. Their mother he banished to the island of Samothrace. (Justin, xxiv. 3.) So far is Justin's story. Arsinoë would appear to have remained at Samothrace till she was summoned to Egypt, to become the second wife of her brother, Ptolemy II. Philadelphus, king of that country, who reigned from B.C. 284 to 246. This was the first example of an unnatural custom which prevailed among the Greek kings of Egypt, the origin of which it is difficult to account for. Though Arsinoë was now far advanced in years, she was much beloved by her brother, and he called one of the districts of Egypt by her name. The architect Dinocrates was employed by Ptolemy to erect a temple to her honour, and he intended it should be arched with loadstones, so that her statue, made of iron, might have the appearance of being suspended in the air. The death of the architect prevented its completion. We thus find that the Mohammedans of Medina were not the first to whom this strange idea had occurred. (Plin. xxxiv. 14.)



[Brit. Mus. Gold.]

Strabo (x. 460) attributes to this Arsinoë the founding of a city called by her own name on the banks of the Achelous, in Ætolia. (See Steph. Byzant.) This fact, if true, will tend to confirm the opinion of the Arsinoë, the wife of Lysimachus, being afterwards the wife of Ptolemy Philadelphus; the strange adventures of her life, and the confusion in this period of history, render it very difficult to believe all the history of Arsinoë, as it is given by the various authorities.

A statue of Arsinoë existed at Athens in the time of Pausanias (i. 8). The beautiful medal of Arsinoë, which we have given, with a cornucopia on the reverse, confirms what Athenæus says (xi. chap. 13), 'that the kind of cup or drinking vessel called Rhuton (ρυτὸν) was first devised by Ptolemy Philadelphus as an ornament for the statues of Arsinoë; which had in the left hand a cup of this kind filled with the fruits of the earth, by which was indicated that this horn is more fertile than that of Amalthæa.'

ARSINOE, a daughter of Lysimachus, king of Thrace, was the first wife of Ptolemy Philadelphus (according to the opinion of some critics), by whom she had three children, Ptolemy, Lysimachus, and Berenice. But it would appear from Pausanias (i. 7) that this Arsinoë was the second wife. Suspecting that she was plotting against his life, Ptolemy banished her to Coptos, or some city of the Thebaïs. (Schol. Theocr. xvii. 128.) It is probable that she escaped and fled to Cyrene, where she was received with much kindness by its king, Magas, who was the half-brother of Ptolemy Philadelphus. Magas married her, and adopted her daughter, Berenice. To put an end to the quarrel existing between Ptolemy and himself, they agreed that Berenice should marry the son of Ptolemy, who was, as far as we can understand the confused statement of Justin, her own brother; but the death of Magas put an end to the negotiations, and her mother gave her in marriage to Demetrius, son of Demetrius Poliorcetes, whom she summoned from Macedonia for this purpose. Demetrius, on his arrival, according to Justin, gave his affections to Arsinoë, instead of her daughter, which led to his assassination, and the marriage of Berenice and Ptolemy III., by which the kingdoms of Cyrene and Egypt were again united. (See Justin, xxvi. 3.) There is great difficulty in identifying this Arsinoë, and much difference of opinion on the subject. (See Schlosser, Th. ii. Abth. i.)

ARSINOE, daughter of Ptolemy III. Euergetes, was married to her brother, Ptolemy IV. Philopator: she is called Eurydice by Justin, and the Cleopatra of Livy (xxvii. 4.) seems to be no other than Arsinoë. She was present at the battle of Rhaphia, a city not far from Gaza in Palestine, fought between her husband and Antiochus the Great, B.C. 217, and is said to have contributed not a little to gain the victory. [See ANTIOCHUS.] Ptolemy afterwards, seduced by the charms of Agathoclea, ordered Arsinoë to be put to death. (Justin, xxx. 1. Polyb. xv. 33.)

ARSI'NOE, the name of a city in Egypt, at the head of the western branch of the Red Sea, and near the termination of the canal which unites the Red Sea and the eastern branch of the Nile: its name, which was derived from Arsinoë the wife of Ptolemy Philadelphus, appears to have been afterwards changed to Cleopatris. The modern site of Suez must correspond pretty nearly to that of Arsinoë. (Strabo, xvi. 769.)

Arsinoë was also the name of a *nome*, or one of the antient provincial divisions of Egypt which corresponds to the modern FAIOUM. This province, and the chief town in it, derived their name from the Arsinoë just mentioned. The old name of the town was the 'City of Crocodiles,' this animal being highly reverenced there, as we learn from Strabo, an eye-witness (p. 811).

Arsinoë, a name given by Ptolemy Philadelphus, in honour of his wife, to Patara in Lycia, after he had repaired that city: but the old name soon prevailed, and the new one was disused. (Strabo, p. 666.)

Two cities in the island of Cyprus were also called Arsinoë. (See the article *Arsinoë* in Stephan. Byzant.)

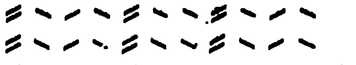
The name Arsinoë occurs in Egyptian Phonetic characters at Gau, Edfu, and Dakké.

The fact of so many places being called by this name, taken in connexion with the medals of the first Arsinoë, helps to fill up the blanks in the history of this period.

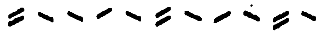
ARSIS (ἄρσις, elevation) is a technical term in antient music and antient metrics. In the latter it denotes that elevation of the voice which we now call metrical accentuation; but whether it consists in a higher musical note, a greater volume, or greater duration of sound, or rather, perhaps, in all the three combined, is matter of dispute. The musician is said to have struck the ground with his foot to mark the arsis, and hence the Latin term *ictus* (stroke) has been used in the same sense. The arsis is opposed to the *thesis* (θέσις) or depression of the voice, the precise meaning of which is of course subject to the same ambiguity. The order in which the arsis and thesis recur, constitutes the law of any verse or metre. It must be recollected, however, that although only two terms are used, yet one arsis may be more energetic than another, one thesis weaker than another. Thus in the ordinary iambic measure of six feet, there are six places marked by the arsis, viz., every even syllable, the second, fourth, &c.; but the stronger arsis attaches itself to the second, sixth, and tenth. The Latin writers on metrics accordingly called the verse we are speaking of sixfold (senarius), while the Greeks applied to it the name of a triple metre (trimeter), the former including every arsis, the latter only those which are more marked. Bentley, following the Greek principle, has inserted only three accents in his edition of *Terence*, yet he was fully aware, and often speaks of the arsis upon the fourth and eighth syllables if not the twelfth also. The German editors of *Plautus* have, for the most part, followed his example. An attention to the difference of power in the stronger and weaker arsis is important for another reason. After the stronger arsis, the thesis must be very weak to mark the contrast, while after the other there may be admitted even a long syllable, provided it has not also the accent. The laws of the iambic, trochaic, Sapphic metres, &c., will afford examples. In many metres, certain variations in the place of the arsis are not merely permitted, but even desirable, at least in poems of any length. In our own iambic metre of five feet, commonly called the heroic verse, the arsis is often found upon the first instead of the second syllable. Again, in the hexameter of Homer, the dactylic arsis, or the arsis followed by two depressions, is the prevailing law; whereas in the Latin hexameter, in addition to the pure dactylic rhythm, we find a large proportion of lines in which there is an approach to an iambic rhythm at the beginning of a line, as in the second verse of the *Æneid*—

"Itáliam fáto prófugus | Lavínaque vénit."

Perhaps this variety may have been more pleasing to the Roman ear, as it is certainly more common in Latin hexameters, from an old attachment to the Saturnian verse, in which the iambic cadence commences, and the trochaic terminates the line; or, in other words, perhaps the Latin hexameter may be a compromise between the Greek hexameter and the Latin Saturnian. A metre in which the arsis is very commonly misplaced by the English reader is the Sapphic, the true melody of which runs thus:—



where ⫽ and ⁄ mark respectively the stronger and weaker arsis; ∖ the thesis; whereas the ordinary English intonation is



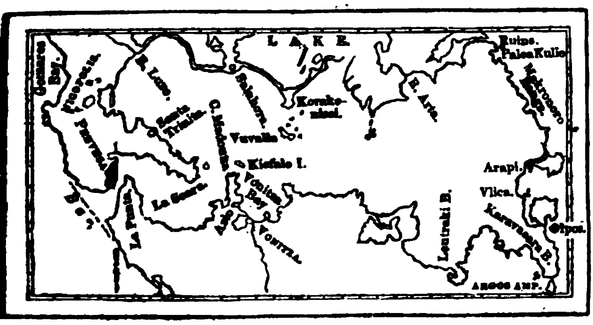
&c.; and thus a melody, which by Horace was selected as peculiarly adapted to the solemnity of the religious hymn, has been degraded by the English into the fit vehicle of burlesque and ridicule. An example may be seen in the pseudo-Sapphic ode on a Knife-grinder in the *Antijacobin*. [See PROSODY, ACCENT.]

ARSIS and THESIS, in music, the rising and falling of the hand in beating time, from ἄρσις, *raising*, and θέσις, *depressing*. These terms were also used by composers who lived in the dark ages of music, to express the inversion of a subject. *Per arsin* is, when the air, or counterpoint, descends from acute to grave; *Per thesin* is, when it ascends from grave to acute.

ARSON (from *ardeo*, to burn), in the technical meaning of the term, at common law, signified the offence of voluntarily and maliciously burning the house of another. This offence always amounted to felony by the law of England, and was punishable with death. But in order to constitute burning a felony at common law, it was necessary that the building destroyed should be a dwelling-house, or a part of it, or at least some of the buildings attached to it. The property destroyed must also have been in the possession *(suo jure)* of some other person than the supposed offender at the time of the fact committed. On these grounds, and on account of the obscure phraseology of several statutes, nice and doubtful questions constantly arose upon the trial of persons charged with arson, both with respect to the nature of the buildings destroyed, and the character of the possession of the proprietor. These ambiguities were removed by a recent statute (7 and 8 Geo. IV. c. 30. sec. 2.), by which it is declared, 'That if any person shall unlawfully and maliciously set fire to any church or chapel, or to any dissenting chapel duly registered, or to any house, stable, coach-house, outhouse, warehouse, office, shop, mill, malt-house, hop-oast, barn, or granary, or to any building or erection used in carrying on any trade or manufacture, or any branch thereof, whether the same, or any of them respectively, shall then be in the possession of the offender, or in the possession of any other person, with intent thereby to injure or defraud any person, every such offender shall be guilty of a capital felony.' By the 5th section of the same statute, setting fire to coal-mines is also declared to be a capital felony; and by the 17th section it is further enacted, 'That if any person shall unlawfully and maliciously set fire to any stack of corn, grain, pulse, straw, hay, or wood, every such offender shall be guilty of a capital felony; and if any person shall unlawfully and maliciously set fire to any crop of corn, grain, or pulse, whether standing or cut down, or to any part of a wood, coppice, or plantation of trees, or to any heath, gorse, furze, or fern, wheresoever the same may be growing, every such offender shall be guilty of felony, and be liable to be transported for the term of seven years, or to be imprisoned for any term not exceeding two years, and, if a male, to be whipped, in addition to such punishment.' The firing must in all cases be wilful and malicious, in order to constitute the crime of arson; but it is not necessary that an intent to injure or defraud should be expressly proved by evidence, as the malicious design may be inferred from such circumstances as obviously point to such an intention; nor is it any defence to a charge of arson to show that the accused had no particular malice towards the owner of the property. The burning of a man's own house, if it be situate in a town, or so near to other houses as to endanger them, is a misdemeanor at common law, punishable with fine and imprisonment.

ART AND PART is a term used in Scotch law to denote the charge of contriving a criminal design, as well as that of participating in the actual perpetration of the criminal fact. The derivation of the phrase is uncertain · Sir George Mackenzie, in his *Discourse upon the Laws and Customs of Scotland in matters Criminal*, says, that 'by *art* is meant that the crime was contrived by the art or skill of the accused (*eorum arte*); and that by *part* is meant, that they were sharers in the crime committed, et quorum *pars* magna fui.' By other writers it has been considered as an abbreviation of the Latin phrase of *artifex et particeps*. It is a charge of very extensive meaning, comprehending not only the offence of accessories before and after the fact according to the English law, and the *ope et consilio* of the Roman law, but also all interference and assistance at the time of the commission of the criminal act. By an ancient Scotch statute, passed in 1592, it is required that in all criminal libels or indictments, the offenders shall be charged as having committed the imputed offence 'art and part.' This enactment was occasioned, as its preamble intimates, by the frequent instances of failure of justice in criminal trials, in consequence of a variance between the evidence and the particulars detailed in the libel or indictment. Thus, previously to the statute, if A and B were charged with murder, and the indictment stated that A held the deceased while B stabbed him, and it appeared in evidence that the facts were reversed, and that B held him while A stabbed him, neither of the accused persons could be convicted. But by the insertion of the charge of 'art and part,' such a failure of justice could not occur; for, in fact, both the panels, or prisoners, are substantially guilty 'art and part,' and are therefore comprehended in the general charge of the indictment. This subject is very copiously discussed in Hume's *Commentaries on the Law of Scotland respecting the Description and Punishment of Crimes*.

ARTA, GULF OF (the 'Αμπρακικὸς κόλπος of the Greek and the Ambracius Sinus of Latin authors), is an arm of the Ionian Sea, between the antient Epirus and Acarnania, and now the boundary between the Turkish province of Albania and the kingdom of Greece. It is twenty-five miles long and ten wide, and is contained between the parallels of 38° 52′ and 39° 3′ N., and the meridians of 20° 43′ and 21° 10′ E. of Greenwich.



Across the entrance is a bar composed of soft sand and sea-weed, over which the greatest depth of water is fifteen feet, and the channel is intricate. Having passed this, the gulf is navigable for vessels of the largest size, and is perfectly free from danger, except off the low shores, where flats extend in some places nearly a mile: but these may be distinguished by the light colour of the water; the banks being of white sand, while in the rest of the gulf the bottom is of black mud. The deepest water is thirty-six fathoms, which is towards the head of the gulf. The narrowest part of the entrance is only 700 yards, and half a mile is its general width in the direction of N E.; it then turns sharply round a low point to the S.E., and opens out much wider for about four miles, the western shore being low and the eastern high. A second entrance is then formed by the two high capes of La Scara and Madonna to the large basin of the gulf, the northern shore of which consists of low sandy ribands, separating large lakes and marshes from the gulf. At the distance of eight or nine miles to the northward of the gulf, a sharp and uneven range of hills runs about east and west; the westernmost part of which, overlooking the Ionian Sea, called Mount Zalunga, is about 1500 feet in height, and continues its undulating descent to the ruins of Nicopolis, three miles north of Prevesa. After a considerable depression, the eastern part of the range rises again to a remarkable three-peaked mountain, called from its colour Mavro Vouno (Black Mountain), which has about the same elevation as Zalunga, but its sides are rugged and precipitous. Between its foot and the lakes before-mentioned, lie the plains of Arta, rich and fertile; but, from the thinness of population and want of commerce, they are little cultivated, and principally devoted to pasture. Farther to the N.E. are ranges of hills connected with the chain of Pindus. To the eastward, and directly on the coast of the gulf, rises the Makronoro ridge, about 250 feet in height, along which runs the road from Albania into Greece: this road is capable of being strongly defended, and particularly at the bottom of Karavasara Bay, where the hills scarcely admit a passage between their bases and the gulf. The southern shore is generally rocky except at the bottom of the bays formed by its irregular line; the hills are round-topped, insulated, and barren, composed principally of limestone and schist, with occasional broad veins of quartz; they descend steeply to the shore. One of these, to the eastward of Vonitza, called Amuthero, rises to the height of 1500 feet. The western shore, from Cape La Scara northwards towards Lake Mazoma, is first rocky and steep; then come grassy cliffs, with a narrow shingly beach at the foot, and lastly, the hills slope gradually down to a low shore.

The only towns on the shores of the gulf are, Prevesa, on the northern side of the entrance, and Vonitza, at the bottom of a bay of the same name on the southern shore. The town of Arta, whence the Gulf derives its appellation, is seven miles from the north coast. At Salahora, which is the port of Arta, there is a custom-house, and there is one also in Karavasara and Loutraki bays. The only village is that of Korakonissi; at Vlica, Arapi, and Karavasara, there are also a few huts.

The ruins of Argos Amphilochicum are now visible at the bottom of Karavasara Bay, in the Gulf of Arta. They are of Cyclopian masonry, situated on a steep acclivity 350 feet high, near the sea. The town which occupied the summit was encircled by walls, and these were tangented by two others, descending the hill and meeting at an angle within a few feet of the beach. The high road from Albania into Greece winds round this angle through a deep ravine commanded by the town, which thus offers a very strong military position.

There is a custom-house, and a few huts near the ruins, known by the name Karavasara. 38° 51′ N. lat., 21° 10′ long. East of Greenwich.

Two rivers, the Luro (antient Charadrus) and the Arta (antient Arachthus), flow into the gulf on its northern shores; both are navigable for boats, seven or eight miles from their mouths. A small stream also flows through the town of Vonitza, affording an abundant supply of excellent water.

The gulf abounds in fish of the finest quality, particularly of the mullet kind; there are also soles, eels, and sardines, and very large prawns. The sardine fishing is generally farmed from the Greek government of Vonitza, whose only right, however, is their naval superiority, by parties of Sicilians, who salt them down in barrels from the nets; but the other fish are taken in fisheries constructed of reeds closely placed in the ground, forming a sort of labyrinth, which terminates in a death-chamber, whence they are taken at pleasure by a hand-net.

The commerce of the gulf is very unimportant and all carried on in small vessels; occasional cargoes of corn and cattle to the Ionian Islands, the vallona, an acorn used for dyeing articles of dress and leather manufactured at Arta, with the exchange of market supplies, constitute the whole trade.

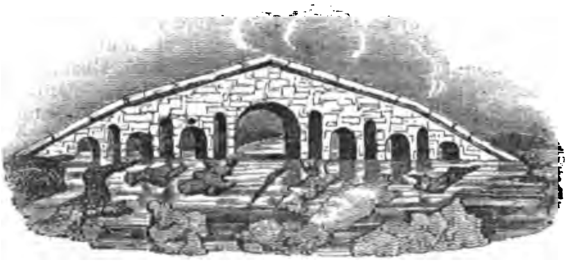
Small veins of coal have been discovered near the convent of Santi Apostoli, on the western side of the gulf, and the rocks bear strong indication of the presence of copper.

There is a rise and fall of about two feet; but this, with the velocity and direction of the current, are much influenced by the wind, so that it cannot be considered as a regular tide. This remark, indeed, applies to the entrance of the gulf more immediately: with the sea-breeze which blows from the westward the current sets to the eastward *into* the gulf, and in the night, when that power fails, the water returns *out* of the gulf.

ARTA, the antient Ambracia, a town of Albania, is situated on the left bank of the river of the same name, and seven miles in a direct line from the north shore of the Gulf of Arta. It is governed by a bey under the pachalick of Yanina, and prior to the struggle for Grecian freedom was a very large and populous city, but having been stormed in 1828 by the Greeks, under Marco Botzaris, was reduced to a ruinous state.

Hellenic remains of considerable extent may still be seen forming the base of the present walls of the castle, which is situated close to the river in the northern quarter of the town. There are also remains of the lower empire in the convent built by the empress Theodosia, about the year 845 of the Christian æra, and another convent, or cathedral, of the same style, but more recent date. Arta is a bishop's see, and has several Greek churches. In the quarter more particularly set apart for trade, each art has its separate street or bazaar, and articles of dress manufactured here are held in high estimation. The floccatas, or shaggy capotes of Arta, are considered the finest; woollens, coarse cottons, and an inferior though strong description of Russia leather, are also manufactured, and this town derives some commercial benefit as the entrepôt between Yanina and the gulf. Butchers kill and vend their meat outside the town; the market is abundantly supplied with fruit and vegetables from the neighbouring country which is fertile and well cultivated, and the plains abound in cattle and sheep.

Distance is reckoned by time at the average rate of three miles to the hour and eight hours to the day. Arta is two days (or thirty-six miles direct distance) S. ¾ E. from Yanina, ten hours (sixteen miles direct) N.E. from Prevesa, and three and a half hours (nine miles direct) N.E. ¼ N. from Salahora. The road to the latter place is very good, as it is the more frequent channel of conveyance for merchandise even to Prevesa. The land transportation of goods is by means of horses, as the people have very few camels, and it is not uncommon to meet a cavalcade of fifty to eighty horses thus laden. There is a bridge of Venetian construction over the river Arta, at the town.



[Bridge at Arta.]

Its whole length is about 200 yards, and the height of the centre angle about 100 feet above the river, which is here divided into numerous streams by sand-banks. Arta lies in 39° 8′ N. lat. and 20° 59′ E. long.

ARTABA'NUS, the last of the Parthian dynasty of the Arsacidæ. He succeeded his brother, and reigned in prosperity until the Emperor Septimius Severus suddenly invaded his dominions and sacked Ctesiphon, his capital, A.D. 199. Caracalla, the son of Severus, injured him more deeply; for having asked and obtained in marriage the daughter of Artabanus, he entered the country with a Roman army, and in the middle of the festivities gave orders for a massacre, A.D. 216, in which numbers of the Parthians perished, and the king himself escaped with difficulty. Indignant at this gross treachery, Artabanus took the field with a numerous army. Caracalla was now dead, having been assassinated on his march between Carrhæ and Edessa, and was succeeded by Macrinus. After a hard-fought and indecisive battle of two days, the Romans came to terms, by informing the Parthian king of the death of Caracalla, against whom he was chiefly incensed, and by restoring the prisoners and booty taken at Ctesiphon. This satisfaction, however, was dearly bought; for it led to the overthrow of the Parthian monarchy. Artaxerxes, otherwise called Ardeshir, took advantage of the losses sustained by the Parthians to incite the Persians to revolt. [See SASSANIDÆ.] After the revolt had been maintained three years, the king and his rebel subject met, each at the head of a powerful army, and after three days' hard fighting the former was beaten, taken, and put to death, A.D. 229. The Parthians in consequence became subject to the Persians, after having been their masters for 475 years. (Herodian, iii. c 9; iv. c. 10 to 15; Lives of S. Severus, Caracalla, and Op. Macrinus, in the *Historia Augusta*; Bayle, *Anc. Univ. Hist.* v. xi.)

ARTAXERXES, or ARTOXERXES, a Persian name, and evidently a compound word, *Arta-Xerxes*. Herodotus (vi. 98) interprets it to signify 'a great warrior.' *Arta* very commonly occurs as the first part of many antient Persian names, such as Arta-banus, Arta-pates, &c. Ammianus Marcellinus (xix. p. 147, ed. Lindenbr. 1603) interprets it as 'conqueror of wars.' We are inclined to consider the root as the syllable *ar*, which appears in many different languages under the form of *er*, *ir*, and *art*, with the addition of *t*, which is not elementary: in all of them it has the idea of courage or strength. Ἄρης, *Mars*, ur, and *Art*, in this Persian word, seem to have the same root. For various opinions on this point, see Herder, *Persepolis*, p. 127; Grotefend, *Beilage zu Heerens Ideen*, i. p. 589; Creuzer, *Symbolik*, i. p. 734; and Pott, *Etymologische Forschungen*, &c. Lemgo, 1833.

I. ARTAXERXES, or ARTOXERXES, surnamed Longimanus (in Greek Macrocheir), from his right hand being larger than his left (Plut. *Artaxerxes*), was the second son of Xerxes I., and succeeded to the throne on the murder of his father and elder brother Darius by Artabanus B.C. 465 or 464. He afterwards narrowly escaped assassination from the same hand, but his superior strength saved him in the struggle, and Artabanus fell by a blow from his dagger. (Compare Ctesias and Diodorus.) During the civil commotions that followed this event, and while the king was engaged in reducing the rebellious province of Bactria, the Egyptians, thinking this a favourable opportunity to recover their independence, of which they had been deprived by Cambyses, rose in arms under Inaros B.C. 460, and nearly freed their country from the yoke of the Persians. They at the same time received a numerous body of Athenian auxiliaries. Artaxerxes employed his uncle Achæmenes or brother (Ctes.) to reduce them to obedience, but he was defeated and slain. (Herodot. iii. 12; vii. 7.) In a second expedition which he sent under Artabazus and Megabyzus he was more successful, and the Athenians found themselves obliged to evacuate the country, B.C. 455, leaving Egypt in the hands of the Persians after an obstinate resistance of six years, during part of which time the Athenians were absolutely in possession of Lower Egypt. The Athenians, however, still continued the war, and sent a body of troops under Cimon to take possession of Cyprus. Cimon defeated the Persians several times, and had nearly reduced the whole of the island when he was cut off by disease B.C. 449. Peace was then concluded on the following conditions:— 1. That all the Greek cities of Asia should enjoy full independence. 2. That no Persian ships of war should enter the sea extending from the coasts of Pamphylia as far as the entrance to the Black Sea. 3. That no Persian army should approach within a horseman's day's journey of the Grecian seas (Plut. *Cim.* 13), or three days' journey, (Diod.) 4. That the Athenians should attack none of the possessions of the king of Persia. This peace was con cluded the same year that Cimon died (Diod. xii. 4), though some writers have placed it immediately subsequent to the battle at the river Eurymedon, B.C. 466 (Plut. *Cim.* 13.) (See the subject discussed in a note on Diodor. xii. 4, by Wesselingius.) Artaxerxes seems to have spent the remainder of his life in peace: he died after a reign of forty years, B.C. 425 (forty-two, Ctes.), and was succeeded by his son, Xerxes II.

Themistocles, who was obliged to fly from Greece, found safety and an honourable reception at the court of this Artaxerxes in the beginning of his reign. The date commonly assigned to this event (B.C. 466) is either incorrect, or we must place the commencement of Artaxerxes' reign a little earlier. [See THEMISTOCLES.] (See Thucyd. i. 104-110; Diodorus, lib. xi. xii.; Ctesiæ *Persica in Phot. Bibl.* p. 119; or, Baehr's ed. of Ctesias, 1824.)

II. **ARTAXERXES**, surnamed Mnemon (Μνήμων) from the excellence of his memory, was the eldest son of Darius II. and Parysatis, and succeeded to the throne on his father's death B.C. 405. His original name was Arsaces, or Arsicas. His younger brother, Cyrus, who founded his right to the crown on his being the first born after the accession of his father (Plut.), conspired against him, and would have been put to death but for the intercession of his mother, who obtained his pardon, and even his continuation in the command of the maritime provinces of Asia Minor. At Sardis he collected a large force with the intention of usurping the throne, and proceeded with these troops and a body of above ten thousand Greek mercenaries to attack the king. This is the celebrated expedition of which Xenophon has left us so interesting an account. [See ANABASIS.] A decisive engagement took place at Cunaxa, about forty miles from Babylon, and the result was the death of Cyrus and the complete establishment of Artaxerxes on the throne, B.C. 401. The part which the Spartans had taken in this expedition was not likely to be overlooked by the king, and a war arose between them. The Lacedæmonians, indeed, were encouraged to enter Asia by the weakness of the Persian monarchy, which the expedition of the 10,000 had revealed to all Greece. After several Spartans had been sent out, Agesilaus was at last appointed to command the Spartan troops in Asia Minor, and his success was equal to the high reputation which he had already acquired. He overran the greater part of the western provinces of Asia Minor, and would probably have reduced the whole of the peninsula, if Artaxerxes by bribery had not succeeded in exciting a Grecian war against Sparta. Agesilaus was recalled to the defence of his country, and the Persians soon afterwards gained a naval victory near Cnidus, principally by the assistance of Conon the Athenian, B.C. 394. The Spartans were at last induced to sign a treaty which gave up everything for which they had been contending, and is known in history as the peace of Antalcidas, from the name of the person who was employed by the Spartans to conclude it, B.C. 387. [See AGESILAUS.] It was to the following effect:—that the Greek cities in Asia and the island of Cyprus should be subject to the king; that all the other Greek states, except Lemnos, Imbros, and Scyros, should be independent. Cyprus, however, did not submit [see EVAGORAS], and it required more than ten years to reduce it to subjection. The only war which Artaxerxes conducted in person was that against the Cadusii, a people inhabiting the mountains on the west and south-west side of the Caspian sea, and in it he exhibited a patience under fatigue which excited the astonishment of his courtiers. The expedition was not successful. He married his own daughters, Amestris and Atossa, the first example that we have in Persian history of such an unnatural alliance. Towards the latter years of his life he put his son Darius to death in consequence of a conspiracy which he had formed against him. Artaxerxes was unsuccessful in his attempts to reduce Egypt. [See AGESILAUS.] He died from grief on account of the bad conduct of Ochus, the youngest of his sons, B.C. 359, at the age of ninety-four (Plut.), and was succeeded by Ochus. (Plutarch's *Life of Artaxerxes;* Diodorus, lib. xiii. xiv.; Ctesias; Xenophon's *Anabasis.*)

III. **ARTAXERXES**, called Ochus before he ascended the throne, was the third son of Artaxerxes Mnemon. All accounts concur in making him one of the most cruel and sanguinary of the Persian princes. He began his reign by putting to death all those of the royal family from whom he thought himself likely to incur danger. Egypt, which never quietly submitted to the sway of the Persians, was at this time in revolt, and governed by the last of its native princes Nectanebus II. Artaxerxes led a powerful army against him, and completely broke the strength of Egypt, B.C. 354. His treatment of the Egyptian god, Apis, is said to have proved his destruction, for it excited so much indignation in the mind of Bagoas, his favourite eunuch, an Egyptian by birth, that on the king's return to Persia he murdered him, B.C. 338, and placed on the throne his youngest son, Arses. If, however, the date of the Egyptian war, B.C. 354, and the death of Ochus, B.C. 338, are both correct, this story seems to have little foundation. (Diodorus, lib. xvi. xvii.; Justin. x. 3.; Plutarch's *Agesilaus.*)

ARTEDI, PETER, a distinguished naturalist, the second son of Olaus Artedi, was born 22nd February, 1705, at Anund, in Angermanland, a province of Sweden. Possessing excellent talents and a good memory, he was destined for the church, but after beginning his studies at Normaling, where his father officiated as clergyman, the secret inclination of his heart led him to visit the rich shores of the Bothnian Gulf to study fishes; he also examined plants, chiefly those used in agriculture and domestic economy.

In 1716 he was sent to the school of Hernösand, where, while others spent their hours of relaxation in play, he devoted himself to the study of fishes and the collecting of plants. During his residence here he read many works on alchemy. In 1724 he went to the University of Upsal to study philosophy and theology, but he gradually abandoned these, and at last gave himself up to natural history; from alchemy he turned to chemistry, and ultimately to medicine.

In 1728 Linnæus likewise went to Upsal to study medicine, and on inquiring who among the students was pre-eminent, all answered, Peter Artedi: on which Linnæus sought his acquaintance.

At this time, according to Linnæus's description of him, he was tall, thin, with long black hair, and a countenance resembling that of John Ray, judging by the portrait of the English naturalist. Their friendship continued through the whole period of their residence at Upsal, which was seven years, during which time an honourable rivalry subsisted between them, each abandoning to the other the departments of natural history in which he seemed to excel; in this way the study of fishes and the amphibia was assigned to Artedi, while Linnæus surpassed him in a knowledge of birds and insects. In testimony of their friendship, before the departure of Linnæus for Lapland and of Artedi for England, they mutually constituted each other heir to their papers and collections of natural history, the survivor pledging himself to publish whatever manuscripts might seem worthy of the public eye.

In September, 1734, Artedi sailed from Stockholm to London, where he met with the most courteous reception, particularly from Sir Hans Sloane. During his stay in London he wrote the preface to his *Ichthyologia.*

In 1735 Linnæus, after his Lapland tour, went to Leyden, where, after residing a few weeks, he was agreeably surprised to find himself joined by his friend Artedi. The means of Artedi being now almost exhausted, he meditated a return to his native land; but a very different fate awaited him. Albert Seba, an old and wealthy apothecary of Amsterdam, who had collected an unrivalled museum of objects of natural history, had published two volumes descriptive of quadrupeds and serpents, and when about to publish the third concerning fishes, he requested the assistance of Linnæus; but he, being occupied with other matters, and moreover engaged with Dr. Cliffort of Leyden, declined Seba's offer. Linnæus, however, recommended his friend Artedi. Previous to this Artedi assisted Linnæus in his great *Systema Naturæ*, particularly in the departments of fishes, and in the umbelliferous plants, in the arrangement and construction of the genera of which, he recommended the adoption of the involucrum as furnishing a good character. Indeed it was the intention of Artedi, after his work on fishes should have been finished, to devote himself entirely to the study of umbelliferous plants. Having entered upon his new office, he drew up for the work of Seba, the descriptions, the synonymes, the genera, and species of nearly all that remained.

About this time, Linnæus, having finished his *Fundamenta Botanica*, hastened to Amsterdam to show it to Artedi, who on his part showed Linnæus his *Philosophia Ichthyologica,* which had been the work of several years labour.

This delightful and advantageous interchange of ideas soon experienced a melancholy interruption; Artedi, on the 21st September, 1735, when returning to his lodgings from the house of Seba, fell into one of the canals of Amsterdam, and no assistance being at hand, he was not discovered till morning. Thus, in the thirtieth year of his age, perished one whom Linnæus justly pronounced an honour and ornament to his country.

Linnæus, in conformity with their testamentary arrangement, claimed his manuscripts; but the landlord, on account of some small debts, refused to give them up, and even threatened to sell them by auction. They were purchased by Dr. Clifford, and by him presented to Linnæus. Among them he found the *Philosophia Ichthyologica* alone finished; the *Synonymologica*, a work of immense labour, complete, but confused; the *Descriptions*, good; the *Bibliotheca*, unfinished; and the *Systema* nearly complete.

Linnæus devoted more than a year to render these works complete, and then gave them to the world, preceded by a well-written life of the author, in 1 vol. 8vo, Leyd. 1738. Linnæus had previously availed himself of them, for the department of fishes, in his *Systema Naturæ*, published at Leyden in 1735.

Cuvier and Valenciennes, in their history of ichthyology, prefixed to their *Histoire Naturelle des Poissons*, Paris, 1828, pronounce this the first work which gave a truly scientific character to the natural history of fishes, completing that which had been so well begun by Willoughby and Ray.

Artedi founded his orders solely upon the consistence of the skeleton, upon the opercula of the gills (branchiæ), and the nature of the rays of the fins. Of these there are four, (for we do not admit the cetacea,) denominated the malacopterygii, the acanthopterygii, the branchiostegii, and the chondropterygii. The branchiostegii, being badly constructed and badly defined, cannot be retained, but the other three are strictly natural, and nothing superior to them has yet been proposed. The genera were sixty-eight, but of these fifty-five only were defined, thirteen being merely indicated in the supplements to the *Genera* and the *Synonymologica*.

enera of Artedi.

I. *Malacopterygii.*
Syngnathus.
Cobitis.
Cyprinus.
Clupea.
Argentina.
Exocœtus.
Coregonus.
Osmerus.
Salmo.
Esox.
Echineis.
Coryphæna.
Ammodytes.
Pleuronectes.
Stromateus.
Gadus.
Anarhichas.
Muræna.
Ophidium.
Anableps.
Gymnotus.

II. *Acanthopterygii.*
Blennius.
Gobius.
Xiphias.
Scomber.
Mugil.
Sabius.
Sparus.
Sciæna.
Perca.
Trachinus.
Trigla.
Scorpæna.
Cottus.
Zeus.
Chœtodon.
Gasterosteus.

III. *Branchiostegii.*
Balistes.
Ostracion.
Cyclopterus.
Sophius.

IV. *Chondropterygii.*
Petromyzon.
Accipenser.
Squalus.
Raia.

Genera indicated in the Supplements.

I. *In the Genera.*
Tænia.
Silurus.
Mustela, phycis.
Sphyræna.

II. *In the Synonyologica.*
Cicla.
Hepatus.
Capriscus.
Pholis.
Citharus.
Atherina.
Siparis.
Chelon.

In his botanical labours he was not so successful. The involucrum of the general umbel and the involucellum of the partial umbel (in other words, the general and partial involucra) are merely *bracteæ*, on which, in no other case, has it ever been attempted to found generic characters. These parts, indeed, furnish very secondary characters, and an arrangement of umbelliferous plants according to them must be at all times bad, and cannot be retained in the present day, especially since the labours of Koch and Decandolle have furnished one so much superior. (See *Nova Acta Academiæ Cæsareæ Naturæ Curiosorum*, 1824, vol. xii. part i. p. 55. and Decandolle, *Mémoire sur la Famille des Ombellifères*, Paris, 1829. Decandolle, *Prodromus Systematis Naturalis Regni Vegetabilis*, vol. iv. Umbelliferæ, p. 55. Paris, 1830.

Linnæus called a genus of umbelliferous plants after his friend, *Artedia*, of which only one species is known. *A. squamata.* Artedi's *Ichthyologia* was reprinted and enlarged by J. Waldbaum, three volumes quarto, Lubeck, 1788, 1789, 1792.

ARTEMIDO'RUS of Ephesus wrote a treatise on general Geography, in eleven books, besides some other works. His æra is not precisely known, but he wrote probably about one century B.C. His geographical work is very often quoted by Strabo as authority, by Pliny in his *Natural History*, by Stephanus of Byzantium in his *Dictionary*, and by other writers. The passages thus quoted are collected in Hudson's *Minor Greek Geographers*, vol. i. We can collect from Strabo that Artemidorus visited Spain, Rome, and Alexandria. He was sent by his citizens on an embassy to Rome, in order to recover two valuable salt lakes near the mouth of the Cayster which belonged to the temple of Diana, but had been seized by the Roman *publicani* (farmers of the taxes). Artemidorus was successful, and was rewarded with a golden statue. (Strabo, xiv. p. 642.)

ARTEMIDO'RUS, surnamed Daldianus, from Daldis, a city of Lydia, which was his birth-place, is the author of a work in five books, entitled 'Ονειροκριτικά, or, *The Interpretation of Dreams*. He lived in the time of the Antonines; and collected his materials by travelling in Greece, Asia, Italy, and various other countries, and registering such communications as he was favoured with by those who studied the interpretation of dreams. (See Lib. I. cap. i.) The value of the work, which is written in very fair Greek, consists in the strange stories, and in the view which it gives of the superstition about dreams in that age: it is also useful for the explanation of several mythological allusions and symbols. The fifth book, entitled 'Αποβάσεις, or 'Results,' is addressed to the author's son: it contains ninety-five short dreams that occurred to different individuals, and the events which followed. Some of the dreams are remarkable as samples of what people's dreams were seventeen centuries ago. The first edition was by Aldus, 1518, 8vo.; the last by Reiff, Leipzig, 1805, 2 vols. 8vo., one of text and the other of notes. An English translation was published in 1644, in 12mo, under the title of '*The Interpretation of Dreams*, digested into five books, by that antient philosopher Artemidorus.' Of this work a tenth edition was published in 1690.

Artemidorus wrote other works besides that which we now have. See Suidas (Ἀρτεμίδωρος), and the author's work, Lib. II. cap. i.

A'RTEMIS, one of the antient Greek divinities, known to the Romans as Diana, whose attributes were so numerous and of such opposite kinds, that it is difficult to imagine how they should have been assembled in the same deity, if we did not know that the imaginative spirit of the Greeks loved to invest their gods with the most opposite characters. In the poetry of Homer and Hesiod she appears as the daughter of Jupiter and Leto (Latona), sister of Apollo, and the goddess who presided over hunting. She traverses the woods, armed with the bow and arrow, and attended by numerous nymphs. Her bow is employed, not only against the beasts of the forests, but also against man; and in those early poems she is represented as never yielding to the allurements of love. She is a chaste and pure virgin. In the *Orphic Hymns* (35,36) we find her invested with other attributes. There she assists at child-birth, is the assuager of pain, looks with benignant eye on the labours of man, and is the author to him of abundant harvests, of peace, and of health. In this she seems to have appropriated to herself part of the duties of Ceres, and indeed, according to Æschylus, she was daughter of that goddess. In a temple at Megalopolis in Arcadia her statue stood by the side of that of Ceres, and she was clothed with the skin of a hind; a quiver hung from her shoulder; she had a lamp in one hand and two serpents in the other. (Pausan. viii. 37.) In the Greek tragic poets she appears under another character, according to which the favour of the goddess must be obtained by the sacrifice of human victims. Iphigenia, daughter of Agamemnon, on her return from the Tauri, introduced this barbarous feature in the worship of Artemis. At Sparta there was a temple of Artemis Orthia, where they exhibited an old wooden statue, said to be that brought by Iphigenia from the Tauri; and though in later times human victims were not offered, the thirst for blood, which the goddess was supposed to feel, was satisfied by the severe scourging of the Spartan youths before her statue. (Pausan. iii. 16.) All these various fables were collected by the Alexandrine poets of later times, and fitted to one another so as to form a whole.

The worship of Artemis was very general throughout Greece and the colonies, but she was more particularly the goddess of the Arcadians, if we may judge from the numerous temples found in that district. There almost every height, fountain, and river, supplied her with a distinctive epithet, so that the poet Alcman (who flourished probably B.C. 672) says, that she derives names from ten thousand mountains, cities, and rivers. She is Lycoatis on Mount Mænalus (Paus. viii. 36), Cnakeatis at Tegea (viii. 53), Stymphalia on Stymphalus (22), Cnacalesia and Condyleatis at Caphyæ (23): and it is curious to observe that this old Peloponnesian divinity is frequently found in connection with streams and rivers. She is *amnium domina*, 'mistress of rivers,' in Catullus (34, 12); *λιμένεσσιν ἐπίσκοπος*, *inspectress* or *superintendent of ports*, in Callimachus (iii. 40).

Artemis was a favourite subject with the artists of Greece, and they have generally represented her as a huntress. They endeavoured to invest her with all the freshness and vigour of youth: in the old style, where she is generally clad in the stola, the artist still contrived to indicate her full and well-formed figure. In the works of Scopas, Praxiteles, and Timotheus, Artemis was, like Apollo, represented of a slender form; her hips and breasts without the fullness of womanhood. The countenance is that of Apollo, only with a softer expression and more full; the hair is sometimes bound over the forehead, but more frequently in a bunch behind or on the top of the head in the manner peculiar to the Dorians. The dress is a Doric vest (*χιτὼν*), either tucked up high, or reaching to the feet; and the shoes are Cretan. Sometimes a dead or dying stag lies at her feet. See Filhol, *Galérie Napoléon*, v. 366; Visconti, *Iconographie*, xlii. 1; *Diana Lochæa in* Millin, *Monuments inédits*, ii. 34. (See this subject treated fully in Müller, *Archäologie der Kunst*, Breslau, 1830.) We have not entered into the question whether there were several goddesses of this name distinct from each other in their character and attributes, but we think that this opinion is by no means improbable. She is considered the same as the Bubastis (Herod. ii. 59) of the Egyptians. (Seyffarth, *Geschichte des alten Ægypten*, Leipzig, 1833; Müller, *Die Dorier* (translation) vol. i.; Voss, *Mythol.* Br. iii. 1. See Diana, Selene, and Hecate.)

ARTEMI'SIA, the daughter of Lygdamis, became queen of Halicarnassus, a city on the coast of Asia Minor, when her husband died. She was one of the most distinguished women of antiquity, if we may credit the account given by her countryman Herodotus. She attended Xerxes in his expedition against Greece B.C. 480, and furnished five ships, which were second only to those of the Sidonians. In the council of war before the battle of Salamis, she strongly represented to Xerxes the folly of risking a naval engagement, and the event justified her opinion. In the battle she displayed so much courage, that it called forth from Xerxes the exclamation, 'that the men behaved like women, and the women like men.' To her Xerxes intrusted the care of his children, that they might be transported in safety to his kingdom. (Herodot. vii. 99. viii. 87-103.) She was represented in the Persian portico (*στοὰ Περσική*, as it was called at Sparta) which was erected to commemorate the great defeat of the Persians. (Paus. iii. 11.)

ARTEMI'SIA, daughter of Hecatomnus, king of Caria in Asia Minor, and wife of Mausolus, whom she succeeded on his death B.C. 353. From all the accounts transmitted to us respecting her, she seems to have been strongly attached to her husband; but that she should have drunk the ashes of his body mixed with water, as Pliny tells us, is a statement rather extraordinary. (See also Valerius Max. lib. iv.) She proposed two prizes, one in tragedy, and another in oratory, to those who should pronounce the best panegyric on her husband; and among those who came forward, according to Aulus Gellius (x. 18), were Theopompus, Theodectes, and Naucrates: some have even added Isocrates. The successful competitors were Theopompus and Theodectes. She caused a monument to be erected to the memory of Mausolus, which, for its grandeur and magnificence, was considered one of the seven wonders of the world. It was called 'mausoleum' from the name of her husband, and hence the name mausoleum is often applied to funeral monuments. It seems to have existed in the time of Strabo (p. 656). She died after a reign of two years, and was succeeded by her brother, Idrieus, B.C. 351. (Diod. xvi. 45.)

ARTEMI'SIA, an extensive genus of plants belonging to the natural order *compositæ*, and remarkable for the intense bitterness of many of its species. It is easily recognised by the multitude of fine divisions into which its leaves are usually separated, and the numerous clusters of small, round, drooping, greenish-yellow, or brownish flower-heads, with which its branches are loaded. The flowrets are all tubular, but those in the circumference of each head are very imperfect.

The most interesting species are wormwood, tarragon, and southernwood; the former (*Artemisia absinthium*) is met with frequently in waste places all over Europe and the northern parts of Asia. Its leaves have a silky or hoary aspect, in consequence of a thick covering of exceedingly delicate hairs, and they are deeply lobed. The flower heads are very numerous, and of a light buff colour. Wormwood is celebrated for its intensely bitter, tonic, and stimulating qualities, which have caused it to be an ingredient in various medicinal preparations, and even in the preparation of liqueurs. It derives its name from its use in destroying worms in children.

Tarragon (*Artemisia dracunculus*) is a Siberian species, the stems of which grow two or three feet high, are perfectly smooth, and of a bright green. Its leaves are undivided, very narrow, smooth, and rather succulent; when bruised they emit a stimulating odour, and if chewed produce a peculiarly pungent moisture in the mouth, which is so generally considered agreeable that the leaves are employed as a pickle, and as an ingredient in some kinds of vinegar. The flower-heads are small, round, and smooth, and contain seven or eight flowerets.

Southernwood (*Artemisia abrotonum*), an odoriferous herb found all over the south of Europe from Portugal to the Dardanelles, and thence through Palestine, Persia, and the middle of Asia into China, is frequently seen in old-fashioned gardens where it was cultivated for its peculiar aromatic scent. It is a hoary plant, becoming in warm countries a shrub, and even with us acquiring a woody stem after a few years; its branches bear loose panicles of nodding yellow flower-heads, which are externally grey with down; the leaves belonging to the panicles are much longer and narrower than those of the stem.

All these are increased either by division of the crown of the root or by what are technically called *slips*, that is to say, cuttings rudely torn from the woody part of the stem as near as possible to the ground; these strike root readily and make young plants in a month or two.

ARTERY, from the Greek *ἀρτηρία* (*arteria*), signifying an air-vessel; because the antients, ignorant of the circulation, and finding the arteries always empty after death, supposed they were tubes containing air. Why after death the arteries are empty and the blood accumulated in the veins will be explained hereafter. By the term artery is meant a vessel which conveys blood from the heart to the different parts of the body: a vein, on the contrary, is a vessel which conveys blood from the different parts of the body to the heart. [See Vein.] All the arteries of the system proceed from two great trunks immediately connected with the cavities of the heart, namely, the pulmonary artery, which arises from the right, and the aorta, which springs from the left ventricle. [See Heart.] The pulmonary artery conveys blood from the right ventricle of the heart to the lungs; the aorta carries blood from the left ventricle of the heart to all the parts of the system, and consequently is the common source of all the arteries of the body, with the exception of those which circulate through the lungs. [See Aorta.] The arteries derived from the aorta contain arterial, those derived from the pulmonary artery contain venous blood, and this latter vessel is the only artery in the system which does not contain arterial, that is, decarbonized or proper nutrient blood. [See Blood.]

The arterial system is arborescent, that is, the branches which spring from the aorta successively increase in number and diminish in size as they proceed from the heart towards their ultimate terminations in the system. Each trunk commonly ends by dividing into two or more branches, the combined area of which is always greater than that of the trunk from which they spring. The capacity of the branches is estimated to exceed that of the trunks in the proportion of one and a half to one. The arterial trunk always dividing into branches, and the larger branches into branches more and more minute, it is obvious that the blood in the arterial system is always flowing from larger into smaller tubes.

The organization of the arteries is peculiar, and differs considerably from that of the veins. [See Vein.] They are of a yellowish-white colour, loose and flocculent on their external surface, but their internal surface is smooth and polished. They are composed of three distinct membranes, which are superimposed one upon the other, and which are intimately united by delicate cellular tissue. Each of these membranes is called a tunic, or coat, and each possesses a peculiar structure, and performs a separate function in the circulation of the blood.

1. The internal tunic consists of a membrane, colourless, transparent, and thin, yet so firm and strong that it is supposed to resist more than any of the others the bursting of the artery by the current of the blood; for if, in a living animal, the other coats be entirely removed, this alone is found capable of sustaining the impetus of the circulation, and of preventing rupture from the dilatation of the artery.

2. The middle tunic, called also the fibrous and the muscular, is composed of yellowish fibres, which pass in an oblique direction around the calibre of the vessel, forming segments of circles which are so joined as to produce complete rings. In the larger trunks, several layers of these fibres can be raised in succession by the forceps, so that this coat is of considerable thickness, and it is proportionally thicker in the small branches than in the large trunks. This coat is firm, solid, and highly elastic. It is the main tunic by which the artery resists dilatation in the transverse direction, which it does so effectually, that when the left ventricle of the heart propels a fresh current of blood into the aorta, little or no dilatation of the vessel is perceptible. The characteristic property of the fibrous coat is contractility. If it be mechanically irritated, or if a chemical stimulant, such as ardent spirit or ammonia, be applied to it, the vessel contracts forcibly upon its contents. This contractile power, which properly belongs to the muscular fibre, induced anatomists to believe that the fibrous tunic consists of muscular fibres; but careful examination has shown that its organization possesses nothing in common with that of the muscular tissue, while chemical analysis has demonstrated that it contains no fibrin, which is the basis of muscle.

3. The external tunic, called also the cellular, consists of small whitish fibres, very dense and tough, interlaced together in every direction. It is much thicker in the large trunks than in the small branches, the reverse of the fibrous coat. Its outer surface is covered by a loose and flocculent cellular substance, which connects the artery with the surrounding parts, and particularly with the sheath of the vessel. Its firmness and resistance are so great, that it is not divided, however firmly a ligature may be placed around the artery; and its elasticity, especially in the longitudinal direction, is so remarkable that it has been called, by way of eminence, the elastic coat.

Arteries are themselves abundantly supplied with arteries, constituting their nutrient vessels, and called *vasa vasorum;* but these nutrient vessels of the artery form but few anastomoses, that is, but few communications with any other arteries. It is essential, in tying an arterial trunk, to disturb it as little as possible, and only to expose just so much of it as is indispensable for the proper application of the ligature. In the first cases treated by Mr. Hunter for aneurism [see ANEURISM], four ligatures were placed around the diseased artery, which was divided in the intervening space. Two of these were called safety-ligatures, being intended to be drawn tight if the others gave way; but the application of these ligatures disturbed the nutrient arteries of the vessel to such a degree, that inflammation, ulceration, mortification, and hæmorrhage ensued, so that those so called safety were really danger-ligatures, producing the very evils which they were intended to avert. The careful observation of the functions of these vessels has corrected this and several other errors, and led to most important improvements in surgical practice.

The principal nerves of arteries are derived from the ganglionic or the organic system, but with these are mingled branches derived from the sentient or the animal system. [See NERVE.] Accordingly, under ordinary circumstances, arteries carry on their functions independently of any influence derived from the brain and spinal cord, but they are capable of being affected by agents applied to those organs. Under ordinary circumstances, and in a state of health, arteries are but little sensible: they may be irritated in living animals by the scalpel, or by the application of chemical stimulants, without affording any indication of pain. Nevertheless, in certain states of disease, there cannot be a question that they become exquisitely sensible.

Among the physical properties of arteries, the most important are their extensibility and their elasticity. Their extensibility is chiefly in the direction of their length. If an artery be tied in two places, and divided between the ligatures, the portion which is next the heart is sensibly elongated at each contraction of the ventricle; but their extensibility in the circular or transverse direction is not great.

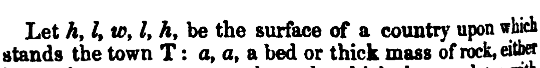
After an artery has been extended, either lengthwise or transversely, it suddenly retracts on itself when the extending force is removed. If the finger be forcibly introduced into the section of a large artery, the sides of the vessel re-act on the finger, and proportionally compress it. If an artery be divided in the dead body, though emptied of its contents, it maintains its cylindrical form, and preserves its capacity unimpaired. The elastic property on which these phenomena depend is common to all the coats, but it is greatest in the external, and least in the internal tunic, and it is also much greater in the large trunks than in the small branches. Elasticity, in the longitudinal direction, restores the artery to its original state after it has been elongated in the various motions of the body; in the transverse direction, it keeps the artery open, and thus maintains a free channel for the passage of the blood through the vessel, while it also assists the fibrous tunic in resisting the over-distension of the artery by the impulse of the circulating current.

The most important vital property of the artery is its contractility, that is, its power of diminishing its capacity, or approximating its parietes, and thus proportionally acting upon its contents. Even the large trunks possess this property in some degree; but it resides chiefly in the ultimate divisions of the arterial branches, that is, the capillary vessels. The main purpose of the trunks and large branches of the arteries is to receive the blood from the heart, and to transmit it to the capillary vessels in the organs. The purpose of the capillary vessels is as various as the actions of the organs in which they terminate, and of which actions, indeed, they are the great instruments. Between the trunks and large branches of the arteries, and their ultimate divisions, there is such a total difference in structure and function, that they must be regarded as two distinct sets of vessels, and the latter require a separate consideration. [See CAPILLARY VESSELS.]

Arteries, besides capillary vessels, terminate also in veins, in exhalant vessels, that is, colourless vessels, which are supposed to open by minute orifices on various membranous surfaces, perhaps in lymphatic vessels (which see), and in excretory ducts. [See GLAND.]

The principal diseases to which arteries are liable, are inflammation, ossification (deposition of bony matter), calcareous deposition (deposition of chalky matter), and aneurism.

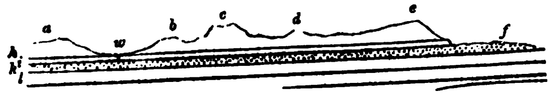
ARTESIAN WELLS are perpendicular perforations or borings into the ground, through which water rises from various depths, according to circumstances, above the surface of the soil, producing a constant flow or stream; they are highly useful in districts where springs or rivers are scarce, or where the usual surface water is of indifferent quality. These perforations have been named Artesian wells (*Puits Artésiens*) from the opinion that they were first used in the district of Artois in France. They are seldom more than a few inches in diameter, and are made by means of the usual boring instruments. Their action is due to the constant endeavour of water to seek its level, as will be readily understood by means of the accompanying diagram, representing a geological section of a country in which Artesian wells may be established.



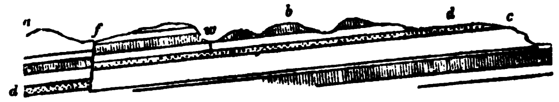
Let *h*, *l*, *w*, *l*, *h*, be the surface of a country upon which stands the town T: *a*, *a*, a bed or thick mass of rock, either impervious to water, or through which it percolates with difficulty: *b*, *b*, a sandy rock, or one through which water easily percolates among the strata that occur beneath the rock *a*, *a*, and are concealed by the latter in the plain on which the town, T, stands, but crop out, as it is geologically termed, or rise to the surface from beneath the rock *a*, *a*, at the heights, *h*, *h*, on each side: *c*, *c*, *c*, a rock through which water either cannot pass, or percolates with difficulty. It will be obvious that the rain-water, falling on the heights, *h*, *h*, and which may not run off into the drainage depressions, will be absorbed by the exposed part of the rock, *b*, *b*. From the action of gravity the water would pass downwards upon the rock, *c*, *c*, *c*, which being impervious, or nearly so, to the passage of water, it will be checked, and take a direction under the other impervious, or nearly impervious, rock, *a*, *a*, percolating through all parts of *b*, *b*. From its endeavour to seek its own level, the water will strive to force its way through the superincumbent rock; but being unable to do so, it will, in the natural order of things, remain beneath, free from evaporation. If, under these conditions, a perforation be made at *w*, near the town T, through the rock *a*, into the rock *b*, *b*, the water in the latter will rise over the surface of *a*, *a*, at *w*, in proportion to the height of *l*, *h*, above the level of *w*, and to the checks, from various causes, which it receives while percolating through the rock *b*, *b*. It might be supposed that these checks would be sufficient to prevent any other than a very slow rise of water in the Artesian well, but it should be recollected that the quantity of water locked up beneath a mass of impervious rock of large area, such, for instance, as the London clay, is considerable, and that the hole or perforation is very small.

The rock *b b* may, in fact, be considered as the inside of a great pipe, into the two ends of which water is poured; so that when a hole is pierced in the upper side of the pipe, as at *w*, the water will spring up, and endeavour to attain the level of the water at the ends.

Artesian wells can be formed under circumstances which appear to the general observer somewhat different, though, in point of fact, they are much the same. Let *a*, *b*, *c*, *d*, *e*, *f*, in the annexed diagram, represent a section of a country, several miles in length, and *h*, *i*, *k*, *l*, four different kinds of stratified rocks, resting conformably upon each other, among which the rock *k* is of a structure to permit the comparative free passage of water, entering it at *f*, while through the other rocks water either percolates with difficulty, or is unable to pass. In this case, the rock *k* merely performs the office of a longer pipe, not indeed so obviously to those unacquainted with geology on the large scale, as in a plain between heights; yet the principle of action is the same, for when the series of rocks, *h*, *i*, *k*, *l*, again rises to the surface on the side now truncated by the section, the same general facts are represented as in the first diagram, though on a much larger scale. Thus when a perforation is made at *w*, in the valley between the hills *a* and *b*, the water rises to the surface, and an Artesian well is established. The Artesian wells at Rouen exist under similar conditions.



In nature, great areas or sheets of stratified rocks, particularly those of a certain relative antiquity, are seldom unbroken; but are, on the contrary, fractured in various directions in consequence of disturbing forces which have acted upon them. Even in these cases, perforations for Artesian wells have sometimes been successful, the hole being pierced between the fracture or fissure and the point where the porous bed receives the rain-water.

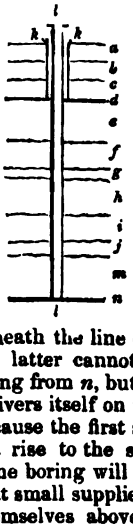


Let the line *a*, *b*, *c*, in the above wood-cut, represent the surface of a country; *d*, *d*, a porous bed, or one through which water, received at *c*, easily percolates, but can neither pass up nor down from the nature of the rocks above or beneath. Let *f* be a fracture or dislocation, geologically termed a fault, from the effect of which the bed *d* is suddenly thrown down to a lower level, on the left of our figure, and the continuity of *d* on the one side and *d* on the other is destroyed. If we tap, as it were, the bed or rock *d*, at *w*, the water in it would rise but a short height upwards, if *d* could be regarded as a hollow pipe, which, receiving its water at *c*, lets it pass freely out at *f*. The rapid percolation of the water is, however, checked by its friction among the particles of sand or against the sides of the strata, so that when a perforation is made at *w*, and a free vent given to the water, it rises, and an Artesian well is established.

It will be evident that, if we regard the above section without reference to the artificial boring at *w*, we have a natural Artesian well, the fissure or fault *f* serving the same office as the artificial perforation; with this difference, that the latter may be considered as a mere puncture, while the effects of the former are felt along a more extended line, occasionally a few miles in length. Without such fissures, which permit the escape of water from beneath, many districts would be comparatively destitute of this great necessary of life, more particularly during droughts. Springs from fissures or faults are more permanent than others. This arises from the mechanical arrangement of the reservoir, if we may so term it, by which a vast quantity of water is accumulated, and can only escape by slow degrees; and thus severe droughts, which dry up the more superficial springs, are comparatively little felt in those from fissures.

It must be apparent from these considerations that extreme caution is necessary in the choice of situations for sinking to obtain Artesian wells, and that a general geological knowledge of the country, in which the attempt is to be made, should precede any borings for this purpose, otherwise much useless expense may be incurred, without a chance of success. Indeed, the power of pointing out those situations where Artesian wells may, in all probability, be successfully established, is one of the practical applications of geology to the useful purposes of life.

Water percolating through, or among the strata of rocks, becomes impregnated with various substances, some of which are injurious to animal or vegetable life, and to various useful processes in the arts. Now it sometimes happens, in sinking Artesian wells, that one or more of the lines of water, which may be tapped, are of this description; it therefore becomes advisable to get rid of such water, if possible, in order that it may not injure, by combining with it, any purer water afterwards met with. Let, in the annexed figure, *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, *j*, *m*, *n*, represent various beds of rock bored through in the process of sinking an Artesian well, a supply of bad water being obtained at *d*, while purer water is discovered at *n*, both waters rising to, and above, the surface. To prevent the mixture of these waters, the diameter of the boring is increased from the surface to the bed, or interstices between the strata, where the bad water is supplied, and a hollow cylinder is passed down through its centre to the continuation of the boring beneath the line of bad water at *d*, in such a manner that the latter cannot mix with the column of good water, *l*, *l*, rising from *n*, but passes up round the interior cylinder, and delivers itself on the surface at *k*, *k*. It by no means follows, because the first supply of water met with in a boring will not rise to the surface, that all other lines of water in the same boring will also refuse to rise, for it frequently happens that small supplies are first cut through which do not elevate themselves above a few feet in the pipe or perforation. These smaller springs are due to the more local percolation of water, and though they obey the same laws, rising to their respective levels, they do not reach the surface, because they are not connected with a system of supply which will enable them to do so. Numerous common wells are so far Artesian, that when a particular bed is cut (and there is generally one or more known to well-sinkers in every district), the water will sometimes rise in them so suddenly as to render an immediate escape by the workmen necessary. In such cases the water in these particular lines does but seek its level; its rapidity in effecting this is proportioned to the freedom with which it can percolate or flow through the beds or fissures of strata containing it.



Artesian wells are necessarily of various depths, and it has been observed by M. Arago and others that the temperature of the water in them increases with their depth, due regard being paid to the mean temperature of the climate in which they may be established. This fact has been considered an argument in favour of the interior heat of the earth.

Artesian wells are now established in various parts of the old and new world; many have been made in the United States; and, notwithstanding their name, appear to have been known as well in Italy as in Artois from time immemorial. It is also probable that they were known to the antients, for, according to M. Passy (*Description Géol. de la Seine Inférieure*), Niebuhr cites the following passage from Olympiodorus:—'Wells are sunk in the oases from 200 and 300 to 400 yards in depth (the yard being equal to half a foot), whence water rises and flows over.'

ARTEVELD, JACOB, a brewer of Ghent, and a great popular leader in the early part of the fourteenth century.

Louis, then count of Flanders, had married a niece of Charles le Bel, king of France. He was grandson of Robert de Bethune, on whose death a dispute arose between Louis and Robert de Cassel, his uncle, about the succession, which was decided by the parliament of Paris, supported by the king of France's power, in favour of Louis. This measure did not gain for Louis the affection of his subjects, and his violent conduct tended to alienate them still more. The great towns of Flanders had charters and privileges, and could not be taxed without their consent. Their wealth consisted in their manufactures and commerce, by which they had been long connected with England, from which country they drew the wool required for their cloth fabrics. The chief proprietors in the country were nobles, who generally took the part of the count and of his French patron, for the king of France was then suzerain of Flanders. The four principal chartered communes, or municipalities, of the county of Flanders were Ghent, Ypres, Bruges, and the country or district of Bruges, which was called *le Franc*, or 'free country.' Bruges during this period repeatedly revolted against Count Louis, and at last took him prisoner, and kept him till the people of Ghent, who were then jealous of their neighbours of Bruges, rescued the count. Another and a more general insurrection of the Flemish was put down by Philip de Valois, who had succeeded Charles le Bel; he defeated the Flemish in a great battle at Mount Cassel in 1328, and obliged them to surrender at discretion. The leaders were put to death, and the towns were heavily taxed.

The war which broke out some years after between Philip de Valois and Edward III. of England gave occasion to another revolt of the Flemish towns. This time Ghent took the lead, and the burghers elected for their captain Jacob Arteveld, a brewer, who superseded the authority of the count, and was in fact the ruler of Ghent. Jacob had the great qualities, as well as the vices, frequently found united in the character of a demagogue. He was active, eloquent, and bold, but violent, overbearing, and tyrannical. He flattered the people, proscribed the nobles, and divided their spoils amongst those of his own party. Edward of England having sent messengers to Flanders, for the purpose of bringing the Flemings to act with him against Philip of France, Arteveld declared for him, and induced the people of Ghent to form an alliance with the English. In order to remove the scruples of the Flemings on account of their allegiance to the French crown, he advised Edward to assume the title of King of France. Count Louis, who was attached to King Philip, opposed Arteveld's intrigues, and in a diet held in the town of Bruges, he caused one of the promoters of the English alliance to be seized and beheaded at Ruppelmonde. The people of Ghent, infuriated at this proceeding, marched to Bruges, and compelled its burghers to join the English alliance; and the insurgents, strengthened by the assistance of the English, defeated the count and his nobles, who were obliged to evacuate Bruges. The count withdrew to France, but returned again in 1338, and made an attempt to conciliate his refractory subjects. Having entered Ghent, he tried to persuade the popular leaders to side with him and with Philip of France, but the burghers shut the gates, made the count prisoner, and compelled him to sign a treaty of alliance offensive and defensive with King Edward (Dec. 1339). Louis soon after found means to escape from Ghent, and again withdrew to Paris. The war now raged between the French on one side and the Flemings and the English on the other. The latter besieged Tournay, but were defeated by the French near St. Omer in 1341. A truce being agreed upon between the hostile parties, King Edward went to Ghent to meet Count Louis, whom he tried to win over to his side, but without success. After Edward's departure from Ghent on his return to England, Count Louis, seeing his subjects wholly estranged from him, and his authority openly set at nought by Arteveld, once more withdrew to Paris. Arteveld now proposed that Edward's son, the young Prince of Wales, afterwards called the Black Prince, should be elected governor of Flanders, on the understanding that the country was to be made by Edward a sovereign duchy. But the Flemings, although they wished to humble their count, were not prepared to disinherit him and his line altogether; and they began to mistrust Arteveld's intentions. A dispute broke out at Ghent between the various trades, in which the fullers were arrayed against the weavers, and a battle was fought in the great market-place between the two factions, which lasted all day; 1500 fullers were killed, and the weavers, being victorious, drove the rest of the fullers out of the city, and utterly destroyed that trade. Arteveld had not taken an open part in the contest, but being jealous of the rising authority of Gerrard Denys, the dean of the weavers, he secretly introduced into Ghent 500 English soldiers, whom he lodged in his premises. Denys and the weavers cried out treason, attacked Arteveld, and killed him, with many of his English soldiers, in July, 1344. The Flemish, however, continued in their hostility to Count Louis, who fell at the battle of Crecy in 1346, fighting in the French ranks. He was succeeded by his son Louis II., called *de Male*, from the castle of Male, his favourite residence. Arteveld's authority in Flanders lasted seven years, during which, in spite of many acts of violence and injustice, the cities prospered in their trade, and enjoyed great respect among their neighbours. (Oudegherst, *Chroniques et Annales de Flandre*.)

ARTEVELD, PHILIP VAN, was the son of Jacob Arteveld. Philippa, Edward III.'s queen, held him at the baptismal font, and from her he received his Christian name. His father left him wealth, and his mother, a woman of a prudent character, watched over his youth. She negotiated an early marriage for him with a lady of good family, after which Philip lived quiet and happy with his wife and mother, keeping aloof from all public affairs. But he had a name which was connected with party feelings and recollections. A fresh revolt broke out at Ghent in 1379 against Count Louis de Male, and after several engagements and many atrocities perpetrated on both sides, the count succeeded in intercepting all supplies to the insurgent city, which was reduced to great distress. Van der Bosch and the other leaders of the Ghentese, finding that the people were impatient of their assumed authority, thought of strengthening themselves by engaging Arteveld as the nominal chief of their party. They proposed him to the people, and he was elected Captain by acclamation. After some desultory negotiations with the count, in the course of which two deputies of Ghent who had agreed to surrender the town were stabbed in the market-place by Van der Bosch, Arteveld, seeing that it was impossible to hold out any longer for want of provisions, conceived the bold resolution of marching out with a chosen body of men and attacking the count, who was then at Bruges. He left Ghent on the 2d of May, 1382, with 5000 men, determined to conquer or die, and halted in a good position, within three miles of Bruges. The next day was a great festival in that city. In the midst of the processions and rejoicings, news came of the Ghentese being at hand. The count went out to encounter them with a body of 800 knights and squires, followed by a numerous but disorderly multitude of the people of Bruges, especially of the butchers, glaziers, cordwainers, and boatmen, who thought they were marching to certain victory over a few half-starved Ghentese. The Ghentese had a marsh in front of their position, and their flanks were protected by a line of carts: they commenced with a brisk fire of artillery upon the assailants, which checked their ardour. Arteveld, by a skilful movement having succeeded in drawing the enemy into the marsh, the men of Bruges fell into confusion, many of the knights were killed, and the rest carried along by the flying multitude. The count re-entered Bruges with only forty horsemen, and the Ghentese poured in at the same time. It was now night, and before the citizens of Bruges had time to recover from their panic, the city was given up to plunder. All the count's people, as well as the butchers and other trades favourable to him, were hunted out and killed. The rabble of the town, as well as many of the servants and apprentices, joined the Ghentese in this horrible carnage. Arteveld succeeded in stopping the indiscriminate slaughter in the morning; but the magistrates and nobles were deliberately sought after and led to execution as traitors to their country. The commerce of Bruges was annihilated for a time by this catastrophe. The count remained concealed that night and the following day in the house of a poor woman, who had often received charity at his palace gate.

After the capture of Bruges, the other towns of Flanders, with the exception of Oudenarde, opened their gates to Arteveld. He now assumed the state and pomp of a sovereign prince, taxed at will the country people, but took care to keep the city of Ghent well supplied with provisions at a low price. His camp abounded not only with all necessaries, but also luxuries. He began the siege of Oudenarde, in which, however, he was unsuccessful. Meantime the people of the neighbouring states, Hainault, Brabant, Liege, &c., showed a disposition to make common cause with the Flemings, and the spirit of revolt spread also into France, where the people were dissatisfied with the exactions and oppressions of their nobles. The feudal nobility at that time had lost much of its old chivalrous spirit, as well as of its independent power, which had been curtailed by the crown, but it still retained all its vexatious and tyrannical demeanour towards the burghers and peasants. It was still, in fact, above the laws. The duke of Burgundy, regent of France, easily induced the young king, Charles VI., to assist Count Louis in putting down the Flemish insurgents, before the English had time to join them. A large force was collected under the command of Olivier de Clisson, a skilful but merciless commander: the oriflamme was displayed, and the campaign began in November, 1382. The French advanced to Roosebeke, between Courtray and Ghent. Arteveld rashly advanced to attack them. his men, equal in numbers, but inferior in military skill, were arrayed too closely, so that the greater part of them had not room to wield their weapons. The battle lasted only half an hour, and 25,000 Flemings were killed, most of them in the pursuit. The body of Arteveld, being found under a heap of slain, was suspended on a gibbet. The battle of Roosebeke has been compared, for the importance of its results, to those of Ætius against Attila, and of Charles Martel against the Moors. ‘Had the Flemings been successful,’ observes Froissart, ‘the insurrection which had already begun at Paris, would have spread all over France, and would have proved more horrible than the Jacqueries; the whole of the nobility and gentry would have been destroyed.’ The troubles of Flanders continued for some years longer, until, after the death of Count Louis in 1384, Philip the Bold, duke of Burgundy, who had married Margaret, the count's only daughter, succeeded him in the possession of Flanders, and at last restored it to peace. (Barante, *Histoire des Ducs de Bourgogne de la Maison de Valois.*)

ARTHRI'TIS. [See GOUT.]

ARTHUR. We shall divide this article into two heads: the first, comprising those particulars of the life of this celebrated British chief which appear to rest on historical evidence; the second, giving a short account of that mass of fictions concerning him which forms the earliest portion of our national literature. Truth, indeed, has been so overlaid by fiction, that some writers (Milton among them) have denied that such a person as Arthur ever existed. Of this there seems no more reason to doubt, than of the existence of Hengist, Cerdic, or any other man of note of that time. Beside the later works of Nennius and Geoffry, the most antient specimens of Welch poetry, the Triads, the poems of Llywarch Hen, and of Taliessin, speak of him, not as the fabulous prodigy described by later romancers, but as a prince and captain of eminence, yet not distinguished by a marked superiority over others his contemporaries. The following are the incidents of his life which appear to be best attested.

He was a prince of the tribe of Britons called Silures: according to some accounts, the son of Meirio ap Tewdrig (Owen, *Camb. Biog.*); according to the common story of Uther, named Pendragon (Dragon's Head) a title given to an elective sovereign, paramount (at least nominally) over the many kings of Britain. The date of Arthur's birth, or even of his accession to his paternal inheritance, it is vain to inquire. He appears to have commenced his martial career about the year 500, and was raised to the Pendragonship, according to Owen, in 517; according to Whitaker, in 508. Nennius asserts that he gained twelve victories over the Saxons. Of these, eleven have been determined by Mr. Whitaker (*Hist. of Manchester*, vol. ii. chap. 2), with great acuteness and plausibility, to have been fought in Lancashire, or still farther to the north, at a period anterior to his election to the Pendragonship. For the ground of that writer's belief we must refer to his work: the reader will at least be repaid by seeing how connected, circumstantial, and plausible a story, may be made out of a meagre string of corrupt or unknown names, assisted by scattered notices in antient chronicles, and local knowledge, and popular tradition. All this early history of Arthur is placed in the north, whither he is said to have been sent by Ambrosius, his predecessor in the Pendragonship; but after he became Pendragon, all his exertions were devoted to stopping the progress of the Saxons in the south, led by the active and successful Cerdic. He was commander-in chief at the battle of Llongborth (literally the ‘haven of ships,’ supposed by Mr. Turner to be Portsmouth), on the authority of Llywarch Hen, a well-known Welch bard, who fought in that battle, and composed an elegy, still extant, on the death of his friend Geraint ap Erbin, who fell in it. He mentions elsewhere another battle, in which ‘Arthur did not recede,’ fought on the river Llawen. The next and the most important battle is that of Badon (placed by Whitaker at Badby in Wiltshire; by Camden and Turner at Bath; by Carte, in Berkshire), the twelfth battle in the list of Nennius, mentioned also by Gildas, Bede, and others, which checked the progress of Cerdic, and compelled him to content himself with those provinces along the south coast which he had already gained; from which Arthur is not recorded to have tried to expel him. The date of this is variously placed. Whitaker, following Matt. West., says 520, which a doubtful passage in Gildas seems to confirm. From this time we hear no more of Arthur, until the revolt of his nephew, Modred, or Medrod, which led to the fatal battle of Camlan in Cornwall, in 542. Modred was slain, and Arthur, mortally wounded, was conveyed by sea to Glastonbury, where he died and was buried. Tradition preserved the memory of the place of his interment within the abbey, as we are told by Giraldus Cambrensis, who was present when the grave was opened by command of Henry II., and saw the bones and sword of the monarch, and a leaden cross let into his tombstone, with the inscription in rude Roman letters, *Hic jacet sepultus inclitus Rex Arturius, in insula Avalonia*, as seen by Leland, and copied from an attested copy by Camden. This story has been elegantly versified by Mr. Warton. A popular traditional belief was long entertained among the Britons that he was not dead, but had been carried off to be healed of his wounds in Fairy-land, and that he would reappear to avenge his countrymen, and reinstate them in the sovereignty of Britain.

The Arthur of romance is a very different person. He is the son of Uther Pendragon by Igerna, wife of Gorlois, Duke of Cornwall, and owed his birth to a magical device, by which Uther assumed the form of the lady's husband. He succeeded to his father when fifteen years old, and immediately prosecuted hostilities against the Saxons in the north of England. He defeated them on the banks of the river Duglas, which, according to Geoffry, was near York, but Whitaker has placed it in Lancashire. (See his very ingenious sketch of this first campaign, vol. ii. chap. 2. sect. 1, 2.) He again defeated them under the walls of Lincoln, and compelled them to quit England and abandon their booty, as the price of their safety. Breaking this agreement, they sailed round the island, and landed at Totness in Devonshire. Arthur hastened by forced marches to punish this new aggression, and routed them with immense slaughter at the great battle of Mount Badon, in which he slew 470 men with his good sword Caliburn and his lance Rou. Again he hastened with all speed to Scotland, to relieve Dunbarton (Alcluyd), besieged by the Scots and Pihts. Having done this, and pursued those barbarians into the fastnesses of Loch Lomond, where he fitted out a fleet and obliged them to surrender, he returned southwards, kept his Christmas at York, and employed himself in destroying the Pagan temples of the Saxons, and restoring the Christian churches. The following summer he conquered Ireland and Iceland, and then returned to Britain, where he spent twelve years in peace. We need not dwell on his foreign conquests of Norway and Gaul, which occupied ten years more. He then returned to England, and held a great festival at Caerleon in Monmouthshire, where he was solemnly crowned, a multitude of tributary kings attending him. Not long after the Romans demanded tribute; on which he collected a mighty army, and passed into Gaul. There he defeated the Romans, and was preparing to cross the Alps, when he received intelligence of the revolt of Modred, who had allied himself with the Saxons, Scots, and Pihts. Arthur gained two victories, one on the coast of Kent and one near Winchester, and forced Modred to fly into Cornwall, where a third engagement, fatal to both, was fought on the river Camlan.

Such is the story told by Geoffry of Monmouth, and much later by Buchanan (*Historia Scotica*), and adopted with all manner of additional fiction by the romancers. The reader will see how widely it differs from the particulars above related on earlier British authorities. Yet Geoffry professed to draw his account from an Armorican or Breton original. Whether he indulged in these amplifications himself, or whether tradition had already so transformed the British hero, has been disputed: we think it clear, however, that Geoffry is not entitled either to the credit or discredit of having invented the preposterous story which he has told. (See Ellis's *Specimens of Metrical Romances*, v. i. p. 85, &c.) It is remarkable, however, that in these Armorican tales, if such they are, we find more mention of the Pihts, Scots, and Irish, than of the Saxons; more traces of Arthur's presence in the north than in the south of the island, though the southern districts may be supposed to have been most familiar to the Breton bards. So in the romances founded on those tales, *Merlin*, *Morte Arthur*, *Lancelot*, and others, the scene is more frequently laid in the north than the south; and York and Carlisle occur more frequently than Caerleon or Caer-gwent (Winchester). Cornwall, however, is a favourite country in romance, and this may point to an Armorican original. On the other hand, our British authorities, Taliessin, Gildas, Aneurin (Gildas and Aneurin, however, have been thought to be the same person), and Llywarch Hen, were all connected with the north of England; yet they are silent as to Arthur's exploits there, and only mention his resistance to the Saxons in the south. This inversion of what might have been expected has not, as far as we are aware, been noticed by any writer on this subject. There is an antient collection of Welch stories for children, called *Mabinogion*, which invests Arthur with certain mythological attributes of romance, which have led Mr. Owen, above quoted, into some very mystical speculations. The island abounds with memorials of the fame of Arthur, whether he be a real or imaginary person: we have Arthur's Seat; Arthur's Round Table, in more than one place; Arthur's Castle; the Welch call the constellation Lyra Arthur's Harp (*Telyn Arthur*); and the Principality abounds in monuments of art or nature which bear his name. The industry of the topographer would soon multiply references.

For the genuine history of Arthur, see the *History of the Anglo-Saxons*, by Sharon Turner, and Whitaker's *History of Manchester*. The work of Geoffry, and the early romances which relate to Arthur, will be found fully treated of in Warton's *History of English Poetry*, vol. i.; Ellis's *Specimens of Early English Metrical Romances*, and Dunlop's *History of Fiction*.

ARTHUR, DUKE of BRETAGNE. [See John.]

ARTHUR'S SEAT. [See Edinburgh.]

ARTICHOKE. [See Cynara.]

ARTICLE, the name given by modern grammarians to the two little adjectives *the* and *an* in the English language, and to words of like import in other modern languages, the former being called the definite, the latter the indefinite article. We do not attempt a more philosophical definition, because the separation of these words from the other adjectives of language, whether pronouns or not, appears to depend upon no very accurate principle; and the distribution of the parts of speech would perhaps not be the less philosophical, if the so called articles were restored to their proper place. The indefinite article *an* is only a corruption of the adjective *one*, or, as our ancestors wrote it, *ane*; and *a* is a still more violent corruption of the same word. Thus in German *ein* is at once equivalent to our *one* and to *an*. In the same way the French *un*, Italian *uno*, Spanish *uno*, &c., are evidently derived from the Latin *unus*. On the other hand, the definite article will appear, on the slightest consideration, to be a corrupted demonstrative pronoun. The term article or ἄρθρον (a joint) was invented by the Greek grammarians, but as used by them it is only applied to the definite article, and also to what, by modern grammarians, is called emphatically the relative (who). Nor is there any inconsistency in applying the same term to these two notions, which will be found on examination to have a common origin. The element *τo* (*to*) of the Greek language, corresponding in power to our word *this*, was employed perhaps originally to denote a physical object pointed out at the time by some action of the body; secondly to an object mentioned just before, and thus mentally present both to speaker and hearer; or, lastly, to an object forthwith to be brought before the hearer's mind. In the last case we are likely to have a repetition of the defining particle, as: 'I gave you *the* book *which* you asked for,' or, what is equally good, except in rhythm, 'I gave you *that* book *that* you asked for.' It was from the contemplation of such a sentence as this that the Greeks considered the defining particles as performing the office of joints which connect the two propositions together; and to distinguish the one article from the other, that which precedes the noun (the) was called the *prepositive* article, and that which follows it, viz. the relative, the *postpositive* article. The qualifying terms are perhaps not very well chosen, but undoubtedly the term article is very expressive of these relative particles, which in all cases, or nearly so, do perform the duty of connecting two propositions together; and hence we ought not to be surprised that a large proportion of the conjunctions have their origin in the relatives or demonstratives. But the repetition of the defining, demonstrative, or relative particle is no way necessary. Whether we say 'I gave you that book' (pointing to it), or, 'You asked for a book that (or that book) I gave you,' or, lastly, 'I gave you that book you asked for,' the word *that* performs in all cases the same duty. The two ideas thus logically connected in the expression—'I gave you the book that or which you asked for,' are—'You asked for the book: I gave you the book.' It is only a luxury in language to vary the forms according to the mere place in a sentence that a word may occupy; and if, in the more polished forms of the Greek language, we find the demonstrative, the definite article, and the relative distinguished, yet they are all evidently derived from a common parent, *τo*, and its dialectic varieties. In Homer, the article does not yet appear; in Herodotus, the same element performs at times all the three offices. As we descend chronologically we find the tragedians still confounding the diverging forms of the relative and article, and even in certain phrases, retained by the later writers, traces of the same confusion arising from a common origin were yet to be seen. Matthiæ in his *Grammar* has so fully acknowledged this triple power of the Greek pronoun, that he treats of the article under the three heads—1. of the article; 2. of the article as a pronoun (he means a demonstrative pronoun); 3. of the article for the pronoun relative.

The Latin language had but an imperfect definite article in its pronouns *hic*, *ille*, *is*; but besides these we find the relative at times employed where the English idiom at least requires the demonstrative *this*; and what is called the conjunction *quod* (that), like the corresponding Greek ὅτι, or French *que*, has the form of a relative, and the meaning of a demonstrative. To trace the same analogy in the Teutonic languages, the German *der*, of which *de* only is radical, is at once demonstrative, relative, and definite article. So completely does the German agree with the Greek, that, when *der* threw off much of its demonstrative power to play the part of the mere article, a kind of doubled form, *dieser*, was adopted for the pure demonstrative, on the same principle of formation as *οὗτος*, from ὅς, with the same meaning in Greek. And lastly, the English philologist will find the same threefold power among the derivatives from the English allied root *the*, viz. among the forms *this*, *that*, *then*, *than* (compare the Latin *quam*), *there*, *thence*, *the*, &c. The form *that* is still retained, as was before observed, with the power of the relative; but in the older writers, *there*, *thence*, &c., were freely used where we now only employ *where*, *whence*, &c.

Horne Tooke, whose views of etymology were neither extensive nor accurate, has fancied that the English article *the* is the imperative of an Anglo-Saxon verb þean, *to take*. (*Diversions of Purley*, Taylor's edition, ii. 63.) We need not repeat that it is allied to the German *der*, or rather the Dutch *de*, for the *r* is merely the characteristic of a masculine nominative, to the Gothic *sa* or *tha*, and through these to the Greek element *tŏ*, a form which actually occurs in the English *to-day* (ho-die), and no etymology for the English article will be satisfactory which does not equally apply to all these languages. In the same way the definite articles of the modern languages derived from the Latin are all referable to the Latin demonstrative *ille*, *illa*, &c. [See Relative, Pronoun Demonstrative.]

ARTICLES OF FAITH. [See Confessions.]

ARTICLES OF WAR. [See Mutiny Act.]

ARTICULA'TA, or ARTICULATED ANIMALS, form the third great section of the animal kingdom, according to the arrangement of Cuvier. They are so called because the different portions of their body are composed of moveable pieces *articulated* to each other. They differ from molluscous animals in generally possessing a skeleton, and from vertebrated animals, by their skeleton being external, while that of the vertebrated is internal. Though presenting considerable diversity of character among themselves, they are generally provided with a skin, which is either soft (as in the leech), or horny and crustaceous (as in the crab and craw-fish). Certain families are destitute of feet, but the greater number are provided with these members, which, when present, are never fewer than six. The connexion of the joints of the members is so close as to permit only a very limited range of motion to each; which is, however, compensated by the greater number of pieces which constitute each member or limb.

The point in which there exists the greatest degree of accordance or resemblance among articulated animals, is the nervous system. Their brain is extremely small, and two nervous cords, surrounding the œsophagus, or gullet, and continued along the abdomen, unite here and there into knots, or ganglia: in some *crustacea* it is still more simple, consisting merely of two knots, one placed at the head, the other in the thorax, united by slender threads. The organs of sense are very imperfectly developed, and in some cases are altogether wanting, except the organ of sight. No organ of smell has yet been discovered, unless the *antennæ* of insects be considered such. The eye presents considerable diversity of structure, being sometimes one and single, or three united in a triangle; in other cases composed of a considerable number of little plates, or facettes (as in the fly), each of which receives a branch from the optic nerve.

The mouth is sometimes destitute of jaws, but when these are present, they are never one above the other, but always lateral; and frequently there exist several of these ranged in succession, the two anterior of which are termed mandibles.

The respiration is effected either by branchiæ, as in those which habitually live in water, such as the crustacea, or by tracheæ, *i. e.* by air-tubes formed of three parts, one membrane internal and one membrane external, both of which are cellular; and a sort of cartilaginous elastic tube, rolled spirally, and placed between the two membranes. These tracheæ receive air by certain lateral openings termed *stigmata*. More rarely, there exist cellular cavities analogous to lungs.

The organs of the circulation vary very much. Sometimes there is a distinct heart, whence proceed blood-vessels, which differ in number in the different orders. (See *Recherches sur la Circulation dans les Crustacés*, par MM. Audouin et Edwards, quarto, Paris, 1827; also, *Annales des Sciences Naturelles*, 1827.) In other instances there is no distinct heart, and the vessels which carry on the circulation are not yet well ascertained; this is more particularly the case in those articulated animals which respire by tracheæ, and in which these organs seem in a certain degree to perform the functions of blood-vessels.

The Articulata have been divided by Cuvier into four classes: viz., 1. Annelida. 2. Crustacea. 3. Arachnida. 4. Insecta. Of these, the general characters have been given under the subject ANATOMY (COMPARATIVE); and the orders, and necessary details, under the heads ANNELIDA, ARACHNIDA; to which we refer, as well as to CRUSTACEA and INSECTA.

ARTICULATION, the term by which anatomists express the union of the different bones of the skeleton. The junction of any two bones, however firmly or loosely connected, or in whatever mode the union may be effected, is designated by the name of articulation. Commonly two substances are employed as the media by which the connexion is established, namely, a firm and strong membranous tissue termed ligament [see LIGAMENT], which may be considered as the band by which the bones are tied together, and a peculiar substance termed cartilage or gristle [see CARTILAGE], which is often interposed between the surfaces of the bones to be united, and which, besides serving as the bond of union, accomplishes other purposes.

Of all the parts of the animal fabric, there is none in which mechanism is more clearly or beautifully shown than in the connexions of the bones with each other; and more especially in the structure of joints. There is no part of the human body which deserves or which receives on the part of the intelligent surgeon more careful study. The manifold and serious injuries to which joints are exposed, such as the various modifications of dislocation and fracture, afford him an opportunity of exemplifying the inestimable value of his art, in the sure and speedy reparation of such injuries which it enables him to effect, and especially when viewed in contrast with the suffering and deformity which result from neglect or from want of skill.

The objects to be obtained in the economy by the union of the several bones of the body are various and even opposite, requiring almost every conceivable variety in the mode of their connexion. And such variety actually exists; but still these varieties admit of classification, and they may all be arranged under three heads, namely, those which form immoveable, moveable, and mixed articulations.

1. One object to be accomplished by the union of bones is, to form a secure situation for tender and delicate structures. Accordingly the bones are often so disposed as to enclose cavities in which the organs that need protection are placed; such, for example, is the cavity of the head which encloses the delicate substance of the brain; the cavity of the spinal column, which encloses the no less delicate substance called the spinal marrow; and the cavities of the chest and abdomen, which enclose soft and tender organs, on the security of which life depends. Bones forming cavities of this class are generally so firmly united that they admit either of no motion whatever, or only of a very slight degree of it, the union being effected sometimes by the apposition of the surfaces of strong and flat bones; at other times by the formation of numerous prominences and depressions which mutually receive each other: examples of both these modes of union are found in the articulation of the bones of the head and face. The firmness of the union is sometimes increased by alternate indentations and projections, like the teeth of a saw, formed on the surfaces of bones, the surface of the one bone being precisely adapted to that of the other; by this mechanism the bones become firmly impacted, and deficiency in extent of contact is compensated by what may be truly called (and it is an admirable example) dove-tailing. *Suture* is the term given to this mode of union, and the bones of the cranium are nicely adjusted and firmly united to each other in this manner. At other times a ridge is formed in one bone which is received into a groove fissured in another. The bony part of the septum which divides the nostrils affords a specimen of this mode of union, while the teeth are secured in their sockets, that is, a conical surface is firmly impacted in a cavity, very much as a nail is fixed in a board.

2. The moveable articulations are those in which the bones are in contact, but not continuous with each other; such, for example, is the union of the arm with the shoulder, the fore-arm with the arm, the wrist with the hand, the lower jaw with the head, the head with the trunk, and so on. In these cases the articulating surfaces are mutually adapted to each other, in general one being convex and the other concave, and the bones are maintained in their situation by the firm and strong membranes termed ligaments. Sometimes the union is assisted by the muscles which surround the joint, as is strikingly exemplified in the shoulder-joint, in which the head of the humerus is kept in contact with the cavity which receives it, partly, without doubt, by ligamentous substance, but partly also by the surrounding muscles. This is proved by the effect of disease; for if by paralysis, or any other cause, the neighbouring muscles become very much weakened, dislocation of the joint readily takes place. Both the strength of the joint and the range of its motion depend mainly on the extent of its articulating surface, and on the arrangement of the ligamentous substance by which the bones are held in their situations. The extent of contact, and the strength and adjustment of the uniting band, are different in every different joint, the diversity being regulated in every case by the kind and degree of motion which it is intended that the joint should exercise.

3. The mixed form of articulation resembles the *immoveable*, in having the bones connected by an intermediate substance (cartilage), and the *moveable* in admitting some degree of motion between the surfaces. The articulations between the several bones that form the spinal column afford examples of this mode of union. There are numerous modifications of these several kinds of articulation, which

are described with great minuteness in anatomical books, and most of which are distinguished by specific names

ARTICULATION. [See Voice.]

ARTILLERY, a word believed to be of French origin. Menage derives it from the old word *artiller*, to fortify. Vossius (*De Vitiis Sermonis*, lib. iii. cap. 1) says the antient word, instead of Artilleria, was *Arcualia*, from *arcus*, a bow; the earliest military engines of this description having arisen out of improvements upon the bow and arrow. Artillery, in its most general signification, implies all kinds of missiles with the engines used in propelling them. Since the application of gunpowder to projectiles, it has chiefly been confined to large ordnance, or cannon, mortars, howitzers, &c., to which rockets are now to be added; and includes their ammunition and appurtenances.

It was long after the nations of the East had formed war into a science, that military engines, such as are comprised in the term artillery, were invented. The earliest were, in all probability, those for casting stones of prodigious weight. Of Uzziah (B.C. 1000), in 2 Chron. ch. xxvi. v. 15, it is said, 'And he made in Jerusalem engines, invented by cunning men, to be upon the towers and upon the bulwarks, to shoot arrows and great stones withal. And his name spread far abroad; for he was marvellously helped till he was strong.'

The names Balista, or Ballista, and Catapulta imply a Greek origin. The balista was for throwing stones, the catapulta for propelling darts and arrows. The invention of the latter of these instruments, or rather its re-invention, is ascribed by Pliny (lib. vii. 56) to the Syrians; but Diodorus (lib. xiv.) and Plutarch (*Apophth*. edit. Wyttenb. 4to. Oxf. i. 533) say they were contrived in Sicily, about the same time with the battering-ram, alluding to a period not more than 300 B.C. Ælian (*Var. Hist.* vi. 12) ascribes the invention to Dionysius the Elder himself in Sicily. The balista is attributed by Pliny to the Phœnicians. Both instruments were unquestionably much used in the Roman times: they are mentioned in Cæsar, Cicero, Livy, Seneca, Tacitus, and other writers; and were employed in great numbers by Titus at the siege of Jerusalem. Two thousand machines for throwing darts and stones were surrendered to the Consul L. M. Censorinus when he marched against Carthage. (Appian, lib. viii. *De Rebus Punicis*, § 89.) Ammianus and Vegetius are both particular in describing the construction of the balista. Vegetius, who lived in the fourth century, under Valentinian, speaks of balistæ, onagri, scorpiones, arcubalistæ, fustibuli, and fundæ, as engines of artillery (lib. iv. c. 22).

We have no evidence that machines of this description were known in England previous to the arrival of the Normans. According to the testimony of William of Poictou, machines of wood (exclusive of the cross-bow) were used for pouring forth showers of arrows even at the battle of Hastings; so early were they introduced in the Norman time. It is worthy of notice, that among the tenants *in capite* in the Domesday Survey, *balistarii* occur as well as *arcubalistarii*. Artillery, however, in the Norman period, was most frequently used in sea-fights, when not only stones and darts were discharged from the machines, but pots of Greek fire, quick-lime, and other combustible materials. Robert of Bruce (in Peter Langtoft's *Chronicle*), speaking of Richard I.'s wars against the Saracens, says, that in his barges and galleys he had mills, which were turned by the wind, and by force of the sails threw not only fire, but stones which were taken from the Rhine.

It would be tedious to enumerate all the arts and all the machines which were employed in the middle ages in assaulting and defending towns and castles. Indeed few sieges of great importance occurred without the invention of some new engine. Grose, in the preface to his *Antiquities of England and Wales*, has given the names and figures of a considerable number. Some of these were distinguished by the appellations balista, catapulta, espringal, trebuchet, mangona, mangonel, bricolla, petrary, matafunda, berfrey, and war-wolf. Père Daniel, also, mentions a machine called engine-a-virge, used by the English in France, as late as the reign of Charles VII. Of the vast force of these machines surprising stories are related in our chronicles. The engines used by Edward I. at the siege of Stirling Castle in 1303, according to Hemingford, threw stones of 300 pounds weight.

This antient artillery continued to be used in sieges for a considerable time, in some instances for two centuries, after the invention of gunpowder and cannon. (See Père Daniel, *Histoire de la Milice Françoise*, tom. i. p. 319.) Greek fire continued also to be employed in war long after the introduction of fire-arms; particularly in the attack and defence of strong places: as at Ypres and Burburgh in France, in 1388. (Walsingh. edit. Camd. pp. 302, 303.)

The invention of gunpowder, however, by slow degrees brought about a total alteration in the art of war. Barbour, in his *Metrical Life of Robert Bruce*, tells us that cannon (which he calls 'crakys of war') were used by Edward III. in his first campaign against the Scots, A.D. 1327. Du Cange, in the article *Bombarda*, shows that the French used cannon at the siege of Puy Guillaume in 1338; and that Edward III. used them at the battle of Crecy, as well as at the siege of Calais in 1346, seems agreed. Four pieces planted on a little hill at the battle of Crecy did great execution among the French troops, and having been before unheard of in France, contributed as much by the surprise as the slaughter to the success of the day. (See Rapin, vol. i. p. 425.) By degrees, the use of cannon became more and more common. Petrarch, in his *Dialogues* on the Remedies of Good and Bad Fortune, written in 1358, describes cannon as no longer rare, or as viewed with astonishment and admiration

Cannon, or, as they were then called, bombards, were the most antient fire-arms. The first cannon were clumsy and ill-contrived, wider at the mouth than at the chamber, and so like a mortar, that Dr. Henry supposed the idea of them might have been suggested by that in which Schwartz, a chemist of the beginning of the fourteenth century, who is said by the Germans to have discovered gunpowder, pounded his materials. They were all made of iron, without any mixture of other metals; and consisted usually of bars or pieces of iron fitted together lengthways, and hooped with iron rings. Some of them were too long, and others of them too short. In a word, the art of making cannon was still imperfect.

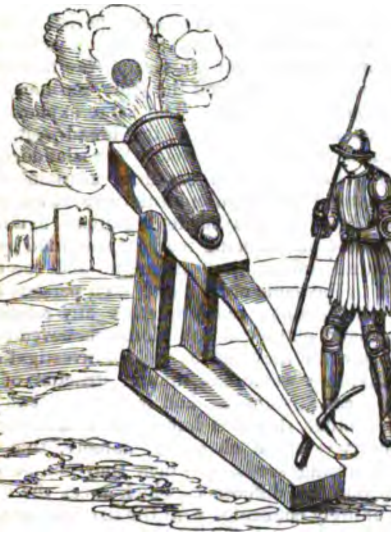
Both gunpowder and cannon were made in England in the fourteenth century. This appears from a commission given to Sir Thomas Norwich by Richard II., A.D. 1378, to buy two great and two small cannon in London, or in any other place, and also to buy certain quantities of saltpetre, sulphur, and charcoal, for making gunpowder. (Rym. *Fœd*. tom. vii. p. 187.) From the same commission, as well as from other evidence, it appears that cannon-balls were at first made of stone: for the same person is therein commanded to purchase six hundred balls of stone, for cannon, and for other engines.

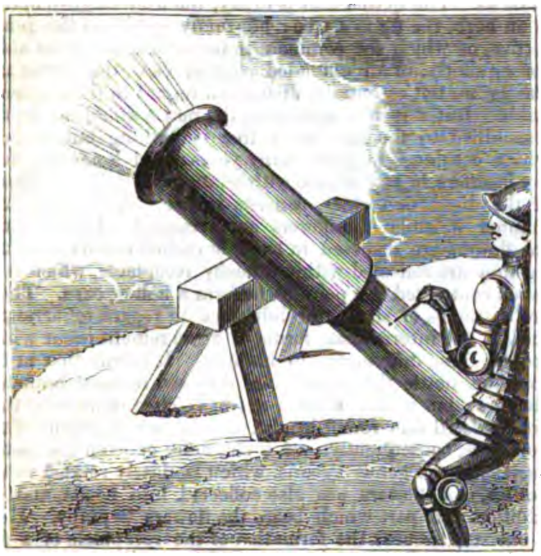
Beside great guns, which are still named cannon, a smaller kind of ordnance called *hand-cannon* came into use at this period. They were so small and light that one of them was carried by two men, and fired from a rest fixed in the ground. (Père Daniel, tom. i. lib. 6, p. 321.) The 400 cannon, or the greatest part of them, with which an English army besieged St. Malo, A.D. 1378, mentioned by Froissart (Lord Berner's *Transl.* chap. cccxxxii.), must have been of this kind: though Dr. Henry conjectures that these hand-cannon were first brought into Britain by the Flemings who accompanied Edward IV. in his return to England, A.D. 1471. The Scots, he adds, had a kind of artillery at this period peculiar to themselves, called *carts of war*. They are thus described in an act of parliament, A.D. 1456. 'It is thocht speidfull, that the king mak requeist to certain of the great barrons of the land that are of ony myght, to mak carts of weir, and in ilk cart twa gunnis, and ilk ane to have twa chalmers, with the remanent of the graith that effeirs thereto, and an cunnand man to shute thame.' By another act, A.D. 1471, the prelates and barons are commanded to provide such carts of war against their old enemies the English. (Henry, *Hist. Brit.* from Black Acts, James II. act 52, James III. act 55.)

The instruments of artillery of the middle of the fifteenth century, though all called by the general name of cannon, were of very different kinds, shapes, and sizes; and distinguished from each other by particular names. The letters which Edward IV. addressed to different persons in 1481 for the resistance to invasion from Scotland speak of 'bumbardos, canones, culverynes, fowelers, serpentynes, et alios canones quoscumque, ac pulveres sulphureos, saltpetre, petras, ferrum, plumbum, et omnimodas alias stufferas pro eisdem canonibus necessarias et oportunas.' (Rym. *Fœd.* tom. xii. p. 140.)

A French translation of *Quintus Curtius* by Vasque de Lucene, a Portuguese, written in 1468, preserved in the

British Museum, and which formerly belonged to Philip de Cluys, a Knight and Commander of the order of St. John of Jerusalem, has one or two early representations of the larger sort of cannon, which are here exhibited





Monstrelet illustrates the clumsy form as well as the clumsy management of antient cannon. Under the year 1459 he says, 'while King James (of Scotland) was observing the effect of his artillery (at the siege of Roxburgh Castle), one of the rudely-contrived cannons of that age, consisting of bars of iron, girded with circles of metal, suddenly burst: a fragment struck his thigh, and the great effusion of blood produced a death almost instantaneous. The Earl of Angus, who stood next to James, was wounded.' Under 1478 he says, 'a great bombard, that had been cast at Tours, was brought to Paris the Monday before Epiphany to be proved, and was for this purpose drawn out into the fields in front of the bastile of St. Anthony. It was pointed towards Charenton, and when first fired threw the ball as far as the gallows on the bridge of Charenton; but as those present did not think it had discharged all the powder that had been put into the chamber, they ordered it to be-recharged and the chamber perfectly cleaned of all that remained within it, which was done, and an iron ball, weighing five hundred weight, put into its mouth, before which stood John Maugué, the founder of it. As the ball rolled down the bombard, by some unknown accident the powder in the chamber took fire before the match was put to it, and by its discharge tore in pieces John Maugué and fourteen other persons, whose heads, legs, arms and bodies were blown into the air. The ball killed a poor innocent bird-catcher that was attending his nets in the fields, and the bursting of the bombard maimed fifteen or sixteen others, several of whom died; so that by this accident twenty-two or twenty-three persons lost their lives. The remains of John Maugué were collected, put on a bier, and carried to St. Merry for interment; and proclamation was made through the street' of Paris that all people should pray for the soul of John Maugué, who had lost his life in the king's service.' (Johnes's *Monstrelet*, 4to., vol. iv. p. 402-403.) In 1477, when Louis XI. made his attack upon different towns of Flanders and Picardy, he ordered bombards of prodigious length and weight to be cast at Paris, Tours, Orleans and Amiens. His iron bullets were cast at the founderies at Creil, and his stone bullets made at the same time in the quarries near to Peronne.

From one or two of the preceding passages, it will be observed that the antient method of constructing cannon had been changed about the middle of the fifteenth century for that of casting. Père Daniel (*Hist. de Milice Franc.* i. 450) tells us, that about the close of that period a hard and mixed metal was invented for this purpose, called *font-metal*, or *bronze*. Cannon, it should seem, were now cast one solid piece.

It is probably this same metal that Stowe alludes to in a passage of his Annals. He says, 'this year, 1535, John Owen began to make brass ordnance, as cannons, culverines, and such like. He was the first Englishman that ever made that kind of artillery in England; his issue of his name and the name of Pitt have continued unto the days of King James most ready and exquisite gun-makers for the general service of the kingdom.' A beautiful specimen of this sort of ordnance, cast at Utrecht in 1544, and presented by the States of Holland to Queen Elizabeth, is still preserved at Dover Castle. Other specimens, both English and foreign, a little later in period, may be seen at the Tower of London and in the Royal Arsenal at Woolwich as well as in many of the foreign arsenals. The sizes of cannon, generally speaking, in the sixteenth century, were considerably diminished, and forms of greater elegance were given to their exterior.

Robert Borthwick, an artist in the service of King James IV. of Scotland, had attempted the establishment of a foundery at Edinburgh a short time previously. Some of his guns, which remained in Lesly's time, had this inscription 'Machina sum Scoto Borthuik fabricata Roberto.'

The largest cast cannon now existing is a brass one at Bejapoor, called Maliek é Meidān, 'the lord of the plain;' it was cast in commemoration of the capture of that place by the Emperor Alum Geer, in 1685. Its extreme length is 14 feet 1 inch; the diameter of its bore 2 feet 4 inches. An iron shot for this gun of proper size would weigh 1600 pounds.

For *Mortars* we are indebted to workmen who were employed by Henry VIII., and for cast-iron ordnance to the reign of Edward VI. Under the year 1543, Stowe says, 'King Henry, minding wars with France, made great preparation and provision, as well of munitions and artillery, as also of brasse ordnances, amongst which, at that time, by one Peter Bawd, a Frenchman born, a gun-founder, or maker of great ordnance, and one other alien, called Peter Van Collen, a gunsmith, both the king's feed men, who conferring together, devised and caused to be made certain mortar-pieces, being at the mouth from eleven inches to nineteen inches wide; for the use whereof the said Peter and Peter caused to be made certain hollow shot of cast-iron, to be stuffed with fire-work or wild-fire, whereof the bigger sort for the same had screws of iron to receive a match to carry fire kindled, that the fire-work might be set on fire, for to break in small pieces the same hollow shot, whereof the smallest piece hitting any man would kill or spoil him. And after the king's return from Boulogne, the said Peter Bawd by himself, in the first of Edward the Sixth, did also make certain ordnance of cast iron, of divers sorts and forms, as fawconet, fawkons, minions, sakers, and other pieces. Unto this Bawd, John Johnson, his covenant servant, surviving his master, did likewise make and cast iron ordnance cleaner and to better perfection, to the great use of this land. His son Thomas Johnson is yet living, a special workman. In the year 1595 he made forty-two cast pieces of great ordnance of iron for the Earl of Cumberland, demy cannons, weighing 6000, or three ton the piece.' (*Annals*, edit. 1631, p. 584.)

It appears from Sir William Monson's *Naval Tracts*, that the *Falcon* was a species of ordnance of two inches and a half bore; weight of shot two pounds: that the *Demi-Culverin* was another kind, of four inches bore; weight of the shot nine pounds and a half: and that the *Mynion* was another of three inches and a half bore; weight of the shot four pounds. The *Culverin* was a species of ordnance of five inches and a half bore; weight of the shot seventeen pounds and a half. The *Fowler* is not described by Monson, but is mentioned by Lodge in his *Illustrations of British History*, vol. i. p. 4, as in use in the time of James I. The *Sacar* or *Saker*, according to Monson, was a piece of ordnance of three inches and a half bore; weight of shot five pounds and a half.

The invention of *Petards* is due to the French civil wars. They were first used by the Huguenots in 1580, at the siege of Cahors in Quercy. (Du Thou, tom. viii. p. 376.) Montelimar and Embrun in Dauphiné were taken by Lesdigecéres in 1585, principally by means of petards. (*Ibid.* tom. ix. pp. 404, 405.) According to Père Daniel (cited in *L'Art de Vérifier les Dates*, tom. i. p. 655), red-hot balls, revived in 1782 at Gibraltar, were used by Marshal Matignon during the siege of La Fère in 1580. But we learn from Elmham's Life of Hen. V., p. 155, that they had an earlier origin. He says, that when an English army, commanded by the Duke of Gloucester, besieged Cherbourg in 1418, the besieged discharged red-hot balls of iron from their cannon ('massas ferreas rotundas, igneis candentes fervoribus a saxivomorum faucibus studuerunt emittere') into the English camp, to burn the huts in which the soldiers were lodged.

The *Howitzer*, an improvement upon the mortar, is said to have been invented by Belidor, and was first used at the siege of Ath in 1697. The *Carronade*, a sort of short cannon, or rather long howitzer, was invented by General Robert Melville, about the year 1779.

Iron Rockets of different sizes, varying in weight from sixteen to more than forty pounds, were invented during the last war by Sir William Congreve, and are now called Congreve Rockets. They were first used at the bombardment of Copenhagen, afterwards against the Boulogne flotilla, then at Flushing, and subsequently at the battle of Leipzig. A rocket establishment now forms a regular branch of the British military service.

Besides the different works already quoted, Grose's *History of the Army of England*; Glenie's *History of Gunnery*; Henry's *History of Britain in the different Periods*; and Wraxall's *History of France*, have been consulted for the present article.

Among antient engines of artillery the *Battering-ram* has been usually included, though it certainly is not embraced in the ordinary or in any other definition of that word. Pliny, whose authority in such a matter is small, says it was invented at the siege of Troy but Homer makes no mention of it. The first notice of this engine is probably in Ezekiel, where the prophet speaks of a feigned siege of Jerusalem as a sign for the Jews, ch. iv. v. 2.: 'set battering-rams against it round about;' and again, ch. xxi. v. 22, 'appoint battering-rams against the gate.' Ezekiel lived about 590 years B.C. The next mention of the battering-ram is in the Peloponnesian war, B.C. 429 (Thucyd. ii. 76); and we are certain that it was used a century afterwards at the siege of Motya by Dionysius the Elder. The ram was sometimes used, but not commonly, in the middle ages. (For the present mode of making CANNON see that article, and for the mode of using them see GUNNERY.)

ARTOCA'RPEÆ (or the Bread-fruit Tribe), a natural order of plants, nearly related to *Urticeæ* (the Nettle Tribe), from which it is so difficult to separate them by any precise character, that there are many who consider them nothing more than a section of Urticeæ. This opinion has been adopted by Dr. Lindley in his *Nixus Plantarum*.

Whether a distinct order, or a section only of Urticeæ, the group of Artocarpeæ is known by its having flowers with a very imperfectly formed calyx, no corolla, leaves with conspicuous stipules, a rough foliage, and an acrid milky juice, which often contains caoutchouc in abundance; the flowers are collected into round heads, and the ovules are suspended singly from the upper part of the solitary cavity of the ovarium. They are thus distinguished from true Urticeæ by the position of their ovules, the manner in which their flowers are arranged, and by their yielding a milky juice; the juice of Urticeæ is watery.

The species are all found in the warmer parts of the world, and many of them are natives of the tropics only. Their milk, which is always acrid, renders some of them intensely poisonous, as the Upas tree of Java, and certain Indian species of fig; nevertheless, if the milk is naturally absent from any particular part of an Artocarpeous plant, that part becomes eatable and even wholesome. Thus the fruit of the cultivated fig, up to a short period before its maturity, remains milky, and at that time it would prove exceedingly unwholesome, but when ripe the milk disappears, is replaced by sugar, and the fruit becomes, as we all know, extremely wholesome. The same explanation is probably applicable to the case of the bread-fruit, which forms an article of food with the South Sea islanders.

With those writers who are too little acquainted with botany to understand the philosophical views which prevail at the present day, it is a favourite argument against the natural relations of plants being really represented by what are called natural orders, that the nettle and the fig are both arranged in the same order; and such persons appeal to what they call common sense, whether any relationship between a fig and a nettle can be seriously believed to exist in nature. If, however, they were capable of investigating the matter carefully, they would find that in structure of stem, leaves, stipules, calyx, stamens, and fruit, these two plants are so like each other, that it is impossible to discover more than one solitary essential character, namely, that of the position of the young seeds, by which they can be distinguished; and that the differences which meet the unpractised eye are entirely connected with the size and manner in which the flowers are arranged: we shall easily show this to be so. The nettle, that is to say, the wild English nettle, is an herb, the fig is a tree; but many species of the genus Urtica, of which the common nettle is one, are trees also; consequently, in an extended point of view, the nettle and the fig are not essentially distinct in regard to their general habit. But if it were otherwise, the nettle would not be the less allied to the fig; for a tree is nothing but an herb which continues to grow many years; and longevity does not interfere in any degree with relationship. This disposes of the distinction which consists in size. Next, as to the manner in which the flowers are arranged. In the nettle the flowers are disposed in loose branched clusters; in the fig they are collected within a fleshy receptacle, which is so much contracted to a point as to form a hollow case. These are extremes of structural difference in regard to arrangement; but intermediate forms of arrangement occur which reduce these differences to nothing. It is true that in the common nettle the flowers are disposed in loose branched clusters; but in the Roman nettle (*Urtica pilulifera*) they are collected into round heads; a loose arrangement of the flowers is, consequently, not a character of even the nettle itself. In the genus Procris, which is closely related to the nettles, the flowers are also collected into heads, and, in addition, the part which bears the flowers is pulpy. Here is one step towards the formation of the receptacle of a fig. In the genus *Dorstenia*, the part which bears the flowers is also fleshy, but so much extended horizontally as to form a sort of saucer, the edges of which are curved inwards. This brings us so exceedingly near the receptacle of the fig, that if the edges of the saucer-shaped receptacle of Dorstenia were only curved inwards till they met, its *apparent* fruit would actually be a fig: we say *apparent*, because, however strange it may seem to make such an assertion, there is, in fact, very little difference between the true fruit of the nettle and the fig; in both it consists of minute lenticular grains, each containing a single seed; but in the nettle it lies among the dry chaff of the calyx and bracts, while in the fig it is buried among the flesh of the receptacle and succulent calyxes.

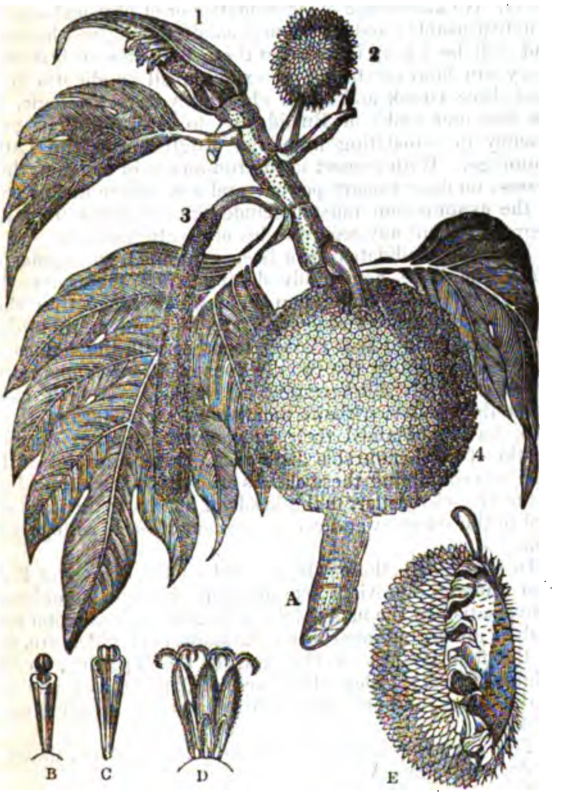
The essential differences between a nettle and a fig are thus demonstrated to be much more apparent than real We do not usually enter so much into arguments touching speculative opinions as we have on this occasion; but the objection, which we have thought it worth answering, is a popular one, which it appears desirable to set at rest in a popular work.

ARTOCARPUS, or the Bread-fruit, is the genus which has given its name to the preceding natural order. It consists of trees having stems of very considerable size, large leaves, which are exceedingly rough with little points; stipules like those of the fig, and monœcious flowers, of which the stamen-bearing ones are disposed in long club-shaped spikes (*fig.* A 3), and the pistil-bearing ones in round heads (*fig.* A 2), which become the fruit and often arrive at a very considerable size (*fig.* A 4.)

A Bread-fruit is a fig turned inside out, and much larger in all its parts; that is to say, the flowers which form the Bread-fruit and fig grow, in both cases, upon a fleshy receptacle; but in the former the receptacle is solid and bears its flowers externally, while in the latter it is hollow and bears its flowers internally.

The stamen-bearing flowers of Artocarpus (*fig.* B, C) consist of a tubular calyx containing a single stamen; the pistil-bearing flowers (*fig.* D), consist of two or three fleshy sepals grown closely together and meeting at the points, between which passes a long slender style with two stigmas, which are hairy and curved downwards. The ovary is simple, and contains but one ovule. At a very early period their flowers grow firmly together into a solid fleshy mass, which finally becomes the fruit. The seeds are large nut-like bodies, which lie beneath the rind of the fruit.

Many species are known, some of which, as *Artocarpus Chaplasha* and *hirsuta*, are large trees, and yield valuable timber in the forests of Bengal and Malabar. The only two, however, we propose to notice here are the Bread-fruit and the Jack.



[Artocarpus incisa.]

A, a shoot very much less than the natural size with stamen-bearing flowers 3; pistil-bearing flowers 2; fruit 4; and its stipules 1; B, a stamen-bearing flower; C, the same opened; D, three pistil-bearing flowers, sliced open at the bottom to show the ovaries; E, a portion of the fruit showing the nuts in the inside.

The Bread-fruit (*Artocarpus incisa*) is a native of the South Sea islands, and of many parts of the Indian Archipelago; it inhabits only such places as are both hot and damp; Dr. Roxburgh complains that the *winters of Bengal are much too cold for it.* It there forms a moderate-sized tree, rarely exceeding forty feet in height, with leaves deeply divided into sharp lobes, and sometimes as much as three feet long. The fruit is green and of considerable size, equalling a melon of the larger kind in dimensions, and is of many different forms: one variety produces it free from all spines on the surface or from seeds internally; this is the best sort: others are split into deep lobes, or covered all over with the sharp-pointed fleshy tops of the calyxes. The nuts, when roasted, are said to be as excellent as the best chestnuts; but it is principally for the fleshy receptacle that it is valued. When roasted it becomes soft, tender, and white, resembling the crumb of a loaf; but it must be eaten new, or it becomes hard and choky. Others compare the flavour to that of a roasted potato; what we have tasted has been in thin slices which had been thoroughly dried, and it was very like a piece of dried biscuit. In Anson's voyages it is said to be delicious when ripe, and, when mixed with lime or orange juice, to have a grateful tart flavour, not unlike apple-sauce.

It forms so important a part of the support of the South-Sea islanders that it was introduced by the British Government into the West Indies, where it is still cultivated, and whence it has been carried to the continent of America. It does not appear, however, equal to the Plantain as an article of human food.

The Jack (*Artocarpus integrifolia*) is also a native of the islands of the Indian Archipelago, and is in its general appearance like the Bread-fruit, but its leaves are totally destitute of all laceration, and its fruit, which is very prickly, weighs 60 or 70lb. This latter is yellow, and constitutes the principal part of the diet of the natives in some parts of India; but it is said to have an offensive odour, and to be little esteemed by Europeans: all, however, concur in attesting the excellence of the nuts when roasted.

Like all other Artocarpeous plants, this exudes a great quantity of a viscid milky juice, from which the best bird-lime of India is prepared. See the 2d volume of the new series of the *Botanical Magazine* for an excellent account of both the Jack and the Bread-fruit, illustrated by figures, by Dr. Hooker.

ARTOIS, a former province of France, now comprehended in the department of Pas-de-Calais. While the old divisions of France existed, Artois was bounded on the N.E. by French Flanders, on the E. by French Hainault and by Cambresis, and on all other sides by Picardie. Former authorities give its length as twenty-five leagues, or sixty-nine miles, and its breadth as about half that distance; but, measured on the *Map of France in Provinces*, published by the Society for diffusing Useful Knowledge, it is eighty miles long N.W. and S.E., and forty broad.

Artois is a flat country. The line of greatest elevation, as determined by the course of the waters, is from S.E. to N.W. On one side of this line, the Aas, and the Scarpe and Sensée (two tributaries of the Schelde), flow to the N.E.; and on the other side the Canche and Authie flow parallel to each other, into the English Channel. The soil is admirably suited for grain, in which it is very productive; but fruit trees do not succeed. Wood is scarce, and is used as fuel only by persons in easy circumstances. The poor burn coal or peat. The population, as given in the *Encyclop. Methodique*, Paris, 1782, was 300,000. That of the department of Pas de Calais, which comprehends Artois and a small part of Picardie, was, in 1826, 643,000.

The capital was Arras, and among the other chief towns were St. Omer, Bethune, Aire, St. Pol, Lens, and Bapaume. [For which see the articles AIRE, ARRAS, BETHUNE, OMER, ST., PAS DE CALAIS, and POL, ST.

Artois takes its name from the people who formerly inhabited it, the Atrebates (from whose designation, also, the capital was called Arras); although the limits of this tribe were hardly so extensive as those of the modern province. It was one of the early acquisitions of the Franks: in whose time the name Atrebates, applied to the city Arras, was corrupted into Adertes or Adratas, and the province seems to have got the name of Pagus Adertisus. Charles the Bald gave it, in 863, as a dowry with his daughter Judith to Baldwin, Count of Flanders, surnamed *Bras de Fer*, or the iron arm. It reverted to the crown on the marriage of Philip Augustus with Isabel of Hainault in 1180. In 1236 it was made a county by Louis IX. (St. Louis), in favour of his brother Robert. After coming to the house of Burgundy, and forming part of the dominions of those powerful princes, it was seized by Louis XI. of France. Charles VIII., son of Louis, ceded it to the Emperor Maximilian, reserving however the feudal sovereignty; and it remained in the house of Austria till 1659, when it was yielded by Spain (for it had gone with the Spanish branch of that race) to France, with which it has been united ever since.

The ex-King of France, Charles X., was known in the early part of his life by the title of Count d'Artois. (*Ency. Methodique; Diction. de* Martinière, &c.)

Previous to the revolution, Artois appears to have enjoyed several privileges and immunities. It had its council for the management of civil affairs, consisting of three constituent bodies, the clergy, the nobility, and the commons (*tiers état*). This council seems to have regulated the levying of the taxes which were imposed by the king, and to have granted exemptions in cases where the pressure was very heavy.

ARTOTYRITES. [See Heretics.]

ARTS, DEGREES IN. Dr. Brett, in a Dissertation on Degrees in the Universities, published in 1722, in the first Number of the Bibliotheca Literaria, states his belief that degrees, such as are now given in our universities, originated with the incorporation of those bodies in the eleventh and twelfth centuries. Previous to this period, the distinctions were for the most part of masters and scholars only, as in our grammar-schools of the present day.

The term *master* is believed to be the oldest among those of graduation. Eugenius II. by the 34th canon of a council held at Rome in 826, mentions the appointment of magistri and doctores in the same sentence:—'ut magistri et doctores constituantur, qui studia literarum, liberaliumque artium, ac sancta habentes dogmata assidue doceant' (that masters and doctors be appointed who may continually teach the knowledge of learning and the liberal arts, and the received opinions in religion). This was confirmed by a decree of Leo IV. in another synod at Rome, in 853. (Muratori, *Antiq. Ital.*, tom. iii. col. 830.)

Du Pin (*Nouvelle Bibliothèque des Auteurs Ecclesiastiques*, 4to. Paris, 1700, tom. x., p. 171) is of the same opinion with Dr. Brett. He states that the academies or universities which were originally established, were in the thirteenth century reduced to form. That of Paris, which had begun to be formed in the preceding century, had grown famous from the number of its scholars, and for the masters with which it furnished all Europe. In its origin, he adds, it was composed of *artists*, who taught the sciences and philosophy; and of Divines, who made commentaries on Peter Lombard's *Book of Sentences*, and explained the Holy Scriptures. Mention of these two faculties only occurs in the constitutions made for the university by the Cardinal di S. Stefano, legate of Pope Innocent III., in 1215. The whole number of arts was originally *seven*, and these were distributed into the *trivium*, comprehending grammar, logic, rhetoric; and all the *quadrivium*, comprehending music, arithmetic, geometry, astronomy. Artidoctor and artista are antient names for masters of arts, mentioned by Du Cange.

Gregory IX., whose pontificate continued from 1227 to 1241, is said first to have instituted the inferior rank of *bachelors*; whose name was derived from *bacilla* (little staves), either because they were admitted by receiving a little wand, or because as following the title adopted for the novices of the soldiery, who exercised with sticks, in order to learn to fight with arms. The bachelors were exercised in disputations, of which the masters were the moderators. Much upon the etymology of the names of bachelor and master may be seen in Bacmeister's *Antiquitates Rostochienses*, in the third volume of the *Monumenta Inedita Rerum Germanicarum*, fol. Lips. 1743, col. 953. The honours conferred upon learned men, in the form of these degrees, greatly increased the number of scholars in all the universities of Europe.

From several passages in Wood's *History and Antiquities of the University of Oxford*, there can be little doubt but that the degrees both of bachelor and master of arts were conferred there in the time of Henry III. and the degree of master of arts probably much earlier. The *Laws* are said to have come into the university in 1149. (Gutch's edit. of Wood, vol. i. p. 52.)

Wood, quoting the commentaries of one Whetley upon Boëthius, written in the time of Edward the First, says, 'When the said bachelor was created master, the chancellor gave him the badges with very great solemnity, and admitted him into the fraternity with a kiss on his left cheek, using these words, "En tibi insignia honoris tui, en librum, en cucullum, en pileum, en denique amoris mei pignus, osculum; in nomine Patris, et Filii, et Spiritûs Sancti."' (Ibid., p. 59.)

The examination for the degree of B.A. (bachelor of arts) in *Oxford* at present consists—

I. In a public examination called *responsions*, that is, the answering of questions publicly proposed by the masters of the schools. This exercise consists of an examination in the Greek and Latin languages (chiefly with a view to their grammatical construction), in the rudiments of logic, or a portion of Euclid's *Elements of Geometry*. This examination is undergone by those students who have been matriculated not less than six, and not more than nine terms: it is a kind of preliminary examination, which, in the opinion of some persons, would be more appropriate if enforced at the time of the student's admission into the university.

II. In a *final examination*, comprising—1. The rudiments of religion, under which head is required a competent knowledge of the gospels in the original Greek—of the history of the Old and New Testament—of the thirty-nine articles of the Church of England—and of the evidences of religion natural and revealed. 2. The Literæ Humaniores, under which head is comprised a sufficient acquaintance with the Greek and Latin languages and ancient history—with rhetoric and poetry—with moral and political science, as derived from the ancient Greek and Roman writers, and illustrated, if need be, from modern authors; with logic (which is indispensably required from all candidates for the first, second, or third classes), and with the art of composition. 3. The elements of the mathematical sciences and of physic.

With regard to the examination in some parts of the Literæ Humaniores, and in the elements of the mathematical sciences, and of physics, the examiners have a discretionary power. No knowledge of mathematics or of physical science is indispensable; and a man may obtain the highest honours and still be totally ignorant of these branches of learning. They are however bound to examine all candidates in at least three Greek and Latin classical writers, in logic, or the first four books of Euclid, and to ascertain their proficiency in translating from the English into the Latin language. With respect to the rudiments of religion, they possess no discretionary power; and any failure in this part of the examination must preclude the candidate from his degree, without any regard to his other attainments.

After the candidates have been examined, the names of those who have honourably distinguished themselves by passing a good examination in a wider range that that necessary for the mere degree, are distributed, in alphabetical order, into four classes, together with the names of their colleges, under the two divisions of *Literæ Humaniores* and *Disciplinæ Mathematicæ et Physicæ*. A fifth class gives the *number*, without mentioning the names of those who, having obtained their *testimonium*, are not deemed worthy of any honourable distinction. Printed copies of the schedule containing these classes are sent to the chancellor, to the vice-chancellor, to the heads of houses, to the proctors, and to the refectory and common room of each college and hall.

In *Cambridge*, those who proceed to the degree of B.A. also undergo a previous examination (known in ordinary conversation by the name of the *little go*), in the second year of their undergraduate course, the subjects of which are, one of the four Gospels or the Acts of the Apostles, in the original Greek; Paley's Evidences of Christianity; and one of the Greek, and one of the Latin classics, or a part of such books.

The next step is termed the keeping of an act, under a moderator. [See Act.]

The *Senate-House Examination*, which follows in the fourth year, is conducted under other regulations. This examination is now extended to eight days.

The examination of those who contend for *Honors* is conducted according to regulations confirmed by a grace of the senate, April 6th, 1832, and which were brought into use in January, 1833. It consists in five days of examination in mathematics, commencing on the Thursday preceding the first Monday in Lent Term; the time of examination each day being five hours and a half, and the candidates being arranged in four classes, determined by the public exercises in the schools, and sometimes by the report of their college tutors. [See Act.] The examination on the first day extends only to such parts of pure mathematics and natural philosophy, as do not require the methods of the *differential calculus*. On the second and third days, the questions from books include, in addition to the above subjects, the parts of natural philosophy somewhat more advanced, and the simpler applications of the *calculus*. The fourth day the examination extends to subjects of greater difficulty, care however being taken that there be some questions suitable for the lower classes. On the fifth day the classes are arranged for examination according to a settled plan, when the questions proposed to all the classes are fixed upon by the moderators and examiners in common; but the duty of examining the answers to the questions is apportioned amongst the moderators and examiners as the plan directs. The result of the examination is published in the senate-house on the morning of the following Friday, at eight o' clock, when the names of all those who have obtained honors are arranged in *brackets*, as it is termed, the first bracket of course containing the names of those who occupy the highest place. If more than one name is in a bracket, which is nearly always the case, the places of such candidates are finally determined by a fresh examination on that day.

The examination of the other candidates for degrees, viz., the fifth and sixth classes who are *not candidates for honours*, takes place according to another plan, confirmed by grace of the senate, May 21, 1828.

Of the six examiners of these candidates, two confine themselves to the mathematical subjects; two to Homer and Virgil; and two to Paley's *Evidences*, Paley's *Moral Philosophy*, and Locke's *Essay on the Human Understanding*.

The examination is conducted entirely by printed papers. Each of the Euclid papers contains twelve propositions, selected from the first four books, with additional questions in the fifth, sixth, and eleventh books, and in trigonometry, at the discretion of the examiners. Each paper in arithmetic and algebra consists of questions entirely elementary: to which are annexed questions in the elementary parts of natural philosophy, at the discretion of the examiners. The papers in Homer and Virgil consist of passages to be translated, which may be accompanied with such plain questions in grammar, history, and geography, as arise immediately out of those passages. The examiners are strictly enjoined to take care that the number of questions to be answered, and the length of the passages to be translated, in any one paper, do not exceed what a person well prepared may be expected to answer and translate in the time allowed.

Upon the completion of the examinations both of those who contend for honours and of the others, a select number, thirty at least, of those who have most distinguished themselves in the first four classes, are recommended to the proctors for their approbation, and their names are set down according to merit, and classed in three divisions, viz., wranglers, senior optimes, and junior optimes, which constitute the three orders of honour; the fifth and sixth classes are also arranged numerically according to merit, but are not published in the Calendar. The candidates, having separately taken the oaths of allegiance and supremacy, and to observe the statutes of the university, and having also subscribed that they are *bonâ fide* members of the Church of England, are admitted to their degrees.

In addition to the examination thus described, an examination in classical learning of such persons as shall voluntarily offer themselves to be examined, follows on the fourth Monday after the general admission to the bachelor's degree. This continues four days. Translations are required of passages selected from the best Greek and Latin authors, as well as written answers to questions arising out of such passages; together with other exercises, but no original composition. The names of those bachelors who pass this examination with credit are arranged in three classes according to their respective merits.

Sixteen terms are required for the degree of bachelor of arts in *Oxford* from all except the sons, and eldest sons of the eldest sons of English, Scotch, and Irish peers, and of peeresses in their own right, as well as baronets, and the eldest sons of baronets and knights, when matriculated as such, and not on the foundation of any college; all such persons are allowed to be candidates for the degree after having completed three years. But of these sixteen terms, the day of matriculation, if it be in term, counts for one, and the day of admission to a bachelor's degree for another, and two more are dispensed with by congregation; so that, in point of fact, residence for twelve terms only is necessary.

In *Cambridge*, a bachelor of arts must also reside the greater part of twelve several terms, the first and last excepted.

In both Universities, the degree of M.A. is conferred without further examination. In *Oxford*, twelve terms are computed before the bachelor can be admitted M.A., though he is required to be actually resident for one term only. In *Cambridge*, a master of arts must be a bachelor of three years' standing, reckoned from the second Tripos Day following his admission to the bachelor's degree.

Bachelors of arts in both Universities, though graduates are considered to be *in statu pupillari*, that is, they are still under nearly the same discipline and control as the under-graduates, except attendance on college lectures. The legislative bodies of the Universities consist of those who are masters of arts or who have taken a higher degree.

Masters of arts, in both Universities, wear a gown of Prince's stuff, with a semicircular cut at the bottom of the sleeves. The Oxford hood, for a master, is of black silk lined with crimson. At Cambridge, if the master is a non-regent, he wears a silk hood entirely black; if regent, it is black lined with white

The Bachelors of both Universities wear black gowns of Prince's stuff; that of Oxford is with a full sleeve, looped up at the elbow, and terminating in a point. At Oxford, the bachelor's hood is edged with fur: at Cambridge, it is lined with lamb's wool. Representations of the dresses may be seen in Ackermann's *Hist. of the Univ. of Oxford*, 4to. Lond. 1814, vol. ii. p. 261; *Hist. of Camb.* 4to. Lond. 1815, vol. ii. p. 310.

For further information on the education of Oxford and Cambridge, particularly with reference to the degree of B.A., the fees, &c., see *Journal of Education*, Nos. I. III. IV. VIII. X. XIII. XV.; on that of Dublin, Nos. XI. XII.; and on the Scotch Universities, Nos. VII. VIII. IX.; and also the Oxford, Cambridge, and Dublin *Calendars*

ARTS, FINE. The fine arts are generally understood to comprehend those productions of human genius and skill which are more or less addressed to the sentiment of taste. They were first employed in embellishing objects of mere utility, but their highest office is to meet our impressions of beauty or sublimity, however acquired, by imitative or adequate representation. The capacity of the human mind for receiving such impressions, whether directly from nature or through the medium of the arts, depends greatly on civilization, and that leisure which supposes that first wants are satisfied; but there exists no state of society, however ignorant, in which some symptoms of taste and some attempts to arrest the beautiful are not to be met with: the difference between such efforts and the most refined productions is a difference only in degree; the fact of the existence of the arts in some form may be always taken for granted, and it would only remain to regulate their influence and direct their capabilities aright.

The arts are peculiarly interesting as human creations. They are composed of nature operating on human sympathies, and reflected through a human medium; and as nations, like individuals, present ever-varying modifications; so the free growth of the fine arts partakes of all these varieties, and may be compared to the bloom of a plant, true to its developing causes whatever they may be, and nurtured in the first instance by the soil from which it springs. In barbarous or degenerate nations, the sentiment of the beautiful has ever been attained only in the lowest degree, while a false excitement, founded on the suppression of the feelings of nature, may be said to have usurped the place of the sublime. We smile at the simple attempt of the savage to excite admiration by the gaudiness of his attire; but we should shudder to contemplate the scenes which his fortitude or obduracy can invest with the attributes of sublimity. The just value of life, the characteristic of that civilization which reduces the defensive passions to their due limits, at the same time naturally elevates the sources of gratification by pointing out the pleasures of the mind as distinguished from those of sense; and the perception of the beautiful is in its turn the cause, as it is in some degree the result, of the rational enjoyment of life.

The great use of the arts is thus to humanize and refine, to purify enjoyment, and, when duly appreciated, to connect the perception of physical beauty with that of moral excellence; but it will at once be seen that this idea of usefulness is in a great measure distinct from the ordinary meaning of the term as applicable to the productions of human ingenuity. A positive use results, indeed, indirectly from the cultivation of the formative arts, precisely in proportion as their highest powers are developed: for it will be found that at all times when the grandest style of design has been practised with success, and particularly when the human figure has been duly studied, the taste thus acquired from the source of the beautiful has gradually influenced all kinds of manufactures. Again, as illustrating science, the fine arts may be directly useful in the stricter sense, but this is not the application which best displays their nature and value. The essence of the fine arts, in short, begins where utility in its narrower acceptation ends. The abstract character of ornament is to be useless. That this principle exists in nature we immediately feel, in calling to mind the merely beautiful appearances of the visible world, and particularly the colours of flowers. In every case in nature, where fitness or utility can be traced, the characteristic quality or *relative* beauty of the object is found to be identified with that fitness;—a union imitated as far as possible in the less decorative parts of architecture, furniture, &c.; but where no utility save that of conveying delight (perhaps the highest of all) exists, we recognise the principle of *absolute* beauty. The fine arts in general may be considered the human reproduction of this principle. The question of their utility therefore resolves itself into the inquiry as to the intention of the beauties of nature. The agreeable facts of the external world have not only the general effect of adding a charm to existence, but they appeal to those susceptibilities which are peculiarly human, and it becomes necessary to separate the instinctive feelings which we possess in common with the rest of the creation, from that undefinable union of sensibility and reflection which constitutes taste, and which, while it enlists the imagination as the auxiliary of beauty, is, in its highest influence, less allied to love than admiration. It is this last feeling which the noblest efforts of the arts aspire to kindle, which not only elevates the beautiful, but reduces ideas of fear and danger to the lofty sentiment of the sublime, which, as its objects become worthier, is the link between matter and mind, and which tends to ennoble sympathy and increase self-respect.

With regard to the classification of the arts, those are generally considered the most worthy in which the mental labour employed and the mental pleasure produced are greatest, and in which the manual labour, or labour of whatever kind, is least apparent. This test would justly place poetry first; but the criterion should not be incautiously applied; for in architecture, where human ingenuity is most apparent, and even where the design is very simple, a powerful impression on the imagination may be excited from magnitude, proportion, or other causes. In such cases, however, it will still be evident that we lose sight of the laborious means in the absorbing impression of the effect, and the art thus regains its dignity. It would be an invidious as well as a very difficult task to assign the precise order in which painting, sculpture, architecture and music, would follow poetry and its sister, eloquence; but it may be remarked, that the union of the arts is a hazardous experiment, and is often destructive of their effect. This is most observable in the attempts to combine the principles of sculpture and painting. The drama itself, which unites poetry with many characteristics of the formative arts, and with music, is in constant danger of violating the first principles of style, viz., the consistency of its conventions; and in the more intimate union of poetry and music, the latter, though the inferior art, is too independent and too attractive to be a mere vehicle, and accordingly usurps the first place. [See the Arts above-mentioned under their respective heads.]

ARUM. [See AROIDEÆ.]

ARUNDEL, a borough town in the rape of Arundel, in the county of Sussex, on the river Arun, a short distance from the sea; 55 miles S.S.W. from London, and 10 E. by N. from Chichester. It stands on a declivity on the N.W. bank of the river, the course of which is very winding in this neighbourhood: 50° 51′ N. lat., 0° 33′ W. long.

The houses are tolerably well built, and the streets paved. The trade of the place is not very great, though vessels of 150 tons can come up to the town, and a canal unites the river on which it stands with the Wey, a feeder of the Thames. There is, however, a good deal of bark shipped, as well as much timber for the use of the dock-yards. The custom-house being at Arundel keeps up the business of the place, which might otherwise be drawn away to Little Hampton, about four miles distant, on the east bank of the Arun, at its mouth. The population of Arundel in 1831 was 2803. The number of houses rated to the house tax at 10*l.* and upwards was, at the same time, 120: the whole number of houses was 537, twenty of which were uninhabited. There are two weekly markets (Wednesday and Saturday), and four annual fairs (May 14, August 21, September 25, and December 17), chiefly for cattle. There is also a theatre.

A neat stone bridge, of three arches, over the Arun, unites the main part of the town with a smaller portion which lies on the opposite bank of the river. The church is a handsome Gothic structure, built partly of flint and stone, in the form of a cross, and mostly in the perpendicular style. From the intersection of the cross rises a low tower. The chancel has a north aisle, and contains many monuments of the former owners of the castle and others. It is now shut up, and in a very dirty, dilapidated state; but the nave and transepts, which are used for divine service, are kept in good repair and clean. A pulpit of stone, supported on wood, standing against the south-west pier of the cross, was till lately used in divine service. This church belonged originally to a priory of Benedictines, subject to the abbey of Seez in Normandy; but the priory was suppressed in the time of Richard II., and a chantry, or college, for a master and twelve secular canons, with other officers, was founded in its place. Southward from the church is a range of buildings, seemingly founded on the ruins of an antient structure, which was perhaps the habitation of the above-mentioned canons. A hospital, called 'Maison Dieu' (God's House), was founded in the time of Richard II., by one of the Fitz Alans, for the maintenance of as many poor as its revenues would permit. It was suppressed at the Reformation, when its income was estimated at 42*l.* 3*s.* 8*d.* per annum.

The most striking feature in Arundel is the antient castle, which gives to its possessor (now the Duke of Norfolk) the title of Earl of Arundel. This instance of a peerage attached to the tenure of a house is now an anomaly. In 11 Henry VI. it was decided, that the tenure of the Castle of Arundel alone, without any creation, patent, or investiture, constituted its possessor Earl of Arundel. (Nicolas' *Synopsis of the Peerage*, 27; Cruise's *Digest*, 3 vols. 152; Report of the Lords' Committee respecting Peerage, 1820.) In 3 Charles I. the Earl of Arundel obtained an Act of Parliament, intituled, 'An Act concerning the title, name, and dignity, of Earl of Arundel, and for annexing of the castle, honor, manor, and lordship, of Arundel, in the county of Sussex, with the titles and dignities of the baronies of Fitzallan, Clun, and Oswaldestre, and Maltravers, with divers other lands, tenements, and hereditaments, in the Act mentioned, being then parcel of the possessions of Thomas, Earl of Arundel and Surrey, Earl Marshal of England, to the same title, name, and dignity, of Earl of Arundel.' (Report of the Lords' Committee respecting Peerage, p. 374.)

The castle stands high, on a steep circular knoll, partly natural, partly artificial, close to the town, and commands an extensive prospect over the low flat country towards the sea as far as the Isle of Wight. It has been supposed that the sea once washed the castle walls, as anchors and other marine implements have been found near it. Arundel castle is mentioned as early as the time of King Alfred, who bequeathed it by his will to his nephew Adhelm. After the Norman Conquest, it was given by William I. to his kinsman Roger de Montgomeri, created Earl of Arundel and Shrewsbury. Robert, one of the successors of this earl, supported Robert Duke of Normandy, the eldest son of William I., against Henry I., the youngest son of the Conqueror. Afterwards the castle passed into the family of Albini, from them to the Fitz-Alans, and at last, by the marriage of the heiress of this race with Thomas Duke of Norfolk (in the reign of Elizabeth), into the family of the Howards, by whom it is still retained.

In the civil war between Charles I. and his parliament, Arundel castle was held and garrisoned by the latter. It was, however, taken by Lord Hopton in 1643, surrendering to him at the first summons, and two months after was as suddenly retaken by Sir William Waller. From that time it continued little better than a mass of ruins, until it was restored by the late Duke of Norfolk to its antient magnificence. A considerable portion of the old building was demolished on this occasion. The modern parts are in the Gothic style, built of free-stone; and stones of a brown cast were selected, in order to accord better with the remains of the antient fabric.

The castle is surrounded on the N. and W. sides by a deep ditch. The entrance gateway, antiently defended by a drawbridge and a portcullis, was built by Richard Fitzalan in the reign of Edward I., and repaired and restored by one of his successors. This, with some of the walls and the keep, is all that remains of the antient castle. The keep is a circular stone tower 68 feet in diameter, and the most perfect in England. In the middle of it is the dungeon, a vault about 10 feet high, accessible by a flight of steps, and about 15½ feet by 9¾ in extent. The keep has been long tenanted by some owls of large size and beautiful plumage, sent over from America, as a present to the late duke. Among the interior apartments of the castle may be mentioned the magnificent library, calculated to contain 10,000 volumes, and built in imitation of the aisle of a Gothic cathedral; the ornamental parts are in imitation of the cloisters at Gloucester, and St. George's, Windsor. It is 122 feet long, and 30 feet wide. The ceiling, columns, &c., are entirely of mahogany. The great hall, called 'the Barons' Hall,' was begun in 1806; it is 70 feet by 34, and 36 feet high. The roof is of Spanish chestnut, curiously wrought, and the plan is taken from Westminster, Eltham, and Crosby Halls. There is at one end a window of stained glass, representing King John signing Magna Charta. In a series of thirteen stained glass windows are portrayed the figures of some of the barons from whom the late Duke was descended; and there are also portraits of his family. In the dining-room is a handsome stained glass window, representing the late duke and duchess as King Solomon and the Queen of Sheba at a banquet; and a painting by Le Brun, of Adam and Eve in paradise, in imitation of *basso rilievo*.

The park is very extensive and finely wooded, including a great variety of picturesque scenery. In the *Museum Rusticum*, i, 85, we are informed, that the country round Arundel was covered with vineyards, from which wine was made; and that, in 1763, there were sixty pipes of excellent wine, resembling Burgundy, in the cellar of the castle, the produce of one vineyard attached to it.

The town was incorporated by Queen Elizabeth, and the corporation consists of a mayor, twelve burgesses, a steward, and other officers. The mayor is chosen annually at the court leet of the lord of the manor, and is a justice of the peace within the borough. The town has been represented in parliament ever since the 30th of Edward I. The franchise was in the inhabitants paying scot and lot; and up to the passing of the Reform Bill they returned two members. The Duke of Norfolk having fixed his residence at the castle, and made considerable purchases in the town, acquired the power of influencing the return of both members. By the Reform Bill the number of representatives was reduced to one; but the boundaries of the borough (which are coincident with those of the parish) remained unaltered, though it had been proposed by the commissioners of boundaries, in their report, to add the parishes of Leominster and Little Hampton, which would have swelled the population to 5039 persons. The proposal of the commissioners met, however, with violent opposition; a committee of the house was appointed to consider their report, and a surveyor sent down from London to make a fresh examination. Upon his report the house acted, and abstained from any alteration in the boundary. The living is a discharged vicarage, in the diocese of Chichester. Arundel is the seat of a deanery, and gives name to one of the *rapes*[*] into which Sussex is divided. This division is of Saxon origin, and the name is peculiar to Sussex.

The river Arun, on which the town stands, rises in St. Leonard's Forest, in the northern part of the county. Its course is not less than forty miles. It is famous for the grey mullets (which, in the summer, come up to Arundel in large shoals in quest of a particular weed, the feeding on which renders them a great delicacy); and also for eels.

See *Beauties of England and Wales*; Neale's *Views of the Seats of Noblemen and Gentlemen*; Pennant's *Tour from London to the Isle of Wight*; Rickman's *Gothic Architecture*; Dallaway's *History of the Western Division of Sussex*.

ARUNDEL MARBLES, certain pieces of sculpture, consisting of antient statues, busts, mutilated figures, altars, inscriptions, &c., the remains of a more extensive collection, formed in the early part of the seventeenth century by Thomas Howard, Earl of Arundel, and presented, at the suggestion of John Evelyn, in 1667, to the University of Oxford, by Mr. Henry Howard (afterwards Duke of Norfolk) the Earl of Arundel's grandson.

Thomas Howard, Earl of Arundel and Surrey, the founder of this collection, was the only son of Philip, first Earl of Arundel of his family, by Anne, sister and co-heir of Thomas, the last Lord Dacre of Gillesland. The year of his birth is fixed by Sir Edward Walker, in his *Historical Discourses*, to 1586. He received his education at home, under the eye of his mother, with whom he lived, in the latter years of Elizabeth's reign, in privacy. He had at that time, by courtesy, the title of Lord Maltravers, a barony derived from his great ancestors, the Fitzalans.

In 1603, soon after James's accession, he was restored in blood by act of parliament, and to such honours as he had lost by his father's attainder, as well as to the earldom of Surrey, and to most of the baronies which had been forfeited by the attainder of his grandfather, Thomas, fourth Duke of Norfolk. The dukedom itself was detained from him. Lodge conjectures that the Earl of Suffolk, Lord Arundel's uncle, who was then in favour, might have prevented that grace, with the hope of obtaining a revival of it in his own line, in the event of the young earl's death without issue.

When Lord Arundel came of age, he married Alathea, third daughter and co-heir of Gilbert Talbot, Earl of Shrewsbury; a match of great advantage, as her two elder sisters, the countesses of Pembroke and Kent, dying childless, she ultimately inherited the most part of her father's noble revenues.

In 1607 the Earl of Arundel was sworn of the privy council; and on the 17th of June that year, the king stood godfather in person to his first-born son. He soon after travelled into France and Italy, a journey which his untoward family circumstances had hitherto prevented; and during his stay in those countries he imbibed that love for the fine arts by which he was afterwards distinguished.

He remained abroad till 1611, and on his return was made K.G. The marriage of the Princess Elizabeth to the Elector Palatine happening soon after, he was appointed to escort them to their dominions. Finding himself once more on the continent, he went again into Italy, and at that time began to form his celebrated collection. When he returned to his own country, in 1614, he embraced the communion of the Church of England; for he had been bred a Roman Catholic in the strictest austerities of that persuasion. In 1621, upon Bacon's removal, he was made one of the commissioners for holding the great seal; and, in the same year, appointed, or rather restored, to the place of Earl Marshal of England.

King Charles I., upon his accession, continued him in this last office, and showed him several other indications of favour; but the earl's eldest surviving son, Henry Lord Maltravers, having married the Lady Elizabeth Stuart, sister of the Duke of Lenox, who was related to Charles, the king showed his resentment by an act of violence, which drew a remonstrance from the House of Peers. It had been the king's intention to marry this lady to Lord Lorne, the son of the Earl of Argyle, and so to reconcile the antient feuds between those two powerful Scottish houses. Lord Arundel was committed, together with his lady, to the Tower, solely by the authority of a royal warrant, in which his offence was not stated. The Lords, however, continued firm in his defence, and after a contest which lasted nearly three months, he was set at liberty June 8, 1626.

After the assassination of the Duke of Buckingham, the Earl of Arundel, who had been the duke's enemy, came again to court, and soon acquired a considerable share of favour and confidence. In 1631 he was appointed a commissioner to examine into the extravagant fees exacted in courts of justice and public offices, and in 1633 attended the king at his coronation in Scotland: in the same year he was deputed ambassador extraordinary to the States-general, and was made chief-justice of the forests north of Trent. But his most important public service about that period was in an embassy, in 1636, to the Emperor Ferdinand II. and the Imperial Diet, on the subject of the restoration of the palatinate to the elector, Charles's nephew; a measure which the king had so entirely at heart, that he could not have given a stronger proof of his confidence in the earl's wisdom and fidelity, than by intrusting it to his management. The mission, however, proved unsuccessful, and the earl, having passed nine months in Germany, during which he expended not less than 40,000*l.* from his own private fortune in augmenting his already splendid library and cabinet, returned to London, and was received by the king with peculiar marks of favour. A Journal, or *Relation*, as it was called, of the occurrences which took place in this voyage, was published in the succeeding year by William Crowne, gent., a book now of extreme rarity: a copy is preserved in the Royal Library at the British Museum.

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[*] The rape is a division between a county and a hundred, containing commonly several of the latter, similar to the *lathes* of Kent. The term *rape* is peculiar to Sussex. Its etymology is uncertain.

In 1637 the Earl of Arundel was appointed commander-in-chief of the forces raised for the reduction of those who opposed the liturgy and hierarchy in Scotland, and afterwards first commissioner for a new treaty. He was soon after appointed steward of the royal household; and in 1640 nominated general-in-chief of the country south of Trent. The violence, however, which marked the meeting of the Long Parliament gave a sudden turn to all public affairs, and prevented the effect of both his civil and military commissions. One of its first measures was the impeachment of the Earl of Strafford, at whose trial Arundel presided as Lord High Steward, with a judgment and impartiality which was admired by all parties. It fell also to his lot to be deputed to give the royal assent to those two fatal bills which cost Charles his crown and his life, and deluged the country in blood; the bill of attainder against Strafford, and that by which it was enacted that the parliament should not be dissolved but by its own consent.

In June, 1641, he presented a petition, supported by another from several peers of great influence, beseeching the king to restore him to the dukedom; but Charles, for some unknown reasons, would favour him no further than by the grant of a patent creating him Earl of Norfolk. Disgusted by this half measure, and foreseeing the dreadful storm which was then gathering, he determined to quit his country, and the king favoured his design by appointing him to escort the queen's mother, Mary de Medici, queen dowager of France, to end there her sorrowful days in security. His family accompanied him, and he returned alone early in the following winter, and remained in England till February, when the king gave him another opportunity of leaving it, by deputing him to attend to Holland Henrietta Maria, and her daughter, the Princess Mary, who had been married in the preceding summer to William, Prince of Orange. He returned no more. After a short stay in the United Provinces, he went to Antwerp; and from thence, leaving there his countess, whom he never met again, to Spa. He wandered slowly over most parts of Italy, and at last settled at Padua, where he died October the 4th, 1646. His body was brought to England, and buried at Arundel.

The Earl of Arundel's character has been drawn at considerable length by two writers, one at least of eminence, the Earl of Clarendon and Sir Edward Walker. Both agree that he wished to be thought a scholar, but that he was more learned in men and manners than in books. Clarendon says, his expenses were without any measure, and always exceeded his revenue.

Sir Edward Walker remarks, 'He was the greatest favourer of arts, especially painting, sculpture, designs, carving, building, and the like, that this age hath produced; his collections of designs being more than of any person living, and his statues equal in number, value, and antiquity, to those in the houses of most princes; to gain which he had persons many years employed both in Italy, Greece, and so generally in any part of Europe where rarities were to be had. His paintings, likewise, were numerous, and of the most excellent masters, having more of that exquisite painter, Hans Holbein, than are in the world besides; and he had the honour to be the first person of quality that set a value on them in our nation; and so, the first person that brought in uniformity in building, and was chief commissioner to see it performed in London, which, since that time, has added exceedingly to the beauty of that city.'

Upon his return to England in 1614, the Earl of Arundel's palace in the Strand, near London, and his country retreat at Albury in Surrey, were resorted to by men of talents. He maintained Franciscus Junius and Oughtred the mathematician; he patronized Inigo Jones, and Vandyke; and brought over Wenceslaus Hollar, the first engraver of merit, and encouraged him in England; and he employed Nicholas Stone, Le Sœur, and Fanelli, the first who practised their art of sculpture in this kingdom. It was from the example and recommendation of Lord Arundel, and encouraged by Villiers, who was glad to make the king a competitor in purchases, that Charles I. was originally induced to study and encourage the arts.

When Lord Arundel determined to collect a gallery of statuary, he retained two men of letters for that purpose. The well-known John Evelyn was sent to Rome, and Mr. (afterwards Sir William) Petty undertook a hazardous journey to the Greek islands and the Morea. In the islands of Paros and Delos, Petty's indefatigable researches had been rewarded with ample success, when, on his voyage to Smyrna, he was shipwrecked on the coast of Asia opposite Samos, and escaped only with his life. At Smyrna he acquired many marbles of great value, particularly the celebrated Parian Chronicle. Still the jealousy of Villiers was active in interrupting Lord Arundel's pursuit, and the delight of his retired hours. Sir Thomas Roe, then ambassador at the Porte, and consequently obedient to the minister, was directed to purchase beyond Petty's ability and to withhold from him every assistance in his diplomatic capacity which he dared not openly refuse.

Lord Arundel having assembled in his gallery his various acquisitions from Greece and Rome, adopted the following arrangement of his marbles: the statues and busts were placed in the gallery; the inscribed marbles were inserted into the wall of the garden of Arundel House; and the inferior and mutilated statues decorated the garden itself. We learn from catalogues, that the Arundelian collection when entire, contained 37 statues, 128 busts, and 250 inscribed marbles, exclusive of sarcophagi, altars, and fragments, and the inestimable gems.

Peacham, in his *Compleat Gentleman* (the second edition of which was published in 1634), says, 'I cannot but with much reverence mention the every way right honourable Thomas Howard, lord high marshal of England, as great for his noble patronage of arts and antient learning, as for his birth and place; to whose liberal charges and magnificence this angle of the world oweth the first sight of Greek and Roman statues, with whose admired presence he began to honour the gardens and galleries of Arundel House, and hath ever since continued to transplant old Greece into England.'

In 1642, when Lord Arundel left his country, Lord Orford says he transported himself and his collection to Antwerp: Dallaway says (what was no doubt the truth) that his gems, cabinet pictures, and curiosities, only were removed. He adds, 'In the general confiscation made by the parliament, the pictures and statues remaining at Arundel House were in some measure included. Many were obtained by Don Alonzo de Cardenas, the Spanish ambassador to Cromwell, and sent into Spain, with the wrecks of the royal collection.'

When Lord Arundel died, he divided his personal estate between his eldest and second surviving sons, Henry Frederick Lord Maltravers, and William, afterwards Viscount Stafford. Henry, second son of the former and sixth Duke of Norfolk, succeeded to the elder share, and in 1667, influenced by the previous recommendations of Selden as well as Evelyn, gave a part of his moiety (the inscribed marbles) to the University of Oxford; the remainder descended to his son Henry, the seventh duke, and were afterwards mostly possessed by his divorced wife.

Arundel House and gardens were converted into streets about the year 1678, when it was determined to dispose of the statues by sale. It was proposed by the agents to sell the whole collectively, but no purchaser could be found. A division was in consequence made. One portion, consisting principally of busts, was purchased by Lord Pembroke; these are now at Wilton. A second was purchased by Sir William Fermor (the father of the first Earl of Pomfret), who removed them to his seat at Easton Neston in Northamptonshire, where such as were capable of being repaired had their defects amended and supplied by one Guelfi, an artist who misconceived the character and attitude of almost every statue he attempted to make perfect, and ruined the greater number of those which he was permitted to touch. Henrietta Louisa, countess dowager of Pomfret, in 1755, transferred these marbles also to the University of Oxford, where they became again united to the inscribed marbles. Mr. Theobald, in a communication to the Society of Antiquaries, made in 1758, says that many of the broken statues, which were thought not worth repairing, were begged by one Boyden Cuper, who had been a servant in the family, and removed by him to decorate a piece of garden-ground which he had taken opposite Somerset Water-gate, in the parish of Lambeth; a place of resort for citizens and others in holyday-time, and long afterwards known by the name of

Cuper's Gardens. Here they continued till about the year 1717, when Mr. John Freeman, of Fawley Court, near Henley, in Oxfordshire, and Mr. Edmund Waller, of Beaconsfield, in Buckinghamshire, happening to see them, and observing something masterly in the designs and drapery of several, and that they were fragments of very curious pieces of sculpture, agreed for the purchase of them at the price of 75*l.* One moiety of these went to Beaconsfield, and the other to Fawley Court. A few statues and broken fragments were given to a Mr. Arundel, a relation of the Duke of Norfolk, who rented a waste piece of ground on the opposite shore of the river, which afterwards became a timber-yard; one or two of these were subsequently given to the Earl of Burlington, and went to Chiswick House. A few elegant remains were carried to Mrs. Temple's seat at Moor Park, near Farnham, in Surrey. Various other fragments, which were not thought worth removing, were buried in the rubbish and foundations of the houses in the lower parts of Norfolk Street, and the other buildings on the gardens. Several of these, including a few trunks of statues, dug up at a later time, were sent down to the Duke of Norfolk's seat at Worksop Manor.

The divorced Duchess of Norfolk, by whom the busts and statues were sold, also possessed the cameos and intaglios, and bequeathed them, at her death, to her second husband, Sir John Germaine. His widow, Lady Elizabeth Germaine, who valued them at 10,000*l.*, offered them, about 1755, for that price to the curators of the British Museum, who were not in a situation to bestow so large a sum upon the purchase; and finally gave them to her niece, Miss Beauclerk, upon her marriage with Lord Charles Spencer, from whom they passed to his brother the Duke of Marlborough; and are now known by the name of the Marlborough Gems.

Sir William Howard, when afterwards Lord Stafford, succeeded to a house built for his mother, the Countess of Arundel, by Nicholas Stone, in 1638. It stood near Buckingham Gate, and was called Tart Hall. The second share of Lord Arundel's curiosities was deposited there, and produced, at a sale in 1720, 8851*l.* 19*s.* 11½*d.*, and the house was soon after levelled with the ground. This information appears upon the minutes of the Society of Antiquaries.

A single article, an ebony cabinet, painted by Polenberg and Van Bassan, was purchased by the Earl of Oxford for 310*l.*

Dr. Mead bought at this sale Lord Arundel's favourite bronze head of Homer, which is introduced into his portrait by Vandyke; at Dr. Mead's sale it was purchased for 136*l.* by Lord Exeter, who gave it to the British Museum, where it is now considered as a head of Pindar.

Lord Orford says, the coins and medals of the Arundel collection came into the possession of Thomas, Earl of Winchelsea, and in 1696 were sold by his executors to Mr. Thomas Hall.

The greater part of the Greek inscriptions in the Arundel Collection now at Oxford were obtained, as has been already noticed, at Smyrna, where Gassendi says the celebrated Peiresc, who was engaged in similar pursuits, had first discovered them. According to this account, one Samson, Peiresc's factor, had paid fifty crowns for the curiosities, but the Turks having seised on Samson and his collection, with a view to obtain a higher price, the Earl of Arundel commissioned Mr. Petty to redeem the whole. They arrived in England in 1627, soon after which, at the suggestion of Sir Robert Cotton, they were carefully examined by the learned Selden, in conjunction with two other eminent scholars. Selden, in 1628, published his *Marmora Arundelliana*, a thin quarto volume, in which twenty-nine Greek and ten Latin inscriptions of this collection are deciphered and illustrated. The Arundel inscriptions were, at first, let into the wall which surrounds the Sheldonian theatre, each marked with the initial of the name of Howard. They were, however, soon increased by the accession of Selden's private collection, and some other donations; so that the whole amounted to 150 inscribed marbles, including tablets, altars, pedestals, stelæ, and sepulchral monuments. An edition of the whole was now undertaken, at the desire of Dean Fell, by Mr. Humphrey Prideaux, then student of Christ Church, but afterwards dean of Norwich, which appeared under the title of *Marmora Oxoniensia, ex Arundellianis, Seldenianis, aliisque conflata;* fol. 1676. They were edited with great care, and illustrated by the annotations of the editor, Selden, Lydiat, and others. This work was republished fifty-six years afterwards by Michael Maittaire, under the title of *Marmorum Arundellianorum, Seldenianorum, aliorumque Academiæ Oxoniensi donatorum; cum variis Commentariis et Indice, Secunda Editio*, fol. Lond. 1732; with great augmentations as to comment. An *Appendix*, consisting of three Greek inscriptions, subsequently given to the University, was published in 1733, fol. In 1763, the *Marmora Oxoniensia* were again published in a new and splendid form, under the auspices of the University, by Dr. Richard Chandler of Magdalen College; including the antient inscriptions collected by Sir George Wheler and Messieurs Dawkins, Bouverie, and Wood, during their travels, some which Dr. Richard Rawlinson possessed, and a few others; with engravings of statues, busts, and other marbles, to the number of 167 articles, 103 of which belonged to that part of the Arundel Collection which the countess dowager of Pomfret had given to the University. The Greek inscriptions of this collection, 'Ad Chandleri exemplar editæ,' were separately published at Oxford in 1791, in a small octavo volume.

The Arundel and Pomfret marbles are at present preserved at Oxford in two rooms belonging to the public schools, beneath the picture gallery. Of the Arundel portion, that which the University places at the head of its collection is the Greek inscription known by the name of the PARIAN CHRONICLE, so called from the supposition of its having been made in the isle of Paros about B.C. 263. Another inscription of interest is a treaty concluded between Smyrna and Magnesia, for the protection of Seleucus Callinicus, engraved on a pillar in the temple of Venus Stratonicis, at Smyrna, about B.C. 244.

Among the more important marbles of the Pomfret donation are the colossal torso (for that portion only is antique) of a Minerva galeata, restored as a statue by Guelfi; a Venus Vestita, or Leda; Terpsichore; a young Hercules; an Athleta, which has been called Antinous; a female figure, unrestored, of early Greek work; and three statues of senators, one of which is usually considered as Cicero. This last was etched by Woolridge.

Some of the statues in this collection, which have been restored, as far as the antient portions go, have no positive attributes of the characters of gods, heroes, &c., which Guelfi, who restored them, made them represent. (See Dugdale's *Baronage*, tom. ii. p. 277; Lodge's *Portraits of Illustrious Personages;* Selden's *Marmora Arundelliana*, and the *Marmora Oxoniensia* of Prideaux, Maittaire, and Dr. Chandler; Gassendi's *Life of Peiresc;* Gough's *British Topogr.*, vol. ii. p. 127; Lord Orford's *Anecd. of Painting*, edit. 1786, vol. ii. p. 124; and Dallaway's *Anecd. of the Arts in England.*)

ARUNDO, a genus of grasses, in which a number of useful species was once comprehended; but in consequence of the altered views of botanists regarding the limits of genera, it is now confined to the *Arundo Donax*, and the species most nearly agreeing with it. These are grasses of considerable size, sometimes acquiring a woody stem, and found only in the warmer parts of the world. Mr. Kunth defines the genus, as now limited, by the following characters:—Spikelets, each containing from two to five flowerets, which are distant from each other, arranged in two ranks, hermaphrodite, the uppermost being withered; glumes two, sharp-pointed, channelled, and keeled, nearly equal, membranous, as long as the flowerets, and at some distance from each other; paleæ two, membranous; the lowermost slit at the end, with a very short beard between the sides of the slit, covered externally, especially at the lower end and rachis, with very long silky hairs.

Arundo Donax, a native of the south of Europe, the Caucasus, Egypt, and Siberia, is one of the largest grasses that we have in cultivation; it is not unusual to see it, in rich soil, nine or ten feet high, with leaves as broad and as long as the blade of a small sword. A beautifully variegated variety is that which is usually seen in gardens.

Arundo arenaria, the sea-reed, or marrum-grass, a dwarf plant which pierces the sand-banks on the shores of the north of Europe with its tough subterranean stems, and which thus converts them into living barriers against the inroads of the ocean, differs a little from the exact character of Arundo, and is called by modern botanists *Ammophila arundinacea.* It is a very rigid plant, with bluish rolled-up leaves, and a stem two or three feet high, terminated by a dense tuft of flowers.

Arundo phragmites, the common reed, now forms the genus PHRAGMITES, which see.

ARUSPEX. [See HARUSPEX.]

ARVA, the most northern circle of the kingdom of Hungary, and one of the thirteen which compose the province of the Citerior-Danube. It is situated between the 49th and 50th degrees of N. latitude, and bounded on the east, north, and north-west by Galicia. It has a surface of 782 square miles; contains five market-towns and ninety-two villages, and 87,000 inhabitants, of whom 1200 are Jews. It occupies higher ground than any other circle in Hungary, of which it is one of the most unproductive portions, being intersected in all directions by offsets of the great Carpathian range, which forms its northern frontier. Of the fifty-two rivers and rivulets, which rise in this circle, the principal are the White and Black Arvas; the former flows into the latter, which has a fall of eighty-four feet in every five miles, and consequently a very rapid current. Arva produces little grain besides oats, on which the inhabitants wholly depend for their bread; but its soil is extremely favourable for the cultivation of potatoes, which are esteemed the finest flavoured in all the kingdom; and sufficient flax is grown to render linen an article of export. Its chief resource is its extensive forests, which afford large supplies of timber and fuel, and abound in bears, wolves, foxes, wild cats, &c. The whole population, excepting about 100 Jews, is of Bohemian-Slavonic, or Slowachian extraction. The capital of the district, Alsó-Kubin, is situated in the S.E. part of the circle, on the left bank of the Arva, and has 1100 inhabitants. It lies in 49° 14′ N. lat., and 19° 19′ E. long. It has a Catholic and a Lutheran church, as well as a synagogue.

ARVE, a river which rises in the mountains of Savoy, flows to the N.W., and falls into the Rhône just below Geneva. Its whole course is about sixty miles.

The source of the Arve is on the Col de Balme, at the N.E. extremity of the valley of Chamouni; but its waters are chiefly derived from the glaciers which cover the northern face of the chain of Mont Blanc. This circumstance causes a difference in the temperature of the river, at different distances from its source, the water growing warmer the farther it flows; and leads also to a daily alteration in the temperature at the same place. The melting of the snow goes on faster during the day, and so produces a more abundant flow of water, which is less affected by the warmth of the atmosphere than when the current is smaller, and, besides, this water traverses the lower country during the coldness of the night. These two causes produce a sensible difference in the temperature of the river near the mouth. From daybreak in the month of August the waters near the mouth have been observed to grow colder till nine or ten o'clock in the morning (the difference being about 2° of Reaumur, or 4°.5 of Fahrenheit); the alteration is effected by the arrival at this spot of the waters formed the preceding day by the melting of the snow. From nine or ten in the morning the temperature rises till ten at night, and then, after remaining stationary for a time, it falls again.

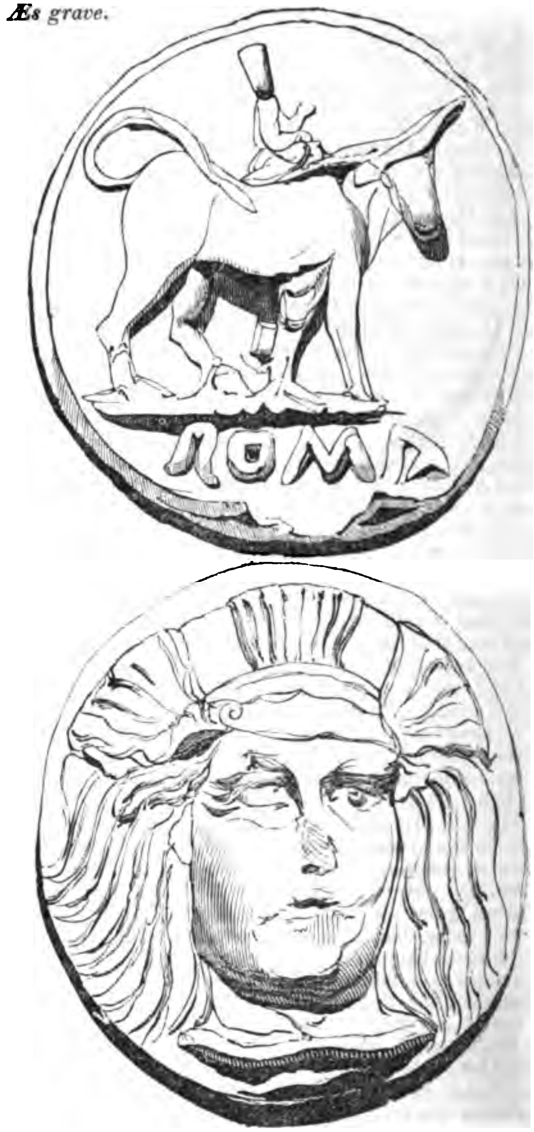
The current of the Arve is so rapid, that, for some time after it enters the Rhône, its waters do not mingle with those of that river; and at times, so great has been its violence, that it has impeded the course of the Rhône, caused the waters of the latter to flow back into the lake of Geneva, and given to the water-wheels of the mills on its banks a direction contrary to that in which they commonly move. (*Encyclopédie Méthodique.*)

ARVI'COLA, in zoology, a genus of Rodentia. [See CAMPAGNOL.]

ARZAMAS, the chief town of a circle in the Russian province of Nijni or Nishni, Novgorod, lies at the confluence of the Arsha and Tesha, seventy-two miles south of N. Novgorod, the principal capital. Though the population scarcely exceeds 5000 souls, the town contains twenty churches, besides a monastery and convent. It is dirty and ill-built; the inhabitants are, however, an industrious and thriving race of men, and independently of manufacturing large quantities of soap, Russia leather, and silver and iron wares, are extensively concerned in weaving and dyeing the krashennina, or blue cloth, which is so great a favourite with the Russian women. They likewise export linen, sail-cloth, and other domestic products to Moscow and St. Petersburgh; and the crown has a large manufactory of potashes in the town. It contains between 1400 and 1500 houses, and lies in 57° 37′ N. lat., and 43° 12′ E. long. Arzamas is connected with the small town of Veshna by means of a bridge across the Tesha, and their united population amounts to between 7000 and 8000.

AS, among the antient Romans, was a weight, consisting of twelve *unciæ* or ounces; it was also called *libra*, *libella*, and *pondo*, or the pound. Pitiscus (*Lexicon Antiq. Rom.*) gives its etymology from the Greek *ἄις*, used in the Doric dialect for εἷς, signifying an integer or whole, one entire thing; but we can find no authority for this word *ἄις*. Others, as we learn from Budæus (*De Asse et partibus ejus*, lib. v. 8vo. Lugd. 1551, p. 146), have more correctly considered As to be equivalent to *Æs*, a piece of copper or brass. (Varro L. L. v. 36, Spengel.)

As, *Assis*, or *Assarius* (Eckhel, *Doctrina Num. Vet.* tom. v. p. 2) was likewise the name of a Roman coin of copper, or rather of mixed metal, which varied both in weight and composition at different periods of the Commonwealth; but which originally actually weighed a pound, whence it was called *As libralis*, and sometimes also *Æs grave*.



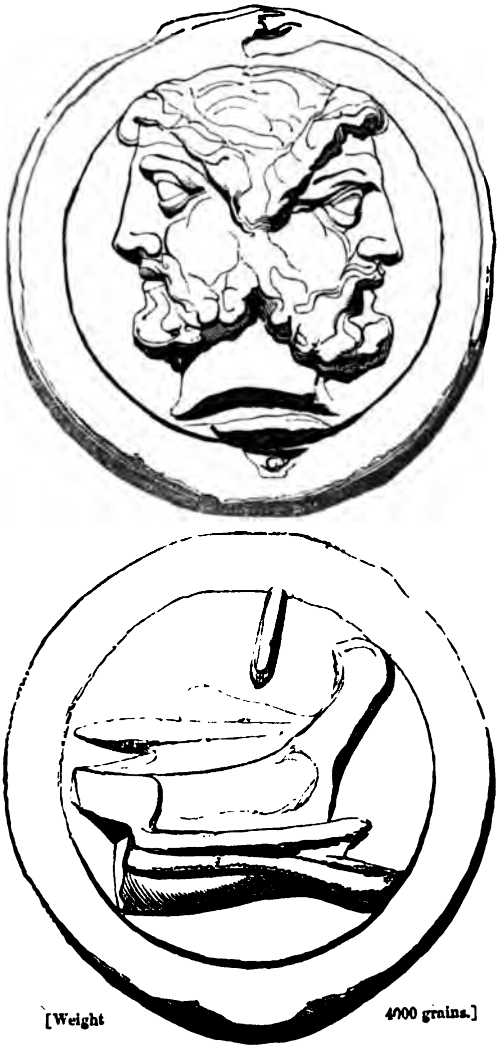
[This As weighs 3872 grains.]

The first coinage of this description, according to Pliny (lib. xviii. c. 3; xxxiii. c. 13), took place in the reign of Servius Tullus, which, if Sir Isaac Newton's chronology of Rome is adopted, would be about the year B.C. 460, or 587 on other authority. The first Asses of Tullus had the figure of a bull, ram, boar, or sow upon them.

Varro (*De Re Rustica*, lib. ii. c. 1), Pliny, and Plutarch, (*Poplicola*, edit. Bryan. tom. i. p. 226) assert that the most antient Asses were so marked. This, in fact, according to the two last writers, was the origin of the term *pecunia*, as used for money, a word derived from *pecus*, cattle; and also of the term *peculium*.

The next in point of antiquity to the As which bore the figure of an animal, is considered by Pinkerton to be the As which was stamped with the two-faced head of Janus on one side, and the prow of a ship on the other. See Pinkerton's *Essay on Medals*, vol. i. p. 100, who adopts his opinion of this being the second As in point of antiquity, from a manuscript *Dissertation on the Etruscan and Roman early Coins*, written by the late Dr. Charles Combe. Ovid, in his *Fasti*, expressly alludes to the As thus marked; and it is described by Pliny (xxxiii. 3). The head of Janus was usually so accompanied, because, according to an old fable, Saturn arrived in Italy by sea.

> "'Multa quidem didici; sed cur navalis in ære
> Altera signata est, altera forma biceps?
> Noscere me duplici posses in imagine,' dixit,
> Ni vetus ipsa dies extenuasset opus.
> Caussa ratis superest: Tuscum rate venit in amnem
> Ante pererrato falcifer orbe Deus."
> Ov. *Fasti*, lib. i. 229—234.



[Weight 4000 grains.]

The figures on this coin will explain the expression used by the Roman boys in tossing up—*capita aut navim*, 'heads or ship.' (Macrob. *Sat.* i. 7.)

The earliest Asses were cast, probably in imitation of the Etruscan coins, which the Romans, in this instance, appear to have copied. In the British Museum there are even four Asses united together, as they were taken from the mould or matrix, in which many were cast at once. In most of the Asses preserved in our cabinets, the edge shows evidently where they were severed from each other, and where the piece at the mouth of the mould was cut off. From being cast, it will be judged that they are not very correctly sized. As the As fell in weight, the smaller divisions were not cast, but struck.

According to Pliny, the As continued of its original weight till the first Punic war, when, the treasury of the state being exhausted, it was reduced to two ounces. This, however, is improbable, and is confuted by the coins themselves; since we find Asses of all weights, from the pound downward to Pliny's two ounces. The As must, therefore, he says, have gradually diminished to ten ounces, to eight, to six, to four; and when the size was so much reduced, still more gradual diminutions must have taken place to three, and to two ounces. One or two of the pieces which remain might even imply that the decrease was more slow, to eleven, to ten, to nine, &c., but it is to be observed that neither the As nor its parts were ever correctly adjusted as to size, so that the marks upon them only, not their comparative magnitude, distinguish the divisions.

The middle of the first Punic war being about the year of Rome 502, or B.C. 250, supposing Pliny to be correct, would be the time of the reduction of the As to two ounces.

Pliny adds, that in the second Punic war, when Q. Fabius was dictator, and the Romans were pressed by Hannibal, the As was further reduced to one ounce. This event is ascribed to the 537th year of Rome, or B.C. 215, being thirty-six years after the former change. He adds, again, that, by the Papirian law, Asses of half an ounce were coined. *Mox* is the word which Pliny uses to indicate the time of this change. A. Papirius Turdus, who was tribune B.C. 178, is suggested by Pighius (ii. 343) as possibly the author of this law; but Eckhel (*Doctr. Num. Vet.* vol. v. p. 5) considers the time uncertain. This weight of the As, however, continued till Pliny's time, and long after.

Pinkerton offers the following sketch of a plan to determine the ages of the different sorts of Asses from their weight:—The As libralis, coined by Tullus, with the figures of oxen, &c., about 167 years after Rome was built, according to Sir Isaac Newton, or B.C. 460; As libralis, with Janus and prow, 400; the As of ten ounces, 300; eight, 290; six, 280; four, 270; three, 260; two, according to Pliny, 250; one, also from Pliny, 214. But this scheme is conjectural, at least down to B.C. 250, and may be considered as intended rather for the amusement of the collector, than as instruction to the sober inquirer.

The As libralis with the head of Janus is the most common form now found of the As, previous to its being reduced to two ounces; a circumstance which shows that form to have been of long duration.

The exact period when the parts of the As were first given, in their proportions of weight and value, is not now ascertainable; but the best authors on numismatic science agree that the time was not very far removed from that of the first coinage of the As.

The coined divisions of the As were the *semis*, *quincunx*, *triens*, *quadrans* or *teruncius*, *sextans*, and *uncia*. There were other divisions of the As by weight, which it may be proper to enumerate concisely. These were the deunx of eleven ounces, the dextans of ten, the dodrans of nine, the bes of eight, the septunx of seven, the sescuncia of an ounce and a half, and the semuncia of half an ounce. But none of these have been found in a coined form in numismatic cabinets; they are therefore universally considered to have been nominal sums. Indeed it is clear they would not be wanted, for 6+5=11; 6+4=10; 6+3=9: so that these nominal sums were made up of the real coins by adding them.*

The *Semis*, *Semissis*, or *Semi-As*, half the As, or six unciæ, was of various types, but always marked with an S. The one here engraved represents a female head on one side, with a strigil behind, or perhaps a hook for reaping or other agricultural purposes, and a head of Pallas on the other: the S, at length, occurs on both sides. Mionnet (*De la Rareté et du Prix des Médailles Romaines*, tom. i. p. 5): and Akerman (*Descr. Cat. of Rare and unedited Roman Coins*, vol. i. pp. 6, 7) have enumerated many different varieties. See also Rasche (*Lexicon Rei Num.* v. Semissis).

The *Quincunx*, the division of five ounces or portions of the As, is of very rare occurrence. All the other portions of the As have been copied for the present work from original coins in the British Museum; but the Quincunx, it is believed, exists in no cabinet at present in this country.

Our present representation of it has been copied from a work entitled *De Nummis aliquot æreis uncialibus Epistola*, by the Cardinal de Zelada, 4to. Rom. 1778, a volume

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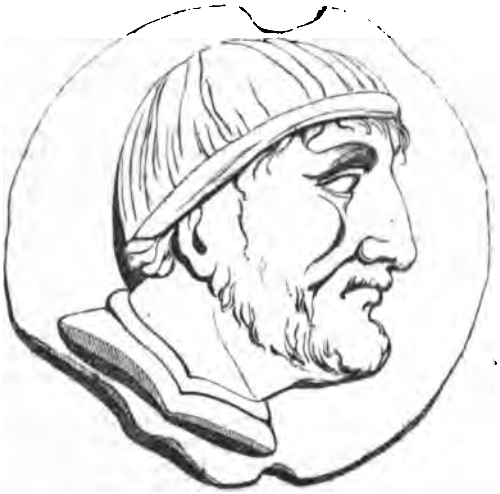
* Horace (*Ars Poet.* l. 325) says, the Roman youth learn to divide the As into a hundred parts:

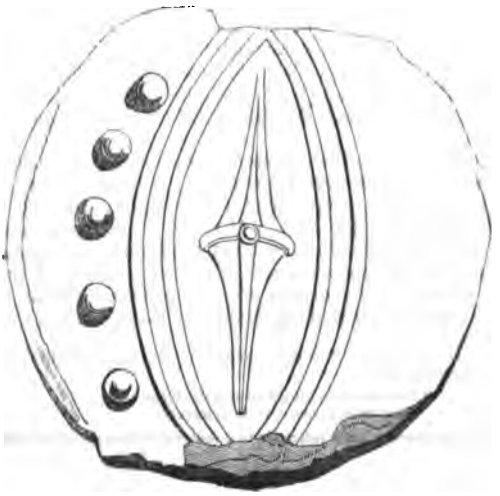
> 'Romani pueri longis rationibus Assem
> Discunt in partes centum diducere.'

Possibly this passage has a reference to a centesimal division of the As, then in use.

[Weight 2191 grains.]

of extreme rarity, written for the express purpose of illustrating the passages already quoted from Pliny.

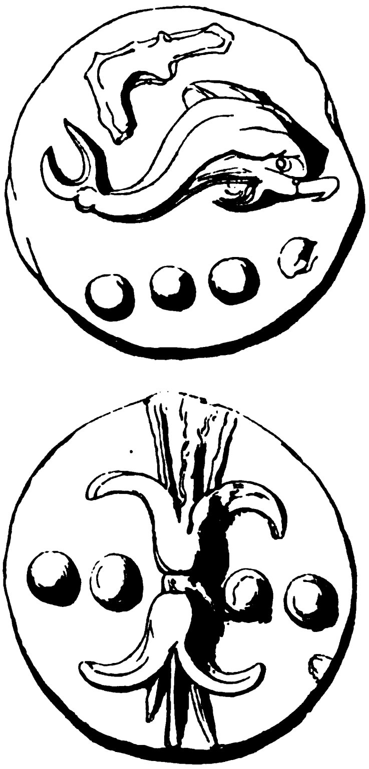




The Quincunx here given represents, on one side, a bearded head; and, on the other, a buckler, or shield, bearing five globules on the dexter half, which indicate its value. Another type is said to represent a sort of cross on both sides; and a third kind has the head of Apollo, with the Dioscuri on horseback, on the reverse, and the word ROMA; both these also bear the globules. The last-mentioned type is preserved in the Imperial Cabinet at Vienna.

It is possible, however, that this which we have engrave may not be a genuine Roman Quincunx; other cities in Italy and Magna Græcia had their own Asses, and their divisions, marked in the same manner as those of Rome herself. (Compare Eckhel, *ut supr.* p. 11—13.) These are usually called, in contradistinction, Italian Asses. Such were those of Velitræ, Tudertia, Luceria, Populonia, Panormus, Pæstum, &c.

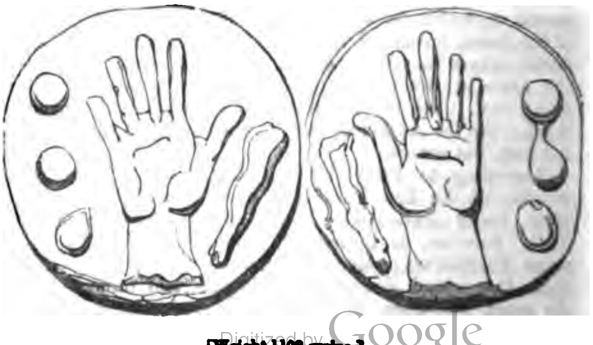
The *Triens* was the third of the As, or piece of four unciæ. The type here engraved bears a dolphin on one side with the strigil above: on the other is a thunderbolt.



[Weight 1571 grains.]

Four globules, or pellets, to indicate its value, occur on both sides. Other types will be found enumerated in Mionnet (*ut supr.* pp. 7, 8); and Akerman (pp. 10, 11). Eckhel says, the head of Pallas was very frequent upon the Trientes (*Doctr. Vet. Num.* tom. v. p. 15). Pliny says (xxxiii. 3) that both the Triens and the Quadrans bore the type of a ship.

The *Quadrans* was the fourth of the As, or piece of three unciæ. The types of this were various also (Rasche, *Lex. Rei Num.* v. Quadrans); but the value of the coin was uniformly denoted by three globules. On the Quadrans here represented, an open hand and strigil occur on both sides.



[Weight 1100 grains.]

Others have a dolphin, grains of corn, a star, heads of Hercules, Ceres, &c., on the obverse.

The *Sextans* was the sixth of the As, or piece of two ounces. The coin here engraved

[Weight 7.9 grains.]

bears on one side a caduceus and strigil, on the other a cockle shell. The value is denoted on each side by two globules. On some Sextantes the value is designated on one side only.

The *Uncia*, twelfth of the As, or piece of one ounce, is marked by a single globule. The type we have selected

[Weight 186 grains.]

bears on one side an ear of barley, and on the other a frog. For the varieties of type, compare Mionnet (p. 13); Akerman (p. 17). Eckhel describes one with the head of Pallas on one side, and on the other the prow of a ship: a globule by the side of each.

As the As fell in weight, larger denominations of coin were struck, bearing names relative to the As. The As was latterly marked I. The *Dupondius*, or double As, was marked II. The *Tressis* III. The *Quadrussis* IV. There were even *Decusses*, or pieces of ten Asses, in copper, marked X. Olivieri mentions one in his own cabinet weighing upwards of twenty-five Roman ounces, which must have been cast when the As was about three ounces; for, as has been mentioned, they are far from being correctly sized. In the Musæum Etruscum is a Decussis of forty Roman ounces, cast when the As was four ounces. The Denarius, Quinarius, and Sestertius were silver coins. According to Pliny, when the As was reduced to one *uncia* in the second Punic war, the *Denarius*, which was originally equivalent to 10, the Quinarius to 5, and the Sestertius to 2½ Asses, were respectively made equivalent to 16, 8, and 4 Asses. On this subject see SESTERTIUS.

Notwithstanding that the As fell, it still continued to be called libra; and in fines of estates, and in other old customs, was, nevertheless, held to be a pound weight of copper. See Cornutus on Persius: that annotator lived in the reign of Domitian. The word *As* was also used in accounts for the whole of any heritage, &c., to late times. *Hæres ex asse* was the phrase used by the jurisconsults for an heir to a whole estate. (Pitisci, *Lex.* v. As.) It is thus used by Martial (vii. 65), and elsewhere. The word As, indeed, with its subdivisions and multiples, was used generally as the representative of number, both in defining measures of length, the proportions of an inheritance, &c.

The Asses drawn for this article, from specimens in the British Museum, have been carefully weighed. A comparison of the weights will show that the parts do not correspond accurately with one another, or with the integer As. Our specimens may probably not all belong to one epoch, nor all to the city of Rome.

ASAM, or TAEKHA, a country of Asia, commonly included among the countries belonging to India beyond the Ganges, because it lies to the east of them; it should, however, rather be considered as an appendage of India on the west side of the Ganges, as the only easy access to it from Bengal is along the Brahmapootra. Asam is a valley of great extent, stretching from the meridian of 90° 30′ E. to that of 97° 30′, or upwards of 440 miles, between two elevated mountain-ranges; the slopes of which, as far as they belong to this valley, advance on the north to the parallel of 28° 30′ N. lat., and on the south to 25° 30′.

Along the north side of this valley, the most eastern chain of the Himalaya mountains extends. Following the boundaries of India within the Ganges, this gigantic mountain-range lies in the direction from N. W. to S. E. or W. N. W. to E. S. E., but near 28° N. lat. 89° 30′ E. long., a change takes place. At this point of change near Tassisudon, the capital of Bhotan, stands the Chamalari, one of the highest pinnacles of the Himalaya-range, which, being visible from a distance of 180 miles, must attain a height of at least 25,000 to 26,000 feet above the level of the sea. From the Chamalari, the range extends nearly due east for about 3° of long., but near the meridian of 92° 30′ it begins to decline a little to the north, and thus continues up to the source of the Brahmapootra, where one of its pinnacles is called Thathutheya. This chain, which, with its numerous ridges, occupies in breadth probably 2° of lat., and perhaps in some places much more, contains a great number of peaks covered with snow, especially between the meridians of 92° and 93°, and of 94° and 95°. Toward the source of the Brahmapootra it seems to decrease in height, and here it is connected with that extensive mountain-region which contains the sources of all the large rivers that drain the peninsula beyond the Ganges and the southern provinces of China, and which has not yet been explored by Europeans. The mountains from which the Brahmapootra rises, lying between 97° and 98° E. long., may still be considered as belonging to the Himalaya range, and as forming the most eastern extremity of that extensive chain. The height of these mountains is not precisely known, but probably it is not much short of 20,000 feet; they bound the valley of Asam on the east. The mountain-range which extends along the southern side of the valley is much less elevated, and varies in height. Where it skirts the upper course of the Brahmapootra and its numerous sources, it may attain an elevation of from 13,000 to 14,000 feet, and may be compared in height, if not in extent, to the Alps of Switzerland. Farther to the south-west, where it takes the name of Patkoi mountains, it seems to be much lower and more accessible; and to the west of the Patkoi are the Naga mountains, still lower than the former, and extending to about 93° 30′, where they are succeeded by the Garrow hills, which rarely rise to more than 6000 feet, and terminate the valley of Asam on the west, opposite the mountain-ridges which surround the southern declivity of the Chamalari. Between these ridges and the Garrow hills lies the wide opening by which the valley of Asam is connected with the plains extending along the Ganges.

Asam, with the bordering districts, including all the countries from the meridian of 90° 30′ to the heads of the sacred Brahmapootra on the east, and from the crest of the Himalaya-range on the north, to the chain of mountains separating on the south the sources of the rivers contributing to the Brahmapootra from those flowing in the opposite direction, comprehends an area of about 70,000 square miles, and exceeds the reputed area of England and Wales by about 12,000 square miles. But about one-half of its surface is occupied by the offsets of the Himalaya mountains, which are inhabited by independent nations, or subject to the Deb Raja, or sovereign of Bhotan; the nations residing in the mountains which skirt the valley on the south are also in a state bordering on absolute independence. Only the level and in some places hilly country which extends along the banks of the Brahmapootra, between 90° 30′ and 96° E. long., with an average breadth of from forty to sixty miles, forms what may be properly called the kingdom of Asam, which boundaries may comprehend an area of from 23,000 to 24,000 square miles, or less than half the surface of England.

The Brahmapootra, whose sources however have not yet been visited by any European, rises in the Himalaya range, or some mountains connected with it, between the parallels of 28° and 29°, and the meridians of 97° and 98°. The upper part of its course is first from N. E. to S. W., and then from S. E. to N. W., between high mountains, in a narrow valley, till changing its direction to nearly due south it passes the sacred pool called the Brahmakoond, and soon afterwards leaves the mountain-region and enters the plains of Asam, between 96° and 97° E. long. The general direction of its course in the plain is nearly due west up to the mouth of the Dihong, which joins it from the north between 95° and 96° E long.; and from that point till it leaves Asam at Goyalpara (Goalpara) the river is called Lohit, and runs for about 120 miles nearly due south-west, and afterwards to the south of west. Before it takes the latter direction it divides into two branches, which afterwards by re-uniting enclose an island called Majholi, which is upwards of twenty miles in length, with an average breadth of from four to five. After its branches have re-united, the river, running W. by S. for upwards of eighty miles, divides again, and here its branches enclose a much larger island, extending, according to report, five days' journey in length and one in breadth, which, however, seems not to be distinguished by any peculiar name, and terminates at no great distance to the east of Gowahat (Gowhatti, or Gohati), about 80 miles from the boundary of Bengal. Having entered Bengal at Goyalpara, it bears the name of Brahmapootra to its junction with the eastern branch of the Ganges, after which the united river is called Megna. In the valley of Asam it may run upwards of five hundred miles, and is navigable for vessels of considerable burden, or for large boats, as far as Sonpura, twelve miles above Sadiya, or about the 96th meridian.

The tributary rivers which descend from the mountains on the north and south sides of the valley are only navigable as far as their courses lie in the plains, and only in the rainy season, and for a short time afterwards. None of those which join the Brahmapootra from the south have a long course; the most considerable, as the Noa (Little) Dihing, Buri (Great) Dihing, and the Deyong run little more than a hundred or a hundred and twenty miles. But many of those which issue from the Himalaya range are very considerable and bring down a great volume of water, especially the Dihong, which joins the Brahmapootra between 95° and 96° of long., and is not without reason supposed to be the same river which in the table-land of Tibet is called the Sampoo or Yarou-Zangbo-tsui, and not a remote branch of the Irawaddy, as we see it represented in some maps. [See BRAHMAPOOTRA.] Farther to the west it is joined by another large river, the Suban Shiri, whose sources, however, like those of the Manas or Bonash, which falls into it near Goyalpara, are unknown to Europeans.

Asam, though not situated within the tropics, partakes of the tropical climate, the seasons being distinguished by the abundance of rain, or the continuance of dry weather. Three or four months of the year, or from the 15th of October to the month of February, may be calculated on as clear and dry, the sky during all this period being free from clouds; but the remainder of the year is perfectly uncertain. The heavy rains set in about the 15th of June, and continue to the 15th of September, when nearly the whole extent of the valley is inundated. These inundations are chiefly caused by the quantity of water brought down by the rivers from the northern mountains, which is so immense as not only to fill the wide bed of the Brahmapootra, but even the channels of the southern rivers up to the place where they issue from the mountains; these latter rivers themselves contribute little to the inundation. When the inundations begin to decrease, the climate is for some time unhealthy, especially for foreigners, but otherwise it seems not to be worse than the climate of Bengal. At the time of the inundation the inhabited places would be isolated, if they were not connected by causeways, eight feet high and about eighteen feet broad. These causeways are almost the only lasting monuments of human industry in this country, but they have in the late unsettled times partly gone to decay.

The soil all over the valley, except some hilly districts, is alluvial, and the result of the annual inundations: it is perhaps not exceeded in fertility by that of any other country, and would doubtless maintain twenty and perhaps a hundred times the number of its present inhabitants, were it not that the comparatively narrow breadth of the valley and its position between two very extensive mountain ranges, inhabited by warlike and barbarous mountaineers, expose its inhabitants to the continual incursions of their neighbours. To some of them, as to the Abors, the inhabitants of the plains are obliged to pay an annual tribute, and persons are sent down every season to collect it. In other places, especially along the upper Brahmapootra, the mountaineers, as the Miris and the Khamtis, have driven out the Asamese, and settled in the plains. To these causes it must be attributed, that only a very small portion of this fine valley, certainly not more than a hundredth part, is under cultivation. But since 1826 the English have undertaken to protect the inhabitants of the lowlands; and as they have shown the mountaineers their superiority in arms in different encounters, a speedy change may soon be expected.

The rural economy of Asam resembles that of Bengal, three-fourths of the cultivated land being appropriated to the production of rice, which yields annually two abundant crops; but they are not always sufficient to save the inhabitants from famine. A kind of mustard-seed is extensively cultivated, and chiefly used for making oil; the quantity of sesamum raised is inconsiderable. Wheat, barley, and millet, though they succeed well in the more elevated and drier districts, are not much used. The cytisus cajan was formerly only cultivated for the rearing of the lac insect, but now it is grown for its pulse, other plants being employed as food for the insect. The most common pulse is the hairy-podded kidney-bean. Black pepper is indigenous, and large quantities of it are gathered without cultivation. Other vegetables, such as long chilies, are raised, with choyies, ginger, turmeric, capsicums, onions, and garlic. Cocoa-nuts are rare, and no palm-wine is made: but oranges abound, and are indigenous in the neighbourhood of Sadiya; the fruit is acid, but not disagreeable, and the pulp of a pale yellow, like that of the lime. Cotton is only cultivated by the mountaineers in the southern hills, but silk is produced in great quantities, and seems to succeed exceedingly well. Four kinds of silk-worms are raised, of which that which feeds on mulberry-leaves is not very common. One kind, called *muga*, which is more abundant, lives on a species of laurus in the open air, and the cocoons are gathered twice in each year, once at the beginning of the dry season of a red, and again towards the end of the spring of a white colour. The white is reckoned the best, and entirely used by the rich people of the country. The worms which give the silk called *medungori* are reared on a tree, the botanical character of which has not yet been determined, but which is planted for that purpose. The worst kind of silk, called *erendi*, is reared on the ricinus in large quantities, especially about Rungpoor.

The botanical wealth of the valley, and that of the contiguous hill, has not been examined by any botanist. The tea-tree is said to grow in the vicinity of Sadiya, and the gum-copal tree in the Naga hills. The caoutchouc tree is indigenous throughout the country. The sugar-cane succeeds well, but is only cultivated for eating. Betel-leaf, areca-nut, opium, and tobacco, are plentifully produced in every district, and even in the mountains, which in some parts are covered with timber trees.

Oxen and buffaloes are reared, but only for the plough, as the inhabitants do not eat beef. Horses are not numerous, and asses are not reared at all, which is also the case in some other parts of the peninsula beyond the Ganges. The sheep are rare, and covered with hair instead of wool; goats are not numerous, but poultry abounds in every district.

The buffalo is found also in a wild state. The elephant and bear are only met with in the forests and mountains of the eastern and southern districts, but deer, tigers, and leopards abound in the numerous tree jungles. In some parts the small black long-armed apes are frequent, and in some rivers otters and river-turtle of a very large size. Fish and wild ducks are every where plentiful. From the mountains wax is brought down in considerable quantity.

Little is known of the metallic wealth of this country. Gold is found in and collected from the rivers flowing from the north, and a gold-mine is said to exist at the junction of the Deyong with the Brahmapootra, about thirty-two miles in a direct line east from Gowahat. Iron mines are found in the Naga mountains, and coal has been discovered in some of the lower hills; among which also salt-springs are found

Garnets, seven-tenths of an inch in diameter, are found in syenitic granite rock, in the mountains near the sources of the Brahmapootra.

Asam is divided into three provinces, Camroop, Asam Proper, and Sadiya, of which the first occupies the western districts, from the boundary of Bengal to the 93d meridian; Asam Proper is in the middle, and extends to the junction of the Brahmapootra with the Dihong; and Sadiya lies to the east of it, and stretches to the heads of the sacred river. Asam Proper contains the best-cultivated districts, and the few places which deserve to be called towns; Jorhath, the residence of the sovereign or raja, and Rungpoor, the most industrious place, the ancient capital Gerghong being almost entirely abandoned; but these places exhibit only a collection of huts, and contain no shops, the inhabitants of the country supplying all their necessaries by domestic industry.

The Asamese, or inhabitants of the plains, are doubtless of Hindu extraction, which appears from their physical constitution, their language, and their religion. The language differs so little from the Bengalee, that the latter has lately been adopted as the common medium of instruction in their schools. Their religion is Brahmanism, but many of the inhabitants belong to impure tribes. In the parts adjacent to Bengal, there are many Mohammedans, but their religion has degenerated into a heathen superstition.

The better classes dress pretty well: the women are always clothed in silk, and even three-fourths of the male population, especially of the middling classes. Cotton, not being grown in the country, is only used by the rich people, and mostly imported from Dacca, in Bengal. Their habitations are miserable constructions, consisting only of thatched huts, with walls of bamboo-mats, and supported by posts of saul (the *Shorea robusta*, a valuable timber tree), with arched roofs and mud floors. Each apartment forms a separate hut. In such huts are lodged the king and the nobility, as well as the poorest man in the country.

Though they have some skill in spinning and weaving silk cloth, even in this respect they have still much to learn from their neighbours in Bengal; and it seems that they know how to profit by the opportunity now offered to them, some spinning establishments having been lately erected. They have also made some progress in working iron, which is brought from the southern mountains; and in making ornaments of ivory.

The sovereign is considered as the only proprietor of the land, and the cultivators, who are called *pykes*, have only a temporary interest. For the privilege of cultivating the soil and enjoying its fruits, they are bound to work four months of the year for the king, or to pay him a compensation. It would seem that this constitutes the only tax they have to pay.

The mountaineers, who inhabit the ranges to the north, east and south of the valley, are mostly Bhuddists, and some of the valleys occupied by them are better cultivated than the plain, chiefly perhaps from not being exposed to hostile invasions. They do not raise much rice, but great quantities of Indian corn, and a small grain named *bubessia*. They cultivate also yams, mustard, pepper, cotton, and tobacco, and rear a great number of animals, especially of the cow kind; for besides the cattle, which are proper to their hills, they keep the small oxen of Asam Proper, and the chowry-tailed cattle of Tibet. Swine, as well as dogs, are numerous among them, and the latter used as food. Their habitations are commonly much larger and more convenient than those of the inhabitants of the plains. These mountaineers' speak languages altogether differing from that of the Asamese, and which do not appear to have much affinity to one another.

The Miris occupy the hilly country on both sides of the Suban Shiri, and partly also the plain; the valleys in the Himalaya range, lying farther west, are subject to the Deb-Raja, or sovereign of Bhotan, and on the east of the Miris the mountains on both sides of the Dihong are inhabited by the Abors, whose neighbours on the east are the Mishmis, up to the source of the Brahmapootra. The heights skirting the upper course of this river on the south are occupied by the numerous and powerful tribe of the Sinh-fos; and the adjacent low country is inhabited by the Khamtis, up to Sadiya. The small tribes of the Mowamarias, or Moras, divide the Sinh-fos from the Nagas, who occupy by far the greatest extent of the southern range, and extend to the Cassya and Garrows, on the boundary of Bengal.

We shall not enter into a detail of the manners and customs of these savage nations, but we cannot help noticing the very singular coincidence of the political institutions of the Abors with those of the inhabitants of the Alps in the country of the Grisons. Every village forms a democratical republic by itself, and is governed by the laws enacted by all the inhabitants in a formal meeting. This meeting is called *Raj*, which evidently signifies the *sovereignty*. It is held in the morning, and every male inhabitant has an equal vote. It appears, though it is not acknowledged by them, that among the Abors, as among the Grisons, some few, either by their superior wealth, hereditary reputation, or real ability, exert a very strong influence over the rest, and can readily sway them to any measure they like. The Raj, however, is extremely jealous, and very vigilant in preserving their democratical rights. Hence they have laws which make the public burdens fall equally on all. In the middle of the village is the *morang*, a large building, which serves as a hall of audience and debate, as a place of reception for strangers, and as a dwelling for the bachelors of the village generally, who by their laws are not entitled to the aid of the community for the construction of a separate house. Their orators seem to have studied rhetoric and to have considered its effects on the minds of their countrymen; they speak in a remarkably emphatic style, dwelling upon each word and syllable. They are wonderfully fond of holding their palavers, at which they are heard with the utmost patience and without any interruption, and in this particular they are certainly much superior to many more civilized nations. If in an affair of importance the assistance of their neighbours is required, they send ambassadors to the other republics, who are charged to make proposals or to accept what has been proposed by another community.

Before Asam was visited by Europeans, the number of its inhabitants was thought to amount to a million or even a million and a half; but now that most of its districts have been surveyed, it is supposed that the population is not much more than 150,000 or 200,000. But this estimate seems rather too low, when we consider the great extent of the country, though it is true that very large tracts are covered with jungle, and show no signs of cultivation nor any traces of inhabitants.

The antient history of Asam is entirely fabulous. It seems for a long time to have been under the sway of sovereigns of Hindu origin, and to have undergone many revolutions. In the seventeenth century the Mogul emperors of Hindustan sent a numerous army to subject Asam: the conquest succeeded almost without any resistance on the part of the inhabitants and their sovereign, and was effected in the course of one dry season; but no sooner had the rains set in than the whole army was destroyed by disease, and by the Asamese, who returned from the mountain fastnesses, to which, at the time of the invasion, they had retired for security. Very few of this Indian army regained Bengal. In modern times the continual discords and intrigues in the royal family brought it under the dominion of the Burmese, who are said to have treated the people and the sovereign with much severity. The Burmese were expelled almost without a struggle by the English in 1824, and obliged by the peace of 1826 to leave this country and its sovereign under the protection of the East India Company.

The commerce of Asam is of very little importance. The mountains which surround it on all sides, except on the west, are of such a description as to preclude almost entirely the possibility of conveying commodities to the contiguous countries. The attempts made by the English to penetrate the Himalaya range and to enter Tibet from this side have hitherto not succeeded, nor have they yet discovered a route leading to that country, though it is certain that such a road must exist, as the mountaineers, especially the Abors, are dressed in cloths of Tibet woollens, and possess other articles of the manufactures of that country. It is, however, known that to the north of the Brahmakoond there is a pass over the mountains which are inhabited by the Mishmis, and this pass conducts to a country inhabited by a nation called the Lamas. But it is a journey of twenty days from the river, through an extremely mountainous region, to the country of the Lamas. The Mishmis seem to be an enterprising and commercial tribe. They cross this range, and likewise the mountains which surround the sources of the Brahmapootra, and bring articles of Tibet manufacture to the Khamtis inhabiting the plains on the upper course of the Irawaddy. Two mountain passes lead from the valley of the Brahmapootra eastward to the Irawaddy; but they pass through a sterile mountain region, in which, for ten days' journey, no habitation is seen. From the town of Rungpoor a road leads over the Naga mountains and descends into the valley of the Ky-an-du-ayn river in the Burmese empire, and this road is even passable for beasts of burden; but since Asam has been withdrawn from the dominion of the court of Ava, all intercourse with that country seems to have ceased. Two passes across the Garrow Hills connect Camrup with Silhit, a province of Bengal, and one of these passes near the sanatarium (or invalid station) of Churra Punje. The commercial intercourse of Asam at present seems to be almost entirely confined to that with Bengal, which is indeed of very little importance. Asam exports the coarsest kinds of silk, but not in great quantity, and receives in return salt and cotton goods made at Dacca; having few things to give in exchange, the people of Asam pay for some of these imported commodities in gold. (Buchanan, Bedford, Neufville, and Wilcox, in the *Asiatic Researches; Asiatic Journal; Map of India East of the Ganges* by Berghaus.)

ASAPH, ST., a city in Wales, near the western extremity of the county of Flint, on the road from Holyhead to Chester. It is twenty-eight miles and a half from Chester, and 217 from London.

St. Asaph stands on the slope of a small hill between the rivers Clwyd and Elwy, of which the former is to the east of the city and at some distance; the latter (a turbulent stream, which falls into the Clwyd a little farther down) is close to the western side of the city, at the bottom of the grounds of the bishop's palace. From its situation on the banks of this stream, St. Asaph had formerly the title of Llan Elwy, or the *town or city* of Elwy. The main street of the city, which is built with tolerable uniformity, runs up the slope of the hill from the bridge over the Elwy (which has five arches) to the cathedral, which is on the summit of the hill. There has been some increase of building on the west side of the town on the Holyhead road, and on the north side, or rather north-west, where a road runs parallel to the course of the Elwy towards Rhuddlan. The place is, however, altogether very small; the whole parish, which is extensive, having in 1831 only 3144 inhabitants. There is not any particular branch of trade or manufacture established here; the town contains very few good houses; and, excepting the cathedral, there is little in it to claim attention. There is a parish church at the bottom of the hill near the bridge; and the bishop has a palace, large and convenient though not magnificent, rebuilt by Bishop Bagot, who held the see about the close of the last or beginning of the present century, and enlarged by the present bishop, Carey. The deanery is on the farther side of the Elwy, and nearly opposite the bridge. It is quite new, having been rebuilt by the present dean.

The cathedral is small, but plain and neat. The original structure was of wood, but was replaced by a building of stone. This having been, in 1282, burnt by the English in their wars with the Welch, an attempt was made to transfer the see from St. Asaph, then an open and defenceless village, to Rhyddlan or Rhuddlan, which was fortified. From some cause or other, not well ascertained, the attempt failed, and in 1284 the cathedral was rebuilt; and this may be considered as the present edifice, for the walls have remained ever since. In 1402 the cathedral was burnt by Owen Glyndwfr, and only the walls left standing. After having lain nearly eighty years in ruins, it was restored by Bishop Redman, who repaired the walls and put on a new roof. Further improvements or repairs were made by Bishop Owens, who filled the see in the time of Charles I.; but the predominance of the puritan party put a stop to them, and subjected the cathedral and its furniture to some injury. Further repairs were made by Bishops Glemham and Barrow, who successively filled the see after the Restoration (especially by the latter); and also by Bishops Fleetwood (from 1708 to 1714) and Wynne (1714 to 1723). The choir was rebuilt in the time of Bishop Shipley (who was bishop from 1769 to 1787), out of a fund vested in the dean and chapter for the purpose.

This edifice stands on the south side of the main street of the city, in a churchyard of sufficient size to afford a good view of each side. It is a plain cross church, with a square embattled tower in the centre, having a square turret staircase at the north-eastern angle. The dimensions are as follows:—

Length of the church from E. to W. . .	178 ft.	in.
——— from the west door to the choir .	84	4
——— of the choir	93	8
——— of the cross aisles or transepts N. to S.	108	
Breadth of the nave and side aisles . .	68	
Height of the nave from the pavement to the ceiling . . .	60	

These dimensions differ from those given in Browne Willis's *Survey of St. Asaph*, and in the *Beauties of England and Wales*, especially in the length assigned to the choir, which has been very much enlarged, while the length from the west door to the choir has been diminished by the alteration in an equal degree. The alteration took place in the spring of the year 1833; and the space taken into the choir is that between the arches that support the square embattled tower, 34 feet 8 inches in length, by 29 feet 9 inches in width. A new organ was put up at the same time. The choir and transepts have no side aisles.

The nave and transepts are of the age when the decorated style of English architecture prevailed, which was, according to Rickman (*Essay on Gothic Architecture*), during the reigns of Edward II. and III. A.D. 1307 to 1377; but this style must have been in use before, as we have seen that the walls were raised in 1284. The architecture of these parts contains some singularities and beauties, among which may be reckoned the west window, and the painted window at the east end of the choir, from a picture by Albano, representing our Saviour about twelve years old, surrounded by angels, and the various instruments of torture, such as the cross, the nails, and crown of thorns. The belfry windows appear to have been altered. The piers and arches of the nave, as also the western door, have plain but bold mouldings. The clerestory windows of this part are small square apertures with portions of tracery, which appears to be antient. The windows of the transepts, though not remarkable for their tracery, are of decorated character. The choir, which, as noticed above, was nearly rebuilt in the time of Bishop Shipley, is an attempted imitation of antient work, but has no real resemblance to any style, though apparently intended to imitate the perpendicular. The tower and some other parts have partially undergone a similar renewal to that of the choir. A portion of the transepts is cut off to form the chapter-house and vestry, and there are neither additional buildings, nor, according to Rickman, any trace of any; but the older plans and drawings of the cathedral, which we have seen, represent the chapter-house as built out from the north side of the choir, and having a door opening into it from the choir. The buttresses about the church are few. The tower is ninety-three feet high, and commands a fine view of the rich and extensive vale of Clwyd. It has only one bell in it, though there are frames for eight. It is built of squared stone, of which some is red, intermixed with a harder sort of a brown or grey colour. The stone used in the choir, and in most of the windows of the church, is soft, red, and mouldering. None of the monuments call for notice except one, supposed to be that of Bishop David Owen (ob. 1512), which was moved from the choir on the repair of the latter; another, lately erected by subscription to the memory of Dean Shipley; and a third, a heavy pile, erected to the memory of Bishop Luxmoore.

The see of St. Asaph is said to have been founded by Kentigern, or, as the Scottish historians call him, St. Mungo, who was bishop of Glasgow. Having been driven from his see about the middle of the sixth century, he took refuge in North Wales, established a monastery, and erected a bishopric near the river Elwy. Upon his recall to Glasgow, he left this charge to his disciple Asaph or Hasaph, a native of Wales, from whom the cathedral and the diocese got their designation. In the wars between the English and Welch, in which the frontier situation of St. Asaph was very disadvantageous to it, the early records of the see perished, and there is a long hiatus in the list of bishops. In modern times the bishopric has been held by men of eminence for talent, piety, and learning. Among these may be mentioned Bishop Lloyd, one of the seven committed to the Tower by James II., Bishops Beveridge, Tanner, Shipley, and Horsley.

The bishop's revenue was valued in 26 Hen. VIII. at 202*l.* 10*s.* 6*d.* in the whole, and 187*l.* 11*s.* 6*d.* clear. We have no data for ascertaining its present value.

The diocese comprehends Flintshire, Denbighshire, and Montgomeryshire (with the exception of a few parishes), and parts of Merionethshire and Shropshire. There were in it, at the beginning of the present century, 130 benefices, viz.

55	rectories,
48	vicarages,
13	parochial curacies,
14	chapels,
130	

all of which, except seven, are, together with the deanery, in the gift of the bishop. It is divided into eight deaneries, viz. Rhos, Tegengle, Bromfield and Yale, Marchia, Penllyn and Idernion, Pool, Caedewen, and Cyfeiliog and Mowddy.

The cathedral establishment includes, besides the bishop, a dean (who has a house west of the town beyond the river Elwy), six prebendaries, seven canons cursal, four vicars choral, an organist, six lay clerks, and six choristers. The archdeaconry has been held *in commendam* with the bishoprick ever since 1573, for the better maintenance of the latter.

The parish church is a small building, of two aisles parallel to each other, and has no steeple.

St. Asaph has a weekly market, viz. on Friday; and four fairs in the year, on Tuesday in Easter week, July 15, October 16, and December 26. The petty sessions for the division of Rhuddlan are held here. There is an almshouse for eight poor widows, founded by Bishop Barrow (uncle to the celebrated Dr. Isaac Barrow), a prelate of eminent benevolence and goodness; and an endowed school for boys.

The parish is large, and contains many townships. It extends into Denbighshire, and is five miles from east to west, and four from north to south. By the late reform bill St. Asaph has been added as a contributory borough to Flint. The boundary of the borough comprehends a considerable portion of land beyond the town, but is not by any means so extensive as the parish. The number of houses valued at ten pounds and upwards yearly value, within the limits, is ninety-three.

The country around the city is very beautiful. Within the parish is Capel Ffynnon Vair (Chapel of our Lady's Well), a picturesque ruin, near a spring, from which it takes its name, once much resorted to by devotees.

From the name of the eminence on which the city stands, *Bryn Paulin*, it has been conjectured that the Roman general Suetonius Paulinus encamped here on his way to or from Anglesey. [See ANGLESEY.] (Browne Willis's *Survey of St. Asaph*; Pennant's *Tour in Wales*; Bingley's *Tour round North Wales*; Rickman's *Essay on Gothic Architecture*, &c.)

ASA'RIUM (in botany), a genus of plants, belonging to the family of the Aristolocheæ, distinguished by having the calyx bell-shaped and three-lobed; the stamens placed upon the ovarium, the anthers adnate to the middle of the filaments, the style short, stigma stellate, and six-lobed; the fruit capsular, and six-celled. The *A. europæum* is known by having two obtuse kidney-shaped leaves on each stem. It is a perennial plant, found in woods in different parts of Britain. The root, which is employed under the name of *asarabacca*, contains a camphor-like principle, and a bitter principle, called asarin, which is combined with gallic acid. To these it is indebted for its action on the human system. Taken into the stomach in a state of very fine powder, it causes vomiting; in coarser powder, it generally purges. It was formerly employed as an emetic instead of ipecacuanha; but, from the violence of its effects, it is now properly laid aside in medical practice: it is still, however, used in veterinary medicine, to vomit and purge. The fine powder applied to the nostrils causes sneezing, and a flow of mucus from the membrane which lines those parts. It is therefore extensively employed as an errhine, and is the basis, or chief ingredient, of many cephalic snuffs. It is used in chronic inflammations and some other diseases of the eye, and in headaches. Where these last arise from disorders of the digestive function, such means can be of no avail: where they are connected with congestion or fulness of the vessels of the head, the increased discharge from the Schneiderian membrane may give temporary relief in the same way as a few drops of blood, flowing spontaneously from the nose, or obtained by puncturing the membrane. When taken into the stomach in considerable quantity, it acts as a poison.

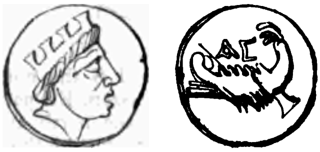
ASBESTUS must be considered, in mineralogy, rather as a term implying a peculiar form sometimes assumed by several minerals, than as a name denoting a particular species; it is in fact applied to varieties of the amphibolic minerals, such as actinolite, tremolite, &c., which occur in long capillary crystals, placed side by side in parallel position, and thus giving rise to a fibrous mass. As might be expected, the above conditions are fulfilled in various degrees, and there are accordingly various kinds of asbestus. Those varieties, the fibres of which are very delicate and regularly arranged, are called amianthus, a Greek term signifying *unpolluted*, unstained: the individual crystals are here readily separated from each other, are very flexible, and elastic, and have a white or greenish colour with a fine silky lustre. Though a single fibre is readily fused into a white enamel, in mass it is capable of resisting the ordinary flame, so that when woven it produces a fire-proof cloth, and hence the name from the Greek *ἄσβεστος*, in the sense of *indestructible*. The most beautiful specimens have been found in the Tarentaise in Savoy; but Corsica must be considered as its principal locality, from its great abundance. It is also found in Cornwall at St. Neverne: likewise in several parts of Scotland. It occurs also in the United States of America, where it is sometimes used as a wick for an oil lamp.

Those varieties in which the crystals are coarser, with scarcely any flexibility, are called common asbestus. It is generally of a dull green, and sometimes a pearly lustre, and readily fuses before the blow-pipe flame. It occurs more frequently than amianthus, and is usually found in veins traversing serpentine.

There are three other varieties, known by the names of mountain feather, mountain wood, and mountain cork, which differ from the common asbestus by the fibres interlacing each other. The two first have received their name from their appearance; the third from its extreme lightness, and from its swimming in water. They have been found in Scotland.

ASCALABO'TES, in zoology, a genus of reptiles. [See GECKO.]

A'SCALON (Ἀσκάλων), a town of Palestine, on the shore of the Mediterranean, about twelve miles north of Gaza: it was one of the 'fenced cities' of the Philistines, but shortly after the death of Joshua it fell into the hands of the tribe of Judah; it was afterwards successively under the Assyrians, Persians, Greeks, and Romans.



[Copper Coin in the Brit. Mus.]

There was a celebrated temple of the Heavenly Venus (Οὐρανίη Ἀφροδίτη) at Ascalon, which Herodotus (I. 105) mentions as having been plundered by the Scythians B.C. 630. Forty rose-granite columns, belonging to an antient temple, in the Greek style, are still standing, with capitals and friezes of the most beautiful marble. This temple is probably the representative of the old Syrian edifice. There are also the remains of a Roman amphitheatre at Ascalon. Antiochus, the academician and the master of Cicero, was a native of this place. In the early ages of Christianity, Ascalon became an episcopal see; and it was one of the strong holds of the Crusaders during the Holy War. On the plains of Ascalon a battle was fought between the Crusaders under Godfrey de Bouillon and the Saracens under the Vizier of Egypt. The cuirasses, casques, and swords of the knights are still found among the ruins.

The town stands on an extensive semicircular hill, the declivity of which is nearly insensible towards the land, but of considerable abruptness on the sea-coast. The walls of the town, with their towers and battlements, are still standing, and among the ruins are vast Gothic churches, a palace, and a chapel dedicated to the Virgin, blended with traces of more antient date. On the roof of the chapel are these words still legible: 'Stella matutina, advocata navigantium, ora pro nobis;' but the place is entirely deserted by every living being, save jackalls and antelopes. The Arabs call it Djaurah, and believe it to be the residence of evil spirits; they assert that strange noises of battle are nightly heard amid the ruins. Excavations have been made by Lady Esther Stanhope, who, however, abandoned them on account of the expense.

At a short distance to the northward is a small modern village called Scalona, evidently a corruption of the antient name; and here is the port for the small vessels that trade along the coast.

Ascalon lies in 31° 35′ N. lat., 34° 47′ E. long. (William of Tyre: Count Forbin's *Voyage au Levant*.)

ASCA'RIDES. [See INTESTINA.]

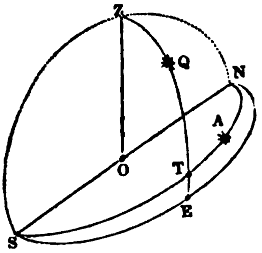
ASCENDANT. [See ASTROLOGY.]

ASCENSION, RIGHT and OBLIQUE, and ASCEN

SIONAL DIFFERENCE, astronomical terms, of which the two latter are nearly out of use, while the term *right ascension* is preserved, in a somewhat different signification from its original meaning, to denote one of the angles by means of which the position of a star is ascertained.

If we suppose a person at the equator, looking directly towards the east, and raising his arms on each side till they are horizontal, his fingers will then point towards the two poles (which, at the equator, are in the horizon), and a line drawn through his arms will be a part of the axis on which the heavens appear to turn. Every star will rise vertically, that is, if the diurnal motion were quick enough to justify the phrase, would appear to shoot above the horizon directly upwards. The great circle of the heavens which his eye traces out as he raises his head without turning to right or left, is the equator, and the same point of the equator rises every day with the same star. If there be a remarkable star in the equator, from the rising of which the spectator chooses to begin his *astronomical* day, he will know the time of rising of any star as soon as he knows how far the point of the equator which rises with it is from the star at whose rising he begins to count the twenty-four hours.

Suppose, for example, it is 60°; then, since the whole 360° of the equator rise in twenty-four hours, 60 of them will rise in four hours, or the star will rise at four o'clock of his astronomical day.

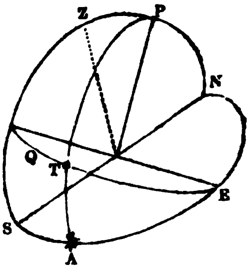


Let O be the spectator, N and S the north and south poles, E the east point of the horizon, EZ part of the equator, and A the star. Through the north and south poles and the star draw a circle N A S, cutting the equator in T. Then if Q be the star at the rising of which the astronomical day begins, the number of degrees in QT is the right ascension of the star.

Instead of the horizon N E S, any other circle may be substituted which passes through N and S; for example, the meridian N Z S. For, draw any circle through N and S, then the diurnal motion will bring A and T upon that circle at the same moment, and Q and T will pass that circle one after the other with the same interval as occurred between their times of passing E, or their times of rising.

Substituting the meridian (which always passes through the poles) for the horizon, this method of reckoning may be used in any latitude. For the same point of the equator always comes upon every meridian with the same star; but, instead of using a star in the equator as the point from which to reckon, the vernal equinox is preferred, or the point at which the sun's path crosses the equator when he ascends into the northern hemisphere. The distance of the point of the equator just mentioned from the vernal equinox, measured upon the equator according to the order of the signs, in degrees, minutes, and seconds, is the right ascension *in space* [see Angle] of the star. The same turned into time [see Angle] is the right ascension in *time*, and indicates the interval which elapses between the times when the equinox and star severally come on the meridian. The whole time which a star takes to complete its diurnal revolution, or the *sidereal* day [see Day], it must be recollected, is not the common solar day, but about four minutes shorter.

The old term *oblique ascension* is an extension of the *right ascension*, as derived from our first illustration, to the *oblique* sphere, in which one pole is above the horizon, and the other below. Let P be the north pole, Z the zenith, E Q the equator, Q the vernal equinox. Let A be a star at its rising, and T the point of the equator which comes to the meridian with it (and would rise with it to a person at the equator). In the latitude represented in the figure, E is the point of the equator which rises with it, and Q E is what used to be called the oblique ascension: the right ascension is Q T; and T E, the difference between the oblique, and the right ascension, was called the *ascensional difference*, but was principally applied to the sun, because when turned into time, it shows the time before or after six o'clock, of sunrise. The ascensional difference is found by the following formula.



Sin. asc. diff. = tan. latitude × tan. star's declination. When the star's declination is north, *from* the right ascension *take* the ascensional difference; when south, *to* the right ascension *add* the ascensional difference: the result is the oblique ascension.

For the method of determining the right ascensions of the stars, see Transit Instrument, Equinox.

ASCENSION DAY, a festival of the Christian church, on which the ascension of Our Lord is believed by some authors to have been celebrated from the very first century of the Christian æra. It has been held for ages on the Thursday next but one preceding Whit-sunday. (See Brady's *Clavis Calendaria*, vol. i. p. 357.) It is also called *Holy Thursday*, a name by which it has been known in this country at least as far back as the time of King Alfred, in whose laws it occurs, On þone halȝan þunꞃeꞅ ꝺæȝ (or the holy Thursday).

It was on this day, or on one of the three days which immediately preceded it, and which were considered as days of preparation for it, that in antient times the minister of every parish, accompanied by his churchwardens and parishioners, was accustomed to go round the limits of his district, to deprecate the vengeance of God, to beg a blessing on the fruits of the field, and to preserve the rights and boundaries of the parish. The week in which Ascension Day occurs is usually called Rogation Week, from the Rogations or Litanies which were used in the perambulations. The Anglo-Saxons called the days of this week Ᵹanȝ ꝺaȝaꞅ (walking days), from the perambulations which were made. In London such parochial processions are still observed on Ascension Day itself.

Pennant, in his *Tour from Chester to London*, p. 30, tells us that on Ascension Day the old inhabitants of Nantwich piously sang a hymn of thanksgiving for the blessing of the Brine. A very antient pit, called the Old Brine, was also held in great veneration, and, till within these few years, was annually, on that festival, bedecked with boughs, flowers, and garlands, and was encircled by a jovial band of young people, celebrating the day with song and dance.

It was upon Ascension Day, too, that the Doge or chief magistrate of Venice was formerly accustomed, by throwing a gold ring into its bosom, annually to espouse the Adriatic Sea; using the words 'Desponsamus te, Mare, in signum perpetui dominii.'—We espouse thee, O Sea, in testimony of our perpetual dominion over thee.—This practice, which is said to have originated in a grant from Pope Alexander III. to the Venetians, of power over the Adriatic Ocean as a man has power over his wife, ceased only with the government of the Doges.

ASCENSION ISLAND lies in the south Atlantic, between Africa and Brazil; the nearest land is the island of St. Matthew, 520 miles to the N.E. It is 685 miles to the N.W. of St. Helena, and 1450 from the coast of Africa. Its form is an oval, seven miles and a half long, and six wide. Like all the islands in the Atlantic, it is of volcanic origin, presenting a surface of rugged conical hills, of different sorts of lava, from 200 to 300 feet in height, some of them with perfect craters. At the eastern part of the island is a double-peaked mountain of gritty tufaceous limestone, which rises to the height of 2818 feet, and from its comparatively verdant appearance has obtained the name of Green Mountain. The whole island is of a naked, desolate character, with a vast quantity of rocks lying upon each other in a very irregular way, with great chasms between them, and strewed with scoriæ, pumice, and other volcanic substances, so that one might as well walk over broken glass bottles. The sea-coast is alternately of a black nitrous lava, and of white beaches, formed by the pulverization of coral and shells, with calcined stones as light as dust. There are, however, about the middle of the island, between the hills, several little plains divided into small spaces, and so remarkably distributed as to appear like parcels of land cleared of stones, and separated by walls.

The island was discovered by João de Nova Galego in 1501, and is said to derive its present name from having been seen on Ascension Day. It was then entirely barren and uninhabited; not a shrub was seen; and the only vegetation which it produced was some coarse grasses, ferns, purslain, a species of convolvulus, and a milkthistle. There were goats, rats, mice, land crabs, and some few insects on the island. It was also much frequented by sea-fowl, such as the frigate and tropic birds, tern, boobies, and gannet, with whose nests the lower part of the island was covered; being hitherto undisturbed by man, they suffered themselves to be knocked down with sticks, or even laid hold of while sitting on their eggs. Turtle were found in great abundance, and the bay afforded a plentiful supply of fish—cavalies, old wives, conger-eels, and rock-cod, in consequence of which the island was much frequented by homeward-bound vessels from the Cape of Good Hope and the East Indies; it was also a great resort for smuggling vessels from our American colonies, who used to meet the Indiamen here on their return home. It was long supposed to be without any stream or spring of fresh water whatever; but small springs have since been discovered, and have obtained the name of Dampier's Springs, from that celebrated navigator having been cast away here on his return from New Holland.

In 1815, during the confinement of Napoleon at St. Helena, the British government took possession of Ascension as a military station, and maintained on it a garrison, consisting of a naval lieutenant as governor, with sixty officers, seamen, and marines, who fortified the island with seventeen guns, the greater number at English Road, where they erected barracks and storehouses of the compact lava (the pulverized coral on the beach forming excellent cement), and contrived to cultivate small gardens, and rear some live stock. A look-out station was established on Green Mountain, where a small spring was discovered which soon yielded an average daily supply of about 140 gallons.

In 1821, the establishment was changed to a major of marines, as governor, with a staff of officers and a party of about 200 privates, most of whom were artificers and labourers, with a number of liberated Africans. From the attention and exertion of the garrison, the island is now in a state of progressive improvement as to its resources, natural and artificial. Roads have been made and iron pipes laid down to convey the water from the springs (an operation that used to be performed by asses and mules) to the fort, near which a large tank has been excavated, capable of containing 1700 tuns, by which it is hoped that a supply of water may always be obtained sufficient for a squadron. Pasturage is rapidly making its appearance; there is a moderate supply of cattle and sheep, which, with turkeys, guinea-fowl, and almost every description of live stock, thrive well; geese and ducks, however, succeed but indifferently, owing to the want of fresh-water streams and pools. The wild goats, to the number of about 600, are allowed to wander in herds, feeding on the herbage they can procure, amongst which are some aromatic herbs which give a peculiarly fine flavour to the mutton. During the season, which is between February and July, when the turtle come ashore for the purpose of depositing their eggs, parties are stationed on the beach to turn as many as are likely to be required before the next season, which are afterwards kept in a large salt-water pond to be taken out at pleasure. Their general weight is from 400 to 700 pounds.

In order to destroy the rats with which the island was overrun, a number of cats were introduced, which, however, multiplying and becoming wild, proved very destructive to the young fowls and rabbits, so that the garrison have been compelled to call to their assistance a colony of bull-terriers to wage war on their combined enemies of the feline tribe. Guinea-fowl are very abundant, partridges, pigeons, and rabbits, from the Cape of Good Hope, with other species of game, have been imported, and the horse has lately been added to the list of their useful and domestic animals.

On the Green Mountain, above the height of 2000 feet, all sterility ceases; the soil is a rich mould, yielding sweet potatoes, Cape gooseberries, onions, carrots, peas, beans, cabbages, radishes, and in short, almost every species of esculent vegetables; there are at present upwards of seventy acres under cultivation. In the valleys also, where the soil offers any prospect of success, spots are set apart for the cultivation of vegetables. Several kinds of fruit have been successfully tried, and thus an island which was once a desert cinder, now yields most useful vegetable productions; and as the climate is exceedingly healthy, it is obvious that this establishment will repay the liberal attention that has been bestowed upon it by affording an eligible rendezvous and depôt of stores and provisions for any squadron destined either for the coast of Africa or Brazil. Including civil officers, the expense of the establishment is 10,400*l.* per annum.

The anchorage, though an open bay, is perfectly safe, and the island is never visited by gales of wind, but a heavy surf rolls on the beach, which sometimes interrupts the communication with the shore for days together. There is no regular tide, and the rise and fall is very trifling. On Green Mountain the annual range of Fahrenheit's thermometer is from 58° to 82°.

The fort is in 7° 56′ N. lat., 14° 24° W. long. (Purdy's *Atlantic Memoir*, and various sources.)

ASCE'TICS (*ἀσκηταί*), a term applied to the pugilists, wrestlers, and other athletæ, among the antient Greeks, who prepared themselves by abstinence for their combats; subsequently, the term was extended to all those who practised the severity of virtue. The exercise of severe virtue among the Pythagorean and Stoic philosophers was called *ἄσκησις*, *askesis:* it consisted in chastity, poverty, watchings, fasts, and retirement. The ascetics seem to have had an Eastern origin. The Brachmans, Germani or Sarmani, Samanæi, Hylobii or Allobii, Gymnosophistæ in Asia, and other sects in East-Africa, were ascetics, who like the present Sanyasseans, Talapoins, and Bonzes, in eastern Asia, exercised their ingenuity in devising new methods of self-torture. For the Jewish ascetics, see the articles Nasireans, Essenes. According to Eusebius (*Hist. Eccles.* ii. c. 23), James the Just, the brother of Jesus, was an ascetic at Jerusalem before the destruction of that city. The Christians were in the earlier centuries more distinguished by their purity of morals than by ascetic austerities. In the second century, the Christians began to distinguish between the commands given to all believers and the evangelical advice which they supposed to be applicable to those only who aimed at the higher sanctity of ascetics. The Christian ascetics were divided into *abstinentes*, or those who abstained from wine, meat, and agreeable food, and *continentes*, or those who, abstaining from matrimony also, were considered to attain to a higher degree of sanctity. Many laymen as well as ecclesiastics were ascetics in the first centuries of our æra, without retiring on that account from the business and bustle of life. Some of them wore the *pallium philosophicum*, or the philosophic mantle, and were therefore called Christian philosophers, and formed thus the transition link to the life of hermits and monks, which was regulated in the fourth century. [See Hermits, Monks.] (Du Fresne *Glossarium Mediæ et Infimæ Latinitatis*, &c. *v.* Ἀσκηταί; Mosheim, *De Rebus Christ. ante Const. M.* p. 311, &c.; Deiling, *Observationes*, t. iii. p. 645, &c. *De Vet. Ascetis;* Plato, *De Republ.*, l. iii. p. 297, ed. Bip. tom. vi.; Plutarchi *Lycurgus;* Epictet. *Dissert.* l. iii. c. 12, *on Askésis;* Görres, *Mythengeschichte der Asiatischen Welt*, i. p. 138, seq. 170, 192; *Petri in Ersch und Grubers Encyclop.;* Neander's *Kirchen-Geschichte*, b. i. abth. 2; Zimmermann *on Solitude*, pt. ii. chap. 3, *On the religious retirement in the first ages of the Christian Church*, &c.; Bryant's *Mythology*, vols. 4 and 5 of the 8vo.)

ASCHAFFENBURG, a principality, on both sides of the Main, and in the western part of central Germany: it is bounded on the N. by the Electorate of Hesse, on the W. and S. by the Grand Duchy of Hesse, and on the E. by the Bavarian dominions, of which it forms at present a portion, included in the circle of the Lower Main. It is 357 square miles in superficial extent, and, before the French revolution, belonged to the Electorate of Mentz. In 1803 it was made over to Archbishop Charles of Dalberg, ephemeral Arch-Chancellor elect under Napoleon; three years afterwards it was annexed to the Grand Duchy of Frankfort, and in 1814 it was transferred to Bavaria, by virtue of the treaty concluded on the 19th of June between that power and Austria, and in exchange for the greater part of the territory of Salzburg, and some minor dependencies. The noble forests of the Spessart and Odenwald occupy a considerable part of the eastern surface of this principality: the former alone is nearly seventy miles in length, and occupies an area of 672 square miles, between the most northern limit of Aschaffenburg and the territory of Würzburg: the elevated ridge on which the forest stands is a subsidiary range of the Rhetian Alps, and is rich in copper, cobalt, arsenic, lead, and iron. The Geyersberg (or Vulture's Mount) near Rohrbrunn, which has an elevation of 1875 feet, is the highest point in the Spessart. The district of Aschaffenburg, in the Bavarian circle of the Lower Rhine, which includes the town, contains sixty and a half square miles, extends on both sides of the Main, and has a population of about 13,000 souls.

Upon an eminence, forming the termination of a western declivity of the Spessart chain, and on the right bank of that river, in one of the most delightful sites which can be imagined, stands the town of Aschaffenburg, whose municipal existence dates from the eighth century at least. It is surrounded by walls on all sides but that towards the river, is irregularly built, and the streets are mostly narrow, steep, and crooked. The pride of its inhabitants is the Johannisburg, a handsome palace, forming a large and regular square, with towers to each face; it crowns the highest ground in the town, lies close upon the banks of the Main, and was erected by the elector of Mentz between the years 1605 and 1614. He and his successors used it as their hunting-seat, and it is still the occasional residence of the crown-prince of Bavaria. Attached to it are a library, picture-gallery, cabinet of engravings, collection of ecclesiastical rarities brought from the old collegiate church, besides an interesting series of models in cork of antient temples and ruins. The immediate vicinity of the palace abounds in picturesque scenery, and an orangery and botanic garden adjoin its beautiful grounds. The old Gothic collegiate church, which contains the tombs of its princely proprietors, and particularly that of Otho duke of Bavaria, who founded it, the massive buildings of the antient university, the former mansion of the Teutonic order, and the town-hall, are all deserving of inspection. There are also a lyceum, gymnasium, ecclesiastical seminary, an institution for the education of females conducted by the English sisterhood, and a school of design and modelling in the town. Aschaffenburg is celebrated for its manufacture of coloured papers, and carries on a considerable traffic in timber, tobacco, perfumery, wine, and other articles of luxury. The asylum for the indigent is well organized, and has separate accommodation for the infirm and orphans, a hospital, house of industry, &c. Aschaffenburg contains nearly 900 houses, and has eight churches, and 6700 inhabitants. It lies (according to Stein) in 50° 1′ 29″ N. lat., and 9° 7′ E. long., 25 miles S. E. of Frankfort.

ASCHAM, ROGER, was born in 1515, at Kirby Wiske, near North Allerton, in Yorkshire. His father was house-steward in the family of Scroope, and his mother, whose maiden-name is not recorded, is said to have been allied to many considerable families. Roger, their third son, having passed his first years under the care of his parents, was adopted into the family of Sir Anthony Wingfield, who committed his education, with that of his own sons, to a domestic tutor of the name of Bond; and afterwards, in 1530, placed him at St. John's College, Cambridge, then one of the most flourishing in the University.

The destruction of the Constantinopolitan empire had, previous to this time, dispersed the Greeks and their language through Europe, though undoubtedly Greek was known by a few individuals in western Europe long before this time. But Greek now began to be taught in the Universities, and more especially at Cambridge, where a taste for this study had been raised by Cheke and Smith. Immediately upon his admission into college, Ascham applied himself to the study of that language; and, when he had arrived at some proficiency, with a view to quicken his improvement, is stated to have read lectures in it, while yet a boy, to other boys who were desirous of instruction.

Ascham took his bachelor's degree in the month of February, 1534, and on the 23d of March following was chosen fellow of his college: which election, says Dr. Johnson, he considered as a second birth, because it relieved him from the necessity of longer dependence on the bounty of Sir Anthony Wingfield, for whom he always retained a grateful and affectionate remembrance.

In Wingfield's family, Ascham had been educated in the doctrines of the Romish church; but new learning and new tenets of religion were gaining ground; he entered into the controversies of the day, and gradually became a Protestant. Nor did his love for an academic life confine him to its severer studies only. He was eminent for other accomplishments. He had learned to play on musical instruments, and was one of the few who excelled in the mechanical art of writing; an art at that time highly valued, and the cultivation of which, as an adjunct to his learning, had an influence upon his future fortune.

He became M.A. in 1537, in his twenty-first year; and then, if not before, commenced tutor. Many of his scholars rose to eminence, and one of them, of the name of William Grindal, was made master of languages to the Lady Elizabeth.

As yet, it appears, there was no established lecturer in Greek at Cambridge: the University therefore appointed Ascham to read in the public schools, and paid him from the public purse an honorary stipend; but a lecture being founded by Henry VIII., Ascham quitted the schools, and returned to explain Greek authors in his own college. He was one of those who restored the pronunciation of Greek to our own modern mode of utterance.

To divert himself after the fatigues of study, his favourite amusement was archery; in which he spent or (according to some who censured him) lost much time. They possibly thought it an amusement of bad example in a place of education. To free himself from this censure, he wrote a small treatise, in which the praise and precepts of archery are joined, entitled *Toxophilus*, published in 1544, and dedicated to King Henry VIII., for which the king, at the suggestion of Sir William Paget, rewarded him with a pension of ten pounds a-year, a sum at that time of course worth more than at present.

Ascham, with this allowance and the enjoyment of his fellowship, must have been at least easy in his circumstances. The same year that he published his book he was chosen University Orator, in which office he wrote all the University letters to the king, and to the great men at court. About this time too it appears he was employed in teaching many illustrious persons to write a fair hand, and, among others, Prince Edward, the Lady Elizabeth, and the two brothers, Henry and Charles, dukes of Suffolk.

In 1548, upon Grindal's death, Ascham was called to court, to instruct the Lady Elizabeth in the knowledge of the learned languages, a duty which he discharged for two years, with great reputation to himself, and much satisfaction to his illustrious pupil; but at length, on account of some ill-judged and ill-founded whispers, Ascham took such a distaste to some persons in the Lady Elizabeth's family, that he left her a little abruptly. Dr. Johnson says, 'Of this precipitation he long repented; and as those who are not accustomed to disrespect cannot easily forgive it, he probably felt the effects of his imprudence to his death.' Chalmers says 'he took great and not unsuccessful pains to be restored to her good graces.'

On returning to the University he resumed his studies and the discharge of his office as public orator. His pension had ceased upon the death of Henry VIII., but it was restored by King Edward VI. Other pecuniary assistance also reached him from lovers of learning, and he had a small pension from Archbishop Lee.

In the summer of 1550 he took a journey into Yorkshire to see his native place and old acquaintance, where he received a letter from the court acquainting him that he was appointed secretary to Sir Richard Morysine, then going ambassador to the Emperor Charles V. In his return to London, he paid that memorable visit to the Lady Jane Grey, at her father's house at Broadgate in Leicestershire, where he found her reading the 'Phædon' of Plato in Greek; an interview, the particulars of which he has affectingly detailed in his *Schole-master*.

On the 20th of September following, he embarked with Sir William Morysine for Germany, where he remained three years, and wandered over a great part of that country, making observations upon all that appeared deserving of his notice. He made a short excursion into Italy, and mentions, in his 'Schole-master,' with great severity the vices of Venice. Dr. Johnson says 'he was desirous of visiting Trent while the council were sitting; but the scantiness of his purse defeated his curiosity.' While he was abroad, Ascham wrote a short but curious tract, entitled 'A Report and Discourse of the Affaires in Germany,' in which, says Dr. Johnson, 'he describes the dispositions and interests of the German princes like a man inquisitive and judicious, and recounts many particularities, which are lost in the mass of general history, in a style which to the ears of that age was undoubtedly mellifluous, and which is now a very valuable specimen of genuine English.'

He was of great use to the ambassador, not only in the management of public business, but in the direction of his private studies, which were for the most part in the Greek language. For four days in the week he explained three or four pages of Herodotus every morning, and more than two hundred verses of Sophocles or Euripides every afternoon. He read with him likewise some of the orations of Demosthenes. On the other three, he copied the letters which the ambassador sent to England; and in the night filled up his diary, digested his remarks, and wrote his own private letters—many to his college—which showed that, in spite of the advantages of novelty and station, he sighed for his return to academical retirement.

While thus employed, his friends in England, in 1552, procured for him the post of Latin secretary to King Edward: but the King, in a short time, died; Morysine was recalled; and Ascham, who came back with him, once more retreated to his fellowship. He had, however, better fortune than he expected. Lord Paget recommended him to the notice of Gardiner, bishop of Winchester, and, though a protestant, his pension was doubled; and he was again instated in the office of Latin secretary, retaining at the same time his fellowship, and his post of public orator. Soon after his re-admission to the office of Latin secretary, he is said to have given an extraordinary specimen of abilities and diligence, by composing and transcribing, with his usual elegance, in three days, forty-seven letters to princes and personages of whom cardinals were the lowest. He was patronised at this time by Cardinal Pole, who, though he wrote elegant Latin himself, sometimes made use of Mr. Ascham's pen.

On the 1st of June, 1554, Ascham married Mrs. Margaret Howe, a lady of good family, who, Chalmers says, brought him a considerable fortune; and of whom he has given an excellent character in one of his letters to his friend Sturmius.

On the death of Queen Mary, in 1558, having previously been reconciled to the Lady Elizabeth, now Queen, he was immediately distinguished by her; and from this time, until his death, he was constantly at court, fully employed in his two offices, one of secretary for the Latin tongue, and the other of tutor to her Majesty in the learned languages, reading some hours with her every day.

In 1559, Queen Elizabeth gave him the prebend of Westwang in the church of York. This appears to have been his only preferment in addition to his places. In 1563, he was invited by Sir Richard Sackville to write 'The Schoolmaster,' a treatise on education, upon an occasion which he relates in the beginning of the book. This work, though begun with alacrity, in hopes of a considerable reward, was interrupted by the death of the patron, in 1566, and afterwards sorrowfully and slowly finished, in the gloom of disappointment, under the pressure of distress. But of the author's disinclination or dejection, there can be found no tokens in the work, which is conceived with great vigour, and finished with great accuracy; and perhaps, says Dr. Johnson, contains the best advice that was ever given for the study of languages. This treatise he completed, but did not publish. It lay unseen in his study, and was at last dedicated to Sir William Cecil by his widow in 1571. Some account of this work of Ascham's, and of his mode of teaching languages, is given by Mr. John Taylor, in his *Essay on a System of Classical Instruction*, London, 1829.

Some time before his death, Ascham was seized by a hectic disease, the most afflictive symptom of which was want of sleep. It was increased by night-studies, when trying to complete a Latin poem which he designed to present to the Queen on the new year; but, on the 23d of December preceding, he was attacked by an aguish distemper, under which he lingered only seven days, and died Dec. 30, 1568. He was interred, on the 4th of January following, in the church of St. Sepulchre, by Newgate.

Although his wife is said to have brought a fortune to Ascham, it is evident that he died in indifferent circumstances, leaving, as she expresses it in the dedication of 'The Schoolmaster,' 'a widow and a great sort of orphans.' There seems reason to believe that Ascham was improvident. One of his failings is recorded to have been a propensity to dice and cockfighting. As a scholar and a man, however, he died universally lamented; and Grant, who wrote his life, says, that when Queen Elizabeth heard the news of his death, she exclaimed 'she would rather have thrown ten thousand pounds into the sea, than have lost her Ascham.'

The only works which Ascham himself published were 1. *Toxophilus, the Schole of Shootinge*, 4to. Lond. 1545; repr. 4to. Lond. 1571; 4to. Lond. 1589, with a pref. by J. Walters; 12mo. Wrexham, 1788. 2. *A Report and Discourse of the Affaires and State of Germany and the Empercur Charles his Court*, 4to. Lond., J. Day. After his death were printed, 3. *The Scholemaster, or plaine and perfite way of teaching Children, to vnderstand, write, and speake the Latin tong*, 4to. Lond. 1571; repr. 4to. Lond. 1589; revised by James Upton, 8vo. Lond. 1711 and 1743. 4. *Apologia Doct. Viri. R. A. pro Cœna Dominica contra Missam et ejus prestigias; in Academia olim Cantabrigiensi exercitationis gratiâ inchoata*, &c., 8vo. Lond. 1577. 5. *Familiarum Epistolarum Libri tres; addita sunt pauca quædam Rogeri Aschami Poemata; omnia collecta operâ et studio E. G. Adjecta in fine ejusdem E. G. Oratio de Vita et Obitu Rogeri Aschami, et ejus dictionis elegantia*, 12mo. Lond. 1576, 1577, 1578, 1590; Hanau, 1602, 1610. Col. Allob. 1611; the last and best edit. (with the omission of the Poems) by W. Elstob, 8vo. Oxf. 1703. Ascham's English works were published by the Rev. James Bennet, 4to. Lond. 1767, with a Life of Ascham prefixed by Dr. Johnson; repr. 8vo. Lond. 1815. A few of Ascham's original Letters are preserved among the Lansdowne Manuscripts in the British Museum. (See the Latin Life of Ascham, subjoined to the different editions of his Letters, by Edw. Grant, Master of Westminster School, the ground-work of all the biographies of Ascham; Johnson's Life; Strype's Cranmer; Biogr. Brit.)

ASCHERSLEBEN, a circle in the south-eastern part of the Prussian province of Magdeburg, containing 168½ square miles, and, according to the census of 1831, 41,059 inhabitants. It possessed at that time 2866 horses, 6036 head of horned cattle, and 67,129 sheep and goats. Quedlinburg is its capital. It is an uncommonly fertile tract of level country, and raises large quantities of corn, flax, and rapeseed. Aschersleben was part of the bishopric of Halberstadt, which was secularized in 1648, and fell to the share of Brandenburg. Between the years 1807 and 1813 it was incorporated with the short-lived kingdom of Westphalia.

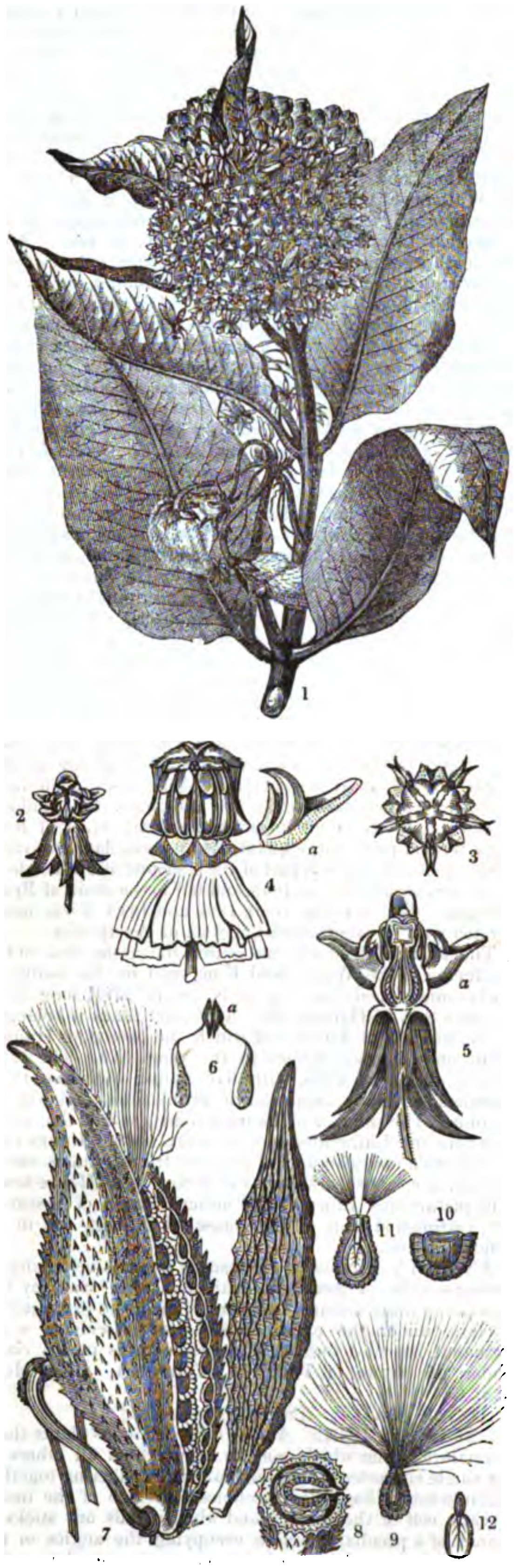
The town of this name lies within the circle, close to the confluence of the Wipper and Eine, and on the banks of the last-mentioned river: 51°46′ N. lat., 11°27′ E. long.; and 18 miles S. E. of Halberstadt. In former times it belonged to the earldom of Ascania, of which the bishop of Halberstadt made himself master in the year 1319. The town is surrounded by walls, with five gates; and has three churches, as many hospitals, a gymnasium, and orphan asylum. The number of its inhabitants, nearly the whole of whom are Lutherans, was, in 1831, 9538. It has very considerable manufactures of flannels, friezes, linens, earthenware, &c. Aschersleben was formerly a Hanse-town. The picturesque ruins of the antient burgh of Ascania, the patrimonial seat of the house of Anhalt, are in its neighbourhood.

ASCI′DIA, a genus of molluscous animals belonging to Cuvier's order of Acephalæ without shells. Savigny has considered these animals sufficiently important to constitute a class, under the name of Ascedies (Ascidia); while Lamarck has also formed them with others into a class, under the name of Tuniciers (Tunicata.) [See MOLLUSCA.]

ASCLE′PIADÆ. [See ÆSCULAPIUS.]

ASCLEPIA′DEÆ. Among dicotyledonous plants there is a natural order which may be known from all others by the single character of its grains of pollen adhering together within a sort of bag which occupies the whole of the inside of each cell of the anther; and when it falls out sticks to glands of a peculiar character occupying the angles of the stigma. Independently of this circumstance, the anther and stigma adhere firmly together, and the fruit is a very curious body, consisting of two carpels, which, when young, are parallel to each other, and united at the point, but when ripe are both on the same plane, pointing in different directions, and shedding a large quantity of seeds, the end of which terminates in long down.

To this order the name of asclepiadeæ has been given, in



[Asclepiadeæ.]

1. A flowering shoot of Asclepias syriaca. 2. A single flower magnified. 3. The same seen from above; the centre is occupied by a broad cushion-like stigma. 4. The anthers much magnified; *a.* one of the horned processes of the corolla. 5. The same cut vertically, and less magnified; *a*, one of the horned processes. 6. Pollen masses; *a*, the gland. 7. One half of a ripe fruit. 8. A transverse view of its inside near the point, showing how the seeds are arranged. 9. Seed. 10. The same cut across. 11 The same cut vertically, showing the embryo. 12. The embryo separate.

consequence of the genus asclepias being the largest which the order contains. It consists of shrubs or herbaceous plants, abounding in an acrid and usually milky juice, and found in their greatest abundance in tropical countries, but rarely in cold latitudes. At the Cape of Good Hope they form a singular stunted deformed vegetation, in the form of the leafless succulent stapelias, the flowers of which are among the most fœtid productions of the vegetable kingdom. A great many species of asclepias inhabit North America, and for their beauty are frequently cultivated in Europe, especially the orange-coloured asclepias tuberosa. Their roots are acrid and stimulating, and usually emetic. Their flowers have curious horned processes, added to the corolla.

ASCLE'PIADES. This name was common to a great number of persons, which has caused some confusion both in the antient and modern accounts of Asclepiades the physician, of whom only we are going to treat.

Asclepiades was a native of Prusa in Bithynia, but the time of his birth is unknown, nor can we ascertain which of the three towns of Bithynia called Prusa claims the honour of his birth. He appears, when young, to have spent some time at Alexandria, and at Parium, on the Propontis; probably also at Athens, where, if the story told in Athenæus (iv. p. 168) refers to him, he gained his living at first by grinding at a mill during the night, in order that he might attend the lecturers on philosophy during the day. In Athens he appears to have been on terms of intimacy with Antiochus, the academician, the master of Cicero.

It is not known in what year he came to Rome, but he lived there at least during the earlier part of Cicero's life; he was probably some years older than the Roman orator. He is said to have lived to a great age, free from all disease, and to have died by accidentally falling down stairs.

The foundation of the healing system of Asclepiades was the doctrine of corpuscles, which he borrowed from Heraclides of Pontus. His corpuscular elements, which he called *ongkoi* (ὄγκοι), differed from the atoms of Epicurus: they were without form, but still divisible, and subject to change. From the collision of these corpuscles in space, from their fracture, and the accidental union of the fractured parts, arose visible bodies. Thus from a union of corpuscles arose the human form; and the motion of the corpuscles, which compose the body, in the spaces assigned to them, or their pores, produce health or sickness, according as the motion is proper and harmonious, or the reverse. On this arbitrary theory all his pathology was founded. It seems to be a natural consequence that he was little acquainted with anatomy, as Galen remarks: he had no exact notion of the difference between the veins and arteries, he was unacquainted with the use of the nerves, and he confounded them with the ligaments.

He is said to have been the first who divided diseases into acute and chronic, and to have considered them essentially different. Like his predecessors, he considered fever as an unnatural heat in all or most parts of the body, connected with a quick pulse; and he attributed it, as well as inflammation, to obstruction. When the larger corpuscles cause a more stubborn obstruction, more dangerous fevers arise; when the obstruction is caused by the finest particles fixing themselves in the pores, the fever is less violent. Accordingly, the character of intermittent fevers is explained by the various size of the corpuscles, since it is the finest particles that cause obstruction in a quartan, the larger in a tertian, and the largest of all in a quotidian fever.

He observed the double-tertian fever which was so common in Rome, and is described by writers after him. [See AGUE, vol. i. p. 223.] He distinguished very accurately between the violent or febrile dropsy, and the chronic one, unaccompanied with fever.

The practice of Asclepiades was in many respects good. He trusted more to dietetic means than to the use of medicines; and often recommended a change in the mode of living, in which he studiously attended to the most minute particulars. He disapproved of the frequent use of emetics and purges, and in place of the latter he recommended clysters. Blood-letting he practised pretty often, especially in inflammatory cases; but yet he considered that this practice was not equally useful in all climates. On the Hellespont, near his native country, it was often very serviceable, but in Rome and Athens frequently dangerous. He recommended cupping to be used with great caution.

He approved of friction in many cases, the gentle motion of the sick in a kind of hanging bed, and to him we must perhaps attribute the shower bath, *pensilis balinearum usus* (see Plin. xxvi. 3), if Sprengel's interpretation is right. Asclepiades gained great favour among the Romans by his use of wine in many complaints, in which, up to his time, it had not been employed; yet he prescribed it with caution. Sometimes he used it even in febrile cases to restore the drooping strength, and he prescribed it also to persons who were convalescent. Laughter, music, and singing he also considered as frequently efficacious in the cure of diseases.

The school which Asclepiades founded continued for some time, and produced several writers, who diffused his principles and practice with more or less exactness.

Asclepiades, according to Pliny (xxvi. 3), was originally a rhetorician; Cicero also (*De Orat.* i. 14) speaks of his eloquence. Pliny treats him as an impudent quack, who gained great practice by humouring the whims of his patients, and prescribing such remedies as would be sure to please. If we are inclined to view him as an adventurer in the medical line, such as start up occasionally in modern times, still, as much of his practice was very good and safe, we may give him credit for being at least a clever quack.

For further information on Asclepiades, see Sprengel, *Versuch einer pragmatischen Geschichte der Arzneikunde*, 2nd ed. Halle, 1800, vol. ii. 6-27; and Asclepiadis Bithyni *Fragmenta*, by Gumpert, Weimar, 1794; Chr. F. Harless, *Medicorum veterum, Asclepiades*, &c. Bonn, 1828.

ΑCΚΛΗΠΙΑΔΗC.

The bust of Asclepiades is only presumed to be his on the ground of the name occurring upon it, and from the improbability of its belonging to any other person of the same name, all of whom were men of much less note than the physician.

A'SCOLI, (*A'sculum Picénum,*) a town in the Papal State, in the province called *La Marca*, and in the administrative delegation of "Fermo ed Ascoli." It lies on the right or southern bank of the Tronto, and between it and the Castellano, just above the confluence of the two rivers, in 42° 50′ N. lat., and 13° 37′ E. long. It is built on a rising ground, commanding a fine and fertile plain, which is enclosed by the Apennines, except on the eastern side, where the river Tronto flows through a valley towards the Adriatic Sea, from which Ascoli is distant seventeen miles. The main ridge of the Apennines rises about ten miles westward of Ascoli, forming the high summit called Monte della Sibilla, 7212 feet high. The valley of the Tronto is celebrated for its fertility: it abounds in vines, olive, and other fruit trees, and is studded with villages and country-seats. The mouth of the Tronto, called Porto d'Ascoli, is defended by a castle; and there is anchorage for small vessels. Ascoli is a frontier town of the Papal State, being only three miles from the boundary of the kingdom of Naples, and fifteen miles N.W. of Teramo, the chief town of Abruzzo Ultra II. A post road leads from Ascoli to Teramo, and thence to Sulmona and Naples. Another road leads from Ascoli eastwards to the mouth of the Tronto, and thence northwards along the Adriatic coast to Fermo and Macerata, where it joins the high road from Loreto to Rome. The Via Salaria was formerly the direct road from Rome to Asculum; after passing Reate it ascended the valley of the Velino, and crossed the Apennines between the sources of that river and those of the Tronto.

The origin of Asculum is lost in the obscurity of the ante-Roman ages. Its foundation has been attributed to the Sabines, who sent a colony north of the Apennines, whose descendants the Picentes were. The name of Asculum has been conjectured to be derived from a species of oak called in Latin *æsculus*, and now by the natives *eschio*, with which the neighbouring mountains abound. Asculum was the chief town of the Picentes, and it was at one time allied to Rome; but having afterwards declared against the latter, was taken after a battle by the consul Publius Sempronius, B.C. 275. After a lapse of nearly two hundred years, passed in subjection to Rome, the people of Asculum joined the Marsian confederacy, and began the social war by killing the Proconsul Servilius, and all the Romans whom they found within their territory. Cneius Pompeius Strabo marched against them, but was defeated and driven within the walls of Firmum. Servius Sulpicius, coming with reinforcements, defeated the confederates, killed Afranius their general, and liberated Pompeius. The following year Pompeius, who was then consul, marched with a fresh army and besieged Asculum. Titus Judacilius, a native of the place, and one of the chief leaders of the confederates, hastened to its assistance, but not being properly seconded by the inhabitants, he could only succeed in throwing himself into the town with eight cohorts. He then put to death those who had been the cause of his failure, and seeing no chance of deliverance, having assembled his friends, he drank poison, recommending them to follow his example rather than behold the destruction of their country. Asculum soon after surrendered at discretion. The consul treated the inhabitants with the utmost severity. The chief citizens were whipped with rods, and then put to death: the rest were led prisoners to Rome or sold as slaves. Their property was confiscated to the Roman treasury, and the moveables given up to the plunder of the soldiers. Among the prisoners who followed the triumphal car of Pompeius, was the wife of Ventidius, one of the chief citizens of Asculum, carrying a child in her arms. This child became afterwards one of the most illustrious generals of Rome, fought under Julius Cæsar in Gaul, and afterwards was Antony's lieutenant in the east, where he defeated the Parthians and avenged the death of Crassus. The booty made by Pompeius at Asculum was very great after his death, his son, known afterwards as the great Pompey, was charged, among other things, with having appropriated to himself some books from the plunder of Asculum. (Plutarch, *Life of Pompeius*, cap. 3.) These books were afterwards taken by Cinna, in the pillage of Pompeius's house, during the factions of Marius and Sylla. Asculum was afterwards restored by the Romans who sent a colony there; and it continued to be the principal town of Picenum. After the fall of the empire, it suffered by the irruptions of the barbarians; its bishops, however, retained, from the 5th to the 13th century, a sort of authority over the town and district; and they continued, until the end of the last century, to be styled Bishop Princes of Ascoli. In 1213, Pope Innocent III. gave Ascoli to Azzo of Este, who was succeeded in it by his son Aldovrando. The town was taken and devastated by Manfred, and retaken by Charles of Anjou. It was for some time under the rule of the Malatesti, the lords of Rimini. It was afterwards united to the kingdom of Naples by Ladislaus. In 1413, it came under the power of the Princes of Carrara, whose authority was confirmed by Queen Joanna II. In 1426, Pope Martin V. having quarrelled with Joanna, took Ascoli, and annexed it to the Papal State, to which it has remained attached ever since.

Ascoli is one of the best built and most pleasant towns in the Papal State. Its buildings are constructed of *travertino*, with which the country abounds. There are eight parochial churches, besides the cathedral, several convents, and a seminary. The churches are rich in paintings, most of which are by native artists; for Ascoli has been remarkably prolific of painters, as well as sculptors and architects. The most noted are the painters Trasi and Ghezzi; and the three sculptors of the name of Giosafatti. On the square del Duomo is the *palazzo anzianale*, a handsome structure, which contains the theatre, a library, and a museum. On the square del Popolo is the government house, where the Papal governor resides. There are many other palaces belonging to the nobility. Among the few remains of antiquity are those of a Roman temple, which has been converted into the church of S. Gregorio Magno, having several

Corinthian columns with capitals of beautiful workmanship. Ascoli is surrounded by walls and towers, and has a castle. It was once considered a strong place, on account of its situation. It is a bishop's see, and has a population of 12,000. Pope Nicholas IV. was a native of Ascoli. Francesco Stabili, commonly called 'Cecco d'Ascoli,' was also born here in 1257. He was physician, philosopher, astrologer and poet. He wrote *l'Acerba*, a desultory poem upon natural philosophy and ethics, in which there are some powerful passages; but the language is much inferior to that of Dante, whose contemporary Cecco was.

ASCOLI DI SATRIANO (*Asculum A'pulum*), a town of Apulia, in the province of Capitanata, situated on a hill near the river Carapella, in 41° 9′ N. lat., and 15° 27′ E. long., ten miles S.E. of Bovino, and on the cross road from it to Venosa. It is a bishop's see, and gives the title of duke to a Neapolitan family. It is a small town, and we find that the whole diocese had not more than 8250 souls at the close of the last century. Asculum was antiently one of the principal towns of Daunia. It is first mentioned in history on the occasion of the war of Pyrrhus, who fought a battle against the Romans in its neighbourhood. Having afterwards espoused the cause of Hannibal, its territory was given up to the Roman veterans after the expulsion of the Carthaginians. It became afterwards a Roman colony, and its inhabitants were called Asculanenses, being thus distinguished from those of Asculum Picenum, who were called Asculani. Minatius Magius, the ancestor of Velleius Paterculus, was a native of Asculum. (V. Paterc. ii. 16.) Asculum was destroyed by Roger the Norman, but was afterwards restored. It is 66 miles E.N.E. of Naples.

ASCO'NIUS, Q. PEDIA'NUS, one of the earliest commentators on Cicero, who is usually considered to have been a native of Padua, though the opinion rests on no surer ground than a passage of Silius Italicus (xii. 212) where he mentions a person of the same name as a native of this city. We are unable to fix the exact period of his birth and death; but from a passage in one of his commentaries (*Ad Orat. pro Scaur.* p. 176, ed. Lug. Bat.) he was employed on his work about A.D. 41, in the reign of Claudius. Philargyrius, quoted by Servius (Virg. *Ecl.* iii. 106), states that he was in his youth the friend of Virgil; but he must have been a mere boy when the poet died, A.D. 19, if Eusebius is correct in making him seventy-three years of age in the seventh year of Vespasian's reign, A.D. 76. At that time he became blind, and survived the calamity twelve years. (Euseb. *Chron. ad Olymp.* ccxiii. 3.) This circumstance has induced some to suppose that there were two of this name; one, the friend of Livy and Virgil, and the commentator on Cicero's works, the other, an historian of a later period; but such a supposition is opposed by the concurrent testimony of the antients. These are the only facts which are known of his private history. Asconius was the author of a work which has been lost, directed against the calumniators of Virgil, and also of a Life of Sallust (*Acron. ad Hor. Sat.* 1, 2;) but there seems no reason to suppose that he was the author of the work 'Origo Gentis Romanæ,' usually ascribed to Aurelius Victor. The most important of his labours was his Commentary on the Orations of Cicero, which he wrote for the instruction of his sons (*Ad Orat. pro Mil.* 6); but under what title, none of the manuscripts enable us to decide. It seems to have extended to all the orations; but only fragments have been preserved, which, though in some of them much disfigured by the glosses of some ignorant grammarian, are still full of valuable information. We are indebted for the greater part of what we possess of Asconius to Poggio, the Florentine, who, during the Council of Constance, A.D. 1416, luckily discovered an old manuscript of it at the Monastery of St. Gall, in Switzerland. This manuscript can no longer be found; but the copy of Poggio is still in the possession of the Biblioteca Riccardiana at Florence. It contained fragments of a commentary on nine orations: Divin.; In Verrem, 3; Pro Corn.; In Tog. Cand.; Contra Pis.; Pro Scaur.; and Pro Mil. The general character of the commentary is, that it refers chiefly to historical facts, and has preserved some curious information on various points, with which we should not otherwise have been acquainted. We may more particularly notice the speeches of Cæsar against Dolabella; of Brutus for Milo; of Lucceius against Catiline; and of Cominius against Cornelius. The historians on whom he seems chiefly to depend for his information are Livy, Sallust, and Fenestella. The commentary on the Orations against Verres is of so entirely different a character from that on the others that it seems not an improbable conjecture that it is the work of some later writer, who availed himself partly of the labours of Asconius. The Latinity is full of barbarisms, and it is more in the style of later grammarians, who devoted their attention chiefly to observations on grammar, etymology, and synonymes. [See Niebuhr. *Præfat. ad Front.* p. xxxiv. not. 4. ed. Berl.] Angelo Mai ascribes to Asconius Pedianus some scholia which he lately discovered in a palimpsestus of the Ambrosian Library at Milan, and published in 1814. They are notes on the oration Pro Scauro, and on the lost orations, In Clodium et Curionem; De Ære alieno Milonis; De Rege Alexandrino; besides on the still extant orations Pro Archia, Pro Sylla, Pro Plancio, In Vatinium. They cannot, however, be considered the genuine productions of Asconius; neither in style, nor in the kind of information they convey, do they resemble his commentary. Another MS. of the tenth century was afterwards discovered at the same library, containing short scholia on the four orations against Catiline, on those Pro Marcello, Pro Ligurio, and Pro Deiotaro. Angelo Mai has still more lately discovered another MS. in the Vatican Library, which he published in 1828, being a collection of the inedited fragments of a commentary on Cicero's Orations. (*Auctor. Class. e Vatic. cod. editi* Angel. Maio. Rom. 1828.) The first edition of Asconius was published, Ven. 1477; with the scholia of Manutius, Ven. 1547; by Haacke, Lugd. Bat. 1644. See Fabric. *Bibl. Lat.* 11, 6; Madwig. *De* Q. Asconii Pediani et aliorum veter. interp. in *Cicer. Orat. Commentariis Disput. critic.* Havniæ, 1828. Bæhr. *Geschichte der Römischen Literatur*, Carlsruhe, 1832.

ASDRUBAL. [See HASDRUBAL.]

ASEDI. [See ASSEDI.]

ASEERGHUR, a strongly fortified town in the province of Candeish, and within the government of the Bombay Presidency. This fortress, with a small adjacent tract of unproductive land, mostly jungle, is in possession of the English; the surrounding territory is subject to Scindia. The town is in 21° 28′ N. lat., and 76° 28′ E. long., and is situated about twenty miles to the north-east of the city of Boorhanpore, the antient capital of the Candeish province. Aseerghur is said to have been founded by a wealthy Hindu Zamindar, named Assa, and to have taken its name from that of the founder: it was considered as the capital of Candeish when that province was subdued by the emperor Akbar. The fortress crowns the top of a hill 750 feet high, the base of which is for the most part precipitous to the depth of 80 or 100 feet, leaving only two avenues of access, both of which are well fortified. This fortress has the further advantage of being abundantly supplied with water. Its importance, in the eyes of the natives, may be estimated from a name by which it was long distinguished, the key of the Deccan.

Aseerghur surrendered, without much resistance, to the army under Colonel Stevenson in 1803; but on the conclusion of peace was restored to Scindia. It made a much better stand in 1819 against a besieging army of 20,000 men, under Generals Doveton and Malcolm; but was at length captured, after sustaining a bombardment of sixteen days, with the loss of 213 men killed and wounded, on the part of the English. The loss, on the part of the garrison, was 138 killed and wounded. On this occasion an entire company of Sepahis, in the pay of the English, were destroyed by the explosion of the magazine, which contained three hundred barrels of gunpowder.

The pettah, or suburb of Aseerghur, stands at the base of the hill whereon the fortress is erected. It is a large irregular village, with only one good street: in 1822 it contained about 2000 inhabitants.

The approach to Aseerghur is through a wild tract of country much infested by wolves and tigers, the latter of which are so daring, as sometimes to have entered the town and carried off some of the inhabitants. Until 1824, the civil and military establishment of Aseerghur was under the Bengal Presidency, but was then transferred to the government of Bombay. (Mill's *History of British India*; Hamilton's *East India Gazetteer*; Major Rennell's *Memoir*.)

ASELLI (or, according to the custom formerly prevalent of Latinizing the name, ASELLIUS), CASPAR, a physician who was born in the sixteenth century at Ticius, or Cremona, and became professor of anatomy at Pavia. He is regarded as the discoverer of the *lacteals*, or the set of vessels which absorb or suck up the nutritious portion of the food of animals, *i.e.*, the chyle from the upper part of the intestinal tube, in order to convey it to the heart and lungs, so that it may become incorporated in the circulating fluid or blood. It is certain that, in 1622, he saw these vessels, and from the white colour of the fluid they contained, from the milk-like character of which is derived the name of *lacteal*, distinguished them from the other vessels, and demonstrated them in his lectures. But he was conducted by chance to make these observations, in the course of dissections for other purposes; and he does not appear to have traced the lacteals accurately, for he thought that they terminated in the liver, whereas they terminate in the mesentery.

He drew up, but never published, an account of his discovery. This treatise was printed after his death, which happened in 1626. It is entitled, 'De Lactibus; seu lacteis venis, quarto vasorum meseraicorum genere, novo invento, Dissertatio,' with figures of the vessels in three different colours: 4to. Milan, 1627, and 4to. Basle, 1628; Leyden, 1640, and again 1641, and 8vo. at Amsterdam, 1645, and lastly among the works of A. Spigelius, folio, Amsterdam, 1645.

Aselli left a MS. treatise on poisons, but it does not appear to have been published.

ASH. [See Fraxinus.]

ASH, MOUNTAIN. [See Pyrus.]

ASHANTEES, a powerful nation of western Africa. Mr. Bowdich (*Mission to Ashantee*, quarto, London, 1819, p. 228) was inclined to think, from the little he could collect, that the state had been founded by an emigration of a number of families from a former residence of the tribe; the situation of which he conceives to have been to the south-east of the district in which the new kingdom was first established. He states, that the common tradition, which he had never heard contradicted but once, is, that the Ashantees emigrated from a country nearer the sea side, and founded their present kingdom, after subduing certain nations further advanced in civilization than themselves, whose arts, and a portion of whose language, they adopted. The Ashantee, Fantee, Warsaw (Wossa), Akim, Assin, and Aquapim languages, he considers to be indisputably dialects of the same common tongue; and from this and other evidence he infers, that the nations now distinguished by these different names were originally one people. A tradition, indeed, still subsists, that all these tribes are the descendants of twelve families: and from one or other of these stocks individuals in each tribe still claim a descent, branches of the same line being found spread among all the different tribes. There is also a general tradition that their original settlement was not on the coast, but somewhere in the interior, from which they were driven by a foreign power. This appears to be the substance of Mr. Bowdich's account, so far as we can understand it.

The statement of Mr. Dupuis (*Journal of a Residence in Ashantee*, quarto, London, 1824, p. 224) is more specific. He says, that it is agreed by all that the original seat of the tribes of Ashantee, Gaman, Dinkira, and Akim, was in Ghobago, Ghofan, and Tonouma, districts in the interior immediately to the north of the present Ashantee Proper; and that from their possessions here they were driven southward into the forest by the Moslems many ages ago, or, as the author expresses it, 'in the early age of Islam.' It was after this that the tract nearer to the coast was gradually peopled by the Fantees, Dinkirans, and other tribes, who were all, in fact, previously established along with the Ashantees in the upper country. As to this point, therefore, it will be perceived, the two accounts are directly opposed, the one making the founders of the Ashantee empire to have been a band of emigrants who separated from the rest of their nation; whereas, according to the other, the Ashantees were the original stock who remained stationary, after being driven southward by the Moslems, while different branches left them to seek habitations nearer the sea-coast. We think the latter the more probable account. Mr. Bowdich's two emigrations look very like different versions of the same story.

Mr. Dupuis goes on to inform us, that in the early part of the 17th century Ashantee was considered a powerful little monarchy, and, in conjunction with its allies, could probably send 60,000 men into the field. It had already obtained a kind of influential control over the neighbouring states of Akim, Assin, Quahou, and Akeyah; and the people had acquired a high renown for their military qualities.

At this time, however, the territory of the Ashantees appears to have been confined to the comparatively small inland district mentioned above, lying in the northern part of their present dominions. Dupuis indeed says that they were unsettled in their habitations, though firm and compact as a nation. The first war by which they are recorded to have secured any considerable increase of dominion was that which resulted in the conquest of the neighbouring kingdom of Dinkira. Dupuis says that this conquest happened, according to the Moslem records, in the year of the Hejira 1132, that is, A.D. 1719; and he quotes, in support of this account, the authority of Bosman, the Dutch governor of Elmina, who wrote, he remarks, in 1721, and who states that it had taken place but a few months previous. But Bosman, the second edition of an English translation of whose book appeared in London in 1721, appears to have written the letters of which it consists in the year 1701. In the first of them, he acknowledges the receipt of a letter from his correspondent in Europe, dated 1st September, 1700. His account of Dinkira and of its conquest by the king of Ashantee, or, as he writes the name, Asiante, is in the sixth letter. He describes Dinkira as lying so far inland that it often took five days to go to it from Elmina, and ten from Axim (a fort near the mouth of the Ancobra river);—' not,' he adds, however, ' so much on account of its real distance from either place, as because of the badness of the roads.' The kingdom of Dinkira, which had formerly been of small extent, had, he states, eventually become so powerful, as to have gained the respect of all the neighbouring nations, with the exception only of Asiante and Akim, both of which were still superior to it in strength and resources. Dinkira, however, which held in subjection the three adjoining districts of Wassa, Encasse, and Juffer, was the chief source from which the supply of gold was obtained. ' But a few months past,' continues the writer, ' it was so entirely destroyed, that it lies at present desolate and waste.' An outrage offered by Bosiante, the king of Dinkira, to one of the wives of Zay, the king of Asiante, made him determine to march against his enemy. Bosiante in the mean time died, but this produced no change in the resolution of the king of Ashantee. ' About the beginning of this year,' continues Bosman, ' being completely ready, he came with a terrible army into the field; and engaging the Dinkirans, who expected him, he beat them; but fighting them a second time, he entirely defeated them. The negroes report, that in these two battles above a hundred thousand men were killed; of the negroes of Akim only, who came to the assistance of the Dinkirans, there were about thirty thousand killed.' He intimates his belief, however, that these numbers must be greatly exaggerated. The plunder consequent upon this victory occupied the Ashantees fifteen days; and the booty collected by the king was said to amount to several thousand marks of gold. Dupuis says that the war with Dinkira is still remembered among the Ashantees. After the great battle, the body of King Bosiante was disinterred by order of the avenging victor; the flesh was given to be devoured by serpents, the skull and thigh bones were preserved as trophies. These relics still remain at the court of the king of Ashantee, and are exhibited on certain holidays for popular insult.

The conqueror of Dinkira, who is called Zay by Bosman, is named Saï Tootoo by Bowdich, and Sai Tooto by Dupuis. Zay, or Sai, or Saï, appears in fact to be the general title of the Ashantee kings. According to Bowdich, Sai Tooto was the conductor of what he calls the later emigration of the Ashantees, and the founder of Coomassie, the capital of the empire. Dupuis denies that he built the town, but allows that he greatly increased its size, and transferred thither the seat of the government, which had previously been sometimes at Kikiwhary, north of Coomassie, and sometimes at Begua, to the south of it. The conquest of Dinkira gave so great an accession of territory and power to the Ashantee state, and so completely altered its relations to surrounding powers, that Sai Tooto, upon whom has been bestowed the epithet the Great, may almost be considered as the founder of the present empire. The history of the country before his time is acknowledged to be legendary and obscure. He is said to have been the first king by whom the Moslems, or Mohammedan inhabitants, were reduced to the same state of subjection with the heathen negroes, and compelled to serve in his armies. It was in his reign also, that a commercial intercourse with the Dutch settlements on the coast first introduced the Ashantees to an acquaintance with white men. Besides his conquest of Dinkira, he carried his arms into the heart of several other of the neighbouring states. He reduced the king of Gaman to the condition of a tributary; entirely subdued the districts of Tofal, Quahou, and another large extent of country beyond the Tando river, to the west of Coomassie; reduced the government of Akim to partial subjection, and ravaged Assin. 'In short,' concludes Mr. Dupuis, 'he created an empire, including tributaries and allies, which was chiefly of a feudal complexion, by the union of all those kingdoms and principalities between the 6th and 9th degrees of N. latitude, and between the 4th degree of longitude west from the meridian of London, and the river Volta. The auxiliary kingdom of Banna was the right arm of Ashantee in those days, and still is.' The empire of Ashantee, however, was still separated from the coast by a tract of forty or fifty miles in breadth, occupied by the perfectly independent states of Aowin, Ama naha, Ahanta, Wossa, Fantee, Inkran, Aquapim, Aquambo, &c. Akim alone had drawn upon itself the resentment of Sai Tooto by its interference on the side of the Dinkirans, and had been compelled to avert the consequences by certain submissions and other sacrifices. It was while engaged in quelling a revolt of this power that Sai Tooto was killed, along with many of his principal nobility, in the year 1731.

He was succeeded by his brother Sai Apoko, in the course of whose reign both Akim and Assin were entirely reduced, and along with Gaman, Bouromy, and Yobati, incorporated as integral parts of the empire. After suppressing a formidable rebellion which suddenly arose in the heart of his kingdom, this sovereign died in 1742. His successor was Sai Akwasy, who after a reign made memorable by a most disastrous campaign with the powerful neighbouring state of Dahomey, lost his life in 1752, from a wound which he received in a war with Banna. His nephew, Sai Kodjoh, then mounted the throne, and reigned till 1781. During his time, a rebellion of several of the recently subjugated provinces brought the empire to the brink of dissolution; but it was eventually quelled, and the influence, if not the actual dominion, of Ashantee, even extended towards the south-west, or in the direction of what is called the Ivory Coast. The reign of the next prince, Sai Quamina, was ushered in by a revolt of Assin, Akim, and Aquapim, which was, however, soon suppressed. But after some years, the leading Ashantee chiefs combined and deposed their sovereign, who had rendered himself obnoxious by a scarcely concealed preference for the Moslem creed, which it was believed he wished to establish as the national religion. This event took place in 1797. The brother of the deposed king was elevated to the vacant throne, under the title of Sai Apoko the Second. He reigned till the year 1800, when he was succeeded by his brother, Sai Tooto Quamina, then a boy of seventeen years of age, the same by whom the throne was still filled when Mr. Bowdich and Mr. Dupuis were in the country.

With the exception, perhaps, of that of Sai Tooto the Great, the reign of Sai Quamina has been by far the most important in the annals of Ashantee. Only a few months after his accession, the young king gave proof of his military talents, by conducting a campaign against the united forces of Ghofan and Ghobago, and defeating them in a decisive battle, in which, it is said, they lost not less than 100,000 men in killed and prisoners. But this must surely be an exaggeration. A considerable accession of territory, and a period of tranquillity which lasted for five years, followed this success. The circumstances out of which new hostilities arose, eventually led also to the intercourse between Ashantee and England, which forms to us the most interesting part of the history of that African nation.

It was in 1807, that an Ashantee army first reached the coast where the European forts are. Down to this time, from the mention of the Ashantees by Bosman early in the preceding century, they do not appear to have been visited by any person from Europe, and their very name had become almost forgotten. Mr. Meredith, who was then second officer in the English fort at Annamaboe, has, in his *Account of the Gold Coast*, given an ample detail of the events which introduced them to the acquaintance of our countrymen, and corrections or explanations of some points in his narrative may be found in the work of Mr. Dupuis, pp. 250-264. The repose from warlike operations which Ashantee had enjoyed from 1801, was broken in 1806 by a revolt of two of the tributary princes of Assin, who were joined by the Fantees, a nation occupying the tract along the coast on which the forts of Cape Coast Castle and Annamaboe are situated. The Fantees seem to have felt that their independence was endangered by the growing power of the Ashantees; and there is some reason to suspect that the English authorities, ill informed of the relative strength and military skill of the two parties, encouraged a revolution, by which they hoped to prevent the further encroachments of the Ashantees. But the Fantees, though able to bring a numerous army of fighting men into the field, were no match for the Ashantees either in bravery or in the art of war. They were beaten by their enemy in every encounter, and in May 1807, the king of Ashantee had established himself and his army at Abrah, not more than fifteen or twenty miles from the sea. He soon after attacked and made himself master of the Dutch stations of Cormantine and Fort Amsterdam. It was now thought prudent by Mr. White, the governor of Annamaboe, to despatch a flag of truce to the negro monarch, with a request to be informed what object he had in view in coming to the coast. Sai Quamina, who, Mr. Dupuis says, was fully persuaded that this proceeding was merely an expedient to gain time, and besides, was quite aware of the encouragement and promises of assistance which his enemies had received from the English authorities, returned the haughty answer, that the governor should be told what his designs were when he should send him twenty barrels of powder and a hundred muskets. In another week, Aga, a town within a mile of Annamaboe, fell into the hands of the invaders. On the 15th of June, the people of Annamaboe went out in great force to attack the enemy, and the result was, the retreat of the latter, but in excellent order, after a short contest. But on the following day the enemy advanced upon the town, and soon carried every thing before them. Mr. Dupuis states, on the information of the king himself, that it was no part of his plan to attack the castle—that he made no attempt upon that building till the guns had been turned against him, and that even then he did not wish to carry matters to extremity against the whites. That the English, from the first, took the part of the townspeople, not only receiving the old men, women, and children within the fort, but employing all its force to repel the assailants, is acknowledged on all hands. Indeed, in the state to which things had by this time been brought, they could not have acted otherwise. The result, however, proved most disastrous both to the Fantees and their European protectors. The contest lasted from eleven in the morning till six in the afternoon, and in that time it is computed by Mr. Meredith that fully 8000 of the inhabitants of Annamaboe perished. About 2000 more escaped by flight. Of the 15,000 souls, of which the population of the place had consisted, only about 5000 remained at the close of the attack, including about 2000 women, children, and old men, who had found refuge within the English fort. Even of these, many had been destroyed by the shot which fell among them in the open court where they were placed. The garrison itself suffered severely, and was reduced to the utmost extremity. It consisted only of the governor, Mr. Meredith, three other officers, four free mulattoes, and twenty other men of all descriptions. Two men having been killed, and the governor, an officer, and four others of the men, having been wounded early in the contest, the force that could be depended upon was, about noon, reduced to eight individuals, including officers. But about six o'clock the enemy retired, and next day no attempt was made to renew the attack. Its renewal, according to Mr. Dupuis, was only prevented by the arrival in the Ashantee camp of a flag of truce from Governor White. This intimation of a wish for the cessation of hostilities was received with the warmest welcome, both by the negro monarch and his soldiery. That circumstance, which is stated by Mr. Meredith as well as by Mr. Dupuis, is of considerable importance in enabling us to form a judgment as to the original disposition of the Ashantee king towards the whites. These negociations produced two amicable interviews between Sai Quamina and Colonel Torranne, the governor of Cape Coast Castle, in which every thing was speedily arranged, and the invading army took its departure from the coast on the

1st of July. 'The treaty of peace,' Mr. Dupuis asserts, 'was a formal and a solemn acknowledgment on the part of the governor,—that, by right of conquest, Fantee, including Cape Coast and every other town in the neighbourhood, belonged exclusively to the empire of Ashantee, with the reservation of a judicial authority to the (African) Company over such towns as stood in the vicinity of any of the castles.' It is further alleged, that another demand of the king's was so far acceded to, that some of the inhabitants of Annamaboe, who had availed themselves of the protection of the fort, were given up to be sold into slavery. It is certain that the two Assin princes, whose insurrection had occasioned the war, were, the day before his first interview with the king, ordered by Colonel Torranne, to be seized and sent as a propitiatory present to the victor, whose friendship he was now so anxious to secure. One of them made his escape, but the other was secured. Mr. Meredith is silent as to his fate, presuming, probably, that no reader could entertain any doubt about it. Mr. Dupuis states that he was sacrificed after having been subjected to the most cruel tortures, and that his head is at this day the decoration of the king's death horn.

As might have been expected, the Ashantee monarch did not fail to avail himself, on subsequent occasions, of the road to the coast which he had thus opened by his sword. He repeatedly returned to inflict further chastisement on the Fantees, restless under their new yoke, and constantly attempting to evade the payment of the tribute. Whether they were encouraged or not by the English authorities in these attempts may be matter of doubt. But in 1816 the English again drew upon themselves the resentment of the invader by interfering for the protection of the Fantees; and the Fort of Cape Coast Castle was in consequence subjected to a long and distressing blockade. The besiegers were only at last induced to withdraw their forces by liberal presents. The governor had to pay, in fact, a large sum in gold, which was claimed as the arrears of tribute due from the Fantees. This led to an attempt the following year, on the part of the African Company, to establish amicable relations with the powerful monarch of the Ashantees. An embassy proceeded to Coomassie, the capital of Ashantee, under the conduct of Mr. James, the governor of the fort of Accra, assisted by Messrs. Bowdich and Hutchison, writers, and Mr. Tedlie, an assistant surgeon, in the employment of the company. It is this mission of which Mr. Bowdich has written an account. The party left Cape Coast Castle on the 22d of April, and reached Coomassie on the 19th of the following month. Their reception was in the highest degree favourable; although it was evident from the first, that they would have a very formidable opposition to encounter from the Moors who were established in the city, and whose object naturally was to retain that monopoly of the commerce of the country which they had till now enjoyed. At one of their first interviews, however, the resentment of the king was suddenly excited by something that passed, which led him to infer that his dignity and rightful claims to the sovereignty of the Fantee territory had not been sufficiently respected by the English governor-in-chief on a particular occasion. In meeting this unexpected outbreak, it was conceived by the other members of the mission that Mr. James did not evince the intelligence or discretion which might have been expected from him in the circumstances: and Mr. Bowdich, on the instant, resorted to the extraordinary step of superseding his chief, and taking the conduct of the mission on himself. A speech which he made appeased the king's anger for the moment. His representations also, seconded by his two colleagues, induced the governor of Cape Coast Castle to order Mr. James home, and to leave in his hands the future management of the negociation. On the 7th of September, accordingly, a definitive treaty was at last signed by Mr. Bowdich, 'in the name of the governor and council at Cape Coast Castle, and on behalf of the British Government' on the one part, and, according to his account, by both Sai Tooto Quamina, king of Ashantee, and Boitinnee Quama, king of Dwabin and its dependencies, on the other. But Mr. Dupuis assures us that there is no such personage as the last-mentioned Dwabin, or more properly Juabin, being merely a town in the vicinity of Coomassie, the governor of which never enjoyed the title of king. When, on Mr. Bowdich's authority, he happened to mention the king of Dwabin, the Ashantee monarch heard him with the utmost astonishment. He asserts that the governor of Juabin signed the treaty merely as an attesting witness. On the other hand, in the translation of the document given by Mr. Bowdich, the two kings are mentioned together in every paragraph. Mr. Dupuis publishes another version, made from the original in his own possession, in which the party contracting with the representative of the Company, appears to be throughout only the king of Ashantee. The principal articles of the agreement were, that there should be perpetual peace between the British and the Ashantees, and also between the latter and all African nations residing under the protection of the Company's forts; that neither party should be considered to have any claim upon the other; that complaints of any injuries sustained should be made by the king of Ashantee, in the first instance, to the governor of Cape Coast Castle; that a British officer should be permitted to reside constantly at the capital of Ashantee, the king engaging to do every thing in his power to promote a commercial intercourse between his subjects and the English settlements; and finally, that certain of the king's children should be committed to the care of the governor-in-chief for education at Cape Coast Castle. A few days after the signing of this treaty, Mr. Bowdich and Mr. Tedlie set out on their return to Cape Coast Castle, and Mr. Hutchison remained at Coomassie as resident representative of the Company.

In the end of 1818, or the beginning of the following year, Mr. Hutchison was recalled by Mr. Smith, the governor of Cape Coast Castle, to fill an office in that fort. But in the meantime Mr. Joseph Dupuis had received from his Majesty the appointment of consul at Coomassie, and had already reached the African coast on his way to that capital. On arriving at Cape Coast Castle he found the aspect of African politics altogether different from what he had been led to expect. The king of Ashantee had set out on an expedition to put down some resistance to his authority in Gaman; and the result of the campaign was the incorporation of that tributary state as one of the provinces of the empire. At the commencement of the war the success of the Ashantees was by many considered very doubtful; and reports were even brought to the coast that the king's army had sustained a great defeat. Mr. Dupuis states that this delusive intelligence was eagerly listened to, both by the Fantees and the authorities at the English forts, who were eager to shake off the Ashantee yoke. The inhabitants of the town of Cape Coast Castle even proceeded to fortify their settlement by the erection of a wall, certainly with the connivance of the English, if not with their direct encouragement and assistance. When the king of Ashantee heard of these proceedings, he immediately gave orders that all intercourse should be suspended between his subjects and the English. Meanwhile the agents of the Company put every obstacle in the way of Mr. Dupuis proceeding to Coomassie; and partly from these difficulties, and partly from repeated attacks of illness, he was detained for more than a year at Cape Coast Castle. At length, however, negociations having been opened by the arrival at the port of a mission from the king of Ashantee demanding explanation and satisfaction, he set out for Coomassie on the 9th of February, 1820, and reached that capital on the 28th of the same month. The next day he was admitted to an audience of the king, and met with the most gracious reception. For the history of the negociations which followed we must refer to the account published by Mr. Dupuis. A definitive treaty was at last signed on the 23d of March, by which the king of Ashantee engaged that he would, with all his power and influence, support, aid, and protect, the British interests in that country; and would, on all occasions, march his armies to any part of the country where the interests of Great Britain might require their assistance. He also relinquished the claims he had made upon the governor of Cape Coast Castle, for compensation on account of the alleged violation of the former treaty; and agreed to an oblivion of all differences both with the authorities there, and with all his Britannic Majesty's other subjects. The consul, on the other hand, acting in the name of the British government, acknowledged the right of his Majesty to the sovereignty of the Fantee territory; on the express condition, however, that the natives residing under British protection were to be amenable, for any act of aggression with which they might be charged, to the British authorities only. Another important stipulation was, that the path or road between Cape Coast and Ashantee should be kept constantly well cleared; the one half by the

English, the other by the Ashantees. Finally, the king of Ashantee was made to acknowledge, not only that he had himself taken his sacred oath of allegiance and fidelity to the Crown of Great Britain, but that all his principal captains and counsellors had done the same. It can hardly be supposed that the full import of this declaration, according to European notions, can have been understood by the negro sovereign; and it would have been better, if so empty an acknowledgment had formed no part of the treaty.

When Mr. Dupuis soon after returned to Cape Coast Castle, accompanied by several Ashantee chiefs, deputed by their sovereign as his ambassadors to the king of England, he found that the authorities there refused altogether to accede to the terms of this treaty. They rested their objections on the old ground, that the sovereignty of Fantee did not belong of right, as this treaty implied that it did, to the king of Ashantee. In this view they were supported by Sir George Collier, who happened to be there in the Tartar man-of-war, and who refused to convey the ambassadors to England. The first result of this conduct was, the gradual withdrawal of the Ashantee merchants and traders from all dealings with the servants of the Company. Although a body of Ashantee forces, however, had taken and retained possession of the town of Cape Coast, they continued to refrain from any actual hostilities. Meanwhile, in the beginning of the year 1821, the forts which had belonged to the African Company were taken by the English government into its own hands, and soon after, Sir Charles M'Carthy was appointed governor-in-chief of all the British settlements on the western coast of Africa, from the river Gambia to the river Volta inclusive. When the new governor landed at Cape Coast Castle, in the early part of 1822, he found that fort closely blockaded by a strong Ashantee force. After a few months Sir Charles began to organize bands of the Fantees into a sort of militia, and to form alliances with various tribes of that nation, and of others established along the coast. The bulk of the population of the district, however, Mr. Dupuis asserts, remained steady to their allegiance to the king of Ashantee.

Sai Quamina appears to have died in the summer of 1823. His successor commenced his reign by a distinct proclamation of war against the English, whom he accused of the infraction of treaties, treachery, cruelty, &c. Soon after, a negro in the service of the garrison was seized by the Ashantees and put to death. It was now resolved by the English no longer to delay active hostilities. The first operations, conducted by Captain Laing, were crowned with success. In August, the Ashantees were completely defeated at Assecuma, in the Fantee territory, by a force, composed partly of Europeans, and partly of native soldiers, commanded by this officer. Encouraged probably by this victory, in the beginning of the following year, Sir Charles M'Carthy had the temerity to advance into the interior at the head of a small body of troops, having previously divided his entire force into four separate divisions. He was attacked on the 21st of January, near the river Pra or Praa, by the enemy, whose numbers are said to have amounted to 10,000 men. The result was a total defeat of the handful of troops under the governor's immediate command. Sir Charles himself was wounded and taken prisoner, and, with the exception of two, all the officers who were with him, were either killed or captured. This disastrous encounter, however, did not terminate the war. It continued for nearly three years, though with long intervals of cessation from hostilities; and was only brought to a close by a severe action fought near Accra, on the 7th of August, 1826, in which the Ashantees were completely defeated. Soon after this, the king submitted to pay 600 ounces of gold, and to send one of his sons and a nephew to be educated at the Castle, as the conditions of a peace.

By these events, the Ashantees may be considered to have been driven from the tract of country immediately adjacent to the sea; but if they have retained their conquests in other directions, the empire must still be of considerable extent. According to the map published by Mr. Dupuis, it appears to stretch, including Gaman, from about our first meridian to nearly the 5th degree of west longitude, or over a range of country not much short of 300 miles in length. Its extent from south to north, when it reached the sea in the former direction, must have been at least as great.

The state next to Ashantee on the east is that of Danomey, from which it is separated by the river Volta, otherwise named the Aswada. Its western boundary on the coast, was the river Assinee; but in the interior, the province of Gaman lies in great part beyond even the westernmost branch of that river, there known under the name of the Bara. To the north and north-east of Gaman are the Manding tribes, and the independent Moslem states of Kong and Enkasy.

Both Bowdich and Dupuis have given a mass of details respecting the internal geography of the kingdom, upon many of which, however, very little dependence can be placed. Indeed, Dupuis has enumerated a multitude of errors, some of them of the most serious magnitude, into which his predecessor had fallen. The greater part of the information collected by Dupuis himself, again, was derived merely from the reports of persons with whom he conversed, whose statements, where defective, he patched up in the best way he could by hypothesis and conjecture.

The empire of Ashantee, Dupuis says, was popularly reckoned to be made up of no fewer than forty-seven different states, and this was before the annexation of the kingdom of Gaman. The chief of these have been mentioned in the preceding historical sketch. According to the map of Mr. Dupuis, the following are the maritime provinces, in the order in which they are placed from west to east:—Amanaha, Ahanta, Fantee, Inkran, Aquapim, and Adampy. To the north of Ahanta is Tofal, and to the north of that Wossau. Farther in the interior are, Dinkira, Akim, and Aquambo. Still beyond these are, Ashantee Proper, and Quahou; then Massy and Akeyah; then Ajorah; then Coransah and Bouromy; then Takima and Yobati. To the north of these is placed the kingdom of Banna, which is independent, although usually in close alliance with Ashantee. Beyond Banna are the Moslem states of Ghofan and Ghobago, said to have been subdued by the late king Sai Quamina. Ghobago extends a considerable distance towards the north-east. Finally, to the west of all the abovementioned provinces is the kingdom of Gaman, as already stated, with its provinces of Ponin, Safoy, Showy, Sumah, and Aowin, as they succeed one another from north to south.

The outline of the coast opposite to Ashantee will be more appropriately described under its common appellation, the Gold Coast. Its general direction is from east to west, although from Cape Three Points in long. 2° 40′ W., it trends on both sides considerably towards the north. The chief rivers which fall into this part of the Gulf of Guinea, are the Volta, or Aswada, the course of which, for nearly 200 miles before it reaches the sea, is almost due south; but the principal branch appears to rise from a mountainous tract considerably to the westward;—the Praa, or Chamah, one branch of which (the Boosempra) flows from the east, while another passes near Coomassie, the capital, and here receiving the former, descends by a course almost due south to the sea, which it reaches about 2° 10′ W. long., forming the boundary between the Fantee and Ahanta territories; the Ancobre (or Rio de Cobre, that is, in Portuguese, the Serpentine River), on the west side of Ahanta; and finally, the Assinee, formed of the united waters of the Tando and the Bara, which join about 6° 10′ N. lat. The hilly portion of the country is in the east and north-east, in the provinces or states of Aquapim, Akim, Aquambo, and Akeyah; but there are no mountains of any considerable height.

The greater part of the country from the sea-coast, as far as fifty or sixty miles to the north of Coomassie, is still a thick forest, through which travelling is impossible, except along the paths or roads which have been conducted with great labour in different directions from the capital. The city of Coomassie, according to the reckoning of Mr. Dupuis, stands nearly in 6° 51′ N. lat., and in 2° 16′ W. long. from Greenwich. Mr. Bowdich has given both a plan and a long description of this barbarian metropolis. It is built, he says, upon the side of a large rocky hill of iron-stone, and is completely surrounded by a half-stagnant stream, or rather marsh, varying from 50 to 100 yards in breadth. The town is an oblong, nearly four miles in circuit, without including a suburb or back town, half a mile distant. Of the principal streets, four are each half a mile long, and from 50 to 100 yards wide. But the streets are merely ranges of fields, bordered with rows of houses. The houses are said to be built in straight lines, and the open spaces between the two rows have each a name. The palace stands in a long and wide street which runs through the centre of the town, and is inclosed by a high wall. The number of streets in all, as reckoned by Mr. Bowdich, was twenty-seven. The population of the town was estimated by the Ashantees themselves at upwards of 100,000; but this is most probably an exaggeration.

Besides the eight great roads, which, according to Dupuis, lead from Coomassie, there are numerous minor roads, although most of them are merely narrow foot-paths, and are often quite impassable. Most of the towns and villages are on the line of some of the great roads. The inland tracts are greatly superior to those that lead down to the coast, an advantage which they owe both to the longer time they have been in use, and to the nature of the country through which they are cut. From beyond Coomassie down to the coast, as has been already observed, the soil is thickly covered either with lofty trees, or with brushwood and trees intermixed; but many of the parts traversed by the great roads in the upper country are open plains.

It would be quite idle to attempt to form any estimate of the numbers of the Ashantee population. Of the military force of the state, the most moderate account which Mr. Bowdich received was that it exceeded 200,000 men.

The men of Ashantee, according to this author, though very well made, are not so muscular as the Fantees. The women he thought in general handsomer than those of Fantee. Among the higher classes both sexes are remarkable for the cleanliness of their persons; but the lower orders are for the most part very dirty.

The most remarkable among the moral characteristics of the Ashantees are their warlike ferocity and their love of blood. These passions have, as usual, deeply coloured their religious belief and observances. We must refer to the work of Mr. Bowdich for an account of their theological system, which is throughout a compound of the most absurd follies. The most horrid of the practices by which they express their devotional feelings are those in which they indulge at what are called the Yam and the Adai customs, the former commencing in the early part of September, when the consumption of the yam crop begins, the latter taking place, alternately on a greater and less scale, every three weeks. On all these occasions human blood flows in torrents. The sacrifices are described as exceeding in their sanguinary character even those that take place at the neighbouring court of Dahomey, with the description of which the European public has been longer familiar.

The government of Ashantee appears to be a despotism, partially controlled by an aristocracy, and to a greater extent by the antient customs of the country. But in whatever degree the royal power may be restrained by these opposing forces, it appears to be unlimited in regard to the right to dispose at pleasure of the property, the liberty, and the lives of all classes of the population. The king, however, is said always to consult his great council before entering upon a war or upon any other business of public importance. The diminution of the numbers of the nobility has been for some reigns a policy steadily pursued by the crown; and Mr. Bowdich says that the order had been at last reduced to only four individuals. There is, however, besides the hereditary nobility, a council of captains, whose advice at least is usually asked by the king on important occasions. The law of succession to the throne (and the same rule holds as to the estates of private individuals) is in some respects very singular, the nearest heir being the brother, the next the sister's son, the next the son, and the next the chief vassal or slave. In the Fantee country it is asserted that the slave comes in before the son, who only inherits such property as his mother had possessed independently of her husband.

In Ashantee, besides the negroes, there is a large population of Moslems, that is of Moors professing the Mohammedan faith, who have penetrated thither from the north of Africa. These people, possessed as they are of the art of writing and other acquirements not shared by the negroes, form a very influential body wherever they are established. In former times they appear indeed, as already noticed, to have been left by the government in the enjoyment of almost complete independence. In different parts of the empire they still, according to Mr. Dupuis, 'live in political societies, governed by their respective princes, who are vassals to the king, but who enjoy prerogatives exceeding those of any other class of subjects.' From what is said elsewhere it appears that these princes, or caboreers, are appointed by the king. At Coomassie and many of the other towns, the commerce with distant places is almost entirely in the hands of the Moslems. The provinces in which they are chiefly found are to the north of Coomassie; and it is stated that wherever they exist in considerable numbers the negro population is much less ferocious, and in general further advanced in civilization. The recently conquered countries of Ghofan and Ghobagho were Moslem states;—that is to say, the government was in the hands of the Moslems.

Mr. Bowdich has written a confused chapter on the Ashantee language, from which very little can be gathered. He says that from Amanahs to the Volta there are six different languages spoken: the Amanahee, Ahanta, Fantee, Affoottoo, Accra, and Adampee. But the vocabularies which he has printed show that these are merely so many dialects of one language. He describes the Ashantee tongue as more cultivated and refined than the Fantee, Warsaw, &c., and as possessing superior euphony, from its abundance of vowel-sounds and its rejection of aspirates. Oratory is an accomplishment in which the Ashantee chiefs generally excel. The rest of Mr. Bowdich's dissertation is principally occupied with a comparison between the grammatical peculiarities of the Fantee and Accra dialects. All these dialects appear to be characterized by the absence of adverbs, prepositions, and those other disguised forms which occur in older languages. The Ashantee music, of which he gives some specimens, is spoken of in high terms by Mr. Bowdich for its sweetness and animation. Among their instruments are a flute made of a long hollow reed, with three holes; a box called a Sanko, the top of which is covered with an alligator's or antelope's skin, having a bridge raised over it, across which are extended eight strings; immense horns, made of elephants' tusks; and an instrument somewhat like a bagpipe. They have also drums made of the trunks of trees hollowed out; and in their martial concerts the noise is increased by the aid of castanets, gonggongs, flat sticks, rattles, and old brass pans.

Mr. Bowdich has given various drawings of the houses of the Ashantees. The walls are usually formed of stakes and wattle-work, filled up with clay. All have gable ends and ridged roofs, consisting of a frame-work of bamboo, over which is laid a thatch of palm leaves, tied with the runners of trees. Many of them have arcades, and many also are highly ornamented with plaster, paint, carving, and other decorations. The doors are formed of entire pieces of cotton wood; and deals of the same wood, cut out with an adze, are also sometimes, though rarely, used for flooring. There is frequently an upper-story supported on rafters. The windows are described as being of 'open wood-work, carved in fanciful figures and intricate patterns, and painted red;' and the frames as 'frequently cased in gold, about as thick as cartridge paper.' While Mr. Dupuis was at Coomassie, the king commenced the erection of a fort, which, although built only of wood, was to be of great height and strength. It was intended as an imitation of Cape Coast Castle.

The principal manufacture of the Ashantees is that of cotton cloth, which they weave on a loom worked by strings held between the toes, in webs of never more than four inches broad. Silk is sometimes interwoven with the cotton. The cloths which they produce are often of great fineness of texture, and their colouring of the highest brilliancy. They paint their patterns with a fowl's feather; and Mr. Bowdich says, that he has seen a man produce these figures in this manner, with great regularity, as fast as he himself could write. Another of the arts in which they have attained considerable excellence, is the manufacture of earthenware. They also tan leather, and work in iron. Mr. Bowdich says that the sword-blades which they make often evince very fine workmanship; but that they have no idea of making iron from the ore as some of their neighbours farther in the interior do. He describes, however, an ironstone of a dark red colour spotted with grey, from which he says they cast bullets. When lead is scarce, some of their ornaments are described as being made of brass; but we do not find it stated that copper is found in the country. But the art for which they are most famous is that of the fabrication of figures in gold. We must refer, however, to Mr. Bowdich's work for a description of the processes which they employ. Articles formed of gold abound in the houses of all the wealthier inhabitants; and in the king's palace those of most common use are described as being made of this precious material. Mr. Dupuis intimates, however, that the statements of Mr. Bowdich upon this head, and also the descriptions he has given of the splendour of the Ashantee court in general, are somewhat high coloured.

Gold is found in this country both in mines and in particles washed down by the rains. According to Dupuis, the richest gold mines known to exist in any part of Africa are those in Gaman. Some of the richest of these mines are said to be esteemed sacred, and on that account are not worked. The wealthier inhabitants load their persons with lumps of native gold; some which Dupuis saw, he thinks, must have weighed fully four pounds. In Akim, and some other parts of the empire bordering on the Volta, from which much gold was formerly obtained, the mines are now either exhausted, or at least are no longer worked. There are many rich mines in the small district of Adoom, westward from Cape Coast and about three days' journey from the sea; and during the rainy season, it is said that not fewer than eight or ten thousand slaves are employed in washing for gold dust on the banks of the Bara, in Gaman.

The rainy season in Ashantee may be said to commence with the month of May; but the heaviest rains are from about the middle of September to the end of the following month. In some years, however, there is little or no rain at all during the usual season. Mr. Bowdich has given the variations of the thermometer for nearly a whole year, over which his own observations, and those of his associates, extended. In June it appears to have ranged at Coomassie from 73° to 84°; in July, from 71° to 81°; in August, from 68° to 80½°; in September, from 70° to 82½°; in October, from 70° to 83°; in November, from 69° to 83½°; in December, from 63° to 85°; and in January, from 58° to 86°. In the morning, especially, it is much cooler at Coomassie than at Cape Coast.

The yam is the chief vegetable that is cultivated in Ashantee. It is planted at Christmas, and dug up early in September. But there is also grown a good deal of corn, rice, sugar-cane, and a mucilaginous vegetable called encruma, somewhat resembling asparagus. The plantations are of considerable extent, and very neatly kept. The principal domesticated animals are cows, horses of a small breed, goats, and a species of hairy sheep. Among the wild animals with which the region abounds are lions, elephants, hyænas, wild hogs, deer, antelopes, alligators, and a variety of snakes. Among the birds are vultures, parrots, and several small species of beautiful plumage, which sing melodiously. But all the departments of the natural history of the country are still very imperfectly known.

ASHBORNE (or, as it is written in antient records, **ESSEBURNE, ASHBURNE**, and **ASHBOURNE**), a considerable market-town, in a rich valley not far from the east or left bank of the river Dove, which falls into the Trent. Ashbourne is 139 miles from London and thirteen from Derby. The population in 1831 was 2246, and the number of houses, including two which were building and twenty-seven uninhabited, was 502.

It is pleasantly situated. High hills shelter it from the cold winds of the north; and to the south-west it looks towards the valley mentioned above, where the Dove winds through some of the richest meadows in the kingdom. The church is in the form of a cross, with a tower rising from the centre, surmounted by a fine spire. The building was probably erected in 1241, as there is a memorial in brass of its dedication to St. Oswald in that year. It is in the early English style, and there are several good door-ways. The walls and buttresses retain the characteristics of this early architecture; but several parts of the church are of later date, and of the decorated English or perpendicular styles. It contains many monuments of the Cokaine and Boothby families, especially a beautiful monument by Banks to the memory of Penelope, daughter of Sir Brooke Boothby, who died in 1791, at the early age of six years. The figure of the child asleep, in white marble, has been much admired. There was formerly a presbyterian meeting-house in Ashborne; and at present there are two places of worship, one for the General or Arminian Baptists, and one for the Wesleyan Methodists; as well as one for the Calvinistic Methodists (or Lady Huntingdon's connexion), in the suburb of Compton, antiently Campdene, which is separated from the town on the south side by the rivulet Henmore, or Schoo.

There is at Ashborne a grammar-school founded by Sir Thomas Cokaine and others in 1585: and a Mr. Spalden, who lived in the beginning of the 18th century, by his will (dated 1710), founded two elementary schools, one for thirty boys, and the other for the same number of girls. There are several almshouses in the town, which owe their origin to different benevolent individuals, especially to Mr. Spalden above-mentioned; and to Mr. John Cooper, who built at his own charge the Calvinistic methodists' chapel in Compton, and also built and endowed an almshouse adjoining to it.

The market is on Saturday, for corn and provisions. There are no less than eight fairs, all for horses, horned cattle, and sheep: wool is sold at the fair in July, which is considered the smallest fair in the year. Ashborne does not seem to possess any particular manufacture, unless it be of lace: but there are iron and cotton factories in the neighbourhood. The chief trade is in cheese and malt.

The parish is very large, and extends into three hundreds, or wapentakes: viz., Wirksworth wapentake (in which is the town), Appletree hundred, and Morleston and Litchurch hundred. It has three dependent parochial chapelries, viz., Alsop-in-the-Dale, Hognaston, and Parwick. The population of the parish, including that of the town (as given above), and of the chapelries, was in 1831, 5699, and the whole area was 16,490 acres.[*] The living is a vicarage, of which the Dean of Lincoln is patron. The rectory of Mapleton is annexed to it. The rectory of Ashborne was granted by William II. (Rufus) to the church of St. Mary in Lincoln, and to the bishop of that see and his successors: but by some arrangement at a remote period, it was attached to the deanery of that see; and is now leased out by the dean. Ashborne is in the archdeaconry of Derby and the diocese of Litchfield and Coventry.

Ashborne was the scene of some contests during the war between Charles I. and the Parliament. In Feb. 1644, the troops of the latter were victorious over the royalists. The young Pretender passed through Ashborne in his retreat from Derby, in 1745. (Lysons's *Magna Britannia*; Rhodes' *Peak Scenery*, &c.)

ASHBURTON (antiently written **ASPERTON**), a borough town in the hundred of Teignbridge, in Devonshire, on the road from London (by Exeter) to Plymouth: 192 miles from London, 19 from Exeter, and 24 from Plymouth.

The town is situated a short distance eastward from the river Dart, and consists mainly of a long street, through which the London and Plymouth road passes, and of a second street, turning off to the right, through which passes the road across Dartmoor to Tavistock. The houses are neat, and are mostly covered with slate, which abounds in the neighbourhood. A small stream, which turns several mills, runs through the town, and falls into the Dart about two miles lower down, just where the Plymouth road crosses the Dart. The church, dedicated to St. Andrew, is a spacious structure in the form of a cross, in the perpendicular style of Gothic architecture. The tower is ninety feet high, and is surrounded by a small spire. In the chancel are several stalls, as in collegiate churches. Adjoining the church is the antient chapel of St. Lawrence, in which the grammar-school is held, and also the meetings for parliamentary elections and other public business. This chapel was formerly endowed with lands valued in the time of Edward VI. at 10*l.* 15*s.* 8*d.* per annum. Of this amount, ten marks, or 6*l.* 13*s.* 4*d.* went as stipend to the chantry priest, who was to keep a grammar-school; and the remainder to maintain and repair the leaden pipes 'for the conduction of wholesome water for the relief of the infected, when the plague should be at Ashburton, that they might not infect others.' These lands, it is probable, are the parish lands now devoted to the repair of the chapel; the endowment of the grammar-school coming from other sources. The chapel was used for marriages and other occasional parochial duty in the early part of the last century.

Besides the grammar-school, there are some endowments for the instruction of the children of the town, especially one given in 1754 by Lord Middleton and the Hon. John Harris (at that time members for the borough), under which, in 1821, upwards of ninety children received education from two schoolmasters of Ashburton. In 1805, the late Miss Dunning founded a gift of 6*l.* per annum, for the instruction of ten girls in reading, sewing, &c.

The independents, particular baptists, and Wesleyan methodists have meeting-houses in the town.

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[*] In the parochial returns for 1831, the chapelries of Hognaston and Parwick are given as distinct from the parish of Ashborne.

The chief manufacture of Ashburton is that of serge, which is made for the East India Company. The market is on Saturday, for corn, provisions, &c. A yarn market, formerly held on Tuesday, under letters patent, granted by Charles II., has been discontinued for many years. There are four fairs, on the first Thursdays in March and June, and the first Tuesdays in August and November*. The March fair is a large cattle fair, and that in November a great sheep fair. The number of houses in the parish of Ashburton was, in 1831, 552, including thirty nine uninhabited, and the population at the same time amounted to 4165.

Ashburton was a parliamentary borough in the time of Edward I., but did not again, except once in the reign of Henry IV., return members till the last parliament of Charles I. in 1640. The right of election was in the inhabitant householders and the holders of burgage tenures; but the boundaries of the borough were not clearly known. The number of voters was estimated at between 300 and 400, but the members were really the nominees of Lord Clinton and Sir Lawrence Palk. By the Reform Bill the number of representatives was reduced from two to one, and the boundary of the parish made the boundary of the borough. The number of houses in the parish, of 10*l.* value and upwards, was estimated in the boundary reports at 342. The returning officer is the portreeve, who is chosen annually at the court leet and baron of the lord of the manor.

The living is a vicarage in the rural deanery of Moreton, the archdeaconry of Totness, and the bishoprick of Exeter; and in the ecclesiastical province of Canterbury. It includes the chapelries of Bickington and Buckland-in-the Moor. The dean and chapter of Exeter are the patrons.

Ashburton is one of the four towns in which the stannary courts are held. These courts are held before the lord warden or his substitutes, for the administration of justice among the tinners of Devonshire and Cornwall, by virtue of a privilege granted to them to sue and be sued only in their own courts. The other stannary towns are Chagford, Plympton, and Tavistock.

This town was the birth-place of John Dunning, the first Lord Ashburton, and of the late William Gifford, editor of the *Quarterly Review*.—(Lysons's *Magna Britannia; Reports of Commissioners of Charities, &c.)*

ASHBURTON, LORD. [See DUNNING.]

ASHBY-DE-LA-ZOUCH (in antient writings called ASCEBI and ESSEBY), a market town in the hundred of West Goscote, in the county of Leicester. It is on the little river Mese, or Mease, a feeder of the Trent, and on the road from London to Burton-upon-Trent; 115 miles from London, and 17 from Leicester, the county town. Its original designation was simply Ashby; the distinctive addition of De la Zouch, it received from the Zouches, who were lords of it.

This town consists chiefly of one street, in which stands a neat market-cross, and was nearly surrounded at one time by three parks, now no longer existing, viz. Prestop park, the great park, and the little park, of which the last was the homestead to the castle. The situation of the town obtained for it from Camden the character of *Villa Amœnissima* (a most delightful town). The land around is chiefly pasture.

The church, dedicated to St. Helen, is a handsome and lofty antient structure. It is of stone, and the tower contains six large bells and a set of chimes. The body of the church is well pewed; and the chancel was fitted up with pews for his own family by Francis, Earl of Huntingdon, who died in 1790. On each side of the chancel is a large chapel, projecting considerably beyond the side of the church: that on the north side is converted into a vestry-room, and that on the south side is the burial place of the Hastings' family. In the latter is a sculptured monument of Francis, Earl of Huntingdon, and his countess, who both died in the sixteenth century. In this church there was, in 1804, when Mr. Nichols's History of Leicestershire was published, a singular instrument of punishment called the finger pillory. It consisted of a horizontal beam divided lengthways into two parts; the upper part turned on a hinge at one end, and was fastened by a lock at the other end, after the manner of the stocks. In this machine are different-sized holes for containing the fingers of the disorderly. The beam is supported by two upright posts about three feet high.

In an open pasture on the south side of the town, on a gentle eminence, stand the ruins of the castle of Ashby. This castle seems to have been of vast extent and very lofty. We can trace out the great hall, kitchen, various chambers of state, the chapel, &c.; wherein are found, in good preservation, rich doorways, chimney-pieces, arms, devices, and other ornamental accompaniments. (See Nichols's *Leicestershire*, vol. iii. p. 612.) It was built by Lord Hastings, a nobleman of great power in the time of Edward IV., and who was beheaded by order of the Duke of Gloucester (afterwards Richard III.), shortly after Edward's death. It was one of the places in which Mary Queen of Scots was confined.

The 'Ivanhoe' baths, erected within the last few years, are supplied from the collieries with water impregnated with muriate of soda, or common salt, to a greater degree than sea water. There are a small theatre, a handsome hotel, and lodging-houses.

There is in Ashby a free school, founded in 1567 by Henry, Earl of Huntingdon; also a school for educating and clothing twenty-six boys, founded in 1669 by Mr. Isaac Dawson, and a small foundation for the instruction of twelve girls. Another charity-school has been lately founded by Alderman Newton, of Leicester.

Woollen and cotton stockings, and hats, seem to be the chief articles of manufacture in Ashby; but the manufacturers suffered materially during the war which followed the first French revolution. The market is on Saturday, and is well supplied. There are four fairs in the year, besides a statute for the hiring of servants on the 22nd September.

Coal and ironstone are worked in the neighbourhood of the town, and there is a canal from the Coventry canal navigation, near Bedworth in Warwickshire, to the neighbourhood of Ashby (see Bradshaw's *Map of Canals*), and a railroad from this canal to the town. The elevation of this canal is 315 feet 5 inches above the base assumed as the general level in Bradshaw's *Map*. It runs for 18 miles direct distance from Bedworth without any lock.

The living is a discharged vicarage with the chapel of Blackfordby, in which the vicar performs service once a fortnight. It is in the deanery of Ackley, archdeaconry of Leicester, and diocese of Lincoln. There are places of worship for Presbyterians, Wesleyan and Calvinistic methodists, and, according to some late accounts, for Independents.

The parish is extensive, and includes the hamlets of Blackfordby and Boothorpe. Kilwardby, and the Calais, which now form parts of the town, were once distinct hamlets. The population was, in 1831, 4727, of whom 327 were in the chapelry of Blackfordby.

Ashby was the native town of the eminent Bishop Hall. In the civil war, in the time of Charles I., Ashby was garrisoned for the king, but evacuated and dismantled by capitulation. (Nichols's *Hist. of Leicestershire.*)

ASHDOD, or ASDOD (Ἄζωτος, of the Greeks), is situated on the shores of the Mediterranean, in Palestine, about nine miles N.E. of Ascalon, and ten miles S.S.W. of Jamnia. The mention of this place occurs frequently in the Old Testament; it was one of the five Philistine cities, and, at the division of the promised land, it fell to the lot of the tribe of Judah (Joshua xv.), who, however, appear not to have obtained possession; for we find (1 Samuel v.) that 300 years subsequently the Philistines in their wars with the Jews having captured the ark of the covenant, brought it to Ashdod, and placed it in the temple of their god Dagon, which fell to the earth before it. David probably got possession of Ashdod when he 'took Gath and its towns out of the hand of the Philistines.' (Chronic. i. chap. 18.) It was taken by the Assyrians about B.C. 714, but afterwards fell into the hands of the Egyptians, after sustaining, according to Herodotus, a siege and blockade of twenty-nine years in the reign of Psammitichus, during which it must have suffered greatly, for Jeremiah calls it 'the remnant of Ashdod.'

The temple of Dagon was destroyed by Jonathan Maccabæus, and the town burnt during the wars between Alexander Balas and Demetrius. It seems never to have recovered its former splendour, though A. Gabinius, the Roman governor of Syria, ordered it to be rebuilt. By the Romans it was called Azotus, and is also noticed by this name in Strabo and the Acts of the Apostles. Its modern name is Asdoud, a near approach to the antient one; but there are no remains of its former grandeur. It is now, Volney says, famous only for its scorpions. The country around is open, and little cultivated, and the village small. The principal object is a large Turkish khan for travellers, which appears to occupy the site of some antient building—probably one of the primitive Christian churches, as an altar and cross are still standing, and there is an inscription over the door in some Eastern language. It lies in 31° 45′ N. lat., 34° 37′ E. long.

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* So Lysons's *Magna Britannia;* the 10th Aug. and 11th Nov. according to others.

The land along this part of the coast is perceptibly gaining on the sea, which is shallow, and deposits in this bend of the coast much of the sand from the mouths of the Nile. (Mangles and Irby. See Steph. Byzant.; and Nehemiah xiii. 23.)

ASHDOWN FOREST, a hilly and woodland district in the northern part of the county of Sussex, in what is usually denominated 'the Weald.' This weald was before the Conquest a vast forest, stretching from Chichester to the border of Kent; and the designation in its widest sense is understood to include all the county north of the South Down hills. Ashdown Forest contains about 18,000 or 20,000 acres. The black sand which covers it is of various depth, and lies upon a thick stratum of soft clay. The chief value of the district is as a rabbit warren. Crowborough Beacon, an eminence at the eastern extremity of the forest, is 804 feet high. The road from London to Lewes, through Maresfield and Uckfield, leads across this waste. (Young's *General View of the Agriculture of Sussex*. See *Ordnance Map*.)

ASHER, one of the twelve tribes of Israel. [See PALESTINE.]

ASHES, the remains of any thing burnt, whether of vegetable or animal origin, and to a certain extent of mineral bodies also. First with respect to *Vegetable ashes*:—Woody fibre, termed chemically *lignin*, is composed of oxygen, hydrogen, and carbon: it constitutes nearly the whole of all vegetable matter, and it is almost entirely dissipated when burnt. Two of its elements, by combining with the oxygen with which they were already united, and a fresh portion acquired from the atmosphere, form new compounds; these products it would be foreign to our present purpose minutely to notice, but it may be observed that they consist chiefly of water and carbonic acid gas. The carbon of woody fibre is the element which remains longest unacted upon, and on this circumstance the preparation of charcoal from wood depends. When, however, this carbon has been totally dissipated by the long-continued and combined action of heat and the oxygen of the air, there remains only a small quantity of ashes; these are derived principally, if not entirely, from such substances as the plant takes up from the soil during its growth, and which, though universally met with, are most frequently to be considered rather as accidental than necessary constituents of the vegetable. Ashes vary in composition according to the nature of the plant, the soil in which it grows, and of the manure used upon it. But few, if any, of the constituents of the ashes occur in them in the state in which they existed in the plant; they are mostly the altered results of combustion. But to this part of the subject we shall presently recur.

The substances usually contained in the ashes of land-plants are potash, soda, lime, magnesia, silica, the oxides of iron and of manganese, chlorine, carbonic, sulphuric, and phosphoric acid; alumina occurs but rarely, and sometimes oxide of copper has been met with. The salts derived from the combination of some of these bodies are soluble in water; such are the compounds of potassium and sodium with chlorine, those of the same metals with the carbonic and sulphuric acids, and with silica. Lime, and some of the other bases, combined with the carbonic or phosphoric acid, or with silica, are insoluble in water. Very frequently more than one-half of the ashes of vegetables consists of carbonate of lime.

The quantity of ashes varies, not only according to the soil, age, and aspect of the plant, but also in different parts of the same plant, from one and a half to three and a half per cent. of its weight, after drying in the air. Sometimes the ashes amount to four or five per cent., and in the bark of the oak to six per cent.; the quantity and quality of the ashes also vary in the same kind of wood from the accidental circumstances already noticed. Berthier (*Annales de Chimie et de Physique*, tom. xxxii. p. 240) has given the results of numerous experiments on the ashes of different kinds of wood; from these the following are selected as almost extreme cases of the quantity of ashes obtained from

	Per Cent.		Per Cent.		Per Cent.	
Elder	5	of which	10.8	were soluble, and	89.2	insoluble in water.
Oak	2½	. .	12	. . . .	88	
do. bark	6	. .	5	. . . .	95	
Birch	1	. .	16	. . . .	84	

The *soluble* saline matter yielded, per cent.,—

	Elder.	Oak.	Oak bark.	Birch.
Carbonic acid .	27.42	24·0	23·2	17·0
Sulphuric acid .	7·53	8·1	6·0	2·3
Muriatic acid .	1·80	0·1	0·7	0·2
Silica . .	1·61	0·2	0·8	1·0
Potash and soda	60·64	67·6	69·3	79·5
	99·	100·	100·	100·

The *insoluble* matter consisted of, per cent.,—

	Elder.	Oak.	Oak bark.	Birch
Carbonic acid .	39·8	39·6	38·5	31·0
Phosphoric acid .	2·8	0·8		4·3
Silica . . .	2·0	3·8	1·1	5·5
Lime . . .	51·8	54·3	50·1	52·2
Magnesia .	2·2	0·6		3·0
Oxide of iron .	0·1		0·8	0·5
—— manganese	0·6		7·4	3·5
Charcoal, &c. .			2·1	
	99·3	99·6	100·	100·

On considering the constituents of the soluble part of wood-ashes, it will be evident that it must consist of the alkaline sulphates, carbonates, and chlorides; while the insoluble matter is chiefly composed of carbonate of lime, and probably of magnesia, phosphate of lime, and phosphate of iron. Wood-ashes may contain a considerable portion of iron without its being indicated by the colour of its oxide, because it is in the state of phosphate; the manganese appears to exist as an oxide: this is indicated, not only by the greyish tint which it imparts, but also by the smell of chlorine evolved by the action of muriatic acid.

It needs hardly be stated that the incineration of wood is a most important operation; from its ashes are obtained the immense quantities of impure potash, and the carbonate called *pearlash*, imported from America and other countries. [See POTASSIUM and its salts.] Although wood-ashes thus yield carbonate of potash, yet there is no reason to suppose that this salt exists in the sap of the plant. On the contrary, in the opinion of Vauquelin, the alkali is there combined with acetic acid; and it is well known that acetate of potash is, by heat and the decomposition of its acid, converted into carbonate. The sap of plants contains also other vegetable acids, as the oxalic, citric, tartaric, malic, &c.; and the salts which these form with potash are decomposed by heat, and yield the carbonate. The sources of the alkalis is a subject which has been much discussed, but there is now no question of their being acquired from the soil, in the same way as the lime and metallic oxides. It is well known that basaltic rocks contain soda, and granite rocks potash; and it has been found that fir trees growing in a soil derived from the disintegration of basalt, contain much more soda and less potash than those which grow in disintegrated granite.

The ashes of land plants yield principally the salts of potash; those of marine plants afford a large quantity of soda salts, and especially the carbonate. There are several varieties of *salsola* and *salicornia* cultivated on the coasts of Spain, which, when full grown, are cut, dried, and burnt in trenches; the resulting ashes are called *barilla*, and are imported in the state of hard, grey, porous masses. The richest barilla contains about 40 per cent. of carbonate of soda, mixed with various saline and earthy impurities. It is used for soap-making, and in other manufactures requiring an alkali; but since the duty has been taken off common salt, and on account of the cheapness with which soda is obtained from it, barilla is now much less used than formerly.

Kelp is the ash of some varieties of sea-weed, especially of the *fucus saccharinus* and *fucus vesiculosus*. It is prepared in the islands of Scotland, and contains scarcely one-tenth as much carbonate of soda as barilla does; the remainder consists principally of chloride and iodide of sodium, sulphate of potash, phosphate of lime, earthy and carbonaceous matter. It is used in the manufacture of crown glass, as well as in that of soap.

It is extremely probable that a portion at least of the carbonate of soda found in the ashes of marine plants results from the double decomposition of common salt by the potash salts originally existing in them. [See SODIUM and its salts.]

Coal ashes are extremely various both in their appearance and composition. Thus much of the coal of the north of England, under common circumstances, burns to a cinder, which is a mixture of the ashes of the coal, with some carbonaceous matter requiring rather a high temperature to burn it, on account of its being enveloped by incombustible matter. The coal of Somersetshire burns to red ashes, evidently coloured by peroxide of iron; those of the Staffordshire coal are nearly white.

Coal, like wood, consists principally of carbon, oxygen, and hydrogen, and, according to Dr. Thomson, it contains nitrogen also. The carbon generally varies from seventy-five to ninety per cent. The quantity of ashes yielded by different kinds of coal varies considerably; according to Kirwan, Wigan coal contains 1·57 per cent. of ashes; Whitehaven coal 1·7, and Swansea coal 3·33 per cent.: they consist principally of silica and alumina, with small quantities of lime, sometimes magnesia, and also peroxide of iron; but they do not contain either the chlorides, phosphates, or alkaline salts found in wood-ashes.

It may be remarked, that while the ashes produced by some kinds of coal are nearly useless, that form of them which results from the imperfect combustion of the north-country coal burnt in London is very largely and economically employed in brick-making.

Peat ashes have been examined by Klaproth; the peat of Mansfeld yielded 20·5 per cent. of incombustible matter, consisting of silica, alumina, lime, sulphate of lime, and peroxide of iron. MM. Oberlin and Buchner have lately analyzed the ashes of the turf occurring near Strasburgh; 1000 parts of the dried turf yielded 180 of ashes, of a reddish grey colour, mixed with white and reddish gritty particles of an earthy, saline taste, and infusible by the blowpipe. One hundred parts of these ashes yielded

Common salt, with a little sulphate of lime	19
Carbonate of lime and of magnesia Phosphate of magnesia and of alumina Sulphate of lime and oxide of iron Alumina and silica	81
	100

The ashes contained neither free nor carbonated alkali, no iodine, nor any sulphuret. (*Journal de Pharmacie*, Avril, 1834.)

With respect to *animal ashes*, we are not aware that the different forms of animal matter have been subjected to incineration. From the following results obtained by Berzelius, in his experiments on the ashes of bones, it is not difficult to anticipate that phosphate of lime would constitute the larger part of the ashes of the animal solids, excepting the fat; he found that ox bones, after the dissipation of the carbonaceous animal matter which they contained, yielded 66·7 per cent. of ashes, composed of

Phosphate of lime, with a little fluoride of calcium	57·35
Carbonate of lime	3·85
Phosphate of magnesia	2·05
Soda, with a very little chloride of sodium	3·45
	66·70

The ashes of human bones contain about four per cent. less of phosphate of lime, and almost 7½ per cent. more of carbonate than ox bones. With the exception perhaps of the phosphate of magnesia, all the above compounds existed as stated in the bone previously to incineration: this circumstance forms a remarkable difference between vegetable and animal ashes.

Animal ashes, termed technically *bone ash*, are sometimes, though with less effect than unburnt bones, employed as a manure; also for the purpose of making assay cupels, and in the preparation of phosphoric acid.

Volcanic ashes only remain to be noticed. Vauquelin examined some ashes from Vesuvius which fell at Naples in 1822; their colour was greyish, they were tasteless, and found to consist of alumina, oxide of iron, muriate of ammonia, sulphate of lime, potash, copper, manganese, lime, and charcoal; the proportions of these, however, were not determined. (*Annales de Chimie et de Physique*, tome xxv. p. 72.) Vauquelin also analysed the ashes ejected in the same year from Ætna; they were of a grey colour, and in fine powder; when heated to redness in contact with the air, they exhaled sulphurous acid, and in a close vessel they yielded sulphur. The following statement shows that the composition of these ashes was very different from those of Vesuvius ejected in the same year. One hundred parts consisted nearly of—

Silica	28·10
Sulphate of lime	18·
Sulphuret of iron	20·88
Alumina	8·
Lime	2·60
Charcoal	1·
Sulphate of copper and of alumina Traces of sulphur, a muriate and moisture	21·42
	100·00

(*Annales de Chimie et de Physique*, tome xxxii. p. 111.)

ASHFORD, a market-town in Kent, on the west side of the Stour, just below the confluence of the two upper branches: it is on the road from London (through Maidstone) to Folkstone, 53 miles from London, 19 from Maidstone, and 14½ from Canterbury. It is called in Doomsday-book both Estefort and Essetesford, and in other antient records Esshetisford, taking its name from the Esshe or Eschet, a now obsolete designation of the west branch of the Stour from its source near Lenham to this place.

The situation of this town is pleasant and healthy, being on a small eminence, with a gentle ascent to it on every side. The houses are well built, and the main street (through which the Folkstone road passes) is of considerable width, and is paved. The market-house is in the centre of it, and the church on the south side. At the east end of the town is a stone bridge of four arches over the river Stour. The market is on Saturday. There is a monthly fair or market for the sale of fat and lean stock, held on the first Tuesday in the month; and there are four other fairs, as far as we can gather from our authorities. Several genteel families reside in the town. The population of the parish in 1831 was 2,809.

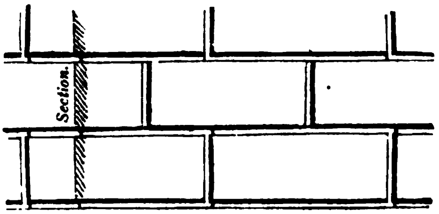
Adjoining the church is a grammar-school of some repute, founded in the reign of Charles I. by Sir Norton Knatchbull. The master is still appointed by the Knatchbull family.

The church is in the form of a cross, with a tower rising from the centre, lofty and well-proportioned, and surmounted by four pinnacles. The church is in the perpendicular style, and has some good doorways and windows. Several sumptuous monuments of the Smyth family are in a chapel adjoining the south transept. The tower was erected in the reign of Edward IV. by Sir John Fogge, who also much repaired, if he did not rebuild, the church; and founded a 'college' or choir (consisting of the vicar as master or prebendary, two fit chaplains, and two lay clerks), which appears to have been suppressed before the Reformation. A chantry founded in the time of Edward III. was also suppressed during the progress of the Reformation. The living is a vicarage in the presentation of the dean and chapter of Rochester. There are places of worship for different denominations of dissenters: also two national schools, one for boys and one for girls.

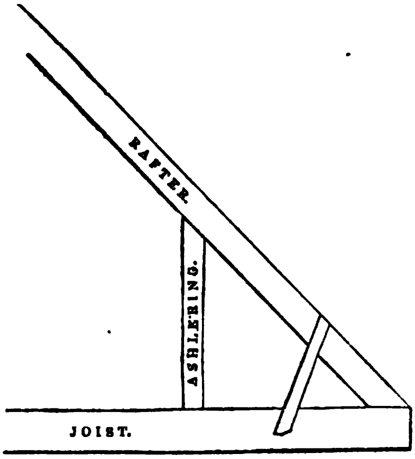
The greater part of the parish constitutes what is termed 'the liberty of the town of Ashford,' and is separated from the jurisdiction of the hundred It has a constable of its own. The town is governed by a mayor, and has a court of record every three weeks for all actions of debt or damages not exceeding twenty marks (6*l.* 13*s.* 4*d.*).

ASHLAR, rough stones of various sizes. This term is applied to free-stones when they are first taken out of the quarry.

ASHLER, a facing made of squared stones. In countries where stone is scarce and expensive, ashler principally consists of thin slabs of stone used to face the brick and rubble walls of buildings. These slabs are generally from four to six inches thick. Ashler is of several kinds. Plane ashler is so called when the surface of the stone is made quite smooth. All the public buildings of London in which stone is used are more or less faced with plane ashler. When the stone shows on its surface a series of narrow parallel flutings, the work is called tooled ashler. This is principally to be met with in the basements of buildings where the stone is set with flutings running perpendicularly. There is also an ornamental kind of ashler, very common in buildings, produced by slightly cutting into the stones, so as to make a depression, along one, two, or more of the sides of the joints. This kind of ashler is called rusticated ashler. [For a more particular account of rusticated work, see MASONRY.] The Banqueting-hall at Whitehall, Somerset house, the Bank of England, and St. Paul's Cathedral, may be taken as examples of rusticated ashler in London. an example of rusticated ashler on the north side of the western entrance of St. Paul's Cathedral is given in the cut.



ASHLERING, a term in masonry signifying the act of bedding in mortar the ashler above described. The term is also used in carpentry to signify the short upright pieces of wood placed in the roof of a house to cut off the acute angle between the joists of the floor and the rafters: almost all the garrets in London are built in this way. The annexed cut, representing a section of a garret, shows the ashlering above described.



ASHMOLE, ELIAS, an eminent antiquary and herald, the founder of the museum which still bears his name at Oxford, was the only son of Simon Ashmole, a saddler of Lichfield, by Anne, daughter of Anthony Boyer of Coventry. He was born May 23d, 1617, and was placed at an early age as a chorister in the cathedral of Lichfield. He was afterwards taken into the family of James Paget, Esq., one of the puisne barons of the Exchequer, who had married his mother's sister; under whose roof he studied law, spending his leisure hours in acquiring music and other accomplishments. In 1638 he married Eleanor, daughter of Peter Mainwaring, of Smallwood in Cheshire, and in Michaelmas term the same year he became a solicitor in chancery. In February, 1641, he was sworn an attorney of the Common Pleas. He lost his wife on the 5th of December the same year. The troubles coming on, and being a royalist in principle, he retired from London into Cheshire. In 1645 he became one of the gentlemen of the ordnance in the garrison at Oxford, whence he removed to Worcester, where he was first a commissioner and afterwards receiver and registrar of the excise. He became, soon after, a captain in Lord Ashley's regiment, and comptroller of the ordnance. In the midst of these employments he was far from neglecting his studies, having entered himself of Brazennose College, Oxford, where he applied himself with great vigour to the study of natural philosophy, mathematics, and astronomy, and where his acquaintance with Mr. afterwards Sir George Wharton led him into the absurd mysteries of astrology.

In July, 1646, the king's affairs having grown desperate, after the surrender of Worcester, Mr. Ashmole withdrew again, for a few months, to Cheshire; but coming to London he fell in with Mr. afterwards Sir Jonas Moore, Mr. William Lilly, and Mr. John Booker, esteemed the greatest astrologers of their time, and was by them caressed, instructed, and admitted into their fraternity. In 1647 he went into Berkshire, where he made choice of the village of Englefield for the place of his retirement, at which he studied botany. In 1649 he married his second wife, the Lady Mainwaring (widow of Sir Thomas Mainwaring, Knt. recorder of Reading), whose second son by a former husband, Mr. Humphrey Stafford, made great opposition to the match. The fortune which he obtained with this lady (he was her fourth husband) enabled him to open his house to the most learned and scientific persons of the time. In 1650 he published in 12mo. a treatise written by Dr. Arthur Dee upon the philosopher's stone, under the title of *Fasciculus Chemicus; or, Chymical Collections expressing the Ingress, Progress, and Egress of the secret Hermetick Science, out of the choicest and most famous authors. Whereunto is added, the Arcanum, or grand secret of Hermetick Philosophy. Both made English by* James Hasolle, Esq., in which name, the letters of his own will be found transposed. He, at the same time, addressed himself to an undertaking of greater consequence, a complete collection of the works of such English chemists as had till then remained in manuscript; to which, as well as to an ardent passion for the study of chemistry, he had been excited by one Backhouse, who was reputed an adept, and whom, from his free communication of chemical secrets, Mr. Ashmole, in the fashion of the time, was accustomed to call 'father.' In his diary, April 3d, 1651, he says, 'Mr. William Backhouse, of Swallowfield in com. Berks, caused me to call him father thenceforward.' He likewise employed a part of his time in acquiring certain manual arts, such as engraving seals, casting in sand, and the mystery of a working goldsmith. In 1652, believing that a competent knowledge of Hebrew was necessary for understanding and explaining such authors as had written on the hermetic science, he applied himself to the study of that language, under a rabbi of the name of Solomon Frank. At length toward the close of 1652 his *Theatrum Chymicum Britannicum* appeared, a quarto volume, containing many pieces of our old hermetic philosophers. This work gained him a high reputation, and among other scholars to whom it extended his acquaintance was the celebrated John Selden, with whom he lived in intimate friendship till his death. Ashmole's marriage with the Lady Mainwaring, exclusive of mere family opposition, involved him in several law-suits, and at last in one in Chancery with the lady herself. October 8th, 1657, he says, 'The cause between me and my wife was heard, where Mr. Serjeant Maynard observed to the court that there were 800 sheets of depositions on my wife's part, and not one word proved against me of using her ill, nor ever giving her a bad or provoking word.'

Ashmole now devoted himself to the study of antiquity and records. This recommended him to Mr. afterwards Sir William Dugdale, whom he accompanied about this time, when making his survey of the Fens. Ashmole's relish for chemistry had abated, and he gave up his intention of extending his *Theatrum Chymicum* to several volumes. In 1658, however, he published a treatise on the philosopher's stone, entitled *The Way to Bliss; in three books:* 4to.; a work, in which he took leave of his friends the astrologers and alchemists with a good grace.

In the spring of 1658 Ashmole applied himself to the collecting of materials for a *History of the Order of the Garter*, the publication of which will be more particularly noticed hereafter. In this year also he went to Oxford, where he made a catalogue of the coins which had been given to the Bodleian Library by Archbishop Laud. In 1659 the younger Tradescant and his wife made over to him, by deed of gift, the Museum of curiosities at South Lambeth, which the two Tradescants, father and son, had been long accumulating.

Upon the Restoration, Mr. Ashmole was early introduced to the presence and favour of King Charles II. who, on June 18, 1660, bestowed upon him the place of Windsor herald; and a few days after appointed him to make a description of the royal collection of medals. On the 3d of September that year, he had a warrant signed for the office of commissioner of excise; and was also joined in a commission for an examination of the notorious Hugh Peters, respecting the royal library and medals which had fallen into Peters's hands in 1648.

On November 2, 1660, he was called to the bar in the Middle Temple hall; and in January, 1661, admitted F.R.S. Soon after this time, he had several new preferments bestowed upon him, and amongst them, by warrant, February 9, 1661, the secretaryship of Surinam. On the 17th of February, 1665, Sir Edward Byshe sealed his deputation for visiting Berkshire, which visitation he began on the 11th of March following. June 9, 1668, he was appointed accomptant-general and country accomptant in the excise. His second wife, Lady Mainwaring, dying at the beginning of April this year, Ashmole paid his addresses with little delay to Elizabeth, the daughter of his good friend Sir William Dugdale, and was married in Lincoln's Inn chapel on the 3d of November following, by Dr. Lloyd, afterwards bishop of Worcester; and on the 19th of July, 1669, he received the degree of M.D. from the University of Oxford by diploma. He was now courted and esteemed by the greatest persons in the kingdom; and having finished his labours upon the History of the Order of the Garter, presented that work to the king, May 8, 1672, who, as a mark of approbation for his toil and research, presented him with a privy seal for 400*l*. In 1675 he resigned his office of Windsor herald; and in 1677, on Sir Edward Walker's death, might have been made garter king of arms, but waived the appointment in favour of his father-in-law, Sir William Dugdale. At the close of 1677 he was proposed to represent the city of Lichfield in parliament, but finding himself insufficiently supported, withdrew his pretensions. On the 26th of January, 1679, a fire broke out in the Middle Temple, in a set of chambers next to those in which Mr. Ashmole resided, by which he lost the greater part of his library, a cabinet of 9000 antient and modern coins, and a great collection of seals, charters, and other antiquities: his manuscripts, however, and his gold medals, were fortunately preserved, by being in the house which had been Tradescant's at Lambeth. Dr. Plot gave an account of this loss to Anthony à Wood, who printed it in his *Athenæ Oxonienses*.

In 1682, the University of Oxford having finished a building as a repository for curiosities near the theatre, Ashmole (according to a proposition made to them before it was begun) sent thither the collection of rarities which he had received from the Tradescants, together with such additions as he had made to them; to which he afterwards added the donation of his manuscripts and library. This is still called the Ashmolean Museum.

In the beginning of 1685 Ashmole was again invited to represent the corporation of Lichfield in parliament, but upon King James intimating to him, by Lord Dartmouth, that he would take it kindly if he would resign his interest to Mr. Lewson, he waited upon his Majesty and told him that he was all obedience. In 1686, on the death of his father-in-law, Sir William Dugdale, he declined a second time the office of garter, which he would have obtained for his brother-in-law, John Dugdale, but was unsuccessful. He however procured for him the place of norroy king of arms. This was one of the last public acts of Ashmole's life; the remainder of it was spent in an honourable retirement to the day of his death, May 18, 1692, when he was in the seventy-sixth year of his age. His body was interred at Lambeth, and a black marble slab laid upon his grave with a Latin inscription.

Besides the works already noticed, which were published during his life, Ashmole left large collections in manuscript:—1. *The Arms, Epitaphs, Fenestral Inscriptions, with the draughts of the Tombs, &c. in all the Churches in Berkshire*, penned in 1666. These were in part published afterwards under the title of *The Antiquities of Berkshire*, three volumes octavo, 1717, 1723, and at Reading in folio, 1736. 2. *Familiarum illustrium Imperatorumque Romanorum Numismata Oxoniæ in Bodleianæ Bibliothecæ archivis descripta et explanata*, finished in 1659, and given by Ashmole to the public library in 1666, a MS. in three volumes folio. 3. *A Description and Explanation of the Coins and Medals belonging to King Charles II.*, a MS. formerly in the king's cabinet. 4. *A brief Ceremonial of the Feast of St. George, held at Whitehall*, 1661, *with other Papers relating to the Order*. 5. *Remarkable Passages in the year* 1660, *set down by Mr. Elias Ashmole*. 6. *An Account of the Coronation of our Kings, transcribed from a MS. in the King's private Closet*. 7. *The Proceedings on the day of the Coronation of King Charles II*. 8. *The Arms, Epitaphs, &c. in some churches and houses in Staffordshire*, taken when he accompanied Sir William Dugdale in his visitation. 9. *The Arms, Epitaphs, Inscriptions, &c. in Cheshire, Shropshire, Derbyshire, Nottinghamshire, &c.* taken at the same time. 10. *Answers to the Objections urged against Mr. Ashmole's being made historiographer to the Order of the Garter*, A.D. 1662. 11. *A Translation of John Francis Spina's Book of the Catastrophe of the World, to which is subjoined Ambrose Merlin's Prophecy* 12. *Collections, Remarks, Notes on Books and MSS.* 13. *The Diary of his Life.* This work was first published in duodecimo in 1717, under the title of *Memoirs of the Life of the learned antiquary, Elias Ashmole, Esq. drawn up by himself by way of Diary, with an Appendix of Original Letters.* Published by Charles Burman, Esq. Reprinted with Lilly's *History of his Life and Times*, octavo, London, 1774. It is from this diary, abounding in absurd and whimsical memoranda, that the dates and facts in the preceding memoir have been principally taken. (See also Wood's *Athenæ Oxonienses*, Bliss's edition, vol. iv. p. 354. *Biogr. Brit.* by Kippis, vol. i. p. 293.)

ASHOVER, a town in Derbyshire, pleasantly situated in a deep narrow valley, watered by the river Amber; six miles S.W. of Chesterfield, which is the post town, and four from Matlock. It has a small market, frequented during the winter by a few butchers; and two fairs for horned cattle and sheep. As the market is so insignificant and irregular, and is moreover held without charter (as are also the fairs), it is commonly regarded as a village: but Messrs. Lysons (*Magna Britannia*) reckon it among the market-towns. Stocking-weaving and tambour-working give employment to some of the inhabitants.

The church is a Gothic building with a handsome spire, and contains several monuments of the Babington and other families. There is in it a singular antient leaden font, hexagonal in the lower part, but in the upper part circular, and ornamented with rudely executed figures in bas-relief, with flowing drapery, and books in their left hands, standing under circular or Norman arches and separated by slender pillars. There is an endowed school, with a school-house built in 1703; also meeting-houses for the Wesleyan and Primitive Methodists.

The parish of Ashover is extensive, containing 11,290 acres, and has a population of 3179. It is mostly in the hundred of Scarsdale; but the dependent hamlets of Dethwick, Lea, and Holloway, are in the wapentake of Wirksworth. The living is a rectory in the archdeaconry of Derby, and the diocese of Lichfield and Coventry. Dethwick is a chapelry.

There are in the parish considerable lead-mines, especially those of Gregory, Brimstone Dyke, and Overton. Blende, or black jack, an inferior species of zinc ore, is found. Limestone is quarried in great quantity, also coarse grindstones, and whetstones of a finer grain. Ochre is found in some of the mines. Chamomile is cultivated for medicinal purposes in considerable quantities; and valerian, elecampane, and roses (the last for the leaves), to a smaller extent.

There are remains of Eastwood Hall, once the residence of the Reresby family, and a structure of some importance, as appears from its massive masonry. It is a gloomy building, with a modern dwelling attached to its shattered walls, standing at the foot of a high hill, which is covered with huge masses of sandstone rock, and crowned with a pine forest. At Overton in this parish is a house which was the property and occasionally the residence of the late Sir Joseph Banks.

At Lea, in this parish, are the ruins of an antient chapel; also a Unitarian chapel, a cotton mill, and a hat manufactory (Lea Wood).

On the declivity of a hill on Ashover common is a rocking stone twenty-six feet in circumference, called by the country people *Robin Hood's Mark;* and near this a singularly-shaped rock, supposed to have been a rock idol. (Lysons' *Magna Britannia;* Rhodes' *Peak Scenery; Beauties of England and Wales.*)

ASHTON-IN-MACKERFIELD, a chapelry in the parish of Winwick, in the hundred of West Derby in Lancashire. It lies on the road between Warrington and Wigan, about two miles and a half N.W. by N. of Newton, one of the boroughs disfranchised by the late Reform Bill. It contained, in 1831, 5912 inhabitants, who are chiefly employed in the cotton and hardware manufactures. Some authorities add that there are collieries and potteries. It is sometimes called Ashton-in-the-Willows. The chapelry is in the gift of the rector of Winwick, whose living is one of the richest in the north of England.

Besides the chapel of the Establishment, there are eight places of worship: three belonging to the Catholics, who are numerous; and one each to the Methodists, Independents, Unitarians, Baptists, and Quakers. (Aikin's *Description of the Country round Manchester*, &c.; Carlisle's *Top. Dict. of England*, &c.)

ASHTON-UNDER-LINE, a manufacturing town in the hundred of Salford in Lancashire, on the north bank of the river Tame, which here divides the counties of Lancashire and Cheshire. Duckinfield, which forms a suburb of Ashton across the river, and is united with it by a bridge, is in the latter county. Ashton is 6½ miles east of Manchester, and 186½ miles N.W. by N. of London.

Ashton is a thriving place; and on the whole well laid out and well built. The streets are paved, and the town lighted with gas. The church is large and antient, furnished with a fine peal of ten bells. The architecture has been much altered by subsequent repairs; and the edifice sustained considerable injury from an accidental fire in 1821. Near to this church is an ancient edifice, called '*The Old Hall*,' supposed to have been built in the fifteenth century; and adjacent to it are the remains of a prison, whose appearance indicates still greater antiquity. This prison is known by the name of '*The Dungeons*,' and was used as a place of confinement till a comparatively recent period. A new church, the cost of which was defrayed by a grant from the commissioners for building new churches, has also been erected. It is of Gothic architecture, and has a square embattled tower surmounted by pinnacles. The court-house for the transaction of public affairs is a handsome building, with a theatre and a concert-room over it.

The chief business of Ashton is the cotton manufacture; the increase of which may be judged of by the fact, that in ten years preceding 1831 the mills increased from thirty to seventy. The goods produced are chiefly ginghams, muslins, and calicoes. The Manchester and Ashton, Peak Forest, and Huddersfield canals, which connect Ashton with the various manufacturing districts of the north and middle of England, much promote the trade of the town. Hats, woollens, and silks are manufactured here or in the neighbourhood, and coal is dug in the adjacent districts, and indeed in the very outskirts of the town, in considerable quantity. There are more than twenty collieries in the dictrict, which employ upwards of 1000 men.

Ashton was once a borough, but had been disfranchised; and its decay was indicated by the disuse of a market once held by patent granted by Henry VI. The ancient cross is still standing in the market-place. The reviving prosperity of the town has led to an application to parliament for re-establishing a market; and within a few years an act for this purpose has been obtained, as well as one for regulating the police of the town, and for lighting, cleansing, and watching it. Under the Market Act, a site has been provided, and buildings erected, at an expense of above 10,000*l.* The market-day is not yet fixed. The main pipes laid down by the gas company exceed eight miles in length. There are four fairs in the year.

There is an ancient foundation-school; also a national school.

The town of Ashton (including, as it appears, the suburbs or quarters of Boston, Charlestown, Hurst, and some others) had a population in 1831 of 14,673, having increased by more than 5000 persons in the previous ten years.

The chief part of the town and of the parish is on the estate of the Earl of Stamford and Warrington. As lord of the manor he holds a court, at which constables are appointed, and in which questions of disputes, breaches of trust, and rights of tenants, as well as actions of debt under forty shillings, are cognisable. By the late Reform Bill Ashton was made a parliamentary borough, the boundary of which coincides with that laid down in the Local Police Act. It returns one member, and contained in 1831 above six hundred 10*l.* houses. There is a court of requests for the recovery of debts under 5*l.*

The living of Ashton is a valuable rectory, wholly or in part in the gift of the Earl of Stamford and T. Hunt, Esq. The parish is very extensive, comprehending about ten square miles. It is about six miles from N. to S., and four from E. to W. In it are several large manufacturing villages; but except in these and in the town itself, the population is not dense. The parish is divided into four arbitrary divisions, for the purpose of collecting rates, viz. Hartshead, Knottlanes, Audenshaw, and Ashton town; but it is all under one municipal government. The population of the whole amounted in 1831 to 33,597. The spiritual wants of these persons were provided for by five places of worship of the establishment, (viz. the parish church*, three parochial chapels, and one chapel of ease), and twenty-four other places of worship; of which, nineteen were Methodist, three Baptist, one Independent, and one Johannite. (See *Parliamentary Returns* for 1830.)

The principal villages in the parish are as follows:—Stayleybridge is on the Tame about a mile E. of Ashton. It is not wholly in this parish; for part of it lies across the river, in the parish of Stockport in Cheshire. The two parts are, however, united by an excellent stone bridge, and included in one local act, for the purpose of lighting, &c. The importance of the place is of modern growth, though so far back as in 1795 it consisted of a continuous well-paved street of half a mile, and had in it an episcopal chapel of octagon form. The chief branches of trade were then, and had been for some time, connected with the woollen-cloth manufacture, and consisted of weaving, dyeing, pressing, &c. The population is not ascertained.

Mossley is N.E. of Ashton about two miles and a half. It is connected with Ashton by a new, but not very good road, over a range of high hills. There are scarcely any houses between the places; but in Mossley there are several good ones, and a parochial chapel in the gift of the rector of Ashton. The population in 1831 was about 1500.

Lees is N. by W. of Mossley, and about five miles N. by E. of Ashton. Its situation rather connects it with Oldham (through which its manufactures are carried off to Manchester) than with Ashton, with which it has little communication. Population in 1831 about 3000.

Hooley Hill, the populous part of Audenshaw, is a mile S.W. of Ashton. It has a population of between 2000 and 3000, and is rapidly increasing.

Fairfield, on the road from Manchester to Ashton, is a settlement of the Moravians. It has a chapel, and several good houses.

Near Mossley is Hart's Head Pike, a well-known object, erected in 1758, on the site of a former structure, which is said to have been used as a beacon. The present building is of stone, and is an upright cylinder, surmounted by a cone, whose base nearly covers the upper surface of the cylinder. It commands a delightful view of the surrounding country.

On the W. side of the town, and on the N. side of the road from Manchester, is a large moss, or shaking bog, from the edges of which turf is cut for fuel. At the depth of ten feet, or thereabouts, lies a tolerable loam, which, with improvement, may be rendered good meadow-land. The moss may be crossed at all seasons. Fir trees, fresh and full of turpentine, have been found in it; likewise oaks quite sound, and as black as ebony.—(Aikin's *Description of the Country round Manchester*; *Boundary Reports*, &c.)

ASH-WEDNESDAY. This, which is the first day of Lent, had formerly two names; one was *caput jejunii*, 'the head of the fast,' the other was *Ash-Wednesday*, so called from the antient ceremony of blessing ashes on that day, with which the priest signed the people on the forehead in the form of a cross, adding this admonition, *Memento, homo, quod cinis es, et in cinerem reverteris*: 'Remember, man, that thou art ashes, and shalt return to ashes.' (See *Festa Anglo-Romana*, p. 19; Moresini Papatus, p. 37; Festivall, fol. 1511, p. 15.) 'Mannerly to take their ashes devoutly,' is among the Roman Catholic customs censured by John Bale in his *Declaration of Bonner's Articles*, 1554. The ashes used this day in the Church of Rome are said to be made from the palms consecrated on the Palm-Sunday before. In Bishop Bonner's *Injunctions*, A.D. 1555, we read that 'the hallowed ashes given by the priest to the people on Ash-Wednesday are to put the people in remembrance of penance at the beginning of Lent, that their bodies are but earth, dust, and ashes.' The antient discipline of sackcloth and ashes on Ash-Wednesday, is at present supplied, in the English established church, by reading publicly on this day the curses denounced against impenitent sinners, when the people are directed to repeat an 'Amen' at the end of each malediction. Compare Wheatley on the *Common Prayer*, 8vo. 1722, p. 227; Brand's *Popular Antiquities*, vol. i. p. 79. Brady, in his *Clavis Calendaria*, says, the primitive Christians did not commence their Lent until the Sunday now called the first in Lent. Pope Felix III., in the year 487, first added the four days preceding the old Lent Sunday, to complete the number of fasting days to forty, of which it actually consists. Pope Gregory the Great introduced the sprinkling of ashes on the first of the four additional days, which gave it the name of Ash-Wednesday; and the council of Beneventum, in the year 1091, strictly enjoined the observance of the ceremony, which was abolished in England at the Reformation, and a commination service, as above alluded to, substituted in its stead.

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* We presume this must be the building mentioned above as a new church.

ASIA, under which name we at present comprehend all the countries to the east of Europe and northern Africa, was also applied by the Greeks to the countries bordering on the eastern shores of the Mediterranean Sea, and extending thence eastward. Herodotus confesses that he is unable to account for the origin of the name. Homer (*Il.* ii. 461) mentions an *Asian* plain lying near the shores of the Ægean Sea between Ephesus and Sardis; and the traditions of the Lydians speak of a king Asius. Hence it seems probable that this name was originally applied to a small district on the western coast of Anatolia: in the progress of time, as the countries east of it became known to the Greeks, the name of Asia became co-extensive with their discoveries, till at length it was customary to designate by it one of the great divisions of our globe.

I. *Asia as known to the Greeks and Romans.*—From the earliest records of European history, the Homeric poems, we learn that an intercourse existed, before the war of Troy, between the inhabitants of Europe and Asia. But as far as we can infer from our authorities, it was more of a hostile than a pacific nature. Commercial exchange seems to have been nearly confined to a few Phœnician vessels which visited the islands of the Archipelago and some ports of Greece, and even with them piracy appears to have been as important an object as commerce. Though the Phœnicians visited the ports of Greece, the inhabitants of that country went only to a few places on the western coast of Asia Minor, and perhaps occasionally to Tyre; their geographical knowledge of Asia was consequently circumscribed within very narrow limits. But confined as their navigation was for a long time, it at last contributed to bring about the settlement of the Greek colonies in Ionia; and this event was followed by another of greater importance in a geographical point of view, namely, the extension of the navigation of these colonies to the countries round the Black Sea, and the exclusion of the Phœnicians from the commerce of this part of the world. The subjection of the Greek colonies in Asia Minor to the kings of Lydia seems not to have injured their commerce, and it doubtless extended their knowledge at least as far as the Halys, the boundary of the kingdom of Crœsus, and perhaps somewhat beyond it.

The progress of geographical knowledge, which hitherto had been very slow, was accelerated by the establishment of the Persian monarchy, B.C. 550. The different states into which till then western Asia had been divided, and which had much impeded the commercial intercourse of its inhabitants, were incorporated into the extensive Persian empire, which comprehended nearly all the countries between the Mediterranean Sea on the west, and the Belur-Dagh on the east, the Caspian on the north, and the mountains which border the valley of the Indus on the west: these countries were inhabited by twenty-nine different nations. The Greek colonies on the coast of Asia Minor, on the overthrow of the Lydian kingdom, had been compelled to submit to the Persian monarch, which circumstance soon led to their intimate acquaintance with Asia beyond the limits of Anatolia. We may judge of the rapid progress made by the Ionian Greeks in their knowledge of Asia, when we find that nardly fifty years after the foundation of the Persian monarchy, Aristagoras, the governor of Miletus, the most commercial and powerful of these colonies, was able to produce at Sparta a copper tablet or map (Herod. v. 49)—the first of which we have any distinct record *—on which the countries and military stations between Ionia and Susa were exhibited. About the same time the Persian dominion over all the above-mentioned countries being firmly established, a regular plan of administration was formed by Darius the son of Hystaspes; this king probably caused a geographical and statistical account of the whole empire to be composed, a custom common in Asia at more recent periods, as the *Ayin-i-Akbari* of the Mogul emperors shows, and one still in use in the Chinese empire. Some such work as this must have existed in Persia, for otherwise we can hardly account for the geographical description of the empire which Herodotus has inserted in his history (iii. 89, &c.; vii. 61, &c.). The sketch of the Greek historian enables us to form a pretty exact idea of all the countries subject to the Persian monarchs, and even of those which he had not an opportunity of examining personally. His information about the countries of Asia beyond the boundaries of the Persian empire is scanty, and much less exact: as it was acquired by oral communication with travellers and traders, it is not surprising that it is often incorrect and mixed with fables, though even the latter in many instances are founded on facts.

Before the time when Herodotus wrote, the Persian empire had become stationary. Accordingly we find that the geographical knowledge of the Greeks, for more than a century, did not advance beyond the antient boundaries of that empire. But as the intercourse, both hostile and pacific, between the Greeks and Persians had during that period considerably increased, their knowledge of the different provinces composing the Persian empire was also enlarged. The most valuable information of this kind we find embodied in Xenophon's *Anabasis*, or the *Expedition of the Ten Thousand.* [See ANABASIS.] It was usual for the Persian kings to have Greek physicians about their persons, as we see in the instance of Democedes (Herod. iii. 129, &c.), Ctesias, and others. Such men had of course considerable opportunities for acquiring exact information. If the work of Ctesias had come down to us entire, we might have formed a better estimate of the value of his history of Persia, now known to us solely by the extracts of Photius and a few other writers. [See CTESIAS.]

The foundation of this extensive empire had proved advantageous to geography: its destruction also was favourable to its progress. By the conquests of Alexander, the remoter provinces of the Persian monarchy, of which a great part till then had only been known in such general outlines as those given by Herodotus, and by the vague information of individuals, were at once opened to the Greeks, who had been prepared for increasing their geographical information by their education and previous habits. The operations of military expeditions and the observations of military men have always rendered signal services to geography. Alexander attempted to cross the boundaries of the Persian empire on the north and on the south; and though his success was limited in the former quarter, the Greeks began from that time to have some notion of the nomadic tribes beyond the Iaxartes (*Sir-Sihon*), who then, as at present, wandered about in those extensive deserts. But his attempts on the south and east were crowned with success. He crossed the Indus and four of the rivers which traverse the Penjab, and had advanced to no great distance from the banks of the Jumna and the valley of the Ganges, when he was obliged to abandon his design of conquering India, owing to a mutiny of his army. On his return to Persia, he made an important addition to the geographical knowledge of the Greeks by exploring with his army and navy the course and the valley of the lower Indus, and still more by ordering his admiral, Nearchus, to sail along the coast from the Delta of the Indus to the mouth of the Euphrates. [See ALEXANDER.] Besides the geographical knowledge acquired by these military operations, and the successful execution of the orders of the Macedonian conqueror by his admiral, this expedition first gave the Greeks a more exact notion of the great extent of India, of its riches, and the peculiarities of the nations which inhabit this great peninsula. The geographical information acquired during the expeditions of Alexander was incorporated in a map by one of his companions in arms, Dicæarchus, a pupil of Aristotle.

Less satisfactory, though not less important, was the information which resulted more remotely from the conquests of Alexander. The Macedonian king destroyed Tyre, and transferred its commerce to Alexandria, which he founded near the western mouth of the Nile. As the Phœnicians, for perhaps a thousand years and upwards, had carried on a lucrative commerce with the countries to the east and south of the Persian empire, especially with India, by way of the Persian Gulf and the Red Sea, their merchants had frequent opportunities of collecting such information as tended to increase their commercial advantages. Accordingly the Phœnicians had more nautical and geographical knowledge than any other nation of the antient world, and they had embodied it in writings. These were likewise transported to Alexandria, and probably aided the merchants of the new emporium in entering at once into the path of their commercial predecessors, and renewing the intercourse between Europe and India by the Nile and the Red Sea, which had been interrupted by the expeditions of Alexander. Accordingly we find that, soon after the death of the founder of Alexandria, Egyptian vessels from the ports of the Red Sea began to visit the shores of Malabar, and to venture as far as Cape Comorin and the island of Ceylon (called Taprobane by the Greeks). But though the geographical information acquired by commerce is often of the most valuable kind, its progress is extremely slow even in our time, and must have been still more so among the antients on account of the numerous defects of their ship-building, and the backward state of their navigation. Besides, such information is commonly limited to the harbours and shores, and rarely extends to any great distance in the interior. Accordingly we find, that though the commercial intercourse between Alexandria and India was continued without interruption for many centuries, the additional geographical knowledge was scanty and vague; and though many of the harbours of Malabar were annually visited by Egyptian vessels, the information thus obtained concerning Ceylon, the coast of Coromandel, and the country farther to the east, is limited to a few places, and was obviously obtained by the Greeks of Egypt from native navigators, none of them probably having ventured to advance beyond the island of Ceylon and Cape Comorin.

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* Anaximander (see that article) is said by Agathemerus to have made the first maps.

The successors of Alexander, being almost continually engaged in wars among themselves, did not disturb the unsubdued nations which surrounded the Greek empire in Asia, with the exception of Seleucus Nicator, the King of Syria, who made, it is thought, a successful attempt to subdue a part of the valley of the Ganges. This opinion rests on the statement of Pliny (vi. 17). It is, however, certain that he sent an ambassador, Megasthenes, to Sandrocottus, king of the Prasii, to whom a considerable part of Hindustan was subject, and to this individual we owe some further particulars respecting India and its inhabitants. (Strabo, 702, 724, &c.) The Greek empire of Bactria, though its kings remained for many years in possession of the Indian conquests of Alexander, added little or nothing to the previous knowledge of the Greeks concerning that country.

Most of the Greek kingdoms in Asia were destroyed by the Romans, but they did not extend their dominion over all the provinces which once belonged to the Persian monarchy. The extreme eastern boundary of the Roman empire was formed by the Tigris, the Euphrates, and the mountains of Armenia. Their military expeditions being carried on in countries previously known, could add very little to the geographical knowledge of Asia. We ought, however, to make an exception with respect to the Caucasus. In their wars with Mithridates, king of Pontus, the armies of the Romans passed the boundaries of the known world and arrived at Mount Caucasus, with whose extent and situation they became acquainted, though they did not enter the valleys which lie in its bosom. In proceeding farther to the shores of the Caspian Sea, they got information of a commercial road through Bactria, by which the countries on the south of the Caspian Sea carried on an active commerce with India; and soon after another route was discovered, which led over the high table-land of Upper Asia to the Seres or Chinese, probably the road which still passes through the town of Kashghar. Nothing further was added to our geographical knowledge of Asia by the military expeditions of the Romans; but the immense riches which many Roman families had accumulated during the commonwealth, and which still continued to increase under the emperors, created a taste and demand for the exquisite productions of India and eastern Asia, and accordingly we find that not only the lately discovered roads to China and India were much frequented by merchants, but also that the commercial enterprise of Alexandria was so increased, that in the time of Strabo a hundred and twenty vessels were annually sent to the coast of Malabar. This intercourse was considerably facilitated by the discovery of the monsoons in the Indian Sea by Hippalus (Hudson's *Minor Geogr.* vol. i. *Periplus of the Erythrean Sea*): this passage has been sometimes interpreted as if the discovery of the monsoons was made about the time this Periplus was written, but there can be no doubt that navigators had availed themselves of the periodical winds long before.

The knowledge which the antients acquired concerning the geography of Asia is embodied in the systematic works of Strabo, of Pliny, and of Ptolemy of Alexandria, the last of whom raised geography to a science by basing it on astronomical principles. From these writers it is evident, that only those countries into which the Macedonian conqueror had carried his arms were known with some degree of correctness as to their general features, and that beyond them their knowledge was limited to a few places traversed by commercial roads, and to the harbours. Ptolemy was acquainted with the road leading over the high table-land in the centre of Asia to the Seres, as well as that through Bactria to India. He also had some knowledge of the north-western extremity of the Himalaya range (called by him Imaos or Himaos) and of Cashmere. He was well acquainted with the coasts of Arabia and Persia, and with those of India as far as Cape Comorin. The island of Ceylon, which at that time was the common resort of the eastern and western navigators of the Indian Sea, was also pretty well known to him, though the dimensions assigned to it are very erroneous. In its neighbourhood he states there were found 1378 islets, by which probably the Laccadives and Maldives are meant; and he names Jabadia (Yavadwīpa) *i.e.* 'the barley-island,' as Java is called in Sanscrit on account of its fertility. He is, however, less acquainted with the coast of Coromandel, and still less with the countries to the east of the Bay of Bengal, where the Aurea Chersonesus evidently represents the peninsula of Malacca, on which the port of Zaba was situated, probably in the neighbourhood of Singapore. Then follows the Sinus Magnus or the Gulf of Siam, after traversing which by a voyage of twenty days, the emporium of Cattigara is arrived at, the harbour of the Sinæ or Chinese, a place which must be sought for in the neighbourhood of Canton; and farther to the east with the Thinæ Metropolis (probably Canton) he arrives at the extreme boundary of his geographical knowledge on the east side of Asia.

Besides these works, the *Periplus* of Nearchus, and another probably written in the second century, and attributed to Arrian, give a more particular description of the coast of eastern Africa and of Asia. Another Periplus likewise, which certainly is the work of Arrian, contains a brief coast description of the Pontus Euxinus (Black Sea). [See ARRIAN.] As to the geography of northern Asia, few additions seem to have been made after the time of Herodotus and Alexander. In some respects there seems to have been a retrograde movement, as the father of history knew the Caspian to be a lake, which Strabo believed to communicate with the northern ocean. Ptolemy in his map restored the Caspian to its true character of an inland sea, but he placed its length from east to west instead of from north to south, as Herodotus had done. [See ARGONAUTS, vol. ii. p. 310; and Pomp. Mela, i. 2.]

II. *Asia as known in the Middle Ages.*—Though the Byzantine empire did not fall before the invasions of the northern barbarians, it was hemmed in on every side by powerful enemies. On its eastern boundaries, the kingdom of the Parthians was replaced by that of the Persians under the dynasty of the Sassanidæ, who, acting with all the vigour of newly-founded governments, stopped the progress of the Roman arms on that side. Consequently, the accession of geographical knowledge concerning Upper Asia was extremely scanty, but some information was obtained of the countries to the north of the Iaxartes, and of some parts of India. For the first we are indebted to an embassy of the Emperor Justinian II., who sent in 569 one of his governors to one of the wandering tribes of the Turks in the steppes on the west and south of the Altai Mountains and about the lake of Saisan, or Zaizang, with the view of inducing them to attack their common enemy, the Persians, without foreboding that the descendants of this very people, after a lapse of nearly nine hundred years, would destroy his own empire and choose Constantinople for their metropolis. Nearly about the same time, an Egyptian merchant, Cosmas, surnamed Indicopleustes, who for a long time had carried on a trade with India and repeatedly visited that country, composed his *Topographia Christiana*, in which he gives some new information respecting Ceylon, called by him Selediva, instead of the antient name of Taprobane, of the commerce of that island with Tsinitza or China, and of the roads through Upper Asia by which the silk manufactures of this country were brought to Persia and Constantinople.

But the channels of geographical information were soon closed. The fanaticism of the newly-founded religion of Mohammed bore down all resistance, and in a short time Egypt and the Asiatic provinces of the Byzantine empire, except Asia Minor, were subjected to the Arabs and their Caliphs; the kingdom of the Sassanidæ also was incorporated in their widely-extended dominions. The intolerance by which the Mohammedans in the first two centuries of the Hegira (commencing A.D. 622) were distinguished, interrupted every sort of commercial intercourse with India as well as with Upper Asia, and the distracted condition of the Byzantine empire, and the state of barbarism in which the western nations of Europe were sunk during the earlier part of the middle ages, was such as to deprive them for more than two centuries of any additional knowledge concerning the countries of the East. From the close of the sixth century to the beginning of the Crusades, no new facts were added to European knowledge of Asia.

Circumstances, however, arose which led the Mohammedans of the Caliphat to abate their intolerance and to adopt a more enlightened policy. Science began to be cultivated, arts to flourish, and commerce to be promoted among them. Geography had its full share of the advantages resulting from this favourable change. As every true Mohammedan was bound by his religious tenets to visit at least once in his life the Kaaba of Mecca, travelling became more frequent among the Arabians than it ever has been in any other nation; and as the love of letters increased and became more general, the number of their geographical works, travels, and voyages increased in the same proportion. Many of their works are undoubtedly still unknown, others are still inaccessible to European readers, but some have been translated. The most important are the *Oriental Geography*, translated by W. Ouseley, London, 1800, which was written in the beginning of the tenth century; the *Travels of Ibn Haukal the Arabian*, written about fifty years later; the *Geography of Edrisi* (1153), arranged, like that of Ptolemy of Alexandria, according to climates; the *Geography of Abulfeda* (1345); the *Geography of Ibn el Wardi* (1371); and the *Travels of Ibn Batuta* (1324-1354), translated by Professor Lee of Cambridge, London, 1829. Ibn Batuta was doubtless the greatest traveller that ever lived. He visited Timbuctoo and the Ural Mountains, Adam's Peak in Ceylon, the eastern coast of China, and Tanger in Africa (which was his birth-place), and traversed all the countries between these extreme points.

The Arabs seem also at an early period to have renewed the commercial intercourse with India by the Red Sea and the Gulf of Persia, and to have soon extended their navigation beyond the extreme limits attained by the Greeks of Alexandria. They were prompted to despise the dangers of such a perilous navigation as much by zeal for propagating their creed as by the love of gain, and they succeeded in converting the inhabitants of the Peninsula of Malacca and some of the islands of the Indian Archipelago. There are extant two works on the countries about the seas of China, written, as it is thought, by Ibn Wahab and Abu Seid about the end of the ninth century. The latter composed only a commentary on the writings of the former. Though it is possible that neither of these voyagers reached Canfu (Canton), they collected very interesting information on the southern provinces of China, its productions, and manufactures; some historical facts which they mention respecting an insurrection in these districts in 878 are confirmed by the annals of the Chinese empire, a coincidence which shows the authenticity of these works.

But the Arabs did still more for geography by establishing it as a science on mathematical and astronomical principles, and thus following up the work of Ptolemy. The Calif Al Mamun (813-833) ordered a degree of the meridian to be measured, and this task was executed by the three brothers Ben Shaker in the great plain to the north-east of Damascus, between Palmyra and Racca on the banks of the Euphrates. In subsequent attempts at the projection of maps, the Arabs soon became sensible of the want of actual astronomical observation. This led them to the erection of observatories, and to the compilation of astronomical tables. Two works of this kind still exist: one composed about A.D. 1345, in the observatory built at Maragha, near the lake of Urmia; and the other in 1449 at Samarcand; the data contained in them, especially in the latter collection, formed till lately the principal basis on which our maps of the countries to the south of the Caspian Sea, and to the north of the mountains of Cabul and of the Hindu-kush range, were constructed.

Among the nations of Asia none perhaps has done more to increase the stock of geographical knowledge concerning this great division of the globe than the Chinese. The historical records of their empire prove clearly, that two hundred years before our æra the Chinese were anxious to collect geographical information concerning the extensive provinces and tributary kingdoms of their dominions; and they have continued this work to the present day. Neither opportunities nor inducements were wanting for that purpose. An empire of such magnitude as the Chinese always has been, which frequently comprehended half the surface of Asia, renders the exact knowledge of the condition of its provinces, and of their inhabitants, a matter of necessity to the government. Besides the information thus collected by means of the administration of the different provinces, the emperor was in the habit of sending ambassadors to the tributary princes and nations, and to those who, from time to time, sent presents to the court of the Celestial Empire. These ambassadors were instructed to gather useful information concerning the countries they were sent to, and to include it in their reports of the embassies: the reports were afterwards deposited in the archives of government. From such materials the geographies of the Chinese empire were composed and published in print, the art of printing having come into general use among the Chinese in the tenth century. These works contain very abundant information concerning Tartary, Corea, Tibet, Turkistan, and Bucharia, and even valuable notices on Siberia, Persia, and India, as well as on Siam, Tonkin, Java, Formosa, and Japan. But till very lately this information could not be used by the geographer, the study of the Chinese language not having been attended to by Europeans. The number of those who now study this language is daily increasing, and we may soon hope to get access to these writings, which is the more desirable as most of the countries described in the Chinese works are still inaccessible to our merchants and travellers. The most copious geographical and ethnographical information about the eastern countries of Asia in the middle ages, before the establishment of the Mongol empire, is contained in the historical library of Ma-tu-an-lin, the most learned man of his time, who, in his work entitled *Wen-hian-thung-khao* (Exact Researches of old Monuments), consisting of a hundred volumes, in 348 books, has given an epitome of Chinese literature to A. D. 1207. This great work is characterized by more judgment and accuracy than the similar compilation of Pliny the elder. Nine books are devoted to the geographical description of China, at the different periods of the native dynasties; and twenty-five contain the description of the foreign countries and nations.

Europeans began to renew their acquaintance with the countries of Asia on the shores of the Mediterranean in the eleventh century by pilgrimages, and soon afterwards by the Crusades (1096-1272) undertaken for the delivery of the Holy Sepulchre from the Infidels. The navies of the Italian republics accompanied these expeditions, and the citizens of Pisa, Florence, Genoa, and Venice had thus an opportunity of forming a correct idea of the advantages likely to result from a commercial intercourse with western Asia. Following up these views, they entered into a very lucrative commerce, and brought by their vessels the most valuable products to Europe. The Genoese, in 1261, having got possession of Galata and Pera, suburbs of Constantinople, and with them the exclusive commerce of the Black Sea, extended their commercial speculations to India through the Crimea, Caffa, La Tara (Azof on the Don), Astrakhan, Urgenz (Khiwa), and Tashkend, of which route the interesting work of Balducci Pegoletti, entitled *Libro de' Divisamenti dei Paesi e Misure*, written in 1335, gives some information. Their rivals, the Venetians, had come to an agreement with the sultans of Egypt, by which the direct road to India through the Red Sea was opened to them, and the sudden increase of the wealth of the republic proved that they knew how to profit by these advantages.

Whilst the Italian republics, from mercantile motives, kept to themselves the scanty information which they had acquired by their commercial intercourse with Asia, the western nations of Europe were at once brought into political connexion with those who inhabited the northern and inland parts of this continent. This was brought about by the conquests of Tshengis-khan and his successors. Soon after the death of Tshengis-khan, who had extended his dominion in little more than twenty years (1206-1227) over all the inland countries of Asia from the boundary of Siberia to that of India and Tibet, the Mongols entered Europe across the Volga, subjected Russia, laid prostrate the power of Poland, and gained a victory at the foot of the Riesengebirge, at Liegnitz in Silesia (1245). All Europe trembled; but the barbarians, having got information of the death of their great Khan, instead of pursuing these advantages, returned to their native country, preserving, however, the dominion over Russia. Then the politics of Pope Innocent IV. and of King Louis IX. of France suggested the plan of directing the power of the great Mongol empire and its warlike army against the Mohammedan princes in western Asia, their implacable enemies; but this object did not seem practicable to the projectors of this plan, unless they could previously convert these barbarians to the Christian faith. For that purpose some friars were sent to the court of the great Khan; John di Plano Carpini in 1246, Father Ascelin, a dominican, in 1248, and William Rubruquis, or Ruysbroeck, in 1254; and though they did not succeed in the main object of their mission, the information which they acquired of the countries through which they passed made the Europeans for the first time acquainted with the immense extent of those regions formerly called by the vague name of Scythia, which from that time obtained the name of Mongolia, or Tartary. Carpini traversed a considerable part of the deserts to the south of the Altai range, and Ruysbroeck advanced even to the then metropolis of the Mongol empire—Karakorum, situated at the conflux of the Tula and Orghon, tributaries of the Selenga, to the south of the lake of Baikal. He gives a curious and very interesting description of that extraordinary town, which was everywhere surrounded like an oasis by extensive deserts. The Mongols, however, continued in their career of conquest in Asia, and at length subjected China to their sway (1275-1279) under the reign of Kublai Khan (1259-1294), the most able of all the successors of Tshengis.

At the court of this monarch the Venetian traveller Marco Polo resided from 1275 to 1292, and as he enjoyed the favour of the emperor in a very eminent degree, and was well acquainted with the most important languages spoken by the people of the country, he was frequently sent on missions to the remotest provinces of the Mongol empire, which were so distant from one another that he was often obliged to travel six months before he arrived at the place of his destination. After traversing, under such favourable circumstances, the Mongol empire in different directions, he was sent as ambassador to the islands of the Indian sea, and had thus an opportunity of becoming acquainted with this part of Asia also. On his return to Europe he passed through the strait of Malacca, remained, on account of the monsoons, five months in Sumatra, visited Ceylon and Malabar, and landed at Ormuz in the Persian Gulf. In all his missions and travels he had been in the habit of keeping a journal, and of entering what appeared to him most worthy of being recorded. On his return to Italy his incredulous countrymen importuned him by unceasing questions, and at length he resolved to make an extract from his journal of the most remarkable objects which he had seen or heard of. This he did in a book entitled *Il Miglione di Messere Marco Polo*, or in Latin, *De magnis Mirabilibus Mundi*; one of the most curious and important works of modern literature, which has been translated into almost all European languages. It very materially influenced the views of Columbus, the discoverer of America, and directed the route of Vasco de Gama, who first went to India by the way of the Cape of Good Hope. The correctness of Marco Polo's information is better known and valued in proportion as, by the study of the Asiatic languages, and by the reports of modern travellers, we become more acquainted with the countries which he described. He has been frequently called the Herodotus of the middle ages, and has doubtless a claim to that title. If the name of a discoverer of Asia were to be assigned to any person, nobody would better deserve it, for he alone added to our geographical knowledge of Asia a much greater amount than what had previously been known by the antients, together with what had been acquired by the travels of Carpini and Ruysbroeck. Besides the information which he gives us concerning Asia, he acquaints us with the eastern coasts of Africa and the island of Madagascar: the latter countries, as well as some parts of Asia, he had not personally visited; but even here his information has proved correct, and shows the care which he used in collecting his facts.

The chief subject of his description is the Mongol empire, which extended over more than one half of Asia, including nearly all the countries of which the antients had either no knowledge at all, or very scanty and confused information. To the north, his knowledge extended to the lake of Baikal, the Tunguse tribes, who had no cattle but rein-deer (which tribes he calls Mekrit), and the adjacent sea (Mare Oceano); and he informs us of the connexion between the plains of eastern Europe on the Volga and Don, and those of Tartary and Mongolia. Further, he gives a description of China, in which Peking had become the residence of the Mongol emperors, and of Japan, called by him Zipangu, which name is evidently formed of the Japanese Dshi-penkue (the Empire of the Rise of the Sun). Japan he had not visited; but as his protector, the great Kublai Khan, had sent, in 1280 and 1281, some naval expeditions from Khanfu and Zaitun, in the Chinese provinces of Chekiang and Fukian, to attempt the conquest of the Japanese islands, Marco Polo had a good opportunity of collecting information concerning them, though, as he says, they were 1500 miles from the Chinese coast. The countries to the west of China he had visited, especially Tibet; here he got information of Mien, *i. e.* Pegu, and Bangala, Bengal, in Hindustan, a name never before known in Europe. Kublai Khan had sent, in 1272, an army to conquer these countries. Marco Polo is the first European, as far as we know, who navigated the seas to the east and south of the peninsula beyond the Ganges; and here he mentions the Spice Islands, 7448 in number, as he says, but he did not see them. They are situated in the sea of Cyn, and are mostly inhabited; but they have no commercial intercourse with foreign nations, except the merchants of Ma-Chin, or southern China, who visit them during the monsoons. He next gives some general information of the islands of Sunda and the adjacent groups, which, according to the information he obtained from navigators, consist of 12,700 islands, partly inhabited and partly uninhabited. All these countries and islands were almost entirely unknown before the publication of the travels of Marco Polo. But of the countries previously known to the antients, the information he gave was likewise interesting, and has proved very useful. He treats of Ceylon, Malabar, and Ormuz, which he himself had visited; and of Aden, Socotora, Abascia (*i. e.* Abyssinia), Zanguebar, and Madagascar, which names were for the first time introduced by him into Europe: these countries had been indicated to him by Arabian navigators. His information concerning these seas served, two centuries later, to direct the course of Vasco de Gama in his first navigation to the shores of India. For he says, 'Departing from the coast of Malabar, a vessel makes, by the assistance of a current, in three months, a thousand miles towards the south-west, and then arrives at Madagascar, and to the still more extensive islands farther to the west (*i. e.* Southern Africa), which are inhabited by black tribes with curly hair, rich in valuable productions, elephants, camelopards, gold, sandal-wood, amber, and frequently visited by merchants from Arabia and India.'

After the time of Marco Polo the number of travellers in Asia increased; but as none of them traversed any considerable part of it, they commonly tried to enliven their works by fables or inventions of their own, or by exaggerating the information which they had obtained by intercourse with the natives. Of this description is the information given by the Armenian monk Hayton, in his Historia Orientalis, who collected it from the communication of his uncle, king Hayton I. of Armenia, who, having been present at the court of the great Khan Mangu Khan, had some opportunity of collecting geographical facts. Equally worthless are the reports of the Venetian monk Oderico di Portenau (1317), and still worse the travels of the English knight John Mandeville (1358); these two travellers seem to vie with one another in exaggerating facts. But later, in the fifteenth century, we find some better information, especially through the Spanish ambassador Gonzalez Clavijo, who in 1406 was sent to the court of the famous Timur at Samarcand; and from the German adventurer John Schildberger, who served in the armies of Bajazet, the Turkish emperor, of Timur, and Shah Rokh, from 1400 till 1427; and especially the Venetian, Josaphat Barbaro, who travelled (1436—1471) in the countries east of the Mediterranean Sea, and carefully collected many remarkable facts. But all these travellers, though they brought back to Europe some useful information, contributed little or nothing to the extension of our knowledge, as to parts which had previously not been known at all, or only very imperfectly. This, however, was effected in a very eminent degree by the discoveries of the Portuguese soon after they had found their way to India round the Cape of Good Hope.

III. *Progress of the geographical knowledge of Asia* *after the circumnavigation of Africa.*—The parts of Asia which had been visited by the Greeks were so far known, as to their boundaries, extent, and principal features, that they could be laid down with a tolerable degree of exactness. This will be evident to any person who examines Ptolemy's map of the extensive region between the Mediterranean, the Caucasus, the Caspian Sea, the Belur Tagh, and the river Indus, though it is also clear that the vague information which this geographer had obtained respecting India betrayed him into very great errors as to that country. The information acquired by the travellers of the middle ages was much less exact. None of them had determined the astronomical position of any place; but as they, and especially Marco Polo, had noticed the immense extent of the countries which they had traversed, a very erroneous idea was formed of their true position on the globe. Thus we find that the German astronomer and geographer, Martin Behaim, who, in 1484 and 1485, accompanied the Portuguese navigator, Diogo Cam, in his voyage of discovery along the coasts of Guinea, and in 1492 made, in his native place, Nürnberg, a terrestrial globe, has placed the Zipangu of Marco Polo, or the present Japan, at no great distance to the west of the islands of Cape Verde. A few years were sufficient to remove this error. But even later geographers, as Sim. Grynæus, Sebastian Münster, and others, in their *Typus Cosmographicus Universalis, i.e.* in their maps of the old and new world, drawn up in the first quarter of the sixteenth century, laid down the same country at a short distance to the west of the Terra di Cuba and Parias, in America, which had been discovered a few years before. It was only by the discoveries of the Portuguese subsequent to the circumnavigation of the Cape of Good Hope, that such errors were removed, and the true position and extent of these countries of eastern Asia ascertained.

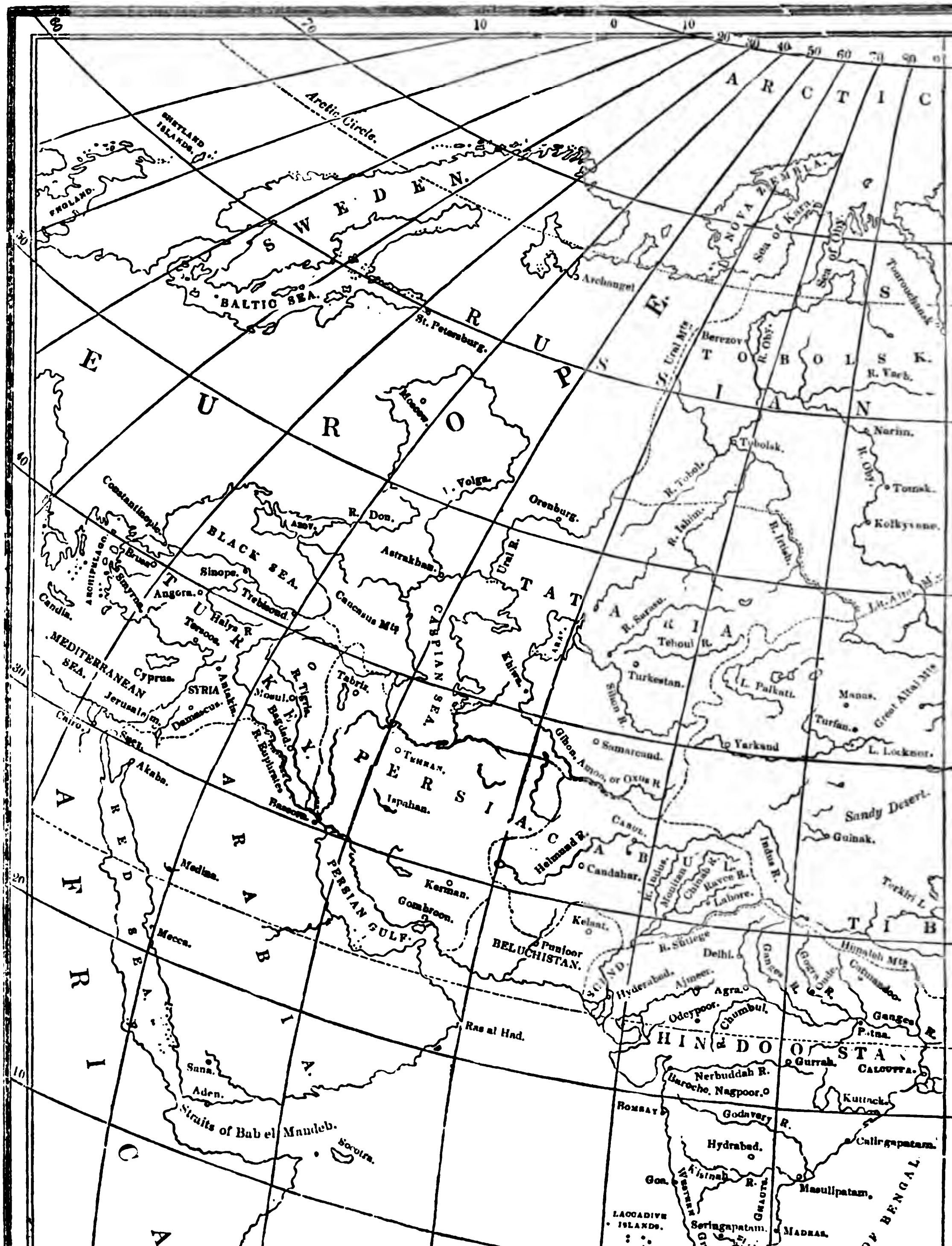
Vasco de Gama arrived, in 1498, at Calicut, on the coast of Malabar, and the Portuguese pushed their discoveries in these seas with such activity and zeal that, in the course of less than half a century, they had explored them as far as Japan. Their first efforts to establish a commerce were directed to the coast of Malabar; and, as the Arabs or Moors, who then carried on a very active trade with these countries, tried every means to exclude them from these parts, and to embroil them with the numerous sovereigns among which this coast was divided, they were soon obliged to have recourse to arms, and to enter into alliance with some of the native powers. In a few years they had acquired a complete knowledge of the whole coast, from Cape Comorin to the Bay of Cambay and its rich emporiums, Surat and Broach; and, as early as 1509, they made several settlements on the southern coast of Guzerat as far as Diu, which then had a considerable commerce with Persia and Arabia, and they erected on this coast some fortresses. The following year Alfonso Albuquerque took from the Mohammedan monarch of Deccan the famous town of Goa, which soon became the centre of all the Portuguese dominions in India and the seat of the viceroy and colonial government. The Portuguese now made advantageous treaties with the petty sovereigns along the whole coast of Malabar. But before this time the neighbouring island of Ceylon had been discovered by Almeida in 1506, which was at that epoch of the greatest commercial importance, being a station for the Arabian vessels which went to the Spice Islands for the spices, which, together with the cinnamon which grows in Ceylon, they exported to the harbours in the Persian and Arabian Gulfs, and thence to Europe. In 1517 the Portuguese erected the fortress of Colombo, in Ceylon, and began to exercise a dominion over its petty sovereigns. To secure the monopoly of India, they tried to exclude Arabian vessels from the Indian sea, and succeeded partly by the conquest of Ormuz at the entrance of the Persian Gulf, and by their superiority in naval force.

While the Portuguese were struggling to obtain the commerce of the Red Sea, they also extended their discoveries and conquests farther to the east. The town of Malacca soon attracted their attention. It was then what Singapore at present begins to be, the resort of all the nations of eastern Asia and the Islands; its harbour was continually visited by vessels from Malabar, Bengal, Siam, China, the Philippine Islands, the Moluccas, and the Sunda Islands. Albuquerque took it in 1511, and the discoveries and the navigation of the Portuguese were speedily extended in all directions. Now, for the first time, they entered the Gulf of Bengal, and became acquainted with the coasts and harbours of Coromandel, Orissa, and Bengal. John de Silveira in 1518 visited the town of Chittagong, from which the finest cotton manufactures, silk, ginger, indigo, and sugar, were exported. The coasts of the peninsula beyond the Ganges were likewise explored, and some knowledge was obtained of the kingdoms of Aracan, Pegu, Ava, Siam, Camboja, and Cochin China. But the Portuguese directed their attention chiefly to the islands. From Sumatra, which was divided into upwards of twenty kingdoms, they obtained gold, tin, pepper, sandal-wood, camphor, &c. They visited Java in 1513, and Borneo in 1523. The innumerable islands scattered over the Indian seas, which thus became known, led the Portuguese historian De Barros to set them down as a separate great division of the globe, calling it by the significant name of Polynesia. The extreme boundary of the Portuguese discoveries was the large island which they called New Guinea, on account of the resemblance of its inhabitants, the Papuas, to the negroes of Guinea on the African coast. In this navigation they successively became acquainted with Celebes, Sulu, Magindanao, Luzon, or Manilla, and the Moluccas or Spice Islands, and even visited the Liquejo, Liew-kiew, or Loo Choo Islands, which are described as rich in gold, and whose vessels visited the harbour of Malacca.

In 1516 the Portuguese navigator, Ferdinand Perez, arrived at the coast of China, in the Gulf of Canton, but the Portuguese were not permitted to enter the harbour and to trade there. They were consequently obliged to confine their commercial intercourse with this empire to a trade with the inhabitants of the island of Hainan and the adjacent coast, till, in 1557, they found means to ingratiate themselves with the Chinese government by being materially instrumental in the destruction of a pirate, who for a long time had ravaged the shores and adjacent islands of southern China. For this valuable assistance they obtained the desert island of Macao, where they soon made a settlement; and as on the change of dynasty in the seventeenth century they were so fortunate as to declare in favour of the party which, in the end, proved victorious against the then established government, the possession of Macao was confirmed to them.

While the Portuguese were still carrying on their coasting trade with China, one of their navigators, Ant. de Mota, was cast by a storm in 1542 on the coast of Nipon, one of the islands which compose Japan, the Zipangu of Marco Polo. The Portuguese were treated with great hospitality, and for some time carried on a very lucrative commerce. Japan was the most eastern limit of their discoveries, by which Europeans became acquainted with the real extent of Asia, and with a great part of its coast. Had the Portuguese only been merchants, the advantages accruing from the commerce with such rich countries would probably have induced them to conceal their discoveries from the commercial nations of Europe; but they entered the Indian seas as conquerors also, and their historians (Barros, Couto, Ed. Barbessa, the companion of Magalhaens, Faria y Sousa, &c) found in their heroic enterprises a subject for national exultation.

The Portuguese had exhausted their strength in forming settlements both in the Old and New World. The spirit of the first conquerors no longer animated the nation, and their tyranny and intolerance made them hated in their colonies. At the close of the sixteenth century Portugal fell under the yoke of Spain; and one result of the struggle of the Netherlands against the power of Philip II. was the gradual transfer of the Portuguese possessions in the East to the hands of the Hollanders, their successful rivals on the sea. The Portuguese were expelled from Japan (1639) and the Moluccas; they lost Malacca (1641) and Ceylon (1656), with their settlements on the Coromandel and Malabar coasts; and they remained, at the conclusion of peace (1663), only in the possession of Goa and Diu, which they have kept to the present day. The Hollanders, though they extended the settlements during the century that they possessed the dominion of the Indian seas, acted more on mercantile principles, and did not materially increase our geographical knowledge of the countries in which they settled. They published, indeed, a few descriptions of some of their colonies, and their natural productions, especially of the plants and shells (Rumphius, *Amboinische Raritätenkammer*; Rheede, *Hortus Malabaricus*; Fr. Valentyn's *Beschreibungen*, &c.); but these works were generally defective in geographical information. The most important communication belonging to this period was furnished by the German


ARCTIC
Arctic Circle.
SHETLAND ISLANDS.
ENGLAND.
SWEDEN.
BALTIC SEA.
St. Petersburg.
Archangel
NOVA ZEMBLA.
Sea of Kara
Sea of Oby
Tourouchansk
EUROPE.
Moscow.
Volga.
R. Don.
Azov.
Astrakhan.
Orenburg.
Ural R.
Ural Mts
Berezov
R. Oby
TOBOLSK.
SIBERIA
R. Tach.
Narim.
R. Oby
Tomsk.
Tobolsk.
R. Tobol.
R. Ishim.
R. Irtish.
Kolkyvane.
Lit. Altai Mts
TARTARY
R. Sarasu.
Tchoui R.
Turkestan.
Sihon R.
L. Palkati.
Manas.
Great Altai Mts
Turfan.
L. Locknor.
Yarkand
Samarcand.
Gihon, Amoo, or Oxus R.
Sandy Desert.
Guinak.
Constantinople.
BLACK SEA.
ARCHIPELAGO
Brussa
Smyrna
Sinope.
Trebisond.
Angora.
Candia.
TURKEY.
Halys R.
Tersoos.
Caucasus Mts
CASPIAN SEA
Aral.
Khiva.
MEDITERRANEAN SEA.
Cyprus.
SYRIA
Antakia.
Mosul.
R. Tigris.
Tabriz.
Jerusalem.
Damascus.
Bagdad.
R. Euphrates.
Cairo.
Suez.
Akaba.
TEHRAN.
PERSIA.
Ispahan.
Bassora.
CABUL.
Cabul.
Helmund R.
Candahar.
R. Indus.
Moultan.
Chinab R.
Ravee R.
Lahore.
Indus R.
Turkiri L.
TIB
Himaleh Mts
ARABIA.
RED SEA.
Medina.
Mecca.
PERSIAN GULF.
Kerman.
Gombroon.
Kelant.
Punjoor
BELUCHISTAN.
SCIND.
R. Sutlege
Delhi.
Hyderabad.
Ajmeer.
Agra.
Ganges R.
Gogra R.
Oude.
Catmandoo.
Ganges R.
Patna.
Odeypoor.
Chumbul.
HINDOOSTAN
Ras al Had.
Gurrah.
CALCUTTA.
Nerbuddah R.
Baroche.
Nagpoor.
Kuttack.
BOMBAY
Godavery R.
Callingapatam.
Hydrabad.
Sana.
Aden.
Straits of Bab el Mandeb.
Socotra.
AFRICA.
Goa.
Kistnah R.
WESTERN GHAUT.
E. GHAUTS
Masulipatam.
LACCADIVE ISLANDS.
Seringapatam.
MADRAS.
BAY OF BENGAL.
Cochin
C. Comorin.
Candy.
CEYLON.
MALDIVE ISLANDS.
INDIAN OCEAN.
Equator.
Longitude East from Greenwich.
80
70
10
0
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20
30
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70
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90
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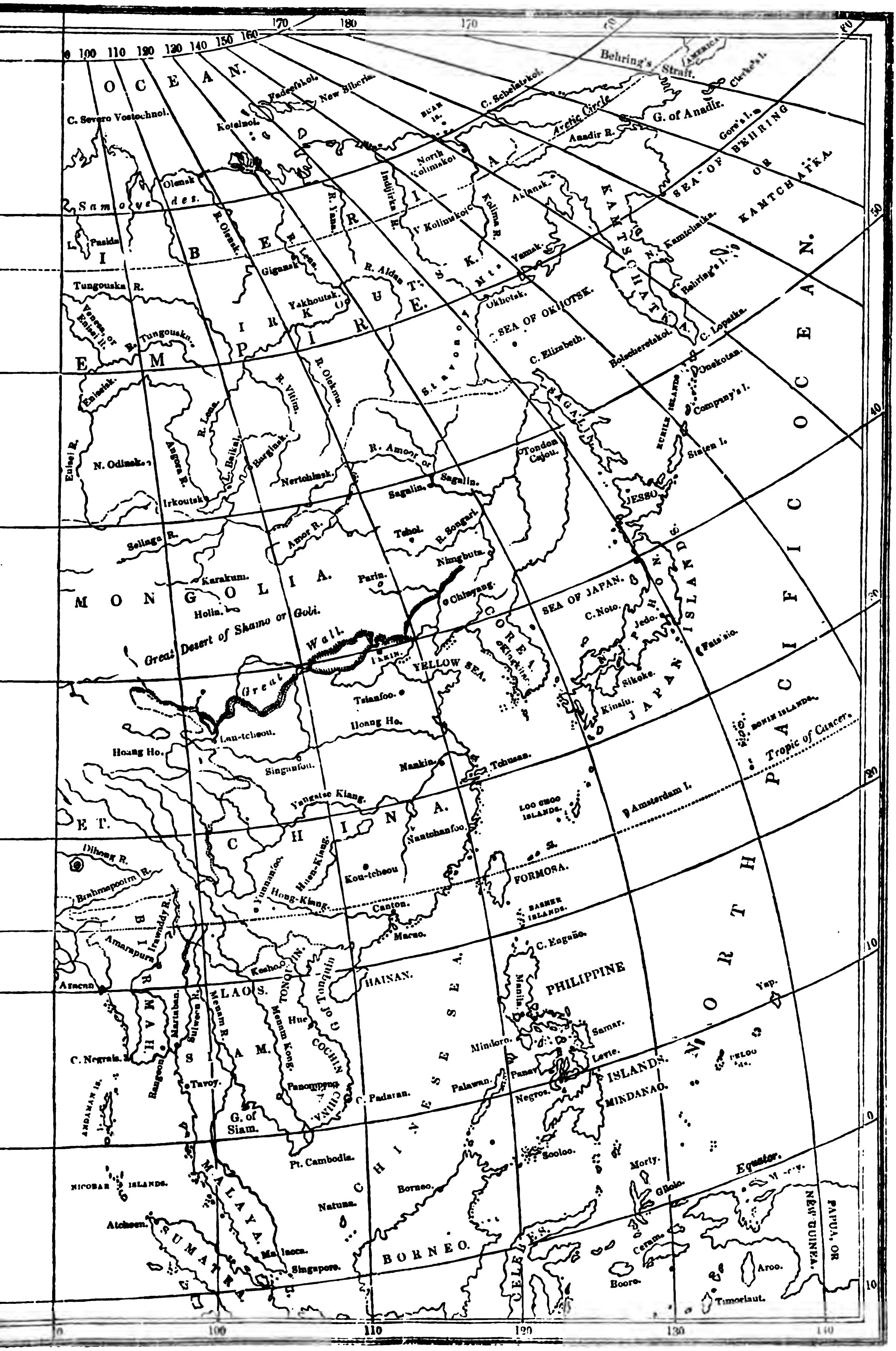
OCEAN.
C. Severo Vostochnoi.
Fadeefskoi.
New Siberia.
Kotelnoi.
BEAR IS.
C. Schelatskoi.
Behring's Strait.
AMERICA
Clerke's I.
Arctic Circle
G. of Anadir.
Anadir R.
Gore's I.
SEA OF BEHRING OR KAMTCHATKA.
North Kolimskoi
Indijirka R.
V. Kolimskoi
Kolima R.
Aklansk.
Olensk
Samoyedes.
L. Pasida
R. Olensk.
R. Yana.
R. Lena.
Gigansk
SIBERIA
R. Aldan
Yakhoutsk.
Yamsk.
KAMTSCHATKA.
N. Kamtchatka.
Behring's I.
Tungouska R.
Yenesei or Enisei R.
R. Tungouska
RUSSIAN EMPIRE.
Stavonoi Mts.
Okhotsk.
SEA OF OKHOTSK.
C. Elizabeth.
Bolscheretskoi.
C. Lopatka.
Onekotan.
Company's I.
KURILE ISLANDS
Staten I.
PACIFIC OCEAN.
Eniseisk.
R. Vitim.
R. Olekma.
R. Lena.
SAGALIEN
Eniesei R.
N. Odinsk.
Angora R.
L. Baikal
Barguinsk
Nertchinsk.
R. Amoor or
Sagalin.
Sagalin.
Tondon
Cajou.
Irkoutsk
JESSO
Sellinga R.
Amor R.
Tchol.
R. Songari.
Ningbuta.
Karakum.
MONGOLIA.
Parin.
Chinyang.
NIPHON ISLAND
Holin.
Great Desert of Shamo or Gobi.
Great Wall.
COREA.
SEA OF JAPAN.
C. Noto.
Jedo.
Fatsisio.
PEKIN.
YELLOW SEA.
Kingkitao
Sikoke.
Kiusiu.
JAPAN IS.
Tsianfoo.
Hoang Ho.
BONIN ISLANDS.
Tropic of Cancer.
Lan-tcheou.
Hoang Ho.
Singanfou.
Nankin.
Tchusan.
Amsterdam I.
Yangtse Kiang.
LOO CHOO ISLANDS.
THIBET.
CHINA.
Nantchanfoo.
Dihong R.
Brahmapootra R.
Yunnanfoo.
Hoen-Kiang.
Kou-tcheou
FORMOSA.
Hong-Kiang.
Canton.
BASHEE ISLANDS.
BIRMAH.
Irawaddy R.
Amarapura
Macao.
C. Engaño.
Kesho
TONQUIN.
G. of Tonquin
HAINAN.
CHINESE SEA.
PHILIPPINE ISLANDS.
Aracan
LAOS.
Manila.
Martaban.
Saluen R.
Menam R.
Menam Kong.
Hue
COCHIN CHINA.
Yap.
SIAM.
Mindoro.
Samar.
C. Negrais.
Panay
Leyte.
PELEW IS.
ANDAMAN IS.
Rangoon
Tavoy.
Panompeng
C. Padaran.
Palawan.
Negros.
MINDANAO.
NORTH
G. of Siam.
Pt. Cambodia.
Sooloo.
Morty.
NICOBAR ISLANDS.
MALAYA.
Natuna.
Borneo.
Gilolo.
Equator.
Atcheen.
SUMATRA.
Malacca.
Singapore.
BORNEO.
CELEBES.
Ceram.
Boore.
Aroo.
Timorlaut.
PAPUA OR NEW GUINEA.
100
110
120
130
140
150
160
170
180
170
10
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40
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60
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10
100
110
120
130
140

naturalist, E Kämpfer, who, in the capacity of Dutch physician, resided in Japan from 1684-1692, and has given a good description of that country.

During the long-protracted contest between the Portuguese and Dutch in the seas of India, the most northern part of Asia which had not been known either to the ancients or moderns, suddenly emerged from the obscurity in which it had hitherto been involved. The sovereigns of Russia, who for more than two centuries had been dependent on the Tartarian princes of the family of Tshengis-Khan, obtained the full sovereignty of their country in 1461, and in the following century they extended their dominion, and with it our geographical knowledge, over the countries drained by the Don, Volga, and Ural, up to the Ural mountains, by the conquest of Kasan (1552) and Astrakhan (1555). In 1578 a chief or hetman of the Cosacks, Yermak Timofeyekf, who was in fear of punishment for having robbed some travellers, crossed the Ural range with a troop of his countrymen, and entered Siberia. The discovery of Siberia, and its subjection to the Russian sway, were pursued with such vigour, that in 1644 the mouth of the Amur was reached, and in 1648 the bold hetman Deshnef, favoured by a mild season, circumnavigated the most north-east corner of Asia, from the mouth of the Kowyma round the north-east cape to the mouth of the Anadyr, and thus proved that Asia was actually separated by an open sea from America. This fact, however, remained for a length of time problematical; the Russian navigator Behring (1725—1728), as well as Captain Cook (1778), found their way impeded by enormous fields of ice. In 1820—1824, the Russian captain Wrangel again succeeded in effecting this circumnavigation. The discovery and conquest of Siberia were completed by Peter the Great, who took possession of Kamtchatka in 1696.

Somewhat later, and still more unexpectedly, Europe obtained a complete geographical view of the immense empire of China, and a considerable part of central Asia. This was not due to conquest, nor to the activity and industry of travellers, but to science. The Jesuits had tried to convert the inhabitants of Japan to Christianity, and had met with more success than in any other country of Asia. But a persecution breaking out against them and their proselytes, from political reasons, the friars, who were now compelled to leave the country, directed their labors to China. Father Matteo Ricci, an Italian, a man of considerable attainments in astronomy and mathematics, soon acquired a great authority at the court of Peking, in 1600. One of his successors in the mission, Father Schall, was appointed chief of the bureau of *Heavenly Affairs*, and maintained himself in this place even after a revolution had taken place (1644), and the dynasty of the Mantshu emperors had ascended the throne. The Jesuits continued in favour to the middle of the last century (1759). During this time some of them had an opportunity of traversing various parts of the Chinese empire, and the countries of central Asia. Thus Father Ben. Goës travelled (1607) from India through Kashghar, Yarkand, and the desert of Gobi, to the great wall of China, and ascertained that *Katai* was northern China, and *Khambulu* the town of Peking, which till then had been considered as different countries and towns. Other Jesuits succeeded in insinuating themselves so far into the favour of the great emperor Kanghi, that some of them always accompanied him in his expeditions and travels, or were sent on certain missions. By these means they acquired a considerable knowledge of China and the countries dependent on it, as Mantshuria, Corea, and even of the great desert called Gobi, as well as of the manners, character, and institutions of the inhabitants of those countries. The observations of the Jesuits were published. But the greatest service which they rendered to geography was their map of China, which was made under the authority and at the expense of the Chinese government, by the friars Bouvet, Regis, and Jartoux, between 1708 and 1718; and after having been corrected by the friars Felix d'Arocha, Espinha, Hallerstein, and Gaubil, was published at Peking, by the authority of the emperor Kienlong in 1760, in 104 sheets. The great imperial geography, entitled *Tay-thsing-y-thoung-tchi*, written by the order of the emperor Kienlong, may be considered as a commentary on this map. The second edition (1790) of this extensive work has been enlarged to 480 books, and we are indebted for our knowledge of it to the industry of some Chinese scholars, especially Sir George Staunton, Davis, Morrison, Abel Rémusat, the Archimandrite Hyacinth and Klaproth. Modern travellers, especially the Dutch (J. Neuhof, 1755, and Van Braam, 1794), and the English (Lord Macartney, with Sir George Staunton and J. C. Hüttner, 1792, and Lord Amherst, with Ellis, Abel, Maxwell, Basil Hall, 1816), have added something to the before-existing stock; but the information which they have communicated extends only over a comparatively small extent of country. The voyage of Captain Maxwell, however, has materially improved our knowledge of the coast of the bay of Petcheli, and the peninsula of Corea, a coast which previously had not been examined with any degree of accuracy.

Whilst the conquests of the Russians in Siberia, and the operations of the Chinese government, opened to us the northern and eastern countries of Asia, our progress in the geographical knowledge of the southern and western countries was comparatively slow. The fanatical policy of the Turks, who, at the end of the fifteenth and the beginning of the sixteenth century, had got possession of them, shut up the roads through Asia Minor and the adjacent countries, which consequently were not visited, except by a few pilgrims. The policy of Persia, however, under the dynasty of the Sofides (from 1501—1722), was much more favourable to European travellers, many of whom got access to every part of the country, and even to the court, and collected very valuable information concerning the geography of Persia, the institutions, and the character and manners of its inhabitants. Such information is contained in the travels of Pietro della Valle (1614—1626), Adam Olearius and Albrecht von Mandelsloh (1633—1639), John Thevenot (1652), John Baptist Tavernier (1665), and especially in those of John Chardin, the court jeweller of the king of Persia and of Charles II. of England, who discovered the ruins of Persepolis; and of Francis Bernier, the physician of the emperor Aurung-Zeb, who first gave some information on the valley of Cashmere. Gasparo Balbi, a Venetian jeweller, made a journey to India (1579—1588), by the route of Aleppo, Bir, the Euphrates as far as Felugia, and Bagdad. Rauwolf, in 1574, also descended the Euphrates from Bir.

Towards the end of the seventeenth century the suspicious policy of the Turks began gradually to relax; and the first fruits of the zeal to explore the countries subject to their sway was the discovery of the ruins of Palmyra by Halifax in 1691, and the travels of another Englishman, Henry Maundrell, to Jerusalem in 1697. They were soon followed by the naturalist J. Piton de Tournefort, who explored Asia Minor, Armenia, and Persia (1701), L. Lucas the antiquarian, and the Dutch painter Corn. de Brayn, who visited Syria and Palestine; and, somewhat later, by the antiquarian Richard Pococke (1727), and C. Niebuhr (1766). In our times, these countries have been visited by Volney (1796), Seetzen (1802—1817), Clarke, Turner, Buckingham, and others. Arabia, which formerly had not attracted the attention of Europeans, and was only known from the description of Abulfeda, was pretty well explored in part of its extent by C. Niebuhr (1761—1767), and its geography, ethnography, and natural history have been considerably enriched in our times by Seetzen and Burckhardt.

The geography of India, that country which, since it first became known, had always most excited the curiosity of the learned, and attracted the speculations of the merchant, was longer involved in obscurity than almost any part of Asia. Up to the middle of the last century, its coasts were very imperfectly determined, and very little indeed was known of the interior of the country itself. A few travellers, as Thevenot, Tavernier, and Bernier, had given some information about a few districts and routes, but it was extremely scanty. The true geographical knowledge of these countries began in the Deccan with the wars of the East India Company and the French (about 1740), and in Hindostan with the conquest of Bengal (1757). From this time its progress was extremely rapid. A great part of the valley of the Ganges was soon explored and surveyed, and an account of the remainder, and of other districts of Hindostan, was obtained by the translation of the Ayin-i-Akbari, an historical and statistical account of the Mogul empire, composed by Abul Fazl, under the orders of the emperor Akbar [See ABUL FAZL.] The military expeditions against Hyder Ali and his son Tippoo Saib, rajas of Mysore, gave that exact information of the southern parts of Deccan which is always the effect of such operations. In the wars with the Pindarries and with the Mahrattas (1801—1818), the northern districts of Deccan and the central region of Hindostan were explored in a similar manner; and as in the wars with the then French government, the colonies of the French and Dutch (Pondicherry, 1793, Ceylon, 1796, Java, 1811) fell into the hands of the English, a full account of them, especially of the island of Java, then almost unknown, was published by Sir Stamford Raffles. The novelty of the scenes opened by these successive conquests induced many scientific men and exact observers of nature to explore these countries, and to them we are indebted for a number of valuable works. The most important are, Forbes's *Memoirs on Malabar;* Sir Francis Hamilton's (Buchanan's) *Travels through Mysore;* B. Heyne's and M. Wilkes's *Researches on Deccan;* Lechenault's *Botanical Excursions through Deccan* (1816); Lord Valentia's *Travels* (1802—1806); Bishop Heber's *Travels* (1824—1826); Malcolm's *Researches on Malwa* (1820); Tod's *Rajasthan;* A. Burnes's *Topographical Researches on Cutch*, &c.; and his *Examination of the Indus and the Penj-ab.* An account of the island of Ceylon is found in the works of Perceval (1796), and of J. Davy (1816—1820); and Sumatra was described by Marsden. Many separate memoirs, either inserted in the Transactions of the Asiatic Societies of Calcutta and London, or published separately, have illustrated the geography, geology, natural history, or antiquities of some separate district or place*. [See ASIATIC SOCIETIES.] It may be truly said that India, which little more than fifty years ago was less known than almost any other country of equal extent, has since that time been so well explored by the industry of our countrymen, that there are few countries out of Europe on which we have better information.

The extensive conquests of the English on the banks of the Ganges and its tributaries, involved them at last in political relations, and in a war with the tribes of mountaineers inhabiting the Himalaya range, especially with the Ghorkas in Nepaul; and this led to the conquest, in 1816, of some of the elevated valleys of these gigantic mountains, which hitherto had remained entirely concealed from the admirers of nature. Their exploration soon became the object of the concentrated zeal of some of our most scientific countrymen. The great height of their pinnacles was determined, and their character explored by Raper, Webb, Hodgson, Crawford, &c. Penetrating through these valleys, Moorcroft (1812) succeeded in entering the high table-land of Tibet, where his progress was impeded by the jealous policy of the Chinese; he afterwards reached Leh in Ladakh (1820—1825), and then passed through the valley of Cashmere, which, since the time of Bernier, had only been visited by G. Forster (1783). Before his time, Tibet had already been visited by Turner, who was sent to the Teshoo Lama, the high priest of the Buddhists, as ambassador, and on his way traversed the valleys of Bhotan.

The political relations, which the East India Company were obliged to enter into with the countries lying on both banks of the Indus, gave rise to the embassy of Mountstuart Elphinstone to the court of Cabul (1809), by whom the whole region known by the name of Afghanistan, which till then had remained almost entirely unexplored, was at once opened to us. A similar effect was produced by C. Grant's embassy to the court of Sind (1809). After that time, Christie and Pottinger traversed Beluchistan, and those regions which antiently were known by the name of Gedrosia and Ariana, and had probably not been visited by an European since the expedition of Alexander the Great: in these journeys they discovered the table-land of Kelat (1810), and the roads which lead thence to Kerman and Herat. The recent journey of Burnes from the Indus into the countries on the Oxus river will make some important additions to our knowledge of these hitherto almost unknown regions.

Our knowledge of Persia has likewise received very important additions in modern times, especially from the industry of the English. This also has arisen from political relations: Sir John Malcolm, the author of the classical history of Persia, and Sir Harford Jones, were sent to the court of Teheran, which they soon prevailed upon to place the organization of the Persian army in their hands, and to permit them to examine the Persian provinces with reference to their capabilities for defence. The result of these geographical researches was an improved map of Persia, and a list of routes through its provinces, published by Macdonald Kinneir in his Geographical Memoir (1813), who, in his travels (1813-14), examined also the roads leading through Kurdistan, Armenia, and Asia Minor. This information was greatly increased by J. Morier's travels, the labours of Ouseley in oriental geography and literature, by Ker Porter's and Rich's researches on Persian antiquities and architecture, and B. Fraser's travels, who in 1821 advanced to Mushed in Khorassan: Fraser first determined the height of the table-land of Iran, and corrected, by his observations, the southern shores of the Caspian Sea. Still more recently we have acquired valuable information from Captain Chesney's report on the Euphrates: the description of that river between Bir and Bassora, and many interesting facts as to its flooding, navigation, and the inhabitants on its banks, are contained in this unpublished document.

Of *India beyond the Ganges* nothing was known at the close of the last century except the coasts and a few ports; but the increasing power of the Burman empire soon produced political relations between it and the government of Calcutta, which in 1795 sent an ambassador, Col. Symes, to the court of Amarapura, accompanied by the naturalist Sir Francis Hamilton (Buchanan), from whom we have the first authentic account of that country. The war with the Burmese, which took place a few years ago (1824-26), made us acquainted with the valley of the Irawaddy, up to the capital of the Burman empire; and the ceded provinces (Aracan, Martaban, &c.), as well as the countries which were declared independent by the peace (Asam, Cashar, Munipore, &c.), began soon to be explored. During the negotiations for peace, Crawford was sent to Amarapura, and published an account of the Burman empire, by which he cleared up the geography of the peninsula beyond the Ganges as much as he had previously done by his account of Siam and Cochin China. This work and his history of the Indian archipelago, have considerably enlarged our views concerning the most unknown portion of India.

Next to the English the Russians have, in modern times, been most active in extending and completing our geographical knowledge of Asia. The establishment of mines in Da-uria on the Amur, and in the Altai mountains between the Irtish and Oby, gave rise to the travels of many scientific men, and the publication of several interesting travels and treatises. The most valuable works on the geography of Siberia are by Messerschmidt (1720), Dr. Müller, De Lisle de la Croyère, Gmelin, father and son, Falk, Pallas (1720), Georgi, Sivers (1791), and, in our times, Von Ledebour (1826), Dr. Meyer, Von Bunge, Hess, A. Erman, and Alexander von Humboldt (1829). The periodical missions to the court of Peking have added some information concerning the table-land which extends between Siberia and China, especially the travels of Timkowski (1819-21) and those of Von Bunge (1830), who first ascertained the elevation of the central table-land crossed in this journey.

The conquests of the Russians in Asia have given us a more complete knowledge of the Caucasus. Peter I. ordered a survey of the Caspian Sea to be made, which was executed by Simonof, and thus the true extent and form of that immense lake were first known. In the war against Persia in 1721-23, the northern ridges of Mount Caucasus and the countries watered by the Kur and Aras were explored; and discoveries were pushed farther south, when (1800) the province of Grusia fell under the sway of the Russians. After that time, the valleys of the Caucasus were visited and explored by Güldenstadt, Reineggs, Von Biberstein, Klaproth (1807), Parrot, and M. von Engelhardt (1815), Kupfer, and M. Lenz (1829), who at last succeeded in reaching the elevated pinnacle of the Elburz; Parrot had previously ascended the Ararat.

The Russians have likewise penetrated into the countries east of the Caspian sea, and surrounding the lake of Aral by passing through the deserts inhabited by the Khirghis Karaks. This was chiefly effected by the missions and embassies of Nazarof to Khokhand (1813), of Murawieff to Khiwa (1819), of Meyendorf and Eversmann to Bokhara (1820), and of Von Berg, Lewchini, &c., to the Lake of Aral, since 1823.

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* Col. Lambton executed (1804—1812), under the orders of the East India Company, a trigonometrical survey of the southern part of Deccan, and measured a meridian from Cape Comorin northward to the Nerbudda in Malwa, nearly sixteen degrees in extent, and on this survey all our modern maps of India are constructed. Some others have added a few districts, as Dangerfield, Tod, and Burnes.

IV. *General view of the extent and figure of Asia.*—Asia lies to the east of Europe and Africa; it is separated from Africa by seas, except at one place, where these two great divisions of the globe are joined by the narrow isthmus of Suez. With Europe it is connected by extensive tracts of land under the meridian of the Ural, which mountain range, together with the desert and deep-lying plains that extend along the lower course of the Volga and the northern extremity of the Caspian Sea, ought to be considered as the natural boundary between Europe and Asia.

The great depression of these steppes, in which the town of Orenburg is not higher than the level of the Atlantic Sea, and the surface of the Caspian is more than 300 feet below it, is the characteristic physical peculiarity of the region on the common boundary of Europe and Asia; and it has greatly influenced the condition of the human race in the adjacent countries.

In the changes, to which the nomadic tribes in the interior of Asia were frequently subject, some of them were driven through that immense gate, which opens between the Ural range and the Caucasus, towards the eastern countries of Europe, richly endowed by nature with a soil fit for agriculture; and in this way a continual migration was effected.

Asia, whose area is more than five times that of Europe, differs materially in its physical figure from Europe and Africa. Africa is like a body without members, but Asia extends its limbs in three directions, preserving at the same time a preponderant mass of body; Europe, on the contrary, which may be considered as an appendage or continuation of Asia, exhibits a preponderance in its numerous limbs over the mass of the body.

The great mass of Asia may be compared to a four-sided figure, whose four unequal angles are placed respectively on the isthmus of Suez, the innermost angle of the Gulf of Tonkin, Cape Shalatzkoi in Siberia, and on the peninsula adjacent to the Gulf of Cara, east of Nova Zembla. It consequently extends to the south of the Tropic of Cancer, and in some parts stretches north of the Arctic Circle. The northern side of this figure, lying within and parallel to the Polar circle, is the shortest, extending only about 2700 miles; that near the Tropic, the longest, measures upward of 5000 miles. Four-fifths of the whole area of Asia, or about fourteen millions of square miles are comprehended in this figure; the whole of its surface amounts to about seventeen millions and a half.

From this extensive continental mass, which may be considered as the body of Asia, its members project on the east, south, and west, in the form of peninsulas and headlands. These peninsulas are that of the Tshuktshes jutting out towards America (with an area of 64,000 square miles), that of Kamtchatka (containing 56,000 square miles), that of Corea of equal extent, the curved arc of the coasts of China, and the three extensive peninsulas stretching south into the seas of India and Arabia,—the peninsula beyond the Ganges occupying 777,000 square miles, India within the Ganges comprehending upwards of a million of square miles, and Arabia about an equal extent: the three last, taken together, have an area nearly equal to Europe. And lastly, the peninsula of Asia Minor, which, not unlike a bridge leading to Europe, has served to facilitate the passage of nations and of civilization. The northern coast alone, though much more indented than any part of the coast of Africa, does not exhibit in its formation peninsulas of great dimensions. These members, detached from the main body of the continent, contain nearly three millions and a half of square miles.

It may be observed that the extensive tract of land which occupies the centre of the continent, and is beyond the reach of any of the seas enclosing Asia, is far superior in extent to the members which surround it; this tract forms what may be called *Central Asia*, and has remained in a state of lasting uniformity, in manners and civilization, whilst its appendages, which lie round it, have undergone numerous changes and made great progress in the arts of civilization.

If we consider—and we think we ought to do so—the islands which lie near a continent as its insulated members, we may say that no part of the globe equals the southern part of Asia in the luxuriancy of this formation. Here lies the group of the Sundas with its thousand islands and islets, the most extensive archipelago of the globe, which forms an easy passage to the continent of Australia and to the Pacific Ocean and its numerous groups. Thus Asia exhibits the greatest contrasts on the surface of the globe. Its interior presents to our view the most extensive, uninterrupted continental formation; and its southern extremity is more split into separate members, and varies more in rapid succession of land and sea, than any other part of the globe of equal extent.

Asia, exhibiting such characteristics in its outline, is no less remarkable for the formation of its surface, on which the climate, and consequently the vegetation and animal kingdom, of its different parts must chiefly depend. In examining the other divisions of the globe, we find that Australia exhibits level and comparatively low countries without any extensive high mountain-range, as far as we yet know. Africa is divided into two nearly equal parts, the southern of which forms an almost uniform table-land, whilst the northern, with the exception of the Atlas region, may be considered as a lowland. Europe contains in all parts plains of small extent lying between dispersed mountain-groups and ridges. In America all the highest land lies on one side, occupying its western coast from the extreme north to the south: it forms the most extensive system of mountain-chains on the globe, which inclose within their arms elevated plateaus, but of comparatively small extent. Asia exhibits different features. The whole mass of the interior continent rises to a considerable elevation above the sea, and this elevated mass, of which the high table-lands occupy by far the greatest extent, is not placed at one of the extremities of the whole mass, but occupies its centre.

From these table-lands, which occupy the centre, the surface descends in gradual and diversified terraces and slopes to the level lowlands which surround them. The table-lands themselves are traversed by numerous mountain-chains, and are everywhere enclosed by high ranges; but though these mountains are among the highest and most extensive on the globe, they occupy, when compared with the table-lands, a comparatively small surface. Their influence on climate and organic nature cannot therefore be equal to that which the table-lands themselves exercise, and consequently their relation to these latter is only subordinate. This observation applies even to the colossal range of the Himalaya, which forms the southern boundary of the extensive systems of table-lands occupying central Asia.

The table-lands, in the interior of the continent, form two separate systems different both in extent and in elevation: they are, as it were, two terraces, a higher and a lower one. The eastern system of these table-lands comprehends the plateau of Tibet and that of the great desert called Gobi, and the countries lying between them; it rises from 4000 to 10,000 feet, and in some parts still more, above the sea: the western, containing the plateau of Iran (Persia), does not generally attain the height of 4000 feet. The latter may occupy an area of about 1,700,000 square miles; the former, more than thrice as large in extent, contains about 7,600,000 square miles, and both taken together more than two-fifths of all Asia; the remainder of the continent is occupied partly by the terraces, by the intervention of which the table-lands sink gradually towards the lowlands, and partly by the lowlands themselves. The length of both systems of table-lands taken together and measured from west to east, from the Black Sea and the Persian Gulf to the sea adjacent to the coasts of Corea, is upwards of 5500 miles. Its breadth from south to north varies considerably: it occupies in its greatest extent on the east, between its southern boundary in the Chinese province of Yunnan and the northern in the country of the Mantshu Tunguses, from 1800 to 2000 miles; but on the west, between the coasts of Carmania and Gedrosia in Beloochistan, and the steep slopes to the lowlands of Bucharia, less than 700 miles.

The boundary of these plateau-regions is marked by Taurus and Caucasus at the north-western extremity, and by Mount Elburz at its slope towards the deep depression of the Caspian Sea; it afterwards advances farther north in the Altai range in Siberia, and on the north-eastern extremity is bounded by the alpine region of Da-uria. On the east the boundary is indicated by the mountain-ranges in western China, which have no common name, but extend from the western extremity of the Great Wall to the Snow Mountains (Siuete Shan) in Kuang-si and Yunnan northward, to the innermost angle of the Gulf of Tonkin. The southern boundary is formed by the Himalaya range and its branches, extending eastward and westward, the latter of which are known by the name of Hindu-Coosh or Hindu-Kuh. Farther to the west, where the plateau of Iran projects towards the south, the table-land region is separated from the Indian Sea by the mountains of Beluchistan, and thence from the Gulf of Persia by the steep Persian mountain-range (in its northern course called Zagrus), which extends along the coast of the gulf, and bounds the Tigris valley on the east: it afterwards joins the chains of Taurus and Amanus, where the Tigris and the Euphrates issue from the mountains. Here the boundary between the lowlands of Mesopotamia and the table-land is very distinctly marked; and from this point the range proceeds westward, under the name of Mount Taurus, and fills, together with the table-lands enclosed between its arms, the greatest part of the peninsula of Anatolia.

Both systems of table-lands are so connected, that, properly speaking, they form only one elevated and continuous protuberance on the surface of the earth, but they decrease considerably in breadth where they join one another; and exactly at this point of junction numerous high masses rise and form an extensive mountain-knot, where the ranges of the Himalaya, Hindu-Kuh, Thsungling, and Belur, meet one another; thus these table-lands are, at the same time, joined and separated in a very characteristic manner.

From the extremity of these table-land systems, especially on the south-east and north-east, south-west and north-west, there issue several separate mountain-chains, not connected with one another, but which form more or less a part of the table-lands themselves. By this peculiarity the highland of central Asia, as far as regards its surface and its extremities, appears not less indented and cut into several divisions and members than the whole continent of Asia on its shores and its exterior figure; the valleys, which by this indentation are produced on the borders of the table-lands, afford peculiar advantages for the progress of civilization. For, as we have already observed, the highland of Asia does not sink on one side only, but on all sides and towards every point of the compass; towards different oceans also, which are everywhere separated from the highland by extensive plains, varying greatly in magnitude and form. This circumstance, added to the valleys formed by the indentations in the exterior margins of the highlands, has given rise to numerous and most extensive river systems, which, descending through the intervening terraces, direct their winding course towards the north, south, west, and east, and thus give to the internal countries of this continent an open communication with the ocean.

The eastern highland of Asia is divided from the western, or, more accurately, the table-land of western Tibet from that of eastern Iran, between the meridians of Balkh and Cabul, by a tract of a peculiar nature. The eastern highland, much larger in extent and of higher elevation, presents more rigid forms, and has the figure of an irregular trapezium; the western has that of a rectangle extending towards the north-west, and is in every respect of a milder character. The mountain-knot formed at the common junction of the several mountain-ranges, which the companions of Alexander called the Indian Caucasus, and which now bears the name of Hindu-Coosh, is an extensive alpine region, or rather a mountain-isthmus, extending between the lowlands of Bucharia and of India, and uniting both highlands in the direction east and west, not unlike the isthmus of Panama, which connects the mountain region of North America with the Southern Andes.

To this peculiarity in the formation of this part of Asia we must add another, namely, the parallelism observable in the direction of the mountain-ranges which form the southern border of the highlands, or, in other words, their southern slopes. They extend in a diagonal direction from E.S.E. to W.N.W. The Himalaya range, which forms the slope of the table-land of Tibet, and extends from the Gulf of Tonkin to Cabulistan, a distance of nearly 2800 miles, is parallel to the Taurus-range, which, bordering the table-land of Iran on the south, extends from the mouths of the Indus to the western extremity of the Taurus in Lycia in Asia Minor, and is nearly of equal length.

This southern chain of the Taurus system is also parallel to the mountain-range which bounds the highland of Iran on the north, and which, considered as a continuation of the mountain-region of the Hindu-Coosh, is traced to the Demavend and Elburz near the southern shores of the Caspian Sea, and thence through Azerbijan and Armenia, though its surface exhibits great varieties in this part, till it terminates with Olympus and the heights of Ida on the shores of the Dardanelles, presenting towards the Black Sea rapid slopes. This northern chain of the Taurus system is nearly equal in length to the southern, extending upwards of 2500 miles. The Caucasus itself, which extends about 680 miles on the isthmus which separates the Caspian from the Black Sea, though it is some distance farther to the north, has nearly the same general direction.

But this parallelism, so remarkable in the western highland, is not observed in the eastern. Here too, indeed, some of the mountain-ranges traversing the table-lands run in the direction of west and east; but this is not the case with the principal chains, the Kuen-luen (35°30′ N. lat.), the Thian-shan (42° N. lat.), and the Altai mountains, farther to the north. In these mountain-ranges a decided divergency is observable. The distance between them widens as they proceed eastward till the most southern of their members, formed by the mountains of India beyond the Ganges, terminates on the peninsula of Malacca, opposite the Sunda islands; and the most northern, the Baikal and Da-urian range, traversing the countries on the Gulf of Okhotzk and the peninsula of the Tshuktshes, approaches the most northern shores of North America.

This diversity in the formation of the surface of eastern and western Asia has had corresponding effects on the civilization of their inhabitants. The divergency of the mountain-ranges in the eastern regions placed the nations inhabiting them at greater distances, whilst the convergency in the centre and in the western region produced a nearer approximation and more easy communication. But, after all, the great features of its formation, which determine its capabilities of influencing organic nature and the history of men, exhibit a marked direction east and west.

To form a complete picture of the varieties in the formation of the surface of Asia, we must add to these mountain-ranges extending in a diagonal direction others which meet them nearly at right angles. Such are the Belur Tagh, or Beloro, which is ascended in passing from the deep steppes of Bucharia eastward to the high table-land of Turkistan, and the towns of Kashghar and Yarkand; and the Soliman range, on the eastern border of Iran, which must be traversed in passing from the lowlands of India to the table-land of Persia. By these mountain-chains the most characteristic features in the formation of Asia are completed.

We have remarked that the two great systems of high table-land are connected by an Alpine region extending between the far advancing angles of two lowlands; that of India from the south, and that of Bucharia from the north, which seem to tend to meet one another, but are interrupted by the high summits of the mountain-region. Such a juxtaposition of all the great features which nature exhibits on the surface of the globe, on such a colossal scale, and in so limited a space, makes this one of the most remarkable spots on the face of our planet. This maximum of the contrasts of natural features, placed in the centre of the continent, is the principal characteristic which distinguishes Asia. By drawing a circle with a radius of a few hundred miles round this common centre, we comprehend in it the countries of Cashmere, Sogdiana, and Cabulistan, the antient empires of Bactria, Delhi, and Samarcand, the cold table-lands of Tibet, of Khotan, and of Kashghar, up to the antient Seres and Paropamisadœ; the most elevated snow-topped summits on the globe, the richest and most diversified Alpine regions and valleys, the sources of the greatest and, in an historical point of view, of the most remarkable rivers of central Asia, the Penj-ab of the Indians on the south, the famous Mawar-al-nahr on the north, and the richest plains in these lowlands; we have Persia on the west, India on the east, Bucharia, Turkistan, and Tibet, on the north. It is the centre of Asia fixed by nature; one of the great physical influences which prompted man to progress and to civilization in the early ages of his history. How numerous and powerful must be the inducements to change in a country where the climates of the polar region come nearly in contact with those of tropical countries intermingled with the temperate zone; and where this diversity of climate is found within a space so limited, and yet diversified by hundreds of different slopes, terraces, and valleys, which, partly watered by rivers and torrents and partly entirely without running water, are placed near one another, but often rise to such different levels above the sea! What an influence must such a country exercise on organic nature, and on the civilization and history of man; and how powerful must this influence have been through all the generations that the human race has existed!

To these two great and characteristic features, namely, the splitting of the south-eastern part of the continent into peninsulas and innumerable islands, and the great contrasts exhibited in the formation of the surface in the centre, we must add a third, which belongs to western Asia. This characteristic feature is partly its external form, and partly its geographical position in the centre of the antient world, to which we may add the influence which it has exercised on the progressive civilization of the inhabitants of the whole globe. As Asia is here connected with Europe and Africa, the three great divisions of the globe are thus brought into contact, and the intercourse thus established between the different nations inhabiting them is still more facilitated by the great maritime roads which nature has placed in this centre of the antient world—the gulfs of Arabia and Persia, the Caspian Sea, the Black Sea, and the sea which extends between Egypt and the peninsula of Asia Minor. This part of Asia is not characterized like the south-east by being split into manifold divisions and members, by which the phenomena of nature are multiplied and diversified, and the intercourse of nations and their progress in civilization facilitated; nor does it exhibit great contrasts in the formation of its surface: but we find here, in the western regions of Asia, more than at any other place, extensive countries surrounded and penetrated by considerable branches of the sea, which characteristic is rendered more important by being placed where the east and the west approach one another.

Such are the great features which characterize the external form and the interior surface of Asia. We shall attempt to indicate the peculiar character of each of these great natural divisions.

First of the eastern highland, or system of table-lands. The axis of its elevation, or its highest part, lies in a direction from south-west to north-east, and begins between Cashmere, Badakshan, and the Thsungling, on one side, and the Kailas mountains, and the sacred lakes of Manassarowara and Hrawan-hrad in Tibet, on the other, east of the sources of the Ganges; it extends to the snow-covered heights of Mount In-shan, situated at the most northern bend of the Hoangho river, and thence it traverses the Khing-khan mountains east of the lake of Baikal, which form the southern and south-eastern border of the great desert of Gobi, to the most northern bend of the river Amur, which seems to be caused by the north-eastern extremity of the axis. On this most elevated part of the eastern highland the table-lands of Great and Little Tibet probably rise to the height of from 10,000 to 14,000 feet above the level of the sea (those of Little Tibet measured on the banks of the Upper Satadru or Setledge); and perhaps the elevation of the deserts of the Gobi, about the lake of Khukhu-nor, or Koko-nor, is not much less. Farther to the north-east, the great caravan-road, which traverses the desert of Gobi between Kiachta and Peking, the table-lands sink considerably, and attain only the height of from 3000 to 4000 feet. This axis of the highland, which is inhabited by Tibetan and Mongol tribes, is not parallel to the separate mountain-chains which traverse the irregular trapezium of the highland from west to east, but cuts them in a diagonal direction. That part of the highland which is situated to the south-east of the axis seems to contain some very high table-lands; but the greatest part of it is probably occupied by very high mountain-ranges, which descend towards the adjacent low-countries with a rapid and steep declivity, and by themselves constitute the most extensive mountain-region of the globe. This Alpine region, however, if we except a small part of the Himalaya range, is almost entirely unknown to Europeans.

To the north and north-west of the axis extends the greater of the two triangles composing the trapezium of the Eastern Highland of Asia. It sinks gradually towards the lakes of Baikal, Zaizang and Aral, forming a series of terraces which continually exhibit less of the characteristic features of the table-lands, till they terminate with the steppes round the lake of Aral, which are below the level of the ocean; the surface of the lake of Aral itself is 186 feet beneath the level. These steppes, therefore, do not form a part of the Highland, but of the low and deeply depressed plains which surround the Caspian Sea and the lake of Aral. At present only the elevation of the large lakes which lie on the northern borders of the lowest terraces, and in their most depressed cavities, has been determined with any degree of exactness. The lake of Zaizang is upwards of 1600 feet above the level of the sea, according to the measurement of Ledebour and Humboldt; the lake of Baikal nearly 1800 feet, according to Erman; and Kiachta, the great commercial town between Siberia and China, situated on a second and higher terrace, is 2530 feet above the sea, according to the barometrical measurement of Erman. During the latest Russian mission to China, a series of heights was ascertained across the Gobi by Bunge and Dr. Fuss, from Kiachta to Peking; and it was found, that the pass leading over the mountain-chain of the Dshirgalantu, lying south of the Chinese provincial capital Urga, and on the south of the river Tola, is only 5005 feet above the sea; and that on the southern border of the Gobi, not far north of Peking, the highest mountain-passes which are crossed by the great Chinese wall are only 5525 feet above the sea-level.

Between Urga and the great wall extends the desert called the Gobi. It is not a level plain, but sinks towards the middle, where it is about 3000 and in some places only 2600 feet above the sea, and forms a long extended flat valley, lying from west to east. The lowest part of this valley is occupied by the proper Gobi, called also Shamo (i. e., sea of sand); its surface is covered with sand, and abounds in salt. In all its extent it displays the traces and phenomena of having once been covered by the sea, and among the Mongols a notion still exists that it will again be filled with water.

Farther to the west, towards the Gobi of Hami called Han-hai or the dry sea, the table-land probably rises again, but still farther to the west it is perhaps again furrowed longitudinally from west to east by a wide and extensive depression of the surface. We are induced to make such a conjecture by the course of the large river traversing Kashghar and Yarkand, which running eastward terminates in the lake Lop, which probably occupies the lowest part of the valley. The culture of cotton and the vine in Chinese Turkistan, along the tract indicated, together with its numerous commercial towns (Kashghar, Yarkand, Aksu, Kutsche, Karashar, Turfan, Hami), which are traversed by the great road leading over central Asia to China, render it very probable, that this valley is not much elevated above the level of the sea, and that the countries lying in this direction offer no great obstacles to travelling. This valley is bounded by two high mountain-chains, running west and east, of which that to the north is called the Thian-Shan (Bogdo Oōla) range, and the southern the Kuen-lun (Koul-koun) mountains. These two extensive mountain-ranges may be called the interior mountain-chains of the Eastern Highland of Asia; the Altai mountains on the north, and the Himalaya range on the south, constitute the exterior mountain-chains of this elevated region.

Between these four extensive mountain systems lie the three wide plains which occupy the central countries of Asia, and in which respectively are found the three large lakes of Balkash, Lop, and Tengri. These three plains comprehend the three countries known under the names of Zungary, Tangut and Tibet, and their general level probably rises higher and higher as they advance from north to south.

The mountain-chains of the Eastern Highland of Asia are little known to us, if we except a small portion of the Altai mountains, and a part of the Himalaya-range. Of the Altai mountains, only the most western ridges, to the east of Semipalatinsk, between the rivers Irtish and Oby, have been explored, and here only their northern slopes, which are known by the name of the Altai Ore Mountains (or Erzgebürge), because they yield annually 70,000 marks of silver and 1900 marks of gold: they rise near Kolywan to about 5400 feet above the sea. But the higher snow-topped ranges called the Altai Bielki, in which excellent jasper and porphyry are found, and which extend farther to the east, near the lake of Telezkoi, attain a height of 10,000 feet and upwards. Neither the woody mountains surrounding the lake of Baikal, nor the Da-urian ranges, which contain rich veins of silver, have so great an elevation, though their height has not been ascertained by actual measurement. They are however remarkable for their formation; their tops do not present craggy summits, but rather extensive and nearly level plains like the table-lands.

The mountains in the interior of the Highland are not nown, except a few spots, which have been traversed by travellers and caravans. Neither their height, direction, nor position is exactly ascertained.

The Himalaya mountains are much better known, at least a part of them, though it is only a comparatively small portion. If we limit the application of this name to the mountains which lie between India and Tibet (though indeed it might with good reason be extended much farther), we find that only a fifth of the mountain-range has been partly explored; that portion which has been measured is still much smaller, though perhaps it is the highest part of the whole system. It comprehends the Alpine country about the sources of the Ganges; the Jumna, a tributary of the Ganges; and the Setledge, a tributary of the Indus. This Indian Alpine region exhibits a greater variety of elevated scenes, natural productions, tribes of men, and difference of political constitutions, than any other mountain-country on the globe. Besides rising in colossal forms to a great height, it covers a great surface of country. In length it is about 1300 miles, and would cover in Europe all the countries between the Pyrenees and the sea of Azof. Its breadth is from 250 to 350 miles. Compared with the Alps, the Himalaya mountains exceed them twice in breadth and thrice in length; the Alps occupy an area of about 130,000 square miles, but the Himalaya from 500,000 to 600,000 square miles. It consists of a great number of ridges running parallel to the direction of the whole range from south-east to north-west, which, however, in many places, are connected with one another by transverse ridges, and in others separated by deep and narrow ravines and glens, in which the different branches and tributary rivers of the Indus and Ganges run. The whole chain, beginning from the high pinnacles of the Hindu Coosh, near Cabul, and terminating in the most eastern valleys of Asam, near the source of the Brahmapootra, is overtopped everywhere by the most elevated ranges, which are always covered with snow—a circumstance which has given rise to the Indian name Himálaya, signifying *the dwelling of snow*.

The whole range may be divided into three sections. The most eastern, or that of Asam and Bhotan, is less known than the remainder. Though it exhibits many high summits, only the peak of Chamalari, near the boundary of Tibet and the road leading to Teshoo Loomboo, has been seen at a small distance by Turner, who estimated its height at about 25,000 feet above the level of the sea.

The central region of the Himalaya range comprehends the mountains of Nepaul, which have been examined with some care by the English residents at Kathmandu, the capital of Nepaul, which town, situated in a valley of the range, is, according to Colebrooke, 4784 feet above the sea. Three groups of high peaks which rise above the line of eternal snow, between the valleys of the Upper Trisul and the Upper Gandaki Ganga, have been measured. The groups of the Salpu mountains and that of the Dhayabung mountains are nearest to Kathmandu, on the north of the town; eight of their peaks which have been measured are from 16,000 to 24,000 feet above the sea. Some days' journey to the north-west lies a still higher group, containing five peaks, not one of which is less than 22,000 feet, but the Sweta-ghar (or the White Tower) attains 25,261 feet, and the Dhawalagiri (or the White Mountain), 28° 30′ N. lat., 83° 30 E. long., 28,000 feet. The latter is the highest known pinnacle on the globe. Except their heights, very little is known of these gigantic mountains.

The western region of the Himalaya range comprehends the ridges traversing the Alpine countries of Kamaoon, Gherwall, Bissahir and Sirmore; and as these countries are dependent on the East India Company, the mountains have been explored with great care, and even trigonometrically measured. Here we find the very high group of the peaks of the Iawahir (30° 22′ 19″ N. lat., and 79° 57′ 22″ E. long.), between the upper courses of the Goree and Dauli Ganga, on the boundary between Kamaoon and Bhotan, to the south of the Niti Ghat (16,895 feet) and to the north of the town of Almora (5337 feet above the level of the sea), which, rising to the height of 25,749 feet, was considered by Hodgson, at the first measurement, the highest mountain on the globe. These summits have only been measured from a distance, and the mountains are not yet explored; but their elevation has been determined by the measurement of Hodgson, as well as that of Webb. To the east of this extensive group, the country between the upper courses of the Goree and of the Kali, the two principal branches of the Kali-Gogra, is covered with a mass of mountains, many of which rise above the line of eternal snow; twelve of their peaks, measured by Webb, attain the height of from 18,000 to 22,000 feet; but they have not been explored in their valleys and ramifications. Still more crowded are the snow-covered peaks to the north-west of the group of the Iawahir summits, especially between the sources of the Vishnu Ganga and Bhagirathi Ganga, where are the colossal summits of Kedarnath and the Rudra Himalaya. This is the case also about the sources of the Jumna, where we find the Bunderpuch and the high chain, which divides the north-western branches of the last-mentioned river from the valley of Baspa and the Setledge, which latter chain is traversed by twelve mountain-passes, and connected with the Ralding Kailasa mountains, on the banks of the Setledge. Even on the north-western banks of this river we find the snow-covered summits of the Kotgerh and the Purkyul. These alpine regions have been explored by Hodgson, and others have continued his survey. Hodgson counted, at his first survey, upwards of fifty summits, rising with craggy conical peaks above the line of eternal snow, of which twenty-three attained upwards of 20,000 feet, and seventeen exceeded in height Mount Chimborazo. The number of the snow-covered mountains which extend farther to the north-west through the alpine region of the Kulu Cashmire Himalaya range and approach the Hindu-Coosh mountains near Cabul, seems nearly innumerable, but none of them have been measured or otherwise explored. The Hindu-Coosh itself, to judge from the great masses of snow with which it is covered, seems to rise to nearly an equal height.

Along the lowest southern slopes of the Himalaya mountains extends a flat country, hardly a thousand feet above the sea, covered with bogs and forests, exposed to a sultry heat, and dreaded by travellers on account of the prevalence of fevers. It is called Tariyana; its inhabitants are disfigured by goîtres. The adjacent ridges, and the lower valleys (called Duhs) of the Alpine region, which rise to the height of from five to six thousand feet, and in which are situated the capitals of the Alpine states, as Rampur on the Setledge (3375 feet above the sea), Sirinagur on the Alakananda Ganga (2300 feet), Almora on the Kosila (5337 feet), Kathmandu, &c., are among the best watered most luxuriant, fertile, and picturesque Alpine countries in the world. To the north-east of these places the mountains rise, but only at a considerable distance attain the line of eternal snow. They are arranged in numerous ridges, commonly running parallel to one another and in the direction of the whole mountain-region, but connected by transverse ridges and groups, and separated by frightfully deep and steep ravines running in some places longitudinally, in others transversely. The most northern of these chains rises above the level of the high table-land of Tibet, and forms the boundary of the highland of eastern Asia. On the side of the table-land they descend with a gentle slope, and soon terminate in extensive undulating plains. The intercourse between India and Tibet is carried on over these high ridges by means of the mountain passes, the lowest of which are probably not much below the height of Mont Blanc, being nowhere less than 14,000 feet above the level of the sea; and some rise even to 18,000 feet.

Nothing renders the Himalaya mountains more remarkable than the different level to which the lines of vegetation ascend on the lower ridges adjacent to the plains of Hindustan, on the interior ridges, and again on the boundary ridges of the table-land. This level, as well as the line of eternal snow, rises higher as the ridges approach the table-land, and thus the higher regions are cultivable and inhabited at an elevation where lower down no habitation and no agriculture are found. A. Gerard has carefully examined this remarkable phenomenon, and has stated the following facts, observed in ascending the valleys of the Sutledge. He divides the whole mountain-range into three regions. Region A, lying along the southern slopes of the Himalaya range, displays cultivated fields to the height of 10,000 feet, but the corn must often be cut green; the highest inhabited place is 9500 feet; the upper boundary of trees 11,800; the upper boundary of shrubs 12,000, and in some well-sheltered places, dwarf birch and little shrubs are found at 13,000 feet. Region B comprehends the higher ridges of the mountains, and here, in the valley of the Baspa, the highest human dwelling is 11,400 feet above the level of the sea, and this is likewise the highest point which agriculture attains; trees are found at 13,000 feet and upwards. Region C extends over the table-land itself, where villages are built at the elevation of 13,000 feet; fields are cultivated at 13,600; very good birch forests grow at 14,000 feet, and some low shrubs, especially tama, used as fire-wood, attain to 17,000 feet above the sea.

The highland of eastern Asia is on every side surrounded by extensive terraces, through which the great river-systems descend to the low lands bordering on the ocean.

On the mountain-ranges which bound the table-lands on the north four great rivers take their rise; the Irtish from the lake of Zaizang joins the Oby and Tobol; the Yenesei unites with the Angara, which issues from the lake of Baikal, and with the two Tunguskas; the Lena, with its great tributary the Witim; the fourth is the Amur. They run respectively 2000, 2500, 2000, and 1900 miles, measured along the course of the rivers. The Irtish, with its tributaries, drains upwards of 1,300,000 square miles, the Yenesei about 1,000,000, the Lena nearly 800,000, and the Amur about 850,000,—all taken together, a surface much more extensive than that of Europe, and by far the greatest part of it belongs to Siberia. They abound in fish, and have plenty of water, so that two-thirds of their courses are navigable; but the lower part is for more than six months of the year covered with ice. This causes in spring-time an excessive swelling of the waters in the upper branches and tributaries, by which their banks are torn off, and great masses of rocks and earth carried down, and strewed over the flat country along the lower course of the river. The navigation on the principal water-courses from south to north is, for this reason, very inconsiderable; but it is much more important in their tributaries running east and west, by means of which a water-communication is established through the greatest part of the countries lying between the Ural Mountains and Okhotzk.

From the mountain-region, bordering on the highland of eastern Asia, two extensive terraces descend gradually towards the Pacific Ocean, besides a great number of smaller ones. The latter are watered by smaller rivers, but the two former give rise to the two great river-systems of the Hoang-Ho and Kiang (Kincha-Kiang, Ta-kiang, or Yantse-kiang), of which the former runs upwards of 2000, and the latter more than 2900, if their great bends are taken into account. Each of them carries off the waters of a surface of above 700,000 square miles. The Chinese call them the sons of the ocean, a name probably derived from the tides ascending them upwards of 400 miles, by which they are changed into seas of fresh water, and rendered navigable to a great distance from the sea. This great advantage of the Chinese rivers, arises from their geographical position with respect to the Pacific Ocean, in which the tides rise to the greatest height. The sources of these two rivers are not very distant from one another on the table-lands, but in their middle course they are widely separated to the north and south by the ranges which form the borders of the highland; in the lowlands of China, however, they converge again, and their embouchures are only about a hundred miles distant from one another; but before they fall into the sea, they are connected by numerous canals. The tract between these rivers may therefore be considered as one immense *delta*, and the rivers themselves as a *double* river-system, formed on the most colossal scale, between which is situated the best cultivated country on the globe, central China, which to these rivers is indebted for its system of canals, and its civilization.

The rivers of southern Asia form three distinct groups, of which those of India east of the Ganges are little known: only their mouths and the lower parts of their course have been explored. These rivers, of which six or seven run a considerable distance, taken together, contain probably a greater volume of water than all the rivers of the northern half of Africa. Their course lies from north to south, or S.S.E., and the valleys drained by them extend in a parallel direction between the mountain-ranges, which are as uniform as the valleys, and widen towards the Sunda Archipelago, in the shape of a fan. The rivers of Camboja, Siam, and Pegu, which are the largest, carry off a great volume of water, and are navigable to a considerable distance from the sea; but they have not yet been explored, except the river of Pegu or the Irawaddy, which, in the late war with the Burmese, was navigated by armed vessels, and ascended by the steam-boat Diana, up to the town of Ava, 446 miles from its mouth. It is said to be navigable for boats three hundred miles higher, to B'hamo. Its upper course was visited in 1827 by Wilcox and Burlton, who, setting out from Sadiya in Asam, traversed the Langtam mountains, and had a view of the river in 27° 30′ N. lat. only about fifty miles from its sources, which lie in the snow-covered mountains farther north. At this place, the Irawaddi is about eighty yards wide. On the maps of D'Anville, this river seems to be identical with the Zangbotsu, or the great river of Tibet, which flows to the south of H'Lassa; and some passages, quoted by Klaproth from Chinese authors, confirm the conjecture of the French geographer. If this is true, the Irawaddy has a course of nearly 2000 miles, and its sources lie at no great distance from those of the Ganges. But the information collected by Crawford in Ava, and by Wilcox in Asam, is not in favour of this hypothesis. [See Brahmapootra; Asam; and *Asiatic Researches*, xvii. p. 457, &c.]

The rivers of India, within the Ganges, run in a direction quite different from that of the rivers beyond the Ganges, which are parallel to one another. The Ganges and the Indus take a diverging course and enter different parts of the sea; but their tributaries, especially the Jumna and the Sutledge approach one another, and facilitate the commercial intercourse of the nations which inhabit the banks of the principal streams. The advantages which result from these rivers flowing into different gulfs are still greater. The Gulf of Bengal brings the inhabitants of the peninsula into communication with the nations of Malay origin and with the Chinese, whilst the Gulf of Malabar opens to them the coasts of Persia and Arabia. It is principally through this direction of its rivers that India within the Ganges has enjoyed such opportunities of civilization over India beyond the Ganges.

The river-system of the Ganges and Brahmapootra extends about 1300 miles in length, and drains a surface of nearly 650,000 square miles. The Ganges rises in the Himalaya mountains, in the most elevated regions of the globe, covered with extensive masses of snow, from which abundance of water continually descends, and is carried off by a dozen great rivers, many of which exceed the Rhine in volume and in length of course. These rivers enter the Delta of Bengal, which is twice as large as that of the Nile, and presents a most extensive and intricate system of rivers and canals, for irrigation as well as for navigation. By its junction with the Brahmapootra, which descends through the valley of Asam, the river-system of the Ganges becomes double and not unlike that of the great Chinese rivers. The Ganges and the Brahmapootra descend from regions different in natural advantages, of which only that adjacent to the Ganges has attained a high degree of civilization.

The river-system of the Indus has the highest historical interest, partly from containing the Penj-ab, the country of the five rivers, which descend from the eastern mountains, partly from the Cabul, the only important river which joins it on the west, and partly from its geographical position. Flowing along the eastern edge of the table-land of Iran, with a general course from north to south, it forms the true boundary between eastern and western Asia. India, that country which more than any other has attracted the admiration of the philosopher, the cupidity of the conqueror, and the speculations of the merchant, is accessible from the west only by two roads, one of which leading along the valley of the Cabul river, passes through Attock on the Indus to the Penj-ab; the other, which has been less used, leads from Herat through Candahar to Shickarpoor near the Indus. The track which leads from the table-land of Iran through Cabul to the narrow terrace on which Peshawer is built, and thence to Attock, is the high-road, along which the nations of Asia for many generations descended in their passage to India, but which never was ascended by the nations of that country. The sources of the Indus have only been discovered in our times (1812), as well as those of its great tributary the Satadru (Setledge); both of them rise on the high table-land of Tibet, the Indus on the slopes of the Kailasa Mountains, and the Satadru in the sacred lake of Manassarovara. These rivers, therefore, do not originate, like the Ganges, on the southern slopes of the Himalaya range, but on its northern descent and the high table-land itself; a fact which till lately was not known. From this circumstance it follows, that these rivers pierce the range in all its breadth, and pass through immense clefts in the mountain-mass, before they arrive at the low plains of Hindustan. Below the Punjnud (or Pancha-nada, *i.e.*, the five-fold river), which receives all the waters of the Penj-ab, the Indus, like the Nile, is not enriched by any considerable tributary; and its delta, which was once so famous for its civilization, is at present in a neglected state, and has partially been changed into an uncultivated desert. The whole course of the Indus amounts to upwards of 1500 miles, and it drains a surface of more than 400,000 square miles.

Such are the ten or twelve extensive terraces of eastern Asia, which, differing in their forms and geographical position, and traversed by large river-systems, display a great diversity of natural productions, and have given a different turn to the progress of civilization among the nations which inhabit them. They are partly divided from one another and partly surrounded by the lowlands. But these latter are not flat level countries. Mountain-ridges and table-lands often rise in the middle of them, though they do not attain such a height as those of central Asia. Such a table-land is found in southern China, where it constitutes the mountain-region of Yun-nan, Su-chuan, and Kuang-si; in India beyond the Ganges, where it occupies Laos; and on the peninsula within the Ganges, where the table-land of Deccan is doubtless the most remarkable and at the same time the best known of these subordinate highlands.

This plateau of Deccan occupies with its elevated plains, which at an average rise from 3000 to 4000 feet above the level of the sea, the greatest part of the triangular peninsula between the Arabian sea and the Bay of Bengal. The mountain-range, known by the name of the Ghauts, forms the western edge of the table-land, and descends rapidly to the narrow, rocky, and picturesque coast of Malabar, which is characterized by its numerous harbours. On the northern side, where the Vindhya mountains stand, it sinks in steep terraces extending through the provinces of Malwa and Bundelkund, till it terminates in the flat plain of northern Hindustan. Towards the east its descent is formed by gentle slopes and terraces, as the course of all its rivers shows, which run off from the high plains to the flat and broad, but sultry and arid, coast of Coromandel, which, though surrounded by shoals and without harbours, has become the favourite place of European colonies. This table-land of Deccan is much favoured by nature. Its insulated position is quite independent of the highland of central Asia; it is placed between two seas and in the conflict of the monsoons, and cooled by sea-breezes. Moreover, its surface being formed by a series of terraces, which lie within the tropics, it enjoys all the advantages of tropical countries, without partaking of their disadvantages. On the sultry coast the luxuriance of vegetation is displayed in the cocoa-palm, the mango-tree, the cinnamon-laurel, and the pine-apple; it thence passes through forests of teak-trees to the rice-fields on the table-land of Mysore; and still higher on the cool summits of the mountains it offers to the observer the fruit-trees and grain-fields of Europe, flax-plantations, and rich meadows. It is easy to comprehend, that these numerous and great advantages, rarely if ever so closely united, determined at an early period the civilization of its inhabitants, and impressed on it a peculiar character. Among the three peninsulas with which Asia terminates on the south, and which remind us of the three peninsulas of Europe, Greece, Italy, and Spain, on which civilization made such rapid progress, the peninsula of Deccan has doubtless contributed most to the progress of social improvement. The same advantages are enjoyed by the adjacent island of Ceylon, which resembles the Deccan in the form of its surface, and may be considered as an appendage of it. The similar results arising from the extensive group of the Sunda Islands with respect to the adjacent countries of southern Asia have already been noticed.

We shall now give a general view of Western Asia, the Highland of which, though much smaller in extent, forms the second principal feature in the physical character of this continent. It is not only nearer Europe, but likewise much more akin to it in its natural structure, and for both reasons more closely connected with it in an historical point of view. The form of its surface, less colossal and extensive in its parts, more nearly resembles that of Europe; and the same may be said of its climate and people.

The Highland of Western Asia, which is named the high table-land of Iran, in opposition to the deep plains which are adjacent to it on the north-east, called Turan, has the figure of a rectangular oblong, extending from the Upper Indus through all Western Asia to the shores of the Grecian Archipelago. Its centre is occupied by Persia; over its western parts extends the dominion of the Turks, and its eastern division contains Afghanistan. It is materially distinguished from the Highland of Eastern Asia by its surface being more generally cultivable, and exhibiting extensive tracts which actually are cultivated, or were so formerly. The latter circumstance is abundantly proved by the numerous ruins of large towns and other monuments of architecture which exist even in those districts which at present are without cultivation; as on the north-east in Khorasan, the ancient kingdom of Bactria, towards the south in Karmania and Persis, and even in the western districts, as in Kurdistan, which formed a part of antient Media. This observation, however, is not applicable to the south-eastern corner of the Highland, comprehending the antient provinces of Gedrosia and Arachosia, which at present forms a part of Beluchistan and attains its greatest elevation in the table-land of Kelat, which rises, according to one estimate, to 7000 feet above the level of the sea. Its eastern and extremely rapid descent towards the valley of the river Indus, which is formed by steep rocks and feeds no rivers, is without cultivation and even without roads except one, and only inhabited by savage tribes of Afghan origin who have no historical records. The road alluded to is that from Candahar, through Pisheen, Quetta, and Baugh, to Shickar-poor. (See Conolly's *Overland Journey to India.*)

The northern edge of the Highland, which extends along the southern shores of the Caspian sea and the deep plains of Bucharia, is historically famous for containing the Bactrian Parthian, Hyrcanian, and Caspian mountain passes, which are narrow defiles, offering a passage for the armies of the conquerors descending from Iran to Turan. This country has for many centuries been the abode of warlike mountain tribes, whose chiefs, by holding possession of the mountain passes on the north, have extended their dominion over the extensive plains of the table-land. This was the policy of Nadir Shah and of Fet'h Ali Shah, who, sensible of this peculiar circumstance, fixed their residence at Teheran, a town built near one of the passes, on the high table-land. The caravans, which travel eastward to India and Bucharia, and westward by Tauris (Tabreez) to Armenia and Asia Minor, are obliged to pass along the southern side of this mountainous boundary-girdle and near the openings of the passes. Along the great road, which is invariably fixed to this tract by the nature of the surface on the northern boundary of the table-land, there rose numerous great emporiums. Here we find the towns of Cabul, Candahar Herat, Meshed, Nishapoor, Teheran, Rai (the antient Rhagæ), Casbin, and Tauris.

The southern border of the table-land of Iran is still more distinctly marked by nature. It is separated from the low and narrow coast and the wide plains watered by the Tigris and Euphrates, by a broad mountain tract, which beginning at the mouth of the Indus extends to the place where the rivers of Mesopotamia, breaking through the rocky masses of the high table-land, enter the low plains. This mountain tract consists of from three to seven ridges, running parallel to one another and separated by as many narrow longitudinal valleys, which sometimes extend many days' journey in length. The ridges themselves are, like the Jura mountains in France, composed of limestone, and rise like terraces from the low coast higher and higher. Beyond them extend the wide table-lands. There are but few mountain passes leading through this natural entrenchment of Persia, a country which on this account may be considered as a fortress erected by nature for the defence of the nations which inhabit it. Among these narrow mountain passes which lead from the sultry low coast called the Gurmsir (warm region) through the great staircase of mountain terraces to the cool table-land in the interior called Sirhud, three roads have acquired some celebrity in history, which we shall notice more particularly under the names of *eastern*, *middle*, and *western mountain road*.

The eastern mountain road begins at the harbour of Bender Abassi or Gambroon, near the entrance of the Gulf of Persia, and leads northward to Kirman, the antient Karmania, situated on the cool table-land, in a spot which abounds in springs and is covered with fruit trees, though on all sides surrounded by desert plains, in which it lies like an oasis in the midst of the Libyan Sahara. From Gambroon a road also leads past Lar to Shiraz. (See Herbert's *Travels*, p. 124, &c.)

The middle mountain road begins at the town of Abou-shehr or Bushire, on the shores of the Persian Gulf, and leads first over a lower ridge to Kazrun, near Shahpoor, the residence of the Sassanidæ (of king Sapor I., A.D. 240), which is situated in the first valley; from this point it passes over a rocky mountain to Shiraz, once the residence of the Arabian caliphs, which is built in a wider and richer valley; farther through winding mountain roads and narrow ravines to the valley in which the ruins of Persepolis still excite our admiration. From these ruins the road, in a northern direction, again traverses some narrow passes through high rocks, which are full of monuments of the early ages of Persia, till at last it issues out of the mountain region and enters the extensive table-land on which Ispahan, the residence of the Sufi dynasty, is built. The residence-towns of these different dynasties have been built on the fields of battle where signal victories were obtained, and are placed at the openings of the most difficult mountain passes, full of narrow defiles. The Arabs were obliged to pass through this difficult road on their way to Persepolis, and this has likewise been the route of modern travellers who have entered the inland provinces of Persia from the Persian Gulf. The Macedonians, under Alexander, and after them Timur, made their way from the banks of the Karoon to Persepolis up the valley of the Jerahi and by the pass of Kalat-i-Sefid.

The western mountain road which lies to the north-west of the former, may be called the Median, in opposition to the Persian, which passes through Persepolis. Beginning at or near the modern Bagdad, it passes through the Mediæ Pylæ of the mountain range called Zagros, runs by Kermanshaw, Besittoon, and the remains of the temple at Kungavur, and terminates at Hamadan, the antient Ecbatana in Media. This road, like the preceding, presents many historical monuments, and it crosses the upper course of the rivers which flow through the low lands of Susiana.

Thus a series of towns, the seats of antient kings, and now the sites of historical monuments, beginning with Kerman and comprehending Persepolis, Parsagadæ (or Parsagarda), Ispahan, and Hamadan, and terminating again at Tauris, lies along the internal slope of mountain ridges which border the table-land of Iran on the south, analogous to that series which we have observed along the northern girdle of the mountain range. By these towns the boundary is marked which separates the region of the natural fastnesses, of the mountain passes, of the battle-fields, of the pastures, and of the country adapted to the chase, which is formed by the mountain terraces, from the interior table-land, which is more level and uniform in its aspect. The table-land itself is traversed by some ridges of hills, which extend mostly in a general direction east and west, and attain only a moderate height above the plain; it is also furrowed by a few valleys, or rather depressions of the surface, which more or less are covered with green meadows, or scanty pastures or steppes, and in a few places with sandy deserts or a soil impregnated with salt.

Fraser, on his route through Persia from Abushehr to Teheran, determined the elevation of many points above the level of the sea, and his statements give a very instructive view of the continually changing surface of Iran. Abushehr is built on the shore of the sea in the sultry Gurmsir, and has a climate favourable to the growth of palms. Kazrun, lying on the first mountain terrace, is 2772 feet above the level of the sea. The highest point of the pass Desht-i-Arjun, above Shiraz, rises to 7200 feet. The town of Shiraz itself, which is built on the second mountain terrace, is 4284 feet above the sea; its climate is favourable to the vine: the roses grow to the size of trees, but the palm does not succeed. The highest point of the pass over the third mountain ridge above Persepolis rises to 6666 feet. Ispahan, lying in the plain which forms the third terrace, is 4140 feet above the sea. From this level the mountain passes lying farther north near Kohrood rise nearly 2000 feet higher. Towards Koom we find the greatest depression in the table-land: here the surface sinks to 2046 feet. It rises again in the plain on which Teheran is built, which has an elevation of 3786 feet. The mountain pass which leads to the Caspian sea past Kishlac, rises to 4572 feet; and the entrance of the Hyrcanian pass at Shahrood to 3414. The Demawend, the highest mountain peak in this country, attains indeed an elevation of 10,000 feet; but most of the adjacent summits do not rise above 7000. The northern slope of this range towards the Caspian sea is extremely steep and rapid, which is owing not only to the short distance at which that immense lake is situated from the crest of the mountains, but also to the singular fact that its level is more than 300 feet below the surface of the ocean.

The most remarkable and characteristic feature in the surface of Persia is the absence of any considerable river, though this country occupies a space at least equal to that of all Germany. This does not arise from a want of spring water, which is found at no great depth under the surface almost everywhere, and renders this country cultivable in most districts; but it is owing to the want of extensive valleys traversed by running waters. This want has deprived it of an extensive river system, and consequently of the most powerful means provided by nature for a continual progress in civilization. To this circumstance it must be attributed, that the nations inhabiting Iran never got entirely rid of the character peculiar to a pastoral life and the continual change of abode, though it must be admitted that from time to time they have exhibited a considerable degree of mental culture.

At the western extremity of Iran, between the innermost corners of the Gulf of Persia and of the Caspian sea, about the fiftieth meridian, the table-land narrows to nearly half its former extent, but it increases in elevation. To the east of this line extensive plains form the prevalent characteristic, but to the west, mountain masses rise higher and higher. Here begins the alpine region of Persia with Kurdistan, here are the lakes of Urmia and Van, and the sources of the rivers Zab, Tigris, Aras, and Euphrates. The table-land is replaced by mountains, which rise to an enormous height, and by elevated valleys between them. Such is Azerbijan, the fire-region, the native country of Zoroaster. On the north-west both the mountain ranges and the table-lands are again united in the compact mountain region and high table-land of Armenia, of which Azerbijan forms only a lower terrace. The countries of Asia, which extend west of Armenia, resemble in their structure Europe rather than Eastern Asia. The surface no longer presents such compact masses, which rise to a considerable elevation, and extend over a great space; it offers to the view more separated and distinct masses, which form as it were individual limbs. We may distinguish four different divisions of this kind.

The first is the elevated and mountainous table-land of Armenia, which extends in the form of a triangle between the angles of three seas, the Caspian, Black Sea, and the Gulf of Alexandretta. Its plains, on which the town of Erzerum is built, rise to 7000 feet above the level of the sea, according to the measurement of W. G. Browne, and the highest summits of the Ararat, which overtop the plains, attain the height of 17,260 English feet, according to the statement of Parrot.

The second great division is formed by the Caucasus, which is united to Armenia by ridges of moderate height, in part covering the Caucasian isthmus. This high mountain region is characterized by its isolated position and its entire independence of the table-lands of Asia, as well as by its double descent to the north and south, which renders it much more like the mountain regions of Europe than those of Upper Asia. It may be compared with the alpine region of Switzerland, and is distinguished like that country by its natural productions and the character of its inhabitants, though the rivers which rise in its mountains (Kur, Phas, Kuban, Terek) cannot be compared with those of Europe in length or in importance.

The third separate mass, which lies on the western border of the Highland of Asia, is the peninsula of Anatolia, which on three sides is surrounded by seas, and on the east is joined to Persia by the mountain system of the Taurus. Its interior is occupied by a table-land, which, at an average, perhaps rises to the height of about 2000 feet above the sea, and descends with steep slopes towards the north and the south. Towards the west the descent is gentle, being formed by long fertile valleys traversed by abundant streams till it terminates on the shores of the Ægean sea in a coast full of promontories and indentations, marking the termination of the ranges which run from east to west in this peninsula. It extends, as we have already observed, like a bridge for the passage of nations between Asia and Europe, it may be compared with the Pyrenean peninsula in many respects. [See Anatolia.]

The fourth region, which is connected with the Highland of Western Asia, is formed by the Syrian mountains, which running towards the south contain Mount Libanus, and thence continue to the elevated cone of Mount Sinai, an isolated mountain mass, which is a rare occurrence in Asia.

Western Asia, though indented by gulfs and arms of the sea, which make peninsulas and head-lands, is not favourable to the formation of extensive river systems, which only occur on the eastern side of Asia. Like Europe, it presents forms of less dimensions and more adapted to the dominion of man. Only one extensive river system exists in this country, and this consists of two large rivers; a feature which is peculiarly characteristic of Asia. This is the river system of the Euphrates and Tigris, or of the Shatt-el-Arab; the north branch of the Euphrates comes from near Erzerum, and the east branch from the western extremity of the table-land of Iran, where the country rises to an alpine region, or to a complete mountain system, with diverging ridges and intervening elevated valleys. The Tigris rises on the south side of the high range, along the north side of which the east Euphrates flows. The Euphrates has a winding course of near 1800 miles, measuring along its whole line. When these rivers have forced their way through the Taurus, the Euphrates north of Rumkala, and the Tigris above Mosul, they begin to converge and to surround Mesopotamia, till they approach, but do not actually unite in, the ancient Babylonia. Their waters traverse the same delta, and enter the Persian Gulf by one channel.

We cannot refrain from making an observation on the historical effect of these systems of double rivers in Asia. We find that in the valley of the Nile civilization descended along its banks from one royal residence to another, from Meroë to Thebes, and thence to Memphis and Sais. But in the valleys of the double rivers of Asia we meet with double royal residences, double civilization, and double political systems, as Babylon and Ninive respectively on the Euphrates and Tigris; Delhi and H'Lassa, with Brahmanism and Buddhism, on the river-system of the Ganges; and on the double river-systems of China, the southern and the northern empire, Ma-chin and Khatai. When in the progress of time civilization descended these streams, and met at their conflux, or where they approach near one another, the different degrees of perfection which it had attained, and the different turn it had taken, must have produced, as the nations came in contact with one another, a beneficial effect. The same observation applies to the fourth great system of double rivers, the Sir and Gihon, on the banks of which, in the centre of Asia, the same fact is repeated in the royal residences of Samarkand and Bokhara.

Like the table-land of the Deccan, which forms a projecting, but independent and isolated limb of the highland of Eastern Asia, the peninsula of Arabia projects from the highland of Western Asia, and may be considered as an entirely independent member. As the Deccan is separated from the highland region by the lowland of Sind, so Arabia is divided from the mountain-system of the Taurus by the lowland of Syria, which extends to the S.W. of the Euphrates. On the south of this lowland the country again rises, and assumes quite a different character. This constitutes the highland of Arabia, which, in the form of a trapezium, contains the table-land of Nejd, the native country of the Wahhabites, a cold country, connected on the south with the elevated Yemen or Arabia Felix, which descends in terraces towards two seas. Its descent towards the west is steep, and formed by parallel mountain-ridges, with well-sheltered valleys between them, in which the famous towns of Mecca and Medina are situated. This part of the country is better known than the similar steep descent towards the south between Aden and Hadramaut, and thence to Muscat. The eastern declivity, which appears to descend with a gentle slope towards the Gulf of Persia, and surrounds the islands of Bahrein, noted for their pearl-banks, is no better known. The cold Nejd is the native country of the Arabian horse and the Arabian camel. On the terraces bordering it on the west the mild climate allows plantations of coffee, and the low and narrow coast, with its sultry air, produces, like the Gurmsir of Persia, the date-palm, which will not grow either on the table-land of Nejd or on that of Iran.

Arabia exhibits characteristics entirely different from those which mark the other parts of Asia. As already indicated by its geographical position, it forms a point of contact between Asia and Africa, and participates in the distinguishing qualities of both. Even its inhabitants, the original Arabs, resemble no nation so much as the mountaineers of Abyssinia, who inhabit the upper country on the opposite side of the Red Sea, speak a language akin to that of Arabia, and are equally well-formed in their body, and probably nearly equal to them in their mental faculties. The Chinese, confined to their own territory by the nature of the country which surrounds them, and separated from the remainder of the world by seas and mountains, feel no inducement to abandon their fertile and extensive country; they therefore never concerned themselves about other nations, and excluded foreigners from their country. The Hindu, born only for his own Indian world, and fit for no other, placed in a country in which all the advantages with which Asia is gifted by nature are concentrated, early acquired a high degree of civilization; but he has never passed the boundary of his native land, and, with equal indifference, has received all foreigners who have entered the country as conquerors, merchants, colonists, or missionaries. The Arabs, on the other hand, whose native country spreads out between two great divisions of the globe, have assimilated themselves to both, and at one time extended their dominion to the most western point of Africa as well as to that of Asia. By far the greater number of Arabs are dispersed without the peninsula, which is the native country of their nation, but which prepared them for the endurance of every climate. Its sultry coasts resemble, in soil and natural qualities, the arid deserts of Libya; the moderate climate of the terraces approaches that of Deccan, Iran, and Catalonia, and the cold Nejd differs little in its physical character from the highland of Central Asia, on which we find the Arabs dispersed to a great distance from their native country.

We now pass to the third great division which the surface of Asia exhibits, the Lowlands, which everywhere are situated without the highland regions and the valleys formed in the extensive terraces around them. These latter, according to a rough estimate, may occupy a surface of about 4,300,000 square miles, or more than one-fifth of the whole extent of Asia, and consequently there remain about 6,000,000 square miles for the surface of the lowlands. These lowlands lie spread around the more elevated parts of the interior, and occupy countries of great extent along the sea, so that the lower course of the great river-systems traverses these often widely-stretching plains with many great windings and with very little fall. In these plains the great empires, by which the history of this division of the globe is so distinguished, have attained their greatest power, and continued for the longest period of time. The extensive low plains are six in number; they are different in their natural character, and in no way connected with one another.

The first is the great Chinese Lowland on the eastern shore of Asia, along the Pacific Ocean, beginning at Peking and extending along the Yellow Sea or Whang-Hay, southward past Nanking to the province of Kiang-si. Lying south of the 40th parallel, and extending nearly to the tropic, it enjoys a temperate climate, and exhibits the most advanced state of agriculture, the most extensive system of canals, the most active internal navigation, and is the richest and most populous granary in the whole world.

The second is the Indo-Chinese Lowland, which, lying between the Gulf of Tonkin and that of Siam, extends from the tenth degree of north-latitude to the tropic, and comprehends the kingdoms of Camboja and Siam; its northern boundary, however, is not yet ascertained. It unites the advantage of being situated south of the tropic with those of being plentifully provided with water, and it is therefore exceedingly well adapted to the culture of rice. A part of its surface is covered with stagnant water and lakes.

The third is the Lowland of Hindustan, or Sind, which comprehends the northern part of India, and extends in the form of a triangle between the Gulf of Bengal and that of Guzerat. It is bounded by the two river-systems of the Ganges and Indus, and overtopped by three table-lands, those of Tibet, of Iran, and of the Deccan. Being situated out of the torrid zone, but near the tropic, it enjoys all the advantages of a tropical climate, without its disadvantages. None of the lowlands equal it in the richness and variety of the natural scenes which surround it on all sides; it is no less populous than that of China, which it far exceeds in the number of different nations inhabiting it, and that of royal residences and centres of civilization, (Delhi, Agra, Benares, Calcutta, Lahore, Multan, Ajmeer, &c.,) nearly all of which are placed near its centre. In the western half, however, of this region, a narrow tract of land is covered with moveable sand, not unlike the Sahara.

The fourth Lowland is that of Syria and Arabia, which on its eastern extremity is bounded by the innermost corner of the Gulf of Persia, on the west by the mountains of Syria, on the south by the table-land of Nejd, and on the north and north-east by that of Iran. Only its northern half is watered by the river-system of the Euphrates and Tigris, while its southern half suffers much from want of moisture, and presents an arid and desert aspect.

The first two lowlands may be called *maritime*, and the second two *continental*. The Chinese and Indo-Chinese Lowlands are for the most part surrounded by seas, exposed to the continual action of high tides, and frequently drenched by the moisture brought by the winds from the east and south-east. The lowland of Hindustan, and that of Syria and Arabia, on the contrary, border only on narrow bays, and are on the south and on the north overtopped by high table-lands always enjoying a dry atmosphere Hence it follows, that in the last-mentioned lowlands dryness of the air prevails, as moisture in the former, and that they must be distinguished by all the consequent variations of vegetation and animal life. In China and the peninsula beyond the Ganges the inhabitants approach in their manners and customs the inhabitants of islands; but in India and Babylonia they are like the inhabitants of inland countries. The southern half of the lowland of Syria and Arabia, indeed, resembles the African Sahara, and is therefore called the Arabian Desert. Though situated without the tropic, it displays a tropical nature; and divested of the peculiarities by which Asia is distinguished, it partakes more than any other country of the features which characterize Africa, its arid climate and its natural productions.

The fifth is the northern or Siberian Lowland, which is by far the most extensive of all, occupying more than half the area of all the lowlands of Asia taken together, and extending along the Polar Sea the whole length of the continent from the Ural Mountains to the Pacific Ocean. Though traversed by extensive river-systems, it derives little advantage from this circumstance, as it contains only in the southern third of its surface (between 50° and 60° N. lat.) habitable and cultivable land; this part has been colonized in all its extent by European settlements, the most numerous in Asia. The northern and most extensive district, lying either within the polar circle or near it, is beyond the boundary of the cultivable world, and belongs rather to the polar region than to that division of the globe which has received the name of the East. The Lowland of Siberia, though its maritime boundary exhibits no great variety of forms, has, by its little elevation above the level of the sea, a great influence on the whole continent of Asia, which doubtless would have presented quite a different aspect, if high mountains had risen on the northern shores of Siberia, and formed its boundary towards the Pole.

The sixth Lowland is that of Bucharia, which is entirely continental, not being in contact with any part of the ocean, and only watered by inland seas, the Caspian and the lake of Aral. Its greatest extent is in the direction of the system of the double rivers which traverse it. Beginning at the innermost angle, formed by the western edge of the table-land of Tibet and the northern edge of that of Iran, this greatest of all the depressions on the surface of the globe extends, to the north-west, over the countries adjacent to both banks of the Volga, up to the river Don and the boundary of Europe, between the mountain-ranges of the Ural and of the Caucasus. Thus it may be considered as an intermediate form which connects Central Asia with Europe. Its extensive plains, which are scantily watered, are a kind of mean between sandy deserts and agricultural soil, and their surface is mainly formed of gravel. They are what are commonly called *steppes*—plains covered with grass, and without wood, in which are scattered, like oases, a few tracts of cultivable ground. Such a country is the natural abode of nomadic tribes. Deprived of all natural riches, except in a few places where agriculture is carried on by artificial irrigation and immense labour, and rather characterized by a total want of natural capabilities, this lowland is very remarkable in an historical point of view. Being placed in the centre of very extensive countries, and surrounded by different nations, it has been involved in all the great historical events: it was here that the conquerors, such as Cyrus and Alexander, who proceeded from the west, or those of China who came from the east, the Bactrians, Ghaznavides, and Great Mogols, who advanced from the south, and the Russians from the north, have found a stop to their farther progress.

The natural poverty of this country, and the comparative richness of those surrounding it, together with the want of fixed abodes, and the various political changes of the neighbouring countries, have frequently induced its inhabitants to pass its natural boundaries. Whilst their neighbours, the Chinese and Hindoos, never left their country, but took root there like plants, and became stationary nations, the inhabitants of this lowland have been, through all centuries, nations of change and migration, who, since the times of the Scythians, Goths, Alans, Uzes, Comanes, Petsheniges, Turks, and Tartars, till nearly our own times, have inundated Europe from time to time, and changed its face by destroying, impairing, or retarding civilization. Their own country, meanwhile, was not exempt from great changes, both as respects the nations which inhabited as well as the dynasties which governed it; and still, in our own times, it exercises a great influence on political events by its geographical position and the obstacles which it opposes to the progress of the three great empires of Asia—the Chinese on the east, the Russians on the north, and the British on the south.

In thus bringing the whole surface of Asia into one view, we find it composed of *six* lowlands, different in their nature, and independent of one another; they spread below and around two highlands occupying an immense space, which themselves are surrounded by seven or eight less extensive and entirely separated mountain or table-land regions: that of southern China, the peninsula without the Ganges, Deccan, Arabia, Syria, Armenia, and the isthmus of the Caucasus,—all of which exhibit peculiar features, by which the countries surrounding them are characterized, in the same manner as the great highlands characterize the whole continent. If we add to their number ten or twelve intermediate formations, constituting the terrace-regions, we have nearly a score and a half of great natural divisions on the surface of Asia, of which every one is subject to its peculiar natural laws, presents its peculiar natural appearance, and maintains a distinct character. Considerations on their mutual connexion and reciprocal influence alone can afford us a true view of the infinite variety and combination in the natural phenomena and the historical events of that great division of the globe, to which both the records of history and the laws of nature have induced us to assign the common name of Asia.

Minerals. Precious Stones.—Rock-crystal in the greatest variety, amethysts in the Altai, Himalaya, and Ural mountains; carnelians, agates, in western India, and in the Gobi desert; casholongs and onyxes, in Mongolia; yu, or oriental jade, in Turkistan; different kinds of jasper, in the Altai mountains; pearl-stone, marcasit, on the shores of the Gulf of Okhotzk; beryl, in the mountains near the lake of Baikal; lapis lazuli, in the same mountains, as well as in the Hindu Coosh, and on the banks of the Oxus; topazes, in the Ural mountains; circony, chrysoberyl, sapphires, on the island of Ceylon; rubies, in Ceylon and in Badakshan; turquoises, in Khorasan; diamonds, in Deccan. Borneo, and the Ural mountains.

Volcanic products are met with on the Sunda Islands, in Japan, and Kamtchatka, in the neighbourhood of Tauris, and many parts of the highland of Armenia, and in western Anatolia.

Steatite, earth-flax, asbestus, and coalin, or the finest porcelain-clay, are found in China and Japan; talc in Siberia: coals in northern China, and different parts of Hindustan; rock-salt in the Ural mountains, northern China, the Penjab, Ajmeer, Yemen, Anatolia; salt in the salt-seas of the steppes, and sometimes on the surface of the ground; salammoniac in the volcanic steppes of Central Asia, not far from the river Ili; nitre in Hindustan; borax, or tinqual, in Tibet; petroleum, near Baku, on the shores of the Caspian Sea, on the Euphrates at Hit, and other places, and at Kerkook east of the Tigris; asphaltum on the Dead Sea in Palestine. Hot springs are very abundant in the snow-covered ranges of the Himalaya range, especially along the upper branches of the Ganges, and in the N.W. of Anatolia.

Metals.—Gold in Japan, Tibet, Yun-nan, Cochin China, Tonkin, Siam, Malacca, Borneo, Asam, Ava, and in the Ural mountains; many rivers bring down gold in their sands; silver in China, Da-uria, Japan, Armenia, Anatolia, and the Ural mountains; tin in Malacca, Anam, the Sunda Islands, and the empire of the Birmans; mercury in China, Japan, and Tibet: copper in the Ural and Altai mountains, Japan, China, Nepal, Azerbijan, Armenia, and Mount Taurus; malachite in China and Siberia; iron from the Ural mountains, through central Asia as far as the Peninsula beyond the Ganges, as well as in Japan and Persia; lead in Da-uria, China, Siam, Japan, Georgia, and Armenia.

Extensive layers of fossil shell-fish are found on the highest table-lands of Tibet, from 16,000 to 18,000 feet above the sea, and the strata of the tertiary formation in Siberia are full of animal remains of the old world, as the elephant, mammoth, rhinoceros, &c.

V. *The Man of Asia.*—As Asia is the most extensive of the great divisions of the globe, it is likewise far superior to the rest, if we consider the number of its inhabitants, their variety, and historical fame. Upwards of 400 millions are dispersed over its surface: consequently, twice as many as the inhabitants of Europe, and more than eight times that of the inhabitants of America, which continent in its area approaches nearer to Asia than any other.

Many questions may be raised respecting the population of Asia. It may be asked, whether or not that continent was ever more populous than at present? How many of its inhabitants were destroyed during the wars of the Mongols? How far has its population decreased, owing to the despotism exercised by the Turks in the western countries? How many nations have already become entirely extinct, or exist in very small numbers, as the Philistines, the Phœnicians, the Babylonians, the Parsees, the Lydians, the Bactrians, the Medes, the Sogdiani? More than forty nations were destroyed in the middle age by the Mongol wars, according to the statements of the annalists of that time; and some have become nearly extinct in our times, as the Doms in the Himalaya range, the Miao-tse in southern China, the Tata in northern China, the tribes of the Tunguses, eastern Turks, and Samoiedes in the mountains of Sayansk, and others in Mount Caucasus. These questions cannot be answered with any degree of probability.

But we may safely assert that the number of foreigners who have settled in Asia is extremely small, compared with the numbers who have left it to inhabit other divisions of the globe. We may estimate the number of Europeans in India at a hundred thousand, those settled in Siberia, the descendants of the Cosacks included, at two millions, which probably exceeds the truth; and the Greeks of European origin, inhabiting Anatolia, at one million and a half, or even two, though these Greeks have long ago been changed into Asiatics. Few settlers have gone to Asia from Africa and America, and still fewer from Australia. The Egyptians never settled in Asia, but the Arabs settled in Egypt. Negro slaves are dispersed over Persia, Arabia, and Hindustan, but they are few in number. Abyssinians indeed, from time to time, entered Asia in crowds; they came, however, not as a nation, but as mercenary soldiers in the service of Arab emirs or of Indian rajas; and their descendants, like those of the Portuguese, have entirely merged in the native population. America, at all events, has not much increased the population of Asia: the Tchuktches, on the most north-eastern peninsula of Asia, who belong to the family of the Esquimaux, as the affinity of their language induces us to suppose, have perhaps not passed the sea into Asia, but are rather aborigines of Asia.

Thus we find Asia, like all other large divisions of the globe at the present day, inhabited by aborigines and foreigners, the two great divisions of mankind in an historical point of view. Asia has been the principal country from which emigration has spread, so far as the history of man is known: it has been the parent of nations who have left its bosom, to form, in other countries, a new character of social life.

If we consider the inhabitants of Asia according to the physical division of three principal races, the white (or Caucasian), the yellow (or Mongolian), and the black (or Ethiopian), and three intermediate races, namely the dark brown (or Malay), the negro-like (or Papuas, also called Austral negroes), and the copper-coloured (or American), we find that the greatest number of these races, and of those nations which connect them, are dispersed over the surface of this continent. They cannot always be exactly distinguished by the form of the skull, the hair, or the complexion of their skin. The three principal races border on one another in the elevated valleys of Central Asia, where the skulls of the Cashmirians show their Caucasian origin; whilst those of the Bhots, or inhabitants of Bhotan and Tibet, are Mongolic, and between them the skull of the negroes is found, if it be true, according to the observations of Traill, that the nearly extinct slave-tribe of the Doms, in the valleys of Kamaoon, belongs to the dark-coloured and woolly-haired race of the negroes. But perhaps these Doms are only the most northern representatives of the Austral negroes, which are dispersed through the peninsula beyond the Ganges and the Sunda Islands, as well as in the adjacent islands of Australia as far as New Guinea, and which, since they have become known, have been constantly called Papuas. By Cuvier they are enumerated among those tribes which have separated from the true negroes. The Malay race in their neighbourhood inhabits the island of Sumatra and the peninsula of Malacca. All the races enumerated are found in Asia, except the copper-coloured races of America; the Caucasian prevails from the centre of the continent toward the west and north-west, and the Mongolian likewise from the centre towards the east and north-east.

We shall not pursue further that division of the nations of Asia which is derived from the history and the genealogy of the different tribes, nor that which depends on their physical character, but rather follow that which results from the spoken languages. But we must also observe, that these three points do not always exactly coincide, and that many difficulties are still to be solved by further investigation. Still we think that the division which rests on the internal structure of the languages, is, as far as the investigation of this matter has been carried, the most certain and safest, and that the nearer or remoter kindred which exists between different nations may in some measure be indicated by it. Adopting, therefore, the division of nations according to their languages, the following groups may be enumerated in Asia.

The first in the order of historical importance is the Semitic nations. These are the Syrians and the Chaldæans, or the antient Aramæans; the Phœnicians—though the number of the pure and unmixed families belonging to this people may be very small—probably still exist in their antient country, especially near the Libanus; the Jews, who from Palestine have been dispersed over all Asia as far as the coast of Malabar and the northern provinces of China ' the Arabs, who are the most numerous of this race and less mixed with other nations, are dispersed through all western Asia as far as the mouths of the Indus and the sources of the Oxus.

It has only recently been demonstrated that the languages spoken by the aborigines of the countries on the Ganges and Indus, and even the peninsula within the Ganges, as well as those of Persia, and farther to the north-west the nations of Europe, as the Slaves, and those of German origin in the west and centre of Europe, display a great affinity in the grammatical structure as well as in the roots of numerous words. To this group belong the inhabitants of India, who speak the numerous dialects or languages derived from or connected with the Sanscrit. This remark applies also to the nations of Iran, as the Persians, perhaps the Kurdes, Beluches, Gipsies, and even the Bucharians, &c., though many of them have been mixed with other nations of Turkish, Mongolic, or Arabic origin. Besides these we must enumerate the Ossetes (or Iron, the descendants of the Alans) in Mount Caucasus, and some nations of Slavish origin inhabiting Asia, as well as the greatest number of the inhabitants of Europe.

The Armenians either belong to this group, or constitute a separate one. But the researches on the grammatical structure of their language have not yet been carried far enough to determine this point with any degree of certainty. From the mountainous table-land which is their native country they have been dispersed through the central and southern countries of Asia as far as China, and may in this respect be compared with the Arabs. The latter indeed are also met with in Africa, but the Armenians are found in Europe even as far as the middle course of the Danube river, but everywhere only as pacific settlers.

The Georgians form a separate group, inhabiting the Caucasian isthmus, between Mount Caucasus and the river Kur; besides the proper Georgians in Imerethi, three branches belong to it, the Mingrelians, Suanes, and the Lazes: the latter occupy the eastern shores of the Black Sea, and are the descendants of the ancient Colchi.

Different from them are the nations which inhabit the Caucasus as aborigines, and not as an adventitious people. They are divided into three principal tribes, the eastern Caucasians or Lesghiens, the middle Caucasians or Mitsdjekhes, also called Chekhes, and the western Caucasians or the Chercassians and Abassis, all of which are again divided into different smaller tribes, as is usual among mountaineers.

The Turkish nations form one of the most extensive groups. The greatest number of them occupy Central Asia, beginning on the east with the table-land of the Gobi of Hami, and the countries about the lake of Lop, and extending to the west through Turkistan, where they are called eastern Turks. Farther to the west, in the low land about the lake of Aral, they receive the name of Turkomans; and still farther in Asia Minor, and in the Ottoman empire of Europe, they are named Turks or Osmanlis. These nations may be considered as the principal stock of this great division, but its branches extend to the north and to the south between other nations of Mongolic or Persian origin, and are manifoldly interwoven and mixed with them; and although the physical structure of their body sometimes may display the most remarkable differences, these nations, from Pekin to Constantinople, speak dialects (called by us the Turk-Tartarian dialects) which are understood by all of them. The Turkmans or Truchmenes, a pastoral nation, divided into innumerable tribes, form the principal stock of the inhabitants of northern Persia, on the west side of the Caspian Sea, in Shirwan, Asia Minor, Khiva, and Bucharia, where a tribe of the eastern Turks, who are the original inhabitants of the centre of the table-land of eastern Asia (in Khotan, Yarkand, Turfan, Kashghar), under the name of the Uzbeks, have obtained the dominion of Turkistan and Bucharia. The Kirghises were formerly under the name of eastern Kerkis (Kazak or Hakas), the neighbours of the Mongols, and inhabited the upper course of the Yenesei and the Altai mountains, but they have been obliged to emigrate towards the west, where they occupy at present as pastoral tribes the steppes, which have received from them the name of the *Steppes of the great, middle, and little Kirghis tribes*. The Bashkires are settled in the southern branches of the Ural mountains. Besides these, many other nations and tribes, which commonly are called Turkish Tartarian, or Tartarian Siberian, or only Tartarian tribes speak Turkish dialects, though some of them have been mixed with Mongolic tribes. Among these may be enumerated the Nogai on the banks of the Kuban and Kuma near Mount Caucasus, who partly occupy also the Crimea in Europe; the Kumuks in the same country; the Karakalpaks near the lake of Aral; many tribes commonly called Tartars settled in Siberia, between Tobolsk and Yeneseisk; the Barabinzes wandering about on the steppe of Baraba, the Kusnes on the river Tom; the Katshinzes, Beltyres and Biruses in the mountains of Sayansk and the banks of the Upper Yenesei; the Teleutes, about the lake of Teletzkoi, and lastly the Yakutes, who form the extreme link of the Turkish nations towards the north-east, and occupy the banks of the middle course of the river Lena about Yakutzk, and even extend to the mouth of that river.

The nations of Samoiedic origin occupy two different countries distant from one another. The southern division inhabits the banks of the Upper Yenesei and the mountains of Sayansk, where the remnants of the formerly very numerous Samoiedic nations have remained in that country, of which they were the aborigines; they are divided into four tribes, the Uriankhai (or Soyot of the Chinese), the Motores, the Koibales, and the Karakashes. The northern division is settled along the Polar Sea to the north of the Lower Tunguska, and extends from the mouth of the river Yenesei to that of the Oby, and farther west to the northern part of the Ural mountains, and even in Europe as far as the White Sea; so that these tribes, which properly are called Samoiedes, are separated from the other above-named branches of their family by Turkish tribes and the Yenesians, who inhabit the country lying between them.

The Yenesians are an isolated and small tribe, whose abode is confined to the valley of the river Yenesei in its middle course between Abakansk and Turukhansk, and who formerly, like their neighbours the Samoiedes, inhabited the mountains of Sayansk and of the Altai-range, but like them were obliged to emigrate towards the north, when other nations which lived in their neighbourhood began to press upon them with superior force—an event which seems to have been extremely common in the countries in the north and north-west of Asia.

The nations of Finnic origin belong less to Asia than to Europe, where they are dispersed from the western declivity of the Ural mountains through the valley of the Upper Volga, as far as Lapland. Two tribes of this origin are found in Asia, the Vogules and the Ostiakes of the Oby river, who may be comprehended under the general name of Eastern Finns; they occupy the country extending from the Ural mountains eastward to the middle course of the Oby, so that they separate the northern Samoiedes from the Turkish tribes inhabiting the western districts of Siberia farther to the south.

The Mongolic stock of nations branches out into three great divisions—the proper Mongols, the Buriates, and the Ölöt or Kalmucks. The proper Mongols are settled on the southern side of the desert of Gobi as tribes charged with the defence of the boundary of the Chinese empire, and there they are called Tsakhar, whilst other tribes, comprehended under the name of Khalka, occupy the northern side of the Gobi. Other tribes farther to the south-west, towards Tangut and Tibet, are known under the general name of Sharaigol or Khor among the inhabitants of Tibet, also Sokbo, i. e. pastoral tribes. The greatest number of them depend on the court of Peking, and are distributed under different banners; a small number however are under the dominion of the Russians, in the countries surrounding the lake of Baikal, which likewise is inhabited by the second great branch of the Mongolic nations, the Buriates, who seem to have kept possession of their original native country. The third great branch of this extensive stock, the Olöth, who are dispersed over all the countries between the lake of Khukhu-Nor and the banks of the Volga, are again divided into four branches, and are known in Europe by the name of Calmucks (Kalmakh), which was given to them by the Russians. The most extensive of these branches was once formed by the Zungares, who, in the middle of the last century (1757), in their war with the Chinese, were partly destroyed, and their original country on the banks of the river Ili and of the lake of Balkash, on the south-west of the Altai mountains, which for some time had been entirely uninhabited, though it contains extensive pastures, was afterwards occupied by another branch of the Ölöt, the Turgut, whose tribes had till then been settled on the banks of the Volga to the north of Astrakhan. But some of their tribes remained on the banks of the Volga, and others are dispersed through Central Asia, as far as the lake of Khukhu-Nor. The third principal branch of the Olöt, the Khoshod, are less numerous, and inhabit likewise the countries surrounding the lake of Khukhu-Nor or the Blue lake. The fourth great branch of these Mongols, the Turbet, are settled still farther to the east, on the upper course of the Hoang-Ho.

The Tungooses form one of the most extensive families of nations in the north-eastern countries of Asia, occupying all that part which lies to the east of the northern Samoiedes on the Polar Sea, of the Yenesians, of the Uriankhai on the upper course of the Yenesei river and on the mountains of Sayansk, and to the north-east of the Mongolic tribes. From the upper course of both Tunguskas, they extend to the Polar Sea and the river Olenek, and thence over the middle course of the river Lena, and from the eastern extremity of the lake of Baikal over the river Witim as far as the shores of the Gulf of Okhotzk, where they are called Lamutes, or inhabitants of the shore. Towards the south-east they occupy the countries lying on the middle course of the Amur or Saghalien Oola and the banks of the Sungari Oola to the boundary of the peninsula of Korea. But neither at the mouth of the Amur, nor farther to the south, do the Tungooses extend to the shores of the sea; the latter being inhabited by the Aino, a tribe not belonging to this stock. The branches of the Tungooses are very numerous, but in modern times none of them has rendered itself conspicuous except that tribe which occupies the south-eastern corner of the country inhabited by them, and is called Mantchoo, which conquered China in the middle of the seventeenth century, and still governs that country. These Mantchoo Tungooses are found dispersed over all the provinces of the Chinese empire, where they constitute the military nobility.

The north-eastern part of Asia from the mouth of the Lena river to the sea between Asia and America is occupied by three nations, who speak quite different languages, though they live near one another on a country of comparatively no great extent. These nations are the Yookaghires, on both banks of the Indighirka; the Koriakes, from the Kowyma river to the Anadyr river, and round the Gulf of Penshinsk: and the Tchuktches, inhabiting the most north-eastern extremity of Asia. Between the latter and the Eskimaux tribes in North America such an affinity exists, as to language, that they have obtained the name of Polar Americans. The Kamtchadales too, who have given to, or received their name, from the peninsula which they inhabit, form a separate group of nations, speaking a peculiar language.

The tribes which are comprehended under the name of Kuriles, or Aino, are placed to the east of the Tungooses, or more exactly at the mouth of the Amur river and on the coast which extends to the south as far as Corea; they inhabit likewise the islands lying along this coast and extending southward to Yesso on the north of Japan, and northward under the name of Kuriles to the southern cape of Kamtchatka. Though these fishing tribes are dispersed over a very extensive coast, they have a common language.

The Japanese speak a language peculiar to themselves; and though their civilization exhibits a striking similarity to that of the Chinese, it seems not to have been influenced by the latter, but to have risen entirely from the peculiar character of the Japanese. Both their language and their civilization are confined to their islands, with the exception of the islands of Liew-kiew, whose inhabitants certainly belong to the same stock, but their language is said to be different.

The Coreans, or inhabitants of the peninsula of Corea, constitute likewise a separate nation, which many centuries ago inhabited the mountain-range which forms the northern boundary of the peninsula, and then were called Siãnpi; at present they are confined to the peninsula itself by their neighbours, the Mantchoo, who occupy the country farther north, and are quite different from them.

The Chinese constitute the most numerous and most civilized nation of eastern Asia, forming by far the greatest part of the population of China itself, and possessing a very rich literature. They are also dispersed over the other countries subject to the court of Pekin, and even beyond this boundary, where, however, they have only settled in more modern times. They have likewise formed many settlements on the island of Formosa, as well as on the Sunda islands, in Siam, Malacca, and in Ceylon.

The Tibetans, or inhabitants of Tibet, who call themselves Bhot or Bhota, constitute a very numerous group of tribes, which are far dispersed over the table-lands of eastern Asia, to the north of the Himalaya mountains, but all of them are very little known; it seems, however, that they are divided into many branches extending to the west, east, and north-east.

The different nations which occupy the peninsula without the Ganges, as the inhabitants of Anam, i. e. of Tonkin and Cochin China, those of Siam, Pegu, and Ava, or the Birmans, are still very imperfectly known; their languages, history, and peculiar manners and character have only of late years become an object of inquiry. The Malays are better known; they perhaps once occupied the mountain region of the peninsula of Malacca, but at present are only settled on the Sunda islands and the southern extremity of that peninsula. They speak a distinct and cultivated idiom, which is far diffused, on the west as far as Madagascar, and on the east over the islands of Sunda and the Philippines, and even to the most eastern island groups of the Pacific Ocean.

These are the principal groups of nations inhabiting Asia; but in the inland countries of that continent there still exist some feeble remains of antient nations which have not yet been subjected to a close investigation. Such are the Miao-tse in southern China, the Goands in Deccan, the Lolos and Carayn on the peninsula beyond the Ganges, the Siapush in the Hindu-Coosh mountains, and some others.

VII. *Political divisions.*—As nearly everything belonging to the geography of Asia appears to be formed on a colossal scale, the political relations of the different states which have taken possession of its extensive natural divisions are the same. We may state with certainty that at present there are only six empires of great power and importance which possess among them the whole continent. The others, of less extent and importance, are either dependent on these six, or at least are subordinate, and rendered of less political weight, from being separated from each other by the six. The east of Asia is occupied by the Chinese empire, the north by Russia, and the south by the British dominions; the other states lying between them, as the empire of the Birmans, and the kingdoms of Siam and Cochin China, are only of the second or third rank. The west of Asia, however, comprehends Persia, which is now divided into two states, Afghanistan (eastern Persia), and Persia Proper (western Persia), Turkey and Arabia; and if we except the small states of Khiwa and Bucharia in the low lands round the lake of Aral, there hardly exists an independent nation or sovereign of any weight in political matters. The area, as well as the population and the physical resources of Asia, are very unequally divided amongst those great monarchies.

Asia, according to an approximate estimate, contains from nineteen to nineteen and a half millions of square miles, including the islands, which occupy nearly one million and a half of square miles, or more than one third of the surface of Europe. If we further subtract the extensive lakes, as the Caspian Sea and the lakes of Aral, Baikal, and Balkash, which together occupy a surface of upwards of 200,000 miles, we find that the whole surface of continental Asia is reduced to about seventeen millions and a half, which may be supposed to be inhabited by from 450 to 500 millions of souls. Europe, which, according to a rough estimate, contains upwards of three millions of square miles, is inhabited by about 180 millions of souls; therefore, though Europe contains only about one-sixth of the surface of Asia, its population is equal to more than one-third of that of the latter continent. But political importance depends entirely on wealth and population, and not on the great extent of countries. Very extensive tracts, which are possessed by the two largest monarchies of Asia, are very thinly inhabited, whilst other portions of that continent have an excessively dense population, which gives them great weight in their political relations with the neighbouring nations.

The Russian empire extends through two of the great divisions of the globe, from the Atlantic Sea to the Pacific Ocean, and contains about 7,400,000 square miles, with a population of about 55 millions; more than two-thirds of its surface, namely, 5,800,000 square miles, and only one-fifth of its population, namely 11 millions, belong to Asia. In this account are included the antient Tartarian kingdoms of Kasan and Astrakhan, which by some geographers are assigned to Europe, and the wandering tribes of the Kirgises, which are estimated at 300,000, and the mountaineers of the Caucasus, at about half a million. Besides the two great Tartarian kingdoms of Kasan (the antient Bulgar), and Astrakhan (the antient Kaptshak), the Russian empire in Asia contains Siberia, the eastern boundary of which is not exactly fixed; the Caucasian provinces, three in number, which lie on both sides of Mount Caucasus and constitute a military government; the steppes of the Kirghises, a protected country; and the Siberian islands and peninsulas in the Polar region of the Pacific Ocean, as far as the north-western shores of North America. Up to the year 1822 Siberia was only under the orders of military governors: but at that period it was placed under a civil government, and divided into two great provinces or general governments, namely, Western Siberia, which comprehends the governments of Tobolsk, Omsk, and Tomsk; and Eastern Siberia, to which belong the governments of Irkutzk, Yeneseisk, and Yakutsk, with the two maritime governments of Okhotzk and Kamtchatka; and it is observed that, since this change has taken place, the settlement of European colonies through Northern Asia, to the east of the Ural mountains, has considerably increased.

The Chinese empire is limited to one of the great divisions of the globe—Asia, but it comprehends more than one-fourth of its surface, namely, upwards of five millions of square miles, with a population amounting at least to 235 millions; but if we may rely on the population list published by the court of Peking in the great imperial geography, the whole population of the empire in 1813 amounted to 361,703,110 individuals, consequently upwards of a hundred millions more than we have supposed. Its extent is greater than that of all Europe by nearly two millions of square miles, and its population is nearly double that of Europe, if we follow the statement of the Chinese government, or is equal to it and the whole population of the Russian empire in addition, if we follow the more moderate supposition. The subjects of the Russian emperor in Asia do not exceed 1-40th of the whole population of that continent, but those who obey the Emperor of China may be considered as constituting one half of all its inhabitants. Though, therefore, both these empires are nearly equal in extent, the amount of their population is widely different, and the Russian empire occupies a very subordinate political relation. China occupies the first place among the political bodies of Asia, and in this position it has maintained itself for two thousand years, whilst the power of Russia does not yet reckon two hundred. But every part of the immense surface of the Chinese empire is not of equal importance. In the Russian empire the Ural mountains are the natural boundary of its body, whose head is placed in Europe, but whose limbs extend through the whole north of Asia as far as Kamtchatka, and are a mere appendage, which adds very little to the internal force of the body. Nearly the same circumstances exist in China. The head of the Chinese empire is at a short distance from the Pacific Ocean, on the eastern side of the table-lands of the Gobi and of Tibet, in the rich and fertile and densely-populated lowlands of China, or in that part which is properly called China (Chin). But all the other provinces to the north of the Great Wall and to the west of its western extremity, must be considered as an appendage, which is of comparatively very little political importance with regard to the whole empire. By some event this union might be dissolved, and the exterior limbs separated, which has actually taken place more than once on the change of the reigning dynasties; but such events have not injured the proper body of the empire, which has rather attained a greater concentration of its internal forces by this separation. These external provinces or intermediate countries are only of importance to the government by impeding foreigners (*i. e.* barbarians, called *fan*) from entering into immediate intercourse with the natives of the Celestial Empire, and as a barrier against the more western empires and nations (Si-yu, Si-fan). As provinces of inferior political importance, but forming an impenetrable barrier to intercourse with the neighbouring nations, we must consider all the countries extending over the Chinese table-lands, the boundaries of which are nearly coincident with those of the highlands of eastern Asia. The Chinese empire accordingly comprehends five great divisions of countries, besides some of less extent; and with respect to their political relation towards the government, they may be divided into three classes. The first class comprehends China Proper alone, the permanent seat of government and the residence of the sovereigns, either in the southern capital (Nan-king), or in the northern (Pe-king), as at present. The second class is composed of three great kingdoms, subject to the court of Pekin,—Mantchooria on the north-east, the native country of the present dynasty, which is of Tungoose origin; Mongolia on the north and north-west, or the native country of all Mongolic tribes; and Hami, Turfan, Khotan, Yarkend, Kashghar, and the mountainous Bucharia, or rather Chinese Turkistan, which are properly the native countries of the eastern Turkish Tartarian tribes. The third class is composed of the protected countries, which have only in part received Chinese institutions, such as Tibet, Bhotan, Undes, Ladakh, and other small countries on the table-lands towards the south and west; and on the east the peninsula of Corea and the island of Formosa, as well as the Liquejos or Liew-kiew islands.

The *British dominions in the East Indies* are, for the most part, in India, or the peninsula within the Ganges, a country which is little less than half the surface of Europe, and has a population inferior to that of Europe by only about fifty millions, so that, though only half as large as Europe, India has nearly three-fourths of its inhabitants. Were the whole population of the Russian empire in Asia uniformly and equally distributed over the country, every square mile would be inhabited only by two individuals: the same calculation, applied to the whole Chinese empire, would assign to every square mile somewhat more than forty-six persons; but in India, more than double that number. This circumstance is of great moment in the political balance in favour of the British dominion, especially as their possessions comprehend those parts of the peninsula which are the most densely peopled, and in which agriculture and civilization have made most progress; whilst the dominion of the Chinese extends over many countries, inhabited by wandering nomadic tribes, still sunk in barbarism. If we consider only the immediate possessions of the British in India, excluding even the island of Ceylon, we find that they have a population of from seventy to eighty millions on a surface little exceeding 650,000 square miles; but their political importance can only be duly estimated, if we consider how this population is concentrated, and how easily accessible these countries are by sea and the great navigable rivers. To this we may add, the security which the peninsula derives from being in the hands of a nation possessing the most powerful navy in the world. But the British influence is not limited to the immediate possessions of the three presidencies of Calcutta, Madras, and Bombay; it extends over a great number of dependent and protected sovereigns, who possess a territory as large as that of the East India Company, and, taken together, probably not less than forty millions of subjects. The whole number of such rajas and nawaubs exceeds forty, and some of them possess countries of considerable extent, as the monarchs of Oude, of Nagpoor, Mysore, Satarah, Travancore, and the Nizam of Golconda. To these we must add the island of Ceylon, which belongs to the crown, and is of the greatest importance as a well-situated and convenient station for the navy. The countries which are still entirely independent of British influence are situated on the extreme boundary of India, as the government of the Sikhs, and the alpine state of Nepaul, both on the northern limits of the British possessions. The territories of Runjeet Singh extend from the Setledge to the Indus, and from Cashmere to Mooltan, comprising the whole of the countries of the Penj-ab: under him the Sikh nation has changed from a republic to an absolute monarchy. One sovereign only at present exists within the boundary of these territories, who may still lay claim to independence, the Maharaja Sindiah, a Mahratta prince, whose possessions, everywhere surrounded by the British dominions, extend to the north of the table-land of Deccan. But all these independent states are subordinate as to power and influence; they comprehend less than 200,000 square miles of surface, with a population short of ten millions. By the peace concluded at the termination of the Burmese war (1826), the possessions of the Company have been increased, by the acquisition of Aracan, with upwards of 20,000 square miles, and a population of about 200,000 souls, and of the more southern maritime provinces of Ye, Tavoy, and Mergui, with a surface of more than 30,000 square miles, but a very scanty population, not exceeding 35,000 persons. But nevertheless the possession of the latter country is important, by securing to the British nation the dominion over the gulf of Bengal and the straits of the Sunda islands.

The *Portuguese*, whose settlements were formerly so numerous on the coasts and in the islands of the Indian Sea, have preserved Goa, with a few adjacent places, Daman, and a small portion of the peninsula of Guzerat, with the fortress of Diu, a place important for the construction of vessels. These possessions, together with the island of Macao, in the bay of Canton in China, and some small districts of the island of Timor, are supposed to contain about 30,000 square miles, and half a million of inhabitants.

The *French* settlements in Asia are confined to India, and comprehend the governments of Pondicherry, with the towns of Pondicherry and Carical, on the coast of Coromandel, and a few other places, among which Chandernagor, in Bengal, and Mahé, on the coast of Malabar, are the most important. The whole area possessed by the French does not exceed 450 square miles, with a population of 200,000 individuals.

The *Danish* colonies consist only of the town of Tranquebar, and its territory, on the coast of Coromandel, a place remarkable for the influence which the missionary establish ment of the Protestant creed, which was erected here more early than in other places, exercised on the neighbourhood. The Danes have also a small settlement at Serampore, on the Ganges.

The settlements of the *Dutch* were formerly dispersed over the coasts of both peninsulas of India, as well as over the adjacent islands; but they were obliged to abandon them by degrees; and since 1821 they have been limited to the islands. Their power begins on the west with Sumatra, and extends over Java, as far as the Moluccas, or Spice Islands. These possessions comprehend a surface of about 86,000 square miles, and a population of perhaps five millions. They are divided into seven governments: Batavia, with the seat of the general governor, and Sumatra, Amboyna, Banda, Ternate, Macassar, and Timor.

These are the great empires and the colonies of the European nations, among which the north, east, south, and centre of Asia is divided; but besides these, there still exist some sovereignties, which, though not powerful enough to influence materially the political affairs of that continent, possess considerable importance in their immediate neighbourhood. Such are the empire of Ava or Birma, with a surface of perhaps more than 250,000 square miles, and a population of fourteen millions; the kingdom of Asam, with about a million of inhabitants, whose raja, however, is dependent on the British in Calcutta; and in its neighbourhood, a few small states in the mountains, as that of the Garrows, Munipore, Cashar, &c.; farther, the kingdoms of Siam and Annam, which latter comprehends the ancient sovereignties of Camboja, Cochin China, and Tonkin, some petty but independent princes on the peninsula of Malacca, on which the British only possess the town and harbour of Singapore, with its annexed territory, and about 30,000 inhabitants, and a great number of petty sovereignties on the Sunda islands. Still we have to notice the most eastern of all Asiatic countries, Japan, which consists of many islands, comprehending an area of more than 200,000 square miles, with a very dense population, estimated at twenty-five millions.

The political relations of western Asia are quite distinct from those of its eastern countries. Other political bodies are here predominant. The influence of the British on the south, and that of the Russians on the north, is here only subordinate; and the empire of China has no weight at all. In the lowlands, on the banks of the Gihon and Sir Darya, political power is subject to continual changes and divisions, which put a limit to the extension of the influence of the Chinese empire, though it projects like a wedge between Siberia on the north and India on the south. This territory of the nomadic tribes, with its agriculture dispersed in the fashion of oases, is probably the country of the Massagetæ of the ancients, the Khorasmia and Mawar-al-Nahar of the Arabs, the Zagatai of the Mongols in the middle ages, and contains at present the states of Bokhara, or Usbekistan, and Khiwa, each of which may comprehend about 100,000 square miles; and besides these, many petty sovereignties in the mountain regions, as Khokan, Badakshan, Turkistan, Tashkend, &c. All these countries must be considered as placed without the political relations of eastern, as well as of western Asia, and cannot be enumerated among the civilized kingdoms, which have attained a fixed and determinate form of government.

The nations whose power is prevalent in western Asia are the Persians, the Arabs, and the Turks. Persia, which occupies the centre, would doubtless exercise a decisive influence, if it still formed one entire and undivided empire; but for more than half a century this country has been divided into two sovereignties, Eastern Persia, or Afghanistan, and Western Persia, or Persia Proper, nearly equal in extent, and each comprehending upwards of 500,000 square miles. But their population is still more unequal: Western Persia contains about nine millions of inhabitants, but Afghanistan probably does not exceed seven. The political power of the latter is besides diminished by its southern portion, called Beluchistan, which comprehends half of its surface, and perhaps one-third of its population, being placed under the sway of its own sovereign, and still further by having lost nearly entirely some of its provinces, as Herat on the west, and Cashmere on the east, which at present are united to it by very slender bonds. Both countries however, Persia Proper and Afghanistan, preserve the importance which is secured to them by their geographical situation, as being the countries through which the commercial intercourse between eastern and western Asia is carried on, which influence is still considerably increased by their being placed between the dominions of the Russians on the north, of the Turks on the west, and the British in India on the south.

Arabistan, the country of the Arabs, is of very little weight in the political affairs of Asia, and has always been so since the destruction of the caliphat. Its inhabitants are for the most part divided into wandering tribes, who are mostly independent of one another, and therefore cannot act in union and with effect. Some of them are subject to the Turkish empire, but the Arabs and Turks consider one another as personal enemies, and have frequent feuds. Though this country is very thinly peopled, its inhabitants may be estimated at from ten to twelve millions, and it is divided into four considerable sovereignties and a great number of smaller political bodies, which however are often more or less dependent either on an Arabian prince or a foreigner. The four great sovereignties are formed by the religious political government of the Wahhabites, in the centre of the country, the Nejd, which indeed seemed entirely destroyed in 1815, but which again, as has already been the case more than once, raises its head, and begins to exist as a separate political body, though it is in some measure subject to the active pasha of Egypt. The most powerful monarchs, besides them, are the Imam of Yemen on the southern shores, and that of Muscat on the south-eastern corner, who, no less than the Sheriff of Mecca, and a great number of petty Beduin princes, are always engaged in secret or open war against the Turks, who claim them as their subjects. At the present moment it may be said that the power of the Turkish emperor over Arabia is only nominal.

The Turkish empire constitutes the last of the three great powers of western Asia; but its power in Europe having considerably declined, especially of late years, this has had a corresponding effect on its political relations in Asia; and it can no longer be said that this empire extends over countries lying in the three great divisions of the antient world.

Not many years ago, the surface of the Turkish empire was estimated at 900,000 square miles; but since that time its possessions in Africa, which formed nearly a third of the whole, have been lost; Greece has been separated from its territory in Europe, and even of the countries belonging in Asia to the Turkish empire, which, on a surface of about 450,000 square miles, contain about twelve millions of inhabitants, a great province, Syria, has been yielded up to the pasha of Egypt. The other provinces, divided into pashalics, are not in any intimate connexion with one another, nor even with the centre of the empire, and a great number of the inhabitants of the pashalic of Erzerum, which protects the northern boundary of the empire against Russia, have been transplanted to other countries. Many of the nations which inhabit the provinces lying on the boundary, as the Turkmans, the Kurds, the Caucasians, are still more difficult to keep in subjection than the pashas themselves.

ASIA, BOTANY OF. With reference to the character of its vegetation, Asia may be conveniently divided into seven regions, namely, 1. the Siberian; 2. the Tartarian; 3. the Cashmerian; 4. the Syrian; 5. the Himalayan; 6. the Indian; and 7. the Malayan or Equinoctial. There are certainly no very precise limits between these, but nevertheless they may be taken as representing so many well-marked features of the Asiatic Flora, and as expressing the most important differences of climate which this division of the world exhibits.

I. The *Siberian* region comprehends all the northern parts of Asia lying between the Arctic Ocean and Tartary, including Kamtchatka on the east and the whole range of the Caucasian and Ural Mountains on the west, thus forming a broad belt passing over the whole continent, and limited on the south by the 50th parallel of latitude. In its general features this region is essentially European on the west, and similar to the west coast of America on the east. Its northern portion experiences in many places extremely rigorous winters and short summers, and the earth is perpetually frozen below the vegetable mould that overlies the surface. In the neighbourhood of Eneseisk or Yeneseisk this is particularly remarkable. In that part of Asia the cold is so incredibly intense, that, according to Gmelin, 72° below zero of Fahrenheit is not very unusual, and it has been known as low as 120° below zero; birds and animals, as well as man, perish beneath this dreadful temperature, their very blood being frozen in their veins.

In a country where this degree of cold exists, vegetation must of necessity be of the most stunted description; accordingly we read of whole districts covered with nothing but morasses of coarse rushes mixed with diminutive birches and arbutus, small willows, and an arctic bramble or two; cabbages will not exist, and corn is almost unknown in a growing state. In somewhat milder districts, where perpetual sunlight begins to be exchanged for the alternation of day and night and longer summers, the country is clothed with immense forests of birches, larches, and pines, among which the Cembra pine is a noble object, frequently attaining the height of 120 feet; to these are added Tartarian maples, balsams, poplars, and wild cherries, along with many species of *Caragana*, which is a genus characteristic of Siberia. Great numbers of gentians, especially *G. algida*, with its blue and white blossoms, large patches of the yellow *Rhododendron chrysanthum*, and the rich purple *Rhododendron dauricum*, with quantities of dwarf almonds and a great variety of other pretty flowers, fill the meadows and open parts of the country. Lilies of different kinds are met with in abundance in the eastern parts of the Siberian region, and their bulbs are used in Kamtchatka for food: in many places are also found rhubarbs, especially that sort called *Rheum undulatum*, but not the officinal species, the station of which is probably in the Tartarian region. Among the strong points of resemblance between this portion of the Asiatic Flora and that of the opposite coast of America may be mentioned the abundance of cinquefoils (*Potentilla*) found in both, one of which, *Potentilla pectinata*, appears to be common to both countries; *Pedicularis resupinata*, a very remarkable species, is also met with in both. Corn is cultivated successfully only in the southern parts of the Siberian region. In the eastern part, according to Malte Brun, grain has not been found to ripen either at Oodskoi, which is under 55°, or in Kamtchatka at 57°, but the south-west parts possess remarkable fertility. On the north of Kolyban, barley gives a return of twelve and oats of twenty fold. Wheat is, however, raised with difficulty, and in its room the inhabitants sow different kinds of buck-wheat (*Polygonum*), from which a bad kind of bread is prepared, as in China and some parts of Lombardy.

II. The *Tartaric* region, as it is next the Siberian, so it resembles it in most respects; and it may even be doubted whether it ought to be botanically distinguished, especially as very little is known of the exact nature of any part of its Flora, except that of Kunawur. It may, however, be characterized as being essentially Siberian in its genera, but distinct in the majority of its species; and so modified by the extreme cold and dryness of the climate, in consequence of the great elevation of the country, that most of the Siberian species, which are formed to breathe a more humid air, can scarcely exist in it. Cut off from the plains of India by the lofty pinnacles of the Himalayan range, it has no gradual communication with a tropical Flora in any of its provinces, but retains to its most southern limits its own peculiar aspect. Of the few species which botanists have seen from the most southern part of this region, scarcely any are met with in Siberia. What is called by travellers Tartaric Furze, has been ascertained by Mr. Royle to consist of prickly species of *Genista*, *Astragalus*, and *Caragana;* and the gooseberries, and currants, and willows, and rhubarb, are all of kinds unknown to the north of Asia, starved and stunted by the miserable climate.

The passes to the northern face of the range of stupendous mountains which divide the *Himalayan* region from that on the west, are described by Burnes as almost destitute of vegetation; but the assafœtida plants grow there in great luxuriance, and form the principal pasture of the flocks which browse on them. An umbelliferous plant, called Prangos, is also found a valuable winter food for sheep.

In some places of this Trans-Himalayan region the aridity of the atmosphere is so great, that things neither rot nor decompose, but fall to dust in course of time: the surface of the soil is parched up and actually baked white by the scorching influence of the sun's rays, so that the face of the hills is actually dead. On the elevated table-land of Tartary the mountains are from 18,000 to 19,000 feet above the sea, and rise from the water's edge without forests or even a bush, clothed with a withered and russet vegetation, and bare of snow. (Royle.) In other places, however, many trees are met with, among which are Tartaric species of ash, hazel, cypress, oaks, poplars, birches, pavias, &c. The Neoza pine (*Pinus Gerardiana*), the seeds of which are eatable, like those of the stone pine in Europe; the Indian cedar (*Abies Deodara*), *Abies Webbiana*, and a few other trees, with a northern aspect, straggle on the mountains from the Indian side, and give an air of grandeur to some parts of this otherwise desolate region. Some places in the lowlands, such as Balk, where the climate is less arid, produce fruit of great excellence, and resemble the Flora of the Cashmerian region. In Kunawur, barley, buckwheat, and turnips, were seen by the Messrs. Gerard at 13,600 feet; and a little lower the ground was covered with thyme, sage, and many other aromatic plants. At 17,000 feet Tartarian furze still grows.

III. In the northern districts of Persia, and in those provinces which stand between the Indian territory and that kingdom, nature still refuses to assume the tropical features which, as will presently be seen, characterize Asia south of the Himalaya and east of the Indus. In many respects the vegetation of this, which may be called the *Cashmerian* region, is so like that of Europe, that, according to a French traveller in Cashmere, one would fancy oneself on a mountain in Auvergne, rather than in an Asiatic province bordering upon India. This arises from the resemblance that exists between the climate of many parts of Persia and that of Europe, which is mainly due to the high level of Iran. Sharp winters and fine warm summers nourish races of trees and flowers far more luxuriant and delicate than can appear in the long-protracted cold, and short summers of Siberia, or the dry and inclement steppes of Tartary. It is here that plants which delight in bright light and high summer heat, with a moist atmosphere, in their growing season, but which require a long and steady rest in winter, are met with in perfection; in a word, it is a climate which would suit tropical plants if it were not for the periodical cold. Rice, oranges, and olives, pomegranates, almonds, and fig trees, remind the traveller of Italy, while grapes, mulberries, and the ordinary European fruit trees cast a northern aspect over the scenery. All things that require much heat and light to arrive at perfection, such as the fragrant principle of tobacco, the narcotic juice of the opium-poppy, and the tears of the manna-ash, are produced in the Cashmerian region in the greatest excellence. In some places the appearance of a few herbs of tropical forms indicates an approach to the vegetation of India; such as the salep plant, which belongs to a genus otherwise confined to the tropical parts of Asia; cotton; and here and there the sugar-cane; but there is no trace of the great features of a more southern vegetation. In Cashmere the most interesting part of the flora is collected. In this province flourish many of the fruits now cultivated in Europe; apricots, peaches, plums, cherries, apples, pears, and grapes, all in the greatest profusion, supply the markets. The walnut, which here is wild, is cultivated extensively for the sake of the oil which is pressed from its seeds, and used both in cookery, for burning, and instead of linseed oil for painters' work. 'The vine scales the summit of the poplar, and is never restrained by pruning, though, compared with it, those of Europe, either on the trellis or the wall, sink into insignificance.' In the forests are found oriental planes and horse-chestnut trees (*Pavias*) truly wild; in the fields grow most of our European kinds of corn along with rice; and in the gardens the ordinary culinary vegetables of Europe. The Singhara nut (*trapa*) forms an object of general cultivation in the lakes which surround the city of Cashmere; one lake alone is stated by Moorcroft to produce from 96,000 to 128,000 ass-loads of this nut, and about 30,000 people are almost wholly supported by it for five months out of twelve. Nothing perhaps is more remarkable in Cashmere than its floating gardens, formed from the entangled stems of water-lilies covered with earth, and planted with melons and cucumbers, which, thus treated, arrive at the highest state of perfection, and are produced in great numbers.

The prangos, already mentioned, a kind of umbelliferous plant, is collected in some parts for the sake of the leaves, which, when dried, furnish a fodder much esteemed for sheep; and finally, the saffron crocus, which arrives at a great size, is extensively cultivated, and is a source of considerable revenue.

IV. Dovetailing, as it were, with what we have called the

Cashmerian region, passing even through southern Persia into northern India, and finding its eastern limits in the Great Indian Desert, of which Delhi may be considered as the extreme point, is a botanical region that requires to be distinguished, and to which the name of *Syrian* may be conveniently given, from its commencing with Syria on the west. It also comprehends the greater part of Turkey in Asia, and the north of Arabia. It might almost be called a *Southern Tartarian* region, for its peculiar appearance is caused by aridity and heat, as that of the real Tartarian region is caused by aridity and cold. At its western extremity the Syrian region resembles the north of Africa and the south of Europe in many of its plants; on the east it is occupied by species having a certain degree of relation to the others, but more Indian in their character; for instance, it appears from Mr. Royle's list, that near Delhi such plants as species of flacourtia, elytraria, cocculus, and lepidagathis, which consist principally of Indian species, are intermixed with fagonias, grewias, capers, camel's-thorn (*Alhagi*), særuas and scrubby heliotropes, which are truly Syrian. Desolation is the characteristic of a very large part of this region; destitute of water, and scorched by a fervid sun, it is physically impossible for the vegetation to consist of any but stunted shrubs or starved and withering herbs. The trees are few and thorny, and scantily clothed with foliage; the very herbs are spiny from want of power to develope the soft green parenchyma of the leaf between their rigid veins; and they are shaggy with long hairs, which nature gives them as a feeble means of sucking up the scanty moisture of the atmosphere. If among this barren region oases are found shaded with date trees and mountains rich with verdure, they only form a sad contrast with the dreariness of the scene beyond them, and by no means diminish the truth of the picture we have drawn. Sinde may be considered the most south-eastern point of the Syrian region; here the vegetation of uncultivated tracts is described as of a miserable description. Great quantities of a sort of tamarisk, intermixed with thorny acacias, a deformed euphorbia, the flowers of which are still more uninviting than its bloated leafless stems, neem trees (*melia*), and peepuls (*Ficus religiosa*), constitute the principal features of the scenery.

V. From countries like these we turn to the rich and varied sides of that stupendous mountain-ridge which, under the name of the Himalaya, forms an eternal barrier between Tartary and Hindustan. Of this fine region, which may hence be called the *Himalayan*, an invaluable account is given by Mr. Royle in his *Illustrations of the Botany of the Himalayan Mountains*, to which we are indebted for the principal part of our data regarding the vegetation of India. In consequence of the rich and humid plains that lie at its feet, and its great elevation, it is characterized by an intermixture of tropical and temperate plants, the former of which ascend the sides of the hills till they lose themselves among the latter, which in their turn give way, as the snow is approached, to truly Alpine vegetation. In the Himalayan region may also be comprehended the whole of the north of China and Japan and the higher ranges of the Neilgherry, so strong is the resemblance between the plants of these countries and the north of India in their leading features. As the Himalayas are ascended from the plains, the pine-apple is found no longer to flourish; mangoes and custard-apples suffer from cold; the plantain is only able to exist in consequence of the numerous coverings formed by the sheaths of its leaves. The trees are nearly the same as those of the plains of Upper India, 'consisting almost entirely of dicotyledonous species, which lose their leaves in the cold weather as completely as trees in more northern climates.' Two species of *phœnix*, or date, form the only palms that are met with; and bamboos become few and weak. But within the Himalayas, at elevations of 2000 feet and more, are valleys which, 'being within the influence of the tropical rains, have a peculiarity of atmospherical phenomena which favours the existence of a series of forms not otherwise to be expected in a climate of which the mean temperature is so low.' Here accordingly are found oranges in a wild state, arborescent plants related to the cashew-nut, cassias, bauhinias, and gigantic cotton-trees, great forests of saul trees (*Shorea robusta*), and shrubby euphorbias; among which are found abundance of scitamineous plants and many epiphytal orchideæ. Cane-palms (*calamus*) reach these valleys, but ascend no higher; and are met by a pine (*Pinus longifolia*), which descends from the mountains till it loses itself amidst tropical forms and a few straggling elms, willows, roses, violets, and other European-looking plants. Mr. Royle mentions 4000 or 5000 feet as the average height at which tropical trees entirely disappear.

It is in the mid-region of the Himalayas, 'between 5000 and 9000 feet of elevation,' that its most lovely features are to be seen. Here in many places occur in the rainy season a few lingering tropical herbs, which are protected from the cold in winter by the earth in which they grow; several scitamineæ, begonias, osbeckias, and justicias, are found among quantities of balsams; while the trees are oaks, sycamores, elms, hornbeam, and pine-trees, and the shrubs berberries, roses, and honeysuckles, all of Indian species but European forms: in this favoured spot are also found numerous saxifrages, crowfoots, geraniums, and violets, with gentians, primroses, and labiate plants. It is this belt that is inhabited by the scarlet rhododendron, and on its lower edge by those wild camellias and tea-like plants which render it probable that the tea-plant itself with all its commercial wealth might be transferred from China to the British dominions in India. At 9000 feet elevation is found the curious *Roscoea alpina* of Mr. Royle, which is a most remarkable instance of an Alpine species of a tribe almost every other species of which is tropical.

The third and upper belt only ceases with vegetation, which on the Himalayas is protracted to an elevation unknown in any other part of the globe. As we ascend from the second belt, trees of rhododendron and *Quercus lanata* are first passed through. To them succeed pines and firs of various kinds; of which the most remarkable species are *Pinus excelsa*, and *Abies Webbiana, Deodara*, and *Morinda*, which exist in a splendid state at 11,000 and 11,500 feet of elevation; oaks in great variety, yews, birches, sycamores, and poplars, together with *Rhododendron campanulatum*, roses, viburnums, and honeysuckles; after which follow patches of snow, with the Himalayan bamboo (a very curious circumstance), levelled with the ground. To these succeed forests of *Quercus semecarpifolia;* and finally the limits of vegetation are marked by a few starved yews and junipers, with primroses 'pressing up in the warmer situations, dwarf species of *Rhododendron, Andromeda fastigiata* (the heather of Mr. Frazer), and *Salix Lindleyana*.' It is curious to find on these mountains some plants, the general conformation of which is first Chinese and then American; instances of which occur in the genera *Tricyrtis, Abelia, Camellia*, and many others, which are Chinese, and in *Triosteum*, which is completely American.

The agriculture of this region is as singular as the other parts of the vegetation; wheat is sometimes cut at the top of a mountain, and rice at its foot. Maize, millet, and many small grains constitute 'the rain-crop;' capsicums, turmeric, and ginger, are grown as high as 4000 feet; cotton succeeds even in Kumaon; wheat is cultivated as high as 10,000 feet, and even 12,000 feet according to Captain Webb.

Notwithstanding the difference in the aspect of the countries and the want of the mountains that constitute the great features of the Himalayas, the plants of the north of China and Japan are undoubtedly of a nature sufficiently similar to be included in the Himalayan region; and if we were also to comprehend the mountain Floras of Java and other Malayan islands, we should probably be correct. At present, however, the data regarding these places are not sufficiently exact to enable us to separate them from the Malayan region in which they are found.

VI. In the *Indian* region should be comprehended all those countries which, like Hindustan, are capable of bearing coffee, indigo, sugar-canes, palms, and other ordinary products of a tropical district, without excessive humidity existing at all periods of the year. In this view it would include Arabia Felix, Burma, Siam, Cochin China, and the continental lands connected with these countries. What is called jungle is met with in most parts of this region. In the words of Mr. Royle, 'tracts of this kind are low, and being inundated during the rainy season, as well as by the hill-streams frequently overflowing their banks, are generally in a moist state, and have hence been called the Turrai or moist land. The powerful rays of a nearly vertical sun beating upon this, and a dense mass of vegetation where there is little circulation of air, produce a heated and moist atmosphere highly favourable to the production of tropical plants.' From the southern and eastern parts of this tract, or the confines of Silhet and Chittagong, Drs. Rox burgh and Wallich obtained their splendid specimens of tree-ferns.'

In these damp and swampy forests eternal pestilence reigns; so that the native wood-cutters are often unable to remain in them more than a few days at a time, fevers and bowel complaints universally attacking them after a short exposure to their baneful influence. It is here, however, that some of the most remarkable and valuable of the vegetable productions of continental India are to be met with: it is here that are found the sapan trees, so important for their extreme hardness, teak, and many of the finest of the Indian timber trees; and amidst the vapours arising from the beds of the mountain-torrents which often tear a way for themselves through the forests, abound numerous species of ferns, together with those singular plants called by botanists *Orchideous epiphytes*, which cling by their aërial roots to the branches of trees, and astonish the traveller by their brilliant colours and grotesque forms.

In the cleared ground, where the soil is exposed to the rays of the sun and the earth is dried by a free ventilation, palms and evergreen trees of remarkable kinds are met with. Mangoes are planted round the villages, Palmyra-trees (*Borassus flabelliformis*) are in many places extremely common; cocoa-nuts and Gomuto palms (*Arenga saccharifera*) are of frequent occurrence; a coarse grass overruns the plains, except in the cultivated spots, which are occupied by rice, sesamum, cotton, hemp, sugar-canes, yams, indigo, maize, the betel and other peppers. In place of *epiphytal orchideæ* the branches of trees are occupied with parasitical *loranthi*, which, absorbing their food from the inside of the trees that bear them, are able to set at defiance the dry atmosphere with which at one season of the year they are surrounded. Tobacco arrrives in some places, as on the coast of Martaban, at such excellence as to rival that of Shiraz, and to render it a subject of surprise that it should not have been an article of export. Add to these areca palms, plantains, and bananas, jacks (*Artocarpus integrifolia*), guavas, and jamrosade trees, and a tolerable notion will be had of the ordinary appearance of the true Indian region. The flora of this country is, however, so vast, that no general description can give an idea of its richness and variety.

Among the most remarkable features in the Flora of India is the Banyan tree (*Ficus Indica*), the branches of which emit roots which descend to the earth, where they fix themselves, and become in time large trunks. When a banyan tree becomes old, and acquires a great number of such trunks, one individual will have the appearance of a grove. Many cases are cited of trees of this sort arriving at a prodigious size; the following, mentioned in the Journal of the Asiatic Society as growing in the territory of Mysore, will give a good notion of the surprising magnitude they sometimes attain. 'The centre tree is about fifty or sixty feet in height, and its branches cover an area of seventy-six yards in one direction and eighty-eight in the other, while the drops now dependent from, or rather supporting, its gigantic branches, amount in number to one hundred and twenty-one, of which some are of enormous size. The place exhibits on all sides vast branches broken off, which have been evidently once connected with thirty trees, now disunited from the centre stock; but the original connexion can still be sufficiently traced to render unnecessary the testimony of the villagers, who state that they and their fathers have been in the habit of disuniting these trees by separating the intermediate parts for the construction of solid cart-wheels, for which, from their size, they are well suited. On measuring the transverse diameters of the whole area, they are found to contain more than 100 yards each way—this single tree thus affording a circle of foliage and shade exceeding 300 English yards in circumference.'

Ceylon may be referred to the Indian region, notwithstanding its insular position. It produces cinnamon forests, nutmegs, and coffee; satinwood and ebony trees are found in abundance in the jungle about Trincomalee; while the forests of the island abound generally in other kinds of timber valuable for naval and other purposes. A kind called Wallaporte is spoken of by Mr. Brooke as girthing from twenty-eight to thirty-two feet.

VII. The seventh and last region of the Asiatic Flora is that which we would call the *Equinoctial* or *Malayan*. Spread over islands lying under the line—their centres usually occupied by mountains, and their coasts washed by the waters of a vast ocean—the features of this Flora are essentially different from those of the continent of India. The atmosphere is in a state of perpetual humidity, acted upon by a vertical sun; the land is little cleared, and allows but slender opportunity for the sun and wind to dry it. Many of the islands are little better than a mass of jungle, or at all events these dense and pestilential woods occupy a considerable portion of the surface. Many of the islands are intrenched with rank after rank of the living palisadoes of the mangrove, rooting into the mud, and surrounding the taller stems of the Nipa palm, Barringtonias, and thickets of sword-leaved vaquois trees. These woods are so dense that the sun never penetrates them; so entangled with climbers, coarse grasses, bamboos, and cane-palms, that no human being can penetrate them without a company of pioneers: and so damp that the parasites actually struggle with the leaves of the trees on which they grow for mastery over the branches; spice-trees, nutmegs, and cinnamon, camphor-trees (*Dipterocarpus*), and tree-ferns, here find their home; and in the depths of their recesses are sometimes nourished the fungus-like form of the huge Rafflesia flower. On the mountains are many species of oak, dammar pines, rhododendrons, and magnolias; and at the summits are found crowsfoot, valerians, bilberries, berberries, brambles, honeysuckles, gentians, and other well-known European forms.

The cleared ground of these countries is occupied with a great variety of fruit trees common to the rest of India, along with the mangosteen, durian, and rambutan, many-headed pines, jacks, and shaddocks, which attain their highest perfection here only. Even in the smaller islands the vegetation is of a similar kind. All the Maldives of any extent are richly clothed with wood, chiefly palms; among which the cocoa-nut is of such importance, that it is doubtful whether some of the Malayan islands would be habitable without it, from their want of water; the inhabitants give its milk to their cattle, and never use any other beverage themselves.

(See *Journal of the Royal Geographical Society of London; Journal of the Asiatic Society of Bengal;* Royle's *Illustrations of the Botany of the Himalaya Mountains;* Malte Brun's *Geography;* Gmelin's *Flora Sibirica;* Wallich's *Plantæ Asiaticæ Rariores;* Reinwardt *über den Charakter der Vegetation auf den Inseln des Indischen Archipels, &c.*)

ASIA, ZOOLOGY OF. Considered in relation to its extent, the continent of Asia and its islands contain a greater number and variety of animals than any other quarter of the globe. This, indeed, might reasonably be expected, from the diversity of soil and climate, the alternations of heat and cold, of drought and moisture, of mountain and lowland, of luxuriant forest and bare plains. Nor is it only in the number and variety of its zoological productions that Asia claims our particular attention. Their intrinsic value in the economy of human society, the prominent part which they played in the early civilization of mankind, and the universal importance which still attaches to the cultivation of domestic animals among the most civilised and refined, as well as among purely pastoral nations, make the consideration of Asiatic zoology an object of interest not less to the historian, the antiquary, and the general inquirer, than to the zoologist. In fact, the great majority of the domestic animals which enabled man to till the earth, to extend his power, and to transport his commodities to distant regions, which first gave to civilized man that mastery over the productions of nature that, perhaps more than all his other attributes, distinguishes him from the savage, and which still continue to furnish him with food and raiment, are of Asiatic origin: the camel, the horse, the ass, the ox, the dog, are all of eastern derivation; and it is there alone that we must look for the original types of these useful animals. Naturalists have wasted much time in endeavouring to discover the wild sources from which some of our most common and useful domestic animals were derived; had they looked for the origin of the dog, the cat, the sheep, and the goat in those regions which witnessed the first dawn of human civilization, and in which these valuable servants were first brought under the dominion of man, their researches would probably have been attended with greater success; for it is but natural to suppose that the wild species, if they still exist in a state of nature, are to be found in the districts where they were first reclaimed.

The numbers, and relative distribution of Asiatic mammals, are expressed in the following table.—

ORDERS.	Whole No. of known species.	Whole No. of Asiatic species	No. of species peculiar to Asia.	No. of species common to Asia and other Continents.
I. Quadrumana	186	45	39	6
II. Cheiroptera	192	46	41	5
III. Carnivora	320	112	60	52
IV. Marsupialia	67	6	3	3
V. Rodentia	295	111	75	36
VI. Edentata	23	2	2	..
VII. Pachydermata	30	11	8	3
VIII. Ruminantia	157	64	46	18
IX. Cetacea	76	25	14	11
Total	1346	422	288	134

Thus it will be observed, that of 1346 known quadrupeds, 422, or very nearly one-third of the whole number, inhabit some part of Asia or its dependent islands; but of these it will be further remarked, that 288 only, or about two-thirds of the whole, are peculiar to that continent, the remaining 134 extending into the neighbouring continents of Europe and America. Indeed it may be generally observed, that the zoological productions of the northern parts of these three continents respectively, if not absolutely identical, are at least extremely similar, even in their most minute features; northern Asia, in particular, from its relative position, as situated between and connecting the other two, partakes equally of the productions of both; and it is probably to this circumstance, more than any other, that we ought to attribute the comparatively small number of its entire mammal inhabitants which are peculiar to this continent, when compared with those peculiar to Africa or America. Africa, for instance, contains 300 quadrupeds; yet out of these 50 only are found beyond the boundaries of that continent; America, again, out of no fewer than 537 species, has only 57 common to other regions, whilst, as already observed, Asia, out of 422 species, has no fewer than 134 equally common to Europe, Africa, and America. It will be likewise observed, from the foregoing table, that the Edentata and Marsupialia are the two orders of mammals in which Asia is most deficient, and that it is most rich in the number of its Ruminantia, compared with the whole number of known species. This is precisely the reverse of what we have already observed regarding the zoological productions of America, nor is the circumstance without importance to those who study the progress of society and the developement of civilization in these two continents.

The elephant, though never bred in a tame state, ought to be considered at the head of the domestic animals of Asia. The inhabitants of India appear to have known and practised, when Alexander's army entered the country, the very same modes of capturing and training the elephant which are employed at the present day. Their antient writings mention this animal as a domestic servant, and he is constantly represented in the same character upon their public monuments. Alexander the Great, during his expedition into the north-west parts of India, found the armies of the native princes attended by their war elephants, just as the European invaders of the same country have done in later times; and from that period the elephant appears to have been constantly employed by the successors of Alexander in western Asia, and also by the Carthaginians, and Pyrrhus, the king of Epirus, who fought against the Romans in Italy. Immense troops of wild elephants are still found in the northern parts of India, in the Malayan peninsula, in Ceylon, and probably in all the large islands of the Indian Archipelago. Those which are employed in the East India Company's service, and which rarely exceed seven feet and a half average height, are obtained in the upper provinces, principally from the vicinity of the great saul forest, which skirts the lower ridges of the Himalayan chain for some hundred miles, and in which these animals are particularly abundant.

The common domestic animals of Asia present more varieties of species, and attain to greater individual perfection of form, than those of any other quarter of the globe. The horse, the ass, the camel, and probably most other species, are originally natives of the central plains of this extensive continent, and, though no longer found in a state of nature, are still proverbial for their symmetry and spirit. In Arabia, particularly, the horse is, of all other animals, the object of most especial care and value. No Arab, however poor in other respects, is without this noble animal, which is at once his friend and companion, the sharer of his riches or poverty, and the partner of all his toils. Subsisting on the same food as his master, which, during their long expeditions in the deserts, is often limited to a scanty supply of dried dates, temperate and enduring to a degree scarcely exceeded even by the camel or dromedary, lodged in the same hut, and caressed with the fondness of a child, the Arabian horse is never subjected to the performance of any mean drudgery or servile labour, and the record of his pedigree and kindred is preserved with the greatest care. This mode of treatment has a corresponding effect on the habits and character of the animal. In no other part of the world does the horse display so much gentleness, intelligence, and spirit as in Arabia; the pupil and constant associate of man, he almost seems to have caught a spark of human reason, readily comprehends and executes the orders of his master, and returns with delight and evident gratitude the attentions bestowed upon him. The nomadic and pastoral nations, which have from time immemorial occupied the central plains of Asia, are universally an equestrian people, they may be almost said to live on horseback, and indeed it would be impossible for them to carry on the predatory expeditions for which they have been in all ages remarkable, or to traverse the steppes of Asia, without the aid of this noble animal. Nor do these people employ the horse as a beast of burthen alone; his flesh supplies them with their favourite food, and the milk of the mare is the greatest dainty of a Tartar feast. Wild horses are said to exist in the interior of Tartary, where the inhabitants hunt them for the sake of their flesh; but the account in this instance, as in the similar report of the existence of wild asses in the same localities, cannot be implicitly relied upon. as travellers imperfectly acquainted with zoological distinctions frequently give the names of familiar animals to others which resemble them in form and appearance, without attending very closely to their specific difference. In the present instance, it is more than probable that both the wild horse and wild ass of eastern travellers are to be referred to the Dziggetai, a species of intermediate size and form, which inhabits the same regions, and has always retained its original freedom.

The asses, like the horses, of Asia are of larger proportions and more generous spirit than those which have been transported to other countries. That central Asia was originally the habitat of both these animals there can be no doubt, not only because we find them there domesticated at the earliest periods of which we have any record, but likewise because the Asiatics are, and, as far as we know, always have been, equestrian nations, whilst, in the neighbouring continent of Africa, the species was probably introduced from Asia, though at what period is uncertain. The horse, indeed, was early known and used in Egypt, as we know from the monuments and from written history. But the negroes of interior Africa, and, generally speaking, the whole southern part of the continent, are to this day destitute of either the horse or the ass. Nothing can present a greater contrast than the comparison of the degraded and degenerate ass of Europe with the same animal bred in his native country. Instead of the dejected air, shaggy coat, pinched dimensions, and miserable half-starved appearance which he presents in these countries, the ass of Persia, Syria, and the Levant approaches nearer to the larger size of the horse, and partakes much of his beautiful symmetry of form, noble carriage, and unrivalled speed.

It appears extremely probable that the camel and dromedary are likewise of Asiatic origin. The wide extent of the Arabian conquests during the middle ages introduced the latter species into most parts of northern and central Africa, where it has been ever since established, and is of the greatest use in crossing the sandy deserts which separate the inhabited regions of the north from the interior of the continent. The camel, which is distinguished from the dromedary by having two humps on the back instead of one appears to have been in all ages more limited and confined in its geographical distribution than the latter species. The camel is found chiefly, if not solely, among the wandering Tartars, from the confines of Siberia to the northern ridges of the great Himalayan chain; whilst the dromedary spreads not only over Arabia, Syria, Mesopotamia, and Persia, but extended into India, and probably even int

China. These animals are mentioned among the earliest lists of the flocks and herds of the patriarchs. and it is not a little singular that here, as in the case of most other domestic animals, not the slightest trace seems to remain of the original wild stock from which the species was first reclaimed. Professor Pallas, it is true, reports the existence of wild camels in the neighbourhood of lake Aral, but he never met with them in his travels, though he frequently heard of them; and Baron Cuvier conjectures, with much seeming probability, that the reports refer to some of the wild animals to which the inhabitants of these regions, from religious motives, restore their liberty at the celebration of particular festivals.

Of the ox kind, no fewer than four distinct species have been, from time immemorial, domesticated in different parts of Asia. The common Indian ox (*Bos Indicus*), though usually confounded with the common ox of western Europe, is in reality a very distinct species; differing not only by his longer legs, and the large hump which marks his shoulders, like that of a dromedary, but likewise by his voice, and even by some details of internal conformation. This animal, from his superior height and more slender proportions, perhaps the most symmetrical and graceful of all the different species of the ox genus, has been from the earliest ages held in the greatest veneration by the natives of India; and there is a strong resemblance between the worship of Apis among the antient Egyptians, and that which the followers of Brahma paid to the Indian ox, as an incarnation of their favourite deity Vishnu. But the whole race of Indian cattle are not equally regarded as objects of religious veneration: these attentions seem to be exclusively bestowed upon a particular breed; and the greatest care is taken to maintain the purity of this sacred race, and to preserve the pedigrees of its individual members. The common Indian cattle, however, are not regarded with the same religious sentiments. They are the usual beasts of draught and burthen in the country; and, from their great speed, are frequently used for the saddle, even by the Europeans settled in the upper provinces. The intercourse which India always seems to have maintained with other commercial nations of antiquity was the means of introducing this beautiful and useful animal into more distant regions; and we now find the Brahmin bull extending over a great part of Persia and Syria, and mixed with the common flat-backed species of the west, in Madagascar, Abyssinia, and generally along the whole eastern coast of Africa.

The Yak (*Bos grunniens*) is another species of ox which has been long domesticated in central Asia. It has always formed the common cattle of the Tartars, and is well described by Ælian under the name of Poephagus. It is this animal which furnishes the tails of long silky white hair, of which the Turks make their military standards, and which are employed all over the East, under the name of chowries, for the purpose of driving away the flies and creating a refreshing current of air about the luxurious inhabitants of India and China. These favourite instruments of luxury are frequently set in silver or gold handles; and as they are an indispensable appendage to the state of a great man, they form one of the regular articles of import between Tibet and India, and are frequently sold for enormous prices. The use of these chowries is of very great antiquity throughout all eastern countries.

The Buffalo (*Bos bubalus*) is a third species of ox, long domesticated in the southern and eastern parts of Asia. India and China appear to be the original climate of this powerful animal: it is still found wild in all the great forests of both these countries, and is probably the only domestic quadruped of which zoologists have clearly ascertained the original source. The wild buffalo, called *arni* by the Indians, is said to be only inferior to the elephant in size; and from his ferocity and malignant disposition is much dreaded by those who reside in the vicinity of his haunts. Combats between the arni and the tiger were formerly a favourite sport of the native princes of India; but it is said by eye-witnesses that the tiger was in no instance a match for his powerful antagonist. Large herds of the domestic buffalo are kept throughout every part of the peninsula of India; and many anecdotes are related of their docility and attachment to the gullahs or herdsmen who attend them, and of the courage with which they defend their keepers from the formidable attacks of the tigers and panthers which inhabit the forests where they are usually pastured. The buffalo in India is not habitually used as a beast of draught or burthen, but supplies the place of the common ox, in furnishing the inhabitants with milk and butter; whilst the ox of the country, which is seldom applied to these latter purposes, assumes the place of the horse, and is used for the saddle, the plough and the hackery, or carriage. Though long domesticated in India and China, the introduction of the buffalo into the west, or even into Persia, is comparatively a recent occurrence, and dates only from the conquests of the Mohammedans. Aristotle, indeed, seems to allude to the buffalo under the name of the Wild Ox of Arachosia (*Hist. of Animals*, book ii. 1); and the followers of Alexander must have become acquainted with the animal during that conqueror's expedition in the Penj-ab. But it was only towards the latter end of the sixth century that it was first seen in western Europe, having been introduced into Italy about the year 596; nor has the species ever extended either in this continent or in Africa, in which it is almost exclusively confined to Egypt.

The fourth and last known species of domestic ox which the Asiatic nations possess, is the Gayal (*Bos Gavæus*). This animal is common among the Burmese, and in all the mountainous districts on the north-east boundaries of British India: it is also found wild, under the name of Gaur, in many parts of India, principally among the hills, and is as much dreaded by the Sheecarries, or native huntsmen, as the arni or tiger. The gayal is a very large animal, with a heavy carcase and short legs, which are commonly white from the knee downwards, whilst the body is of a uniform dark brown colour: the os frontis forms a singular excrescence or ridge which easily distinguishes the gayal from all other species of the ox kind; and the horns are round, and twisted into a kind of irregular spiral, with the points turned inwards and backwards.

Of sheep and goats, many different varieties are found in Asia. The broad-tailed sheep of Arabia was known to the antients, and is mentioned by Herodotus (iii. 113) and Aristotle: this variety has now spread throughout all the steppes of the continent, as well as through Egypt and northern Africa, where the fat of the tail frequently amounts to ten pounds' weight. The tail is the best part of the animal, for the flesh is dry and insipid; and instead of wool, the body is covered with a short coarse hair, unfit for manufacturing purposes. On the higher table-lands of the continent, however, other species of sheep are found with a longer and finer fleece; but in no instance does the wool of the Asiatic sheep approach in softness and beauty of texture to that of the shawl-goat of Cashmere, from the fleece of which the Indians manufacture those rich and valuable shawls, which are so highly esteemed in Europe as well as throughout the East. The shawl-goat is a small variety of very ordinary form and appearance; it is found principally in Bhotan, Tibet, and generally along the northern face of the Himalaya, but does not thrive when brought across the mountains, not even in the upper regions of Nepaul, where it might have been expected that it would find a congenial climate: its wool forms a valuable article of commerce between Tibet and the lower plains of India. The Angora goat is an inferior variety of the shawl-goat, with drooping ears and long wool of tolerably fine texture, but not adapted to the same purposes as the richer wool of the Tibet animal. The common variety of goat in Asia, which appears to extend over every part of the continent, is a tall long-legged animal, with very short hair, large drooping ears, and small spiral horns. Its flesh is in many parts preferred to mutton; and the animal is valued in all places for the richness and abundance of its milk.

The Hog, though found wild in most parts of Asia, is a domestic only among the Chinese, who appear to esteem its flesh in proportion to the detestation with which it is regarded by the followers of Mohammed and Bhudda. In India, herds of semi-domestic hogs are frequently found about the native villages; but as the religion of Brahma prohibits the destruction of animal life, and consequently the use of flesh as an article of food, they are turned to no account by the inhabitants; by whom, however, they are not regarded with the horror and detestation which attaches to them among the followers of the Arabian prophet. The Indians abstain from the use of pork for the same reason that they abstain from eating any other kind of flesh; not from any peculiar antipathy which they bear to the animal itself. The hog is regarded by the Chinese as the greatest luxury; and it is well known that the dog and the hog were the only domestic animals which their first discoverers found among the Polynesian islanders. It appears probable, however, that the animal called a hog in the voyages of early navigators, and which was found spread over all the various archipelagos of the Indian Ocean, is in reality a different species from our common European hog, though closely allied to it in form and appearance.

The Dog of Asia, as in every other great division of the world, is subject to an almost infinite number of varieties. Troops of this animal, called in India pahria dogs, inhabit every village, and without acknowledging any particular master, know and obey the inhabitants, warn them of the approach of wild beasts and robbers, and perform the common offices of public scavengers. Legacies are frequently left for their support by the pious Hindoos; and hospitals are built for the reception and care of the aged and wounded. But besides these public troops, which may be considered as the property of the state, there are various varieties of sporting and other dogs kept by private individuals in different parts of Asia; of which the principal are the large mastiff of Tibet, and the greyhound of Persia. The flesh of the dog is a common article of food in China, as it formerly was in the islands of the Indian Ocean; and it is said to be a most amusing sight to the few Europeans who have obtained access to the large cities in the interior of the empire, to witness the antipathy with which these sagacious animals pursue their enemies the butchers, when they appear in the public streets.

The Cat has always been a favourite domestic among the Asiatics; and the Mohammedans, in particular, who consider the dog as unclean, lavish all their attention and caresses upon this far less gentle and sagacious animal. In the central plains and table-lands of Asia, in Khorasan, Cashmere and Bhotan, as well as in Angora and other districts of Asia Minor, the fur of the cat assumes a long silky texture, of great beauty and fineness; and individuals of the esteemed colours are frequently sold for extravagant prices. This is the breed which is often brought to Europe under the name of Persian cats; they are much more gentle in disposition than our common domestic cat, but are less useful, and decidedly inferior to the dog as a pet or companion.

Of the wild Mammals peculiar to Asia, we have already observed that there are, comparatively speaking, a greater variety than in any other portion of the globe. The true apes (*pithecus*) are, with a single exception, that of the Chimpanzee (*P. troglodytes*) of Africa, peculiar to this continent; as are likewise the *Semnopitheci*, an extensive tribe which differs from them only by the possession of a very long slender tail. Among these latter, the Kahau, (*S. nasutus*,) a large species inhabiting China and the Malayan peninsula, nearly attains to the dimensions of man, and is remarkable for a large prominent nose, which assimilates it in general appearance more nearly to the human species than any other of the monkey tribe. The Macaques (*macacus*) are likewise a purely Asiatic genus of quadrumana, and appear to supply on this continent the situation which the baboons fill in Africa. They swarm in all the woods of India and China, and are remarkable only for their malevolent dispositions and their disgusting manners. Of the Lemur tribe, two genera, *nycticebus* and *tarsius*, inhabit Asia: all the rest of this numerous family, as we have observed in the article on the zoology of Africa, are found in the island of Madagascar, and along the eastern coast of the neighbouring continent.

Among the Cheiroptera, or Bat kind, the *pteropi*, or large frugivorous species, are almost exclusively Asiatic; as are likewise the *galeopitheci*, or, as they are commonly called by travellers, flying foxes. Both these genera inhabit the woods and forests of the intertropical parts of Asia, principally those of the great Indian Isles; unlike the generality of winged quadrupeds, they are of diurnal habits, live entirely upon leaves and fruits, and are eaten by the natives. The more common species of nocturnal and insectivorous cheiroptera swarm in every part of Asia; the most remarkable among them is a species (*cheiromeles*) with an opposable thumb on the hind feet, which inhabits the Malayan peninsula.

Among the Carnivorous animals of Asia are three or four different species of Bears; one of these (*Ursus Syriacus*), lately discovered on Mount Lebanon, is frequently mentioned by the sacred writers; the others inhabit the Himalaya and other more eastern mountains, except one species (*U. labiatus*), which is found in the jungles on the plains of India. Besides these, the common brown bear of Europe, and the white, or Polar bear, abound in Siberia, Kamtchatka, and along the shores of the Frozen Ocean. The Bali-Saur (*arctonyx*) is the badger of India; and among the smaller Carnivora, the Gymnuræ, Mydai, Ailuri, Arctites, and Paradoxuri, are peculiar to the continent of Asia and the large islands of Borneo, Sumatra, and Java. Among the fur animals, northern Asia produces the sable, the ermine, and various other species of *mustela;* the sea-otter, the most valuable of all, has been hitherto found only in the northern Pacific, along the coasts of Asia and America, from the parallel of Japan northward, as far as navigators have yet been able to penetrate. The tiger, the most savage and formidable of all the carnivorous animals, exists only in Asia and the neighbouring isles; the Rimau-dahan (*Felis macrocelis*), a large species but lately described, inhabits Siam and Sumatra; and the leopard and panther are common among the forests of India. The lion also has lately been found in the province of Guzerat; but, unlike the African variety, he is without a mane, and appears to be altogether a much less formidable animal. The striped hyæna is common in all the warmer parts of the continent; and various species of wild dogs and foxes are every where abundant.

The Marsupial animals are for the most part confined to Australia; a few species, nevertheless, extend throughout the long chain of islands which nearly unite this continent with Asia. Of these, one is a kangaroo (*Macropus Bruynii*), the first of the genus ever discovered, having been described and figured one hundred and fifty years ago by Le Bruyn; the other five marsupials enumerated in the table belong to the genus Phalangista, and are distinguished from the Australian phalangers, by having the tail partially or entirely naked and scaly.

Of the numerous Rodentia which inhabit every part of Asia, very few indeed are deserving of attention, either in a commercial or economical point of view. Three or four species of hares (*lepus*), and an equal number of lagomice, or hare-rats, are the only Asiatic animals of this tribe which Europeans are accustomed to consider as fit for human food; the rest consist principally of squirrels (many of which are of large size and prettily variegated with stripes and shades of different colours), rats, gerboas, hamsters, marmots, flying-squirrels, and two or three different species of porcupines. The gerboas (*dipus*), of which ten or twelve species are found in the deserts of the interior, burrow in the sand, at the root of some plant or shrub, and are almost the only animals which enliven the long and dreary wastes which the traveller frequently encounters in Asia, hopping along on the hind legs like a bird, and crossing his path with the rapidity of an arrow. The flying-squirrels (*pteromys*) inhabit the forests of the whole continent, from Siberia to Java, and are remarkable for an expansion of the skin along the sides, which enables them to leap to the distance of forty or fifty yards, in passing from tree to tree: it acts like a parachute to prevent too rapid a descent, though it is incapable of being moved like the wings of birds, and consequently of exercising the proper function of flying.

The Edentata of Asia are confined to two species, both belonging to the genus Manis or Pangolins, frequently called scaly ant-eaters by travellers. These singular animals in fact resemble the real ant-eaters of the American continent in every thing but their external covering, which, instead of the ordinary hair of quadrupeds, consists of a succession of parallel rows of large imbricated scales, that lap over one another like the tiles of a house, and are capable of being elevated or depressed at the will of the animal. One of the Asiatic species is clearly indicated by Ælian (lib. xvi. cap. 6) under the name of Phattage.

Among the Pachydermata of Asia, the elephant has been already noticed. Three different species of rhinoceros are known to inhabit the continent of India and the great islands contiguous to the Malayan peninsula. The continental species (*R. Indicus*), and that which inhabits the island of Java (*R. Javanicus*), have but one horn; the Sumatran rhinoceros (*R. Sumatrensis*) resembles the African species by having two of these excrescences, for they cannot be properly called horns. Of the genus *Equus* the common horse and ass have been already mentioned as in all probability originally indigenous to the central plains of Asia. One other species, the Dziggetai (*E. he-*

mionus), still retains its native freedom in the same localities. It is a beautiful animal, in point of size intermediate between the other two, with much of the symmetrical figure and graceful carriage of the horse, and of the same dun colour as the ass, marked along the back with a broad coffee-coloured stripe, but without the cross on the shoulder which distinguishes that animal. The Dziggetai, probably also the Koulan of the modern Persians, was well known to the antients, and is mentioned by Aristotle and Xenophon by the name of the wild ass. Aristotle (vi. 36), in addition to the wild ass, mentions an animal called the Syrian mule, from its resemblance to a mule. The latter author mentions that, during the expedition of the Ten Thousand under the younger Cyrus, these animals were observed on the open plains of Mesopotamia, where the ostrich also lived; and though these gigantic birds no longer inhabit the Asiatic deserts, the same phenomenon is daily observed in South Africa, where the ostrich and the quagga are invariably found to associate together. Of the hog genus (*Sus*), two species at least are found in Asia: one of them, the common wild boar of Europe (*S. scrofa*), appears to extend over every part of the Old World; the other, the *Sus babyrussa* of naturalists, is peculiar to the great Indian Isles, and is remarkable for the singular manner in which the tusks of the upper jaw pierce through the lip on each side, and curl round and over the eyes like a pair of circular horns. The only other pachydermatous animal of Asia which deserves particular notice is the Malayan tapir (*T. Indicus*), a species the existence of which in this part of the world is the more remarkable, since its congeners are confined to the forests of South America.

Of the ruminating animals of Asia, the camel, the dromedary, and the four species of the ox kind which have been domesticated by the natives, have been already mentioned. In other respects, the principal feature in this department of Asiatic zoology is the great abundance of the deer tribe, and the comparative scarcity of antelopes. Out of thirty-seven known species of deer (*Cervus*), twenty-five are found in Asia, and of these twenty are peculiar to it; whilst not more than a dozen, out of nearly sixty antelopes, are found upon the same continent. These different species will be found described under the articles ANTELOPE and DEER respectively. But there is one small genus of Asiatic ruminants too remarkable to be passed over unnoticed,—the musks, so called from the Tibet species, which produces the perfume so well known by this name. The Tibet musk (*Moschus mosciferus*) is about the size of a small goat; both sexes are without horns, but the musk is produced by the male only, and is contained in a bag which grows upon the prepuce. This perfume has always been held in high esteem throughout the East, and when genuine and pure, is said to be sometimes sold for its weight in gold; but its great value holds out strong temptations to adulterate it with foreign substances, and the hunters are accustomed to mix the blood of the animal with it in order to increase the quantity, so that it can seldom be procured without adulteration. The Tibet musk inhabits the highest parts of the Himalayan and Tibetian mountains, seldom descending below the snow line, and leaping among the rocks and precipices with the security of the chamois or the ibex. Four or five smaller species of the genus Moschus, probably the smallest of all hoofed animals, being seldom larger than a good-sized hare, inhabit the forests of lower India and the islands.

The Cetacea of Asia are principally found along the northern coasts, and are the same species which frequent the Frozen Ocean generally. Various species of dolphins (*Delphinus*) inhabit the tropical seas, and the dugong (*Halicore*) is found among the great Indian islands; but in no other respects does this part of Asiatic zoology demand particular notice.

The principal circumstance worthy of notice in the birds of India, is the great abundance and varied and brilliant colours of the Gallinaceous tribes which inhabit this part of the world. Indeed the most valuable of our domestic fowls, the common cock and hen, as well as our domestic quadrupeds, originally came from this continent, and are still found wild in the woods of India; as are likewise the peacock, the pheasant, and many kindred species. The Himalayan mountains, in particular, produce three or four different species of the Tragophans, or horned pheasants, and the Impayan pheasant, remarkable for the brilliant metallic lustre of its plumage. The gold and silver pheasants (*Phasianus pictus* et *nycthemerus*), so common in the aviaries of Europe, are indigenous in China, as are likewise the collared pheasant (*Ph. torquatus*), and a new species (*Ph. Reevesii*) lately discovered, remarkable for the great length of the tail feathers, which sometimes exceed four feet; the fire-pheasant (*Ph. ignitus*) and argus-pheasant (*Ph. argus*) inhabit the mountains of Sumatra and Borneo.

It has already been observed that the ostrich, though formerly abundant in the deserts of Mesopotamia, is no longer found on the continent of Asia, unless we take the testimony of Herbert (p. 132), who says that he saw ostriches in the plains between Lar and Shiraz (A.D. 1627). The cassowary (*Casuarius*), a bird which nearly approaches the ostrich both in size and internal structure, inhabits the islands of the Indian Archipelago. In other respects the ornithology of Asia is by no means peculiar; at least the generic forms are not so remarkable as those of either Africa or America. All the common European species are found even in the most distant parts of the continent, apparently so identical, that specimens from the two localities cannot be distinguished even by the difference of a feather. The common house-sparrow, for instance, is found in the Himalayan mountains, and is as abundant about the villages of Upper Nepaul as in any part of England.

The reptiles, fishes, and insects of Asia are likewise too nearly assimilated to those of other continents to require a detailed enumeration of their different forms and genera. Like birds, these different classes of animals possess powers of locomotion which are denied to mammals; and it is consequently to the latter class alone that we can look for any thing very peculiar in the zoology of a continent like Asia or America. It is on this account that we have been more particular in the enumeration of the quadrupeds than of any other class.

ASIA MINOR. [See ANATOLIA.]

ASIATIC SOCIETIES are learned bodies formed for the especial purpose of instituting and encouraging inquiries into the geography, history, religions, languages, literature, &c., of the East. The earliest institution of this kind was the Asiatic Society of Bengal, founded at Calcutta by Sir William Jones, in January, 1784. Its transactions and the dissertations or essays read at its meetings, are embodied in the *Asiatic Researches*, the first volume of which was published at Calcutta, 1788, 4to.: the latest that has been received in Europe is the seventeenth volume, printed in 1832. Lately a separate physical class has been formed in the society, the attention of which is principally directed towards the zoology, meteorology, mineralogy, and geology of India. its transactions are published apart, under the title *Asiatic Researches: Transactions of the Physical Class of the Asiatic Society of Bengal* (part i., Calcutta, 1829; part ii., 1833, 4to.) Since the year 1832 the proceedings of the society have been published in a monthly periodical, *The Journal of the Asiatic Society of Bengal*, edited by James Prinsep, a publication which, from its cheapness and from the well-chosen variety of its contents, seems particularly calculated to awaken a general interest for the objects of the society.

At Paris an Asiatic Society was formed in the earlier part of the year 1822, by the well-known French orientalists, Silvestre de Sacy, Abel Rémusat, Saint-Martin, Chézy, &c., under the patronage of the Duke of Orleans (now King of the French). The transactions of this society were, from July, 1822, published in a monthly periodical, the *Journal Asiatique*, which, up to December 1827, formed eleven volumes, besides a separate volume containing an alphabetic index, &c. Since January 1828 the publication has appeared under the title of *Nouveau Journal Asiatique*. This journal is sent to all the members of the society, who pay an annual subscription of thirty francs (about 24*s*.). Through the careful management of its limited funds, the Asiatic Society of Paris has been enabled to encourage, by liberal subscriptions, the publication of several important works connected with oriental literature, and has besides printed some most valuable books at its own exclusive expense. Among the latter we shall here only mention the elegant edition and French translation of the Sanscrit play Sacuntala by the late M. Chézy.

A similar institution was formed at London in March 1823, and was incorporated under the denomination of the Royal Asiatic Society of Great Britain and Ireland, by a charter which is dated August 11th, 1824. Its labours are published under the title *Transactions of the Royal Asiatic Society of Great Britain and Ireland*, of which, up to the present moment, two volumes, and two parts of vol. iii. have appeared. With a view to give a wider circulation to its proceedings, the society has determined in future to publish a *Quarterly Journal*, besides the Transactions, the first number of which is now in the press. The society possesses a library and museum, to which additions are constantly made by the liberality of its members and friends. The library contains some most valuable and scarce books and MSS. Among the latter, a collection of Sanscrit MSS., formed by Colonel Tod in Rajasthan, and presented by him to the society, deserves to be particularly noticed. Intimately connected with the Royal Asiatic Society is the Oriental Translation Committee, instituted in 1828, which has for its object 'to superintend the publication of translations of works in the oriental languages, and also occasionally of original texts, free of expense to the authors.' (*Regulations*, &c., 1832.)

The literary societies of Madras and of Bombay, though originally instituted for more general purposes, deserve to be noticed here, as their labours have in a great degree been directed towards the same objects as the Asiatic Societies of Calcutta, Paris, and London. The Madras Literary Society owed its origin to the late Sir John Newbolt, aided by Dr. B. G. Babington; but shortly after its foundation the society was deprived, by death or by removal from India, of several of its most able contributors. A volume of *Transactions of the Literary Society of Madras* was published at London, 1827, 4to. The society has since been combined with that of London, under the denomination of the Madras branch of the Royal Asiatic Society. Of the Transactions of the Literary Society of Bombay three volumes have appeared at London, 1819-1823, 4to. In 1829 this society joined the Royal Asiatic Society, and is now designated as the Bombay branch of that institution. At Batavia a society of arts and sciences was formed by the Dutch, which in point of time even precedes the Asiatic Society of Bengal. Its Transactions have been published in Dutch under the title *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen*: the first volume appeared at Batavia in 1780, 8vo.; the latest that we have seen is the fourteenth, published in 1833.

ASKEW, ANNE, a lady of an honourable family in Lincolnshire, whose name is otherwise spelt Ascough or Ascue, has obtained mention in most histories of England, as one of those sufferers, who, before the final completion of the Reformation, abjured in part the doctrines of the Romish church. She was more highly educated than was ordinary in that day, and by study of the scriptures became a convert to the opinions of the reformers, at which her husband, one Kyme, a violent papist, was so much displeased that he turned her out of doors. She came up to London to sue for a separation, and appears to have attracted the favourable notice of the queen, or at least of some ladies high at court. She was soon accused of holding heretical doctrines concerning the sacrament, and denying the corporal presence of Christ's body in the elements after consecration; and on this charge she was committed to prison. Being examined before the chancellor, the bishop of London, and others, she is said to have replied boldly to the lord mayor's question, 'Whether the priests cannot make the body of Christ?' 'I have read that God made man; but that man can make God, I never yet read.' (Strype. *Memorials*, i. p. 387.) Yet it is said by Burnet, that 'after much pains, she set her hand to a recantation, by which she acknowledged that the natural body of Christ was present in the sacrament after the consecration, whether the priest were a good or an ill man: and that, whether it was presently consumed or reserved in the pix, it was the true body of Christ.' (*Hist. of Reformation*, B. iii.) Her recantation, however, was not satisfactory, or at least not effectual, for she was soon apprehended again, examined closely as to her belief and doctrines, and committed to Newgate, where she was again strictly questioned as to what ladies at court had shown her favour and encouragement. Not being able to extract any information on this point, she was placed on the rack and cruelly tortured in the sight, and as Fox says, by the hand, of the Lord Chancellor Wriothesly, whose eagerness in this matter is ascribed to his desire to gain some ground of offence against the Duchess of Suffolk, the Countess of Hertford, or some other ladies. But her patience and fortitude could not be shaken, nor does it appear that she had any disclosures to make. She was burnt with four others at the stake in Smithfield, July 16, 1546. (Fox's *Martyrs*; Burnet's *History of the Reformation*.)

ASKEYTON or **ASKEATON**, a small town in Ireland, in the Conello lower barony, in the county of Limerick, about twenty miles S.W. by W. of the city of that name. It was once a walled town of some importance; and till the Union, it sent two members to the Irish parliament. It lies at the conflux of the river Deel with the Shannon. The population in 1821 was 1239, and that of the whole parish 3425. The chief claim of Askeyton to notice is founded on the remains of an antient castle of the Earls of Desmond; and the fine ruins of an abbey adjacent to the castle, first occupied by the conventual Franciscans, and then by the Observantines. There are two fairs in the year. Askeyton is a vicarage in the diocese of Limerick. (Archdale's *Monasticum Hibernicum*; Seward's *Topographia Hibernica*.)

ASKRIGG, a small market-town in the county of York. [See Yorkshire.]

ASKOE, one of the numberless isles in the Bucker-fiord, or bight of Bucker, which lies within the north-western limits of the bailiwick of Stavanger and province of Christiansand in Norway. It is celebrated for the spring, called the Spring of St. Agatha, which is very cold in summer, and has never been known to freeze in winter: 60° 27′ N. lat.

There is a Danish island likewise of this name, which lies south of Famoe, near the coast of Zealand, and is inhabited by only 130 individuals. 54° 54′ N. lat., 11° 46′ E. long.

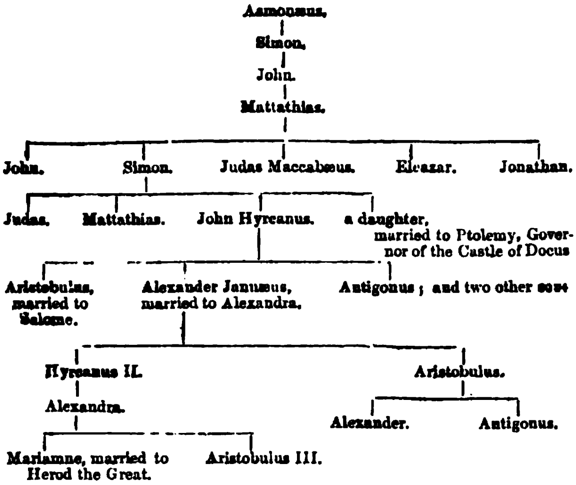
ASMONÆANS (Gens Asamonaea, בני חשמונים בית. חשמנאים or בני חשמנאי הכהנים or חשמונים domus Hasamonaeorum). The Asmonæan family derived their name, according to Josephus (*Antiq.* xii. cap. 6), from Asamonæus (Ἀσαμοναῖος). The son of Asamonæus was Symeon or Simon, whose son Johannes was the father of Mattathias, the father of the Maccabees. The name Asamonæus, or Asmonæus, had probably, like other Hebrew names, a significative meaning; the word חַשְׁמַנִּים (Chahsmanim) occurs only once in the Old Testament, in Psalm lxviii. 32. It there means *fat ones*; that is, rich noblemen, princes—grandees who keep many servants. Hence the designation Asmonæans implies nobles or princes emphatically so called. In the chronicles of Rabbi Joseph Ben Jehoshuang, in the Tsemach David of Rabbi David Gans, and other rabbinical writers, the cardinals are called חשמונים. The word חֶשְׁמוֹן, fatness, occurs as the name of a town in the tribe of Judah (Jos. xv. 27). Chashmonah חַשְׁמֹנָה, meaning *fatness*, was one of the stations of the Israelites in the Wilderness. (Num. xxxiii. 29.)

The state of the Jews, while subjected to the Seleucidæ, or Greek kings of Syria, has been compared to that of the modern Greeks under the dominion of the Turks. The Jews, like the modern Greeks before their last revolution, had, during this period, no political existence. Priests were the organ of every interest. The high-priest in Jerusalem, as well as the patriarch of Constantinople, were the heads of their respective nations.

The Jews had for many years been subject to the arbitrary rule and cruelty of the Syrian kings, when Mattathias and his five heroic sons, John, Simon, Judas, Eleazar, and Jonathan, commenced their victorious resistance to the attempt of Antiochus Epiphanes to compel the Jews to exchange their ancestral monotheism for the idolatry of their Syro-Macedonian oppressors. This struggle is described in the books of the Maccabees, which are included among the books of the Apocrypha. It is also detailed in the Antiquities of Josephus, from Book xii. cap. 6, to the end of Book xvi. [See Maccabees.]

The power of the Asmonæan dynasty lasted from the year B.C. 166 to B.C. 37; but the family survived the dynasty. It arose from the pious heroism of the Maccabees. Their first descendants ruled without the title of king, but with sovereign power: they united in their persons the functions of the high-priest, the chief civil magistrate, and the chief commander of the army. Their power was based upon the grateful esteem of the Jewish nation, which they had restored to independence. The later Asmonæan monarchs adopted the title of king, but they lost, with the pious virtue of their ancestors, the love of the nation, and subsequently, by family discord, the kingdom itself.

The genealogy of the Asmonæan family is as follows:—


Asmonæus.
Simon.
John.
Mattathias.
John.
Simon.
Judas Maccabæus.
Eleazar.
Jonathan.
Judas.
Mattathias.
John Hyrcanus.
a daughter, married to Ptolemy, Governor of the Castle of Docus
Aristobulus, married to Salome.
Alexander Jannæus, married to Alexandra.
Antigonus; and two other sons
Hyrcanus II.
Aristobulus.
Alexandra.
Alexander.
Antigonus.
Mariamne, married to Herod the Great.
Aristobulus III.

After the death of Mattathias, Judas, at the head of those Jews who had fled into the wilderness, made war (B.C. 166) against Antiochus Epiphanes, overcame and killed Apollonius in battle, and thus became chief of his people. The next year he vanquished Lysias and Gorgias, two other generals of Antiochus; he then purified the temple and restored the former worship. Antiochus, having heard of the defeat of his troops, swore that he would destroy the whole nation. As he was hastening to Jerusalem he died miserably, B.C. 164 or 165. Antiochus Eupator, his son, made peace with the Jews, but the war was soon renewed. In a battle against him, Eleazar, one of the younger sons of Mattathias, perceiving an elephant armed with royal harness, and supposing that the king was upon it, ran through the enemy's ranks, crept under the elephant and slew it. The dying elephant fell upon him and crushed him to death. Demetrius Soter having put to death Antiochus, usurped his kingdom, B.C. 162, and conferred the high-priesthood on Alcimus. In a battle against Bacchides, one of the generals of Demetrius, Judas was killed. [See JUDAS MACCABÆUS.] Jonathan succeeded his brother, and after some years of commotion, was made high-priest B.C. 153.

Jonathan entered into an alliance, B.C. 150, with the usurper, Alexander Balas, who pretended to be the son of Antiochus Epiphanes, against Demetrius, who soon fell in battle. Demetrius Nicator, the eldest son of Demetrius Soter, became king of Syria by the death of Alexander, B.C. 146. Tryphon, who wished to give the crown to Antiochus, the son of Alexander Balas, made an alliance with Jonathan; but wishing to usurp the kingdom, and fearing that Jonathan would not suffer it, he killed him by treachery. [See JONATHAN APPHUS.] Simon, B.C. 144, shook off the yoke of the kings of Syria, and took the city of Gaza and the fortress of Jerusalem. He made an alliance with Antiochus Sidetes; but it was soon after broken, and Antiochus sent Cendebeus against him. Simon, now too old to go to war, resigned the command to his sons, by whom Cendebeus was defeated. Ptolemy, the son-in-law of Simon, aspiring to reign in his stead, invited his father and brothers-in-law to a feast, at which both Simon and his sons were assassinated, B.C. 135. [See SIMON MATTHES.] John Hyrcanus, the third son of Simon, not being with him when he was murdered, Ptolemy sent to Gazara, in which place he was, to kill him. John, aware of his design, seized his emissaries and put them to death. Ptolemy now called Antiochus Sidetes to his assistance. They besieged Jerusalem, which being reduced to a state of famine, John was obliged to capitulate. John went afterwards with Antiochus in an expedition against the Parthians; and for his exploits against the Hyrcanians was surnamed Hyrcanus. [See JOHN HYRCANUS.]

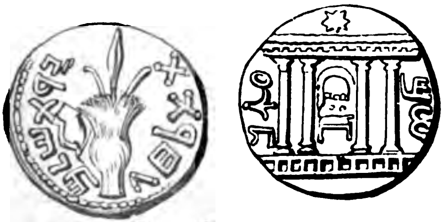
Aristobulus, the son of Hyrcanus, became high-priest after the death of his father. Hyrcanus bequeathed the sovereign authority to his wife, but Aristobulus caused her to be shut up; and, contrary to former custom, assumed both the diadem and regal title, B.C. 106. He afterwards undertook an expedition against the Itureans, whom he in a great measure subdued, and introduced among them the practice of the Jewish religion. Being attacked by illness, he returned to Jerusalem, leaving his favourite brother Antigonus to finish the war. The wife of Aristobulus took advantage of the absence of Antigonus to weaken his influence with his brother; and she endeavoured to excite in her husband's mind the belief that Antigonus sought to obtain the royal dignity. Antigonus, having brought the war to a successful close, returned to celebrate the feast of tabernacles, when Aristobulus summoned Antigonus to his presence. The approach to the palace was by a subterraneous passage. In this Aristobulus planted guards, with orders to despatch Antigonus if he should present himself armed, but to let him pass if unarmed. The wife of Aristobulus, who desired the ruin of Antigonus, privately informed him that the king wished to see him in his armour. Antigonus, entertaining no misgivings, came armed, and was murdered on the spot. The remorse of Aristobulus for his brother's murder aggravated his disorder, and he died at the close of the first year of his reign. Three of his brothers whom he had kept in prison were set at liberty on his death. The eldest, Alexander Jannæus, succeeded him in the royal title and office, B.C. 105. [See ALEXANDER JANNÆUS.] Alexander Jannæus reigned twenty-seven years, and was succeeded by his wife Alexandra, B.C. 79. His son Hyrcanus became high-priest. Alexandra reigned nine years. Upon her death, B.C. 70, the government devolved upon Hyrcanus II., a prince of a weak character and inactive disposition. His brother Aristobulus, dreading lest the influence which the sect of the Pharisees possessed over the mind of Hyrcanus should impair the royal authority, gained to his interest the commanders of the fortresses, and having caused himself to be proclaimed king, marched to Jerusalem. Hyrcanus reluctantly went out to meet him. In the midst of the ensuing battle, being abandoned by his soldiers, he threw himself upon the mercy of his brother, who granted him permission to retain the office of high-priest, and allotted him an ample revenue. Hyrcanus consented to resign the regal dignity, but after some time, being assisted by Aretas, king of Arabia, he attempted to resume his former rank. Aretas besieged Jerusalem, and Aristobulus was reduced to great straits; but having gained to his party Scaurus, one of the lieutenants of Pompey, Aretas was obliged to raise the siege and to return to defend his own dominions. Thus commenced the Roman power in Judæa. The authority of Aristobulus had not yet been sanctioned by the Romans; and on the appeal of Hyrcanus, Pompey, having heard the arguments of both parties, decided in favour of Hyrcanus, whom he reinstated in the government under Roman protection. Aristobulus upon this shut himself up in Jerusalem. Pompey besieged the city during three months; and took it at last by fixing his engines on the Sabbath. The Jews would not violate the sanctity of that day by offensive warfare, although they were ready to repel attacks: Pompey accordingly issued strict orders that nothing having the semblance of attack should be suffered to occur, in order that the Jews might have no pretext for disturbing his preparations. Pompey carried Aristobulus to Rome, and made him appear in the triumphal procession which celebrated, among other victories, the Jewish conquest. Aristobulus found means to escape from Rome, and returning to Judæa, excited fresh commotion. Gabinius, the Roman general, took him prisoner, and sent him a second time to Rome. On the breaking out of war between Pompey and Cæsar, the latter sent Aristobulus to Judæa to proclaim peace with that country on the part of Cæsar. He was poisoned shortly after by the partisans of Pompey.

The government of Hyrcanus was disturbed by continual commotions, which he had not the ability to prevent. Cæsar gave him many of the neighbouring towns, and allowed him to rebuild the walls of Jerusalem; but Hyrcanus derived little advantage from these concessions, as his minister Antipater, the Idumean, wrested from him all but the name of ruler. Antigonus, the son of Aristobulus, to revenge the death of his father, procured the assistance of the Parthians; coming to Jerusalem with an army he took Hyrcanus prisoner, and, in order to disable him for exercising the sacerdotal functions, cut off his ears. The king o Parthia treated Hyrcanus with humanity, and sent him back to Jerusalem, after Herod had invited him to return. Herod, the son of Antipater the Idumean, being informed that Hyrcanus maintained a correspondence with the chie of the Arabs, caused him to be put to death B.C. 30, a the age of eighty. On the death of Hyrcanus, Antigonus became king; but being soon after besieged by M. Antony, at the expiration of three years from the commencement of his reign, he was put to death by the Romans, B.C. 37, to make way for Herod. Herod had ingratiated himself so much with Julius Cæsar, M. Antony, and the Romans in general, that with their assistance he was enabled to supplant the Asmonæans, and to commence a new dynasty A.D. 37. To confirm his authority, he married Mariamne, granddaughter of Hyrcanus II. and made her brother Aristobulus III. high-priest, reserving to himself the regal power; but finding that Aristobulus retained many partisans, he caused him to be drowned B.C. 35. It is worthy of remark, that the historian Josephus was descended from the Asmonæan family.

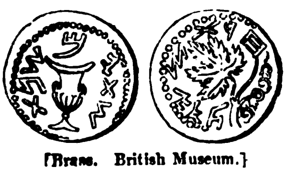
Mariamne, who was distinguished by her beauty and talents, was murdered by order of Herod on an unfounded suspicion of conspiracy and adultery. Her sons were also put to death on a charge of rebellious designs. But the Asmonæan family did not end entirely with their power, for we read in the commencement of the auto-biography of Fl. Josephus, 'By my mother I am of the royal blood; for the children of Asamonæus, from whom that family was derived, had both the office of the high-priesthood and the dignity of a king for a long time together. I will accordingly set down my progenitors in order. My grandfather's father was named Simon, with the addition of Psellus: he lived at the same time with that son of Simon the high-priest, who first of all the high-priests was named Hyrcanus. This Simon Psellus had nine sons; one of which was Matthias, called Ephlias: he married the daughter of Jonathan the high-priest, which Jonathan was the first of the sons of Asamonæus, who was high-priest, and was the brother of Simon the high-priest also. This Matthias had a son, called Matthias Curtus, who was born in the first year of the government of Hyrcanus; his son's name was Joseph, born in the ninth year of the reign of Alexandra: his son Matthias was born in the tenth year of the reign of Archelaus; and I was born to Matthias in the first year of the reign of Caius Cæsar. I have three sons; Hyrcanus, the eldest, was born in the fourth year of the reign of Vespasian, Justin in the seventh, and Agrippa in the ninth.' These are the last traces of the Asmonæan family.

The best sources of information concerning the Asmonæan dynasty are contained in *The Five Books of the Maccabees, with Notes and Illustrations*, by Henry Cotton, D.C.L., Archdeacon of Cashel, Oxford, 1832. Two of these books belong to the Apocrypha, which are frequently annexed to the Old Testament. See Josephus, *Antiq.* xii. 6—xvi. end.; Comp. יוסיפון בן גוריון ed. Breithaupt, books iii. and iv., ed. Munster, from the commencement; Franc. Perez. Bayer, *de Numis Hebræo-Samaritanis*, Valentiæ, 1781, p. 181, fol.; Franc. Perezii Bayer, *Vindiciæ Numorum Hebræo-Samaritanorum*, 1790, fol; Ezechielis *Spanheimii Dissertationes de Præstantia et Usu Numismatum*, Lond. 1706. vol. i. p. 61, &c.; *Doctrina Numorum Veterum conscripta a* Josepho Eckhel, pars i. vol. iii, pp. 441—481; *Annales Regum et Rerum Syriæ Numis Veteribus Illustrati ab* Erasmo Froelich, *Prolegomena*, pp. 74—91; *Description de Médailles Antiques*, par T. E. Mionnet, tome v. pp. 555—564.

In the British Museum there is a number of Asmonæan coins, from which the following drawings are taken.



[Silver. British Museum.]

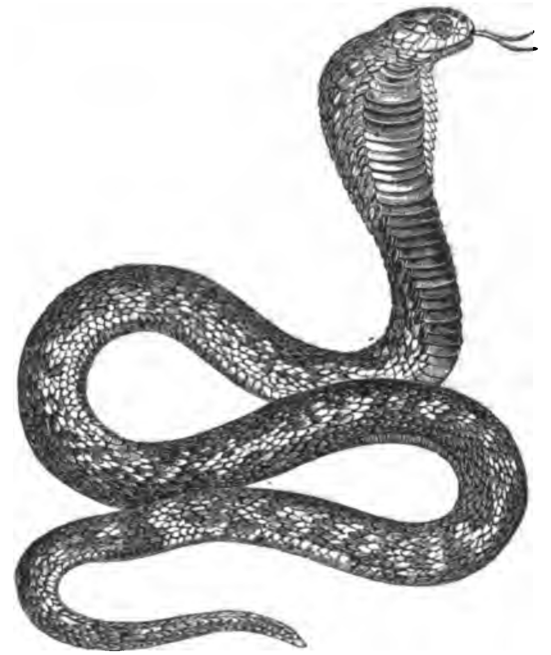


[Brass. British Museum.]

The legends of the larger coin, which is of silver, are, if expressed in the usual square character, שמען = Shimeon, לחרות ירושלם = to the liberty of Jerusalem.

On the smaller coin, which is of brass, we read—
חרת צית = liberty of Zion; שנת שתים = second year.

ASP (*Vipera Haje*, Daudin), a species of noxious serpent, celebrated as the instrument of death which Cleopatra is said to have selected to terminate at once her amours and her existence. The asp (ἀσπίς) is often mentioned both by Greek and Roman writers; and from the discrepancies which are observable in the accounts given by different authors, it seems probable that two or three different species of poisonous serpents were known to the antients under this common name. From various circumstances, however, and particularly from the description of Pliny (*Nat. Hist.* lib. viii. cap. 35.), it is evident that the most common and celebrated is the species to which the modern Arabs give the name of *El Haje*, or *Haje Nascher*. This animal measures from three to five feet in length: it is of a dark green colour, marked obliquely with bands of brown; the scales of the neck, back, and upper surface of the tail are slightly carinated, and the tail is about one-fourth part the length of the whole body. The haje is closely allied to the cobra capello, or spectacled snake of India, the chief apparent difference being its want of the singular yellow mark on the back of the neck, from which the latter species derives its name. In other respects these two serpents are nearly of the same size; they are equally venomous, and both have the power of swelling out the neck when irritated, and raising themselves upright upon their tails to dart by a single bound upon their enemies. These habits render it probable that the puff-adder of the Cape of Good Hope, so called from its custom of puffing out or distending the neck and throat when disturbed or provoked, is no other than the haje or asp of Egypt, or at least a very closely allied species; but the two animals have never been properly compared, and till this is done the question of their specific difference or identity must remain undetermined.



The poison of the asp is of the most deadly nature. Pliny, in the passage above referred to, gives the following account of this celebrated serpent:—'The neck of the asp is capable of distension, and the only remedy against its bite is the immediate amputation of the wounded part. This animal, otherwise so much to be dreaded, has a sentiment, or rather a kind of affection, truly wonderful. It never lives alone, the male and female being constantly found together, and if one happens to be killed, the other seeks with the utmost fury to avenge its death. It knows and selects the destroyer from among crowds; it follows him to great distances, surmounts every obstacle, and can only be deprived of its revenge by the most speedy flight, or the intervention of some rapid river. It is difficult to say whether Nature has been more prodigal of evils or remedies. For instance, she has bestowed upon this reptile, so terrible from the deadly effects of its poison, so indifferent a vision, its eyes being placed on the sides of the head so as to prevent it from seeing straight before it, that it is frequently trodden under foot before it is aware of its danger.' Forskœl, a Swedish naturalist, who has written on the animals of Egypt, informs us that the jugglers of Grand Cairo have the art of taming the haje, as those of India do the cobra capello, and teaching it to dance for the amusement of the populace; taking care, however, to deprive it of its poison fangs, though even then they avoid its bite when irritated. The habit which this serpent has of erecting itself when approached, made the antient Egyptians imagine that it guarded the places which it inhabited. They made it the emblem of the divinity whom they supposed to protect the world; and accordingly they have represented it on their temples sculptured on each side of a globe.

ASPA'RAGI. [See ASPHODELEÆ.]

ASPA'RAGUS, a genus of monocotyledonous plants belonging to the natural order *asphodeleæ*. It is easily recognized by its very narrow leaves, which drop off the branching stem as soon as they begin to wither, by its small greenish-white or yellowish regularly-formed flowers, and by its seeds being enclosed in a pulpy fruit.

Unlike the principal part of monocotyledonous plants, and especially of those which belong to *asphodeleæ*, the stems of the different species of asparagus branch like those of dicotyledons, and even become hard and woody; some of them twine and scramble over other shrubs, and certain species even hook themselves to their supporters by means of their stiff and spiny branches which are stunted and destitute of leaves.

The species are natives of the temperate and tropical regions of the old world, but they are not found wild in either North or South America. The most remarkable one is the common cultivated asparagus which is found in sandy and maritime places in most parts of the middle and south of Europe, the Crimea, and also of Siberia and Japan. It is too well-known a plant to require description, and we shall therefore occupy ourselves exclusively with the method of cultivating it for its succulent and agreeable heads.

An asparagus plant consists of a cluster of fleshy roots connected by the stem, where a quantity of buds are formed, from which branches are yearly emitted. The heads are those branches in a young and tender state; their quality depends wholly upon their size and rapid growth. These are the simplest considerations that are involved in the cultivation of asparagus; the question is how the largest size and the most rapid growth are to be attained.

Seeing what the natural situation of the asparagus plant is when wild, it will be obvious that it should have a light soil which offers little resistance either to the emission of its roots or the protrusion of its stems; the soil should also be capable of both receiving and parting with water readily. Accordingly gardeners take care that all stiff loam, or stones, or solid masses of earth are separated from the soil of their asparagus beds, and that they are completely drained by having trenches 2½ feet deep cut between the beds.

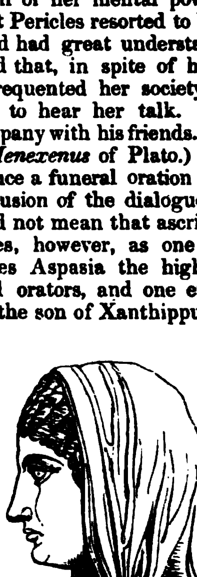
To give vigour to the shoots, manure is added in as great a quantity as the cultivator can afford to apply it; when the seed is sown, or the young plants finally placed in the situation in which they are to produce a crop, an abundant supply of decayed manure, or of bones, or of parings of horses' hoofs, is buried below them; and they are also annually top-dressed with finely pulverized manure, when the beds are arranged in the winter. Attention being paid to these circumstances, asparagus is one of the easiest of all vegetables to cultivate; but no art or skill will produce precisely the soil which is most favourable for its growth. This exists naturally in some places in the fittest of all possible states, and it is there only that it is to be obtained in its greatest perfection; as in the rich alluvial soil of Battersea, Mortlake, and other places round London: in some of these villages it is produced of such extraordinary size that 110 heads in a state fit for the kitchen have been known to weigh more than 32 lbs. There are those who think that this gigantic asparagus is a peculiar variety; but it is ascertained that, on being removed into less favourable soils, it gradually loses its vigour and degenerates into the common kind.

The most convenient breadth for asparagus beds has been found by experience to be 4½ feet, and the least depth of the intermediate trenches 2 feet. The beds are either planted with seedlings one year or two years old, buried six inches beneath the surface, and standing about a foot apart, or sown at once and the seedlings afterwards thinned to such a distance; the latter method is the most simple and the most effectual.

In this country it is frequently forced, but seldom with much success; the heads being usually small and stringy, without sufficient succulence. For this purpose an asparagus bed is dug up, and the plants transferred to a place heated with dung, where they come up in a fortnight or three weeks; but as the roots are always much injured by the operation of transplanting, the little success that attends this method is easily accounted for. In many parts of the north of Europe, especially about Riga, a far better mode is adopted. The forcing takes place in the asparagus beds themselves without disturbing the roots; the trenches are filled with hot dung, and the beds are covered with the same material about six inches deep; if the weather is very severe, the beds are also covered with frames, but this is rarely necessary in England. Treated thus, asparagus is as fine as if it waited till May to make its appearance. But when this method is practised the heads cannot be cut down at the natural time in the same season. In order to recover from the effect of forcing, they must be allowed to grow as freely as possible during all the succeeding summer, so that they may form a new supply of food for the support of the heads the succeeding spring. Where it is wished to have exceedingly large heads of forced asparagus, pieces of bamboo, or any other hollow tubes, should be put over the shoots when they first make their appearance. The latter will thus acquire a length of as much as eighteen inches without losing their tenderness.

ASPA'SIA. As the select companion and adviser of Pericles, and the associate, and, according to Plato, the instructress, of Socrates, this person claims a degree of notice to which she would perhaps not otherwise be entitled.

Aspasia was a native of Miletus, and the daughter of Axiochus. Of her early life we find no notice. She gained entire possession of the affections of Pericles, who divorced his first wife with her own consent, according to Plutarch, in order to marry Aspasia. We are told little of her beauty; much of her mental powers and cultivation. Plutarch says that Pericles resorted to her 'because she was a wise woman, and had great understanding in matters of government;' and that, in spite of her mode of life, the Athenians who frequented her society used to carry their wives with them to hear her talk. Socrates sometimes visited her in company with his friends. (See Xen. *Mem.* II. vi. 36; and the *Menexenus* of Plato.) The Menexenus is written to introduce a funeral oration ascribed to Aspasia, though the conclusion of the dialogue seems to intimate that the author did not mean that ascription to be implicitly believed. Socrates, however, as one of the speakers in the dialogue, gives Aspasia the high praise of 'having made many good orators, and one eminent over all the Greeks, Pericles, the son of Xanthippus.



ΑϹΠΑϹΙΑ

On this and similar authority we learn that Pericles was indebted to Aspasia for much of that mental cultivation in which he excelled all men of his age. Her moral influence, if the scandalous chronicles of antiquity be true was less beneficial. She is accused of having led the Athenians by her influence with Pericles, into two wars. One of these was the Samian war, B.C. 440; an interference in behalf of Miletus, the birth-place of Aspasia, to secure to it the possession of Priene, contested by Samos. Thucydides, in his brief account (I. 115), gives no hint that the Athenian leader was guided by any such corrupt influence: he merely says that the Milesians, being worsted, came to Athens, and accused the Samians; their complaints being assisted by a strong desire on the part of the Athenians to render the Samian government more democratical. Aristophanes charges Pericles with having involved the country in a quarrel with Megara, by a non-intercourse act, in revenge for the forcible abduction by some Megarians of two young attendants upon Aspasia. (See *Acharn.* 523, ed. Kust.) Other comic writers, among whom Plutarch names Cratinus, were not slow in taking advantage of her real or supposed influence, and called her the new Omphale, Deianeira, Juno, with epithets of no civil nature appended thereto. Hermippus, the comedian, prosecuted her on the more grave charge of not believing in the gods, and besides, of being instrumental in debauching free women to gratify the lust of Pericles. (See also Plutarch's *Pericles*, c. 24.) We are told on the same authority (that of Plutarch), that nothing but the personal exertions, the tears, and entreaties of Pericles procured her acquittal. These stories, however unfavourable alike to Pericles and Aspasia, depend on the authority of late writers, as Plutarch and Athenæus: contemporary writers contain no hint of them, with the exception of the comic writers, whose trade was scandal. We have no notice of Aspasia's adventures after the death of her lover and patron, except that she transferred her affections to Lysicles, a man of low origin and vulgar mind, who, however, by her instructions, according to Plutarch, became after the death of Pericles for a time the popular leader in Athens. (See Plutarch's *Pericles*, c. 24, 30, 32; and Bayle.)

ASPECT, an astronomical term, now entirely disused, applied to the various positions of the planets with respect to one another, as seen from the earth. The terms *conjunction* and *opposition* are the only two out of five names of aspects which have been retained; the remainder being called sextile, quartile, and trine. At *conjunction* two planets have the same longitude; when sixty degrees apart, the aspect is *sextile*; when ninety, *quartile*; when 120, *trine*; when 180 degrees apart, or opposite, they are in *opposition*. The following are the characters which are used.

Name of Aspect.	Character.	Diff. of Longitude.
Conjunction	☌	0°
Sextile	⚹	60°
Quartile	□	90°
Trine	△	120°
Opposition	☍	180°

ASPEN. [See POPULUS.]

ASPER, or **ASPRE**, a small Turkish coin, and money of account. As a coin it is worth something more than an English halfpenny. The only impression it bears is that of the Prince's name under whom it was struck. Three aspers make a medina. The pay of the Janissaries, when they existed, was from two to twelve aspers per diem.

Kelly, in his *Universal Cambist*, informs us, that at Aleppo and the seaport of Scandaroon, at Cairo, and at Patras in the Morea, accounts are kept in piastres of 80 aspers: at Algiers, in saimes or doubles of 50 aspers: at Constantinople, in piastres, sometimes divided into 80 and sometimes into 100 parts, called aspers or minas: at Salonica, in piastres of 120 aspers. at Tripoli, in piastres of 52 aspers: at Smyrna, the general division of the piastre is into aspers, the number of which varies. thus the English and Swedes divide the piastre into 80 aspers; the Dutch, French, and Venetians, into 100 aspers; and the Turks, Greeks, Persians, and Armenians, into 120 aspers. (See the *Univ. Cambist*, vol. i. pp. 4, 5, 72, 276, 307, 317.)

ASPERGILLUM (in Zoology), a genus of the family Tubicolées (Lamarck), furnished with a bivalve shell incrusted, as it were, in a tubular testaceous sheath. This tubular sheath gradually lessens in diameter to the aperture which is farthest from the incorporated bivalve. The end nearest to the bivalve is dilated into a concave disk, with a central fissure, and perforated with minute but raised holes. The disk is bordered by a tubular frill. There are but few species; and of these, *Aspergillum Javanum*, known to collectors as 'The Watering-pot,' is the most common.

ASPERN, GREAT, a village in the province of Lower Austria, situated on an arm of the Danube, nearly opposite to Vienna, but a little to the east of it, and containing about 900 inhabitants. It is celebrated for one of the severest contests which occurred between France and Austria, in the short, though, for the latter of those powers, disastrous campaign of 1809. On the 12th of May in that year, Napoleon had made himself master of the Austrian capital, and the Archduke Charles had, subsequently to his repulse at Eckmühl, taken up a position on the left bank of the Danube, close upon Vienna. Napoleon was not long in possessing himself of two islands in that river, by which he threw his forces across it; and, on the 21st of May, offered his adversary battle from the position he had taken up at the villages of Aspern, Esslingen, and Engersdorf. In this position he was attacked with so much ardour by the Archduke's forces, that both Aspern and Engersdorf were carried before nightfall. Aspern itself, which has since been rebuilt, was converted into a heap of ruins, after enduring thirteen successive assaults. Esslingen and the entrenched island of Lobau however remained in the hands of the French; but the Archduke, having employed the next night in destroying the bridge of communication between the island and the left bank of the river, renewed his attack upon Esslingen the ensuing morning, and ultimately drove General Massena and his broken troops back upon the island. The obstinate gallantry with which the field was contested may be inferred from the loss of the French, which amounted to 30,000, or, according to the Austrian accounts, 41,000 men, in killed and wounded; not more than 3500 prisoners and but three pieces of cannon remained as trophies to the victors. A pyramid was erected by the Austrians with the 3000 French cuirasses which they collected on the spot. Marshal Lannes, with Generals D'Espagne, St. Hilaire, and Albuquerque, fell during this two days' struggle; and Massena, Bessières, and many other generals, were wounded. Never was victory, however, by the sacrifice at which it was purchased and the excess of confidence which it created, more fatal to the fortunes of the conquerors. The battle of Wagram, fought on the 5th and 6th of July following, placed Napoleon in a situation to dictate the most humiliating terms to the Austrian sovereign at Schönbrunn; the cession of one-third of his dominions and the loss of upwards of eight millions of subjects were the price which he paid for a peace with the conqueror.

ASPHALTI'TES, LACUS. [See DEAD SEA.]

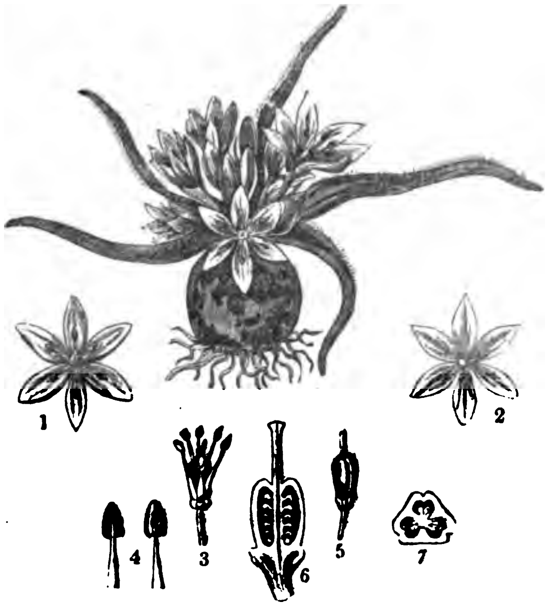
ASPHALTUM, (a Greek word, ἄσφαλτος, of unknown etymology,) frequently known by the name of slaggy or compact mineral pitch, is one of the varieties of bitumen, arising from the decomposition of vegetable matter. (See NAPHTHA.) It occurs massive, of a dark brown or black colour, with a conchoidal fracture, and a resinous lustre. It is opaque, and exceedingly brittle at a low temperature, but softens and fuses by the application of heat; in density it varies from that of water to 1·6. It may be recognized by the following characters: it is insoluble in alcohol, but soluble in about five times its weight of naphtha, with which it forms a good and useful varnish; its combustion is rapid and brilliant, with the production of the bituminous odour.

It is found in most countries, but most abundantly on the shores, or floating on the surface, of the Dead Sea; at Hit above Babylon, on the Euphrates; near the Tigris: in Trinidad in the West Indies it fills a basin of three miles in circumference and of unknown depth. There is a pitch-spring in Zante, which we know to have been at work for above 2000 years. (See Herod. iv. 195.) It is also found in limestone at Bleiberg in Carinthia; in beds of sandstone in Albania, and in veins in the Hartz in Germany; in Derbyshire, Shropshire, and several other places. It is the principal colouring matter of the dark indurated marl, or shale, which is found in coal districts.

ASPHODE'LEÆ, or the asphodel tribe, are monocotyledonous plants, which form a very natural assemblage, for the most part easily recognized, although in certain species and genera it approaches other orders so closely as to be distinguished only with great difficulty. They all have regular flowers with three sepals, and three petals of nearly equal size and colour, six (very seldom three) stamens, and a superior three-celled ovary, with only one style. Their fruit is either dry or succulent; and their seeds have a brittle coat.

Asphodeleæ are known from *junceæ*, or the rush tribe, by their larger and more coloured flowers, and by the hardness of the coat of their seeds; from *liliaceæ*, or the lily tribe, by the smallness of their flowers, and the latter character; and from *melanthaceæ*, or the colchicum tribe, by their single style, and by their anthers being turned towards the ovary. They may be formed into two subdivisions.

The first, or the *alliaceous* subdivision, in which there is no true stem, and which consists entirely of bulbous species; the roots being emitted and perishing annually. To this belong the onion, garlic, and their allies, together with the hyacinth, squill, and star of Bethlehem (*ornithogalum*). A great quantity of species are favourites with the horticulturist, on account of their early appearance in the spring and their easy cultivation.



[Asphodeleæ.]

A plant of *Ornithogalum fimbriatum*. 1. A flower seen from within. 2. The same viewed from without. 3. The stamens and ovary. 4. Two stamens apart. 5. An ovary. 6. The same cut perpendicularly. 7. The same cut horizontally.

The second subdivision, consisting of the true asphodels and those which resemble them, have no bulbs, but in their stead clusters of fleshy roots such as we find in the asparagus, which belongs to this subdivision; the stems of these are frequently woody, but in that case they are branched: *dracæna*, or the gum-dragon tree, is a most remarkable instance of this, it having almost the appearance of a dicotyledon when deprived of foliage. This subdivision also contains aloes, with their thick fleshy leaves and forked stems.

ASPHO'DELUS, the genus from which the foregoing natural order takes its name, comprehends some handsome hardy perennial plants, with fleshy finger-like roots, and upright undivided annual stems covered with long leaves; they are among the most highly developed of the monocotyledonous plants of northern countries. The most remarkable species are the following:—

A. luteus, or the common yellow asphodel, is a beautiful perennial, very often seen in cottage-gardens, or on the outskirts of shrubberies. It grows wild in Barbary, Sicily, Dalmatia, the Peloponnesus, and even spreads into the Crimea. Its stems are from two to three feet high, never branched, and covered all over with long narrow bluish-green leaves, which have very broad, sheathing bases. The flowers are handsome, deep yellow, with a green streak on the outside of each petal. The fruit consists of red pulpy berries.

Very nearly related to this are, *A. capillaris*, which differs chiefly in its very narrow leaves, shorter bracts, and extremely narrow divisions of the flower; and *A. Sibiricus*, figured in the *Botanical Register*, plate 1507; which is principally known by its dwarfer stature, earlier and paler flowers, more glaucous leaves, and shorter bracts.

A. albus, or the white asphodel, found all over the southern provinces of Europe and the basin of the Mediterranean Sea, is as frequently seen as the first, and in similar situations: its flowers are white with a reddish streak on the outside of each petal, and are disposed in branched clusters. *A. ramosus*, of many gardens, seems merely a branched state of this species; and several other reputed species with white flowers are also, in all probability, not distinct.

ASPHY'XIA, a Greek word (ἀσφυξία) which signifies a cessation of the pulsation, originally expressed any state of disease in which there was a suspension or loss of the heart's action, and a consequent failure of the pulse; but the term is now used to denote a suspension or loss of the power of respiration. The state of asphyxia is that in which the respiratory actions are either temporarily suspended, or have wholly ceased; a state necessarily inducing such a change in the nature of the blood as is incompatible with the continuance of life. The blood which circulates in the two great systems of blood-vessels, veins, and arteries, is essentially different [see BLOOD]; that in the veins is incapable of supporting life; that in the arteries is the proper nutrient and excitent of the system. The object of respiration is to convert venous into arterial blood. The blood returned from the system to the right side of the heart is venous; when it has circulated through the lungs, and thereby been brought into contact with atmospheric air, it is changed into arterial blood. Of all the conditions necessary to the action of vital organs, that of receiving a due supply of arterial blood is the most indispensable. If a ligature be placed around the trachea (windpipe) of an animal, so as completely to prevent the access of air to the lung, and if at the same time the carotid artery be opened, that is, one of the great arteries which springs from the arch of the aorta [see AORTA], and which passing along the neck to the head, is the main channel through which the brain receives its supply of arterial blood, it is found that in a definite time the blood flowing in this artery has ceased to be arterial, and has become venous. Taking the average of a great number of experiments performed on dogs for the express purpose of ascertaining this fact, it is found that in about three-quarters of a minute after the complete exclusion of air from the lung, the blood in the carotid artery begins to lose its vermilion colour. After a minute and a quarter, it has become obviously dark. In the space of a minute and a half, no difference whatever can be perceived between the blood that flows from this artery, and ordinary venous blood: in this space of time, therefore, the system of an animal from whose lung air is excluded is brought completely under the influence of venous blood.

While the blood is thus changing from arterial to venous, the function of the brain is greatly affected. Sensibility diminishes as the blood darkens, and when it has become quite dark the power of sensation is wholly abolished, and the animal lies in a state of profound coma.

The influence of the circulation of venous blood upon the muscular system is no less powerful than that upon the nervous, for the muscle can no more perform its function without the stimulus of arterial blood than the brain. When, in consequence of the exclusion of air from the lung, venous blood is sent out to the system, the heart is always the first muscle that feels the effect of this abstraction of its accustomed stimulus; because venous instead of arterial blood is instantly brought into direct contact with the surface of its left cavities [see HEART], and because venous instead of arterial blood is sent by its nutrient arteries (the coronary, which are the first branches given off by the aorta) into its very substance; and this blood, as has been already stated, is incapable of affording it the requisite nourishment and excitement. Accordingly, the action of the heart is always greatly affected from the very first moment that an animal is brought under this condition. At first its contractions are somewhat accelerated, probably on account of the violent struggles of the animal, and in consequence of the emotion of fear; but in a few seconds its action begins to be arrested, and it becomes rapidly less and less frequent until it sinks to a point surprisingly low. When in a state of health and unexcited, the pulse of a dog is 130 in a minute; but in two minutes after the exclusion of air from its lung, it sinks to twenty-five, and it often falls still lower. Immediately before death it invariably becomes again accelerated, sometimes rising to its natural standard; but what it then gains in velocity it loses in strength, and in all cases within three minutes after the complete exclusion of the air from the lung, the action of the heart has become feeble; this feebleness gradually but rapidly increases, until at the end of the fourth minute it is seldom that the action is at all perceptible by the finger. But though the heart be the first to feel the effect of the abstraction from the system of its

usual stimulus, yet the blood which is transmitted to all the other muscles of the body is alike incapable of exciting them to contraction: the muscles of respiration suffer with the rest, so that the respiratory movements, that is, the alternate enlargement and diminution of the cavity of the chest, indispensable to the entrance and exit of fresh currents of air, cease. In this manner are abolished, though not quite simultaneously, yet in rapid succession, the functions both of respiration and circulation.

As the circulation fails and the pulse sinks, the muscles termed *sphincter*, that is, muscles placed at the mouths of certain cavities in order to close their passage, that their contents may be retained for a given time, are commonly relaxed; the rectum and the urinary bladder evacuate their contents; often violent convulsions now come on, and immediately before the extinction of life the fæces and urine are expelled with great force.

The phenomena attendant on the state of asphyxia, and which are characteristic of it, are now sufficiently manifest. It is impossible to raise the thorax so as to draw in air, that is to inspire; nevertheless, violent though vain efforts are made to accomplish this object; but although no air can be introduced into the lung, yet a small portion can be expelled from it, so that the lung is ultimately brought to the extreme state of expiration. Complete exclusion of the air is rapidly followed by the abolition of sensation, this by the diminution and the ultimate cessation of the heart's action, together with the diminution and ultimate cessation of the respiratory movements; and when these changes have terminated in death, the body remains warm for a very long period; the aspect of the countenance is peculiar; the face is swollen; it is either of a reddish violet hue or of a livid colour, and the eyes are clear, bright, and preternaturally prominent. Shakspeare's description of this state is physiologically correct:

> " But, see! his face is black and full of blood;
> His eye-balls farther out than when he lived,
> Staring full ghastly, like a strangled man.
> His hair uprear'd; his nostrils stretch'd with struggling;
> His hands abroad display'd, as one that grasp'd
> And tugg'd for life, and was by strength subdued."

As the animal heat is longer retained than is usual in death from other causes, so the coming on of the stiffness consequent on death is longer protracted; but when it has once come on, it is retained for a proportionally longer period.

The morbid appearances in the internal organs observable on dissection are, *in the brain*, turgescence of the blood-vessels, especially of the veins, which are gorged with blood; the blood itself is preternaturally fluid and of an unusually dark colour. No diseased appearance is commonly found in the cavities of the brain, nor is its substance materially changed from the healthy state. *In the respiratory organs*, the mucous or lining membrane of the larynx, trachea, and bronchi, are unusually red; the bronchial divisions are of a violet or reddish-brown tint; the lungs are of a blackish-brown colour, and when cut into, large drops of a thick, fluid, and very black blood ooze out. *In the organs of circulation*, the heart is the organ chiefly affected. Its veins are gorged with dark blood; dark-coloured blood is found both in its right and in its left cavities, but it is invariably accumulated in a larger proportion in its right than in its left cavities; generally there is at least one-third more in the right than in the left. *In the abdominal organs*, the liver, the spleen, and the kidneys, are gorged with dark and fluid blood. Thus the blood in all the organs of the system is always unnaturally fluid in consistence and dark in colour.

Causes. From what has been stated it is obvious that whatever is capable of preventing the admission of air to the lungs, or of arresting the chemical action of the air upon the blood, is capable of producing the state of asphyxia.

I. Various circumstances are capable of acting in the first mode. 1. Whatever affords a mechanical obstruction to the action of the respiratory muscles, as a heavy weight resting upon the chest. 2. Whatever affords a mechanical obstruction to the due expansion of the lungs, while the respiratory muscles still act with the requisite energy, as the accumulation of fluid in the cavity of the chest, or the diminution of the cavity of the chest by the enlargement or displacement of the abdominal viscera. 3. Whatever affords a mechanical obstruction to the entrance of the air into the lung, as the application of a ligature around the wind-pipe, causing strangulation; the submersion of the body in water, or drowning; the introduction of foreign bodies into the larynx, trachea or its divisions, the bronchi; exposure to a too rarefied atmosphere, or to irrespirable gases, such as nitrogen, hydrogen, carburetted hydrogen, carbonic acid gas, &c.

II. The circumstances which are capable of producing the state of asphyxia, by arresting the chemical action of the air upon the blood, are either what may be termed mechanical or vital. The mechanical are those which act in the mode just adverted to, namely, by preventing the entrance of air into the lung, as suspension, submersion, and so on. The vital are those which act chiefly through the medium of the nervous system. If injury be done to the organic nerves which supply the lungs, or if from any cause the nerves of this class fail to supply the lungs with the nervous influence which it is their office to afford, the requisite changes in the blood do not take place. Such an injurious effect upon this class of nerves may be brought about gradually and progressively by the long-continued action of intense cold upon the system, or may be produced instantaneously by a stroke of lightning. The like cause may also act through the nervous system upon the respiratory muscles, stopping the action of what may be termed the mechanical portion of the respiratory apparatus, namely, the alternate enlargement and diminution of the thoracic cavity. Injury done to the other great division of the nervous system, the sentient; injury or division of the eighth pair of nerves; injury or pressure upon the upper portion of the spinal cord (the *medulla oblongata*); injury or pressure upon the spinal cord itself, and especially upon that portion of it which is placed in the neck, whether from fracture or from dislocation of the bones of the spinal column, may destroy the contractility of the respiratory muscles, and thus stop the respiratory movements. It often happens that both sets of causes are combined; the contractility of the muscles of respiration being destroyed by the operation of the same causes which abolish the nervous energy of the lungs.

There are certain varieties of asphyxia which, on account of their practical importance, being states of continual occurrence from accident and otherwise, require a separate consideration. The more important of these are drowning, hanging, strangulation, and suffocation. The physiological condition of the system is the same in each of these varieties of asphyxia; but there is a treatment suitable to each, which will be better explained under its appropriate head. [See Drowning, &c.]

ASPIRATE, a name given to one of the divisions of consonants. Grammarians have generally avoided any formal definition of the principle which characterizes this or the other classes of letters; they have generally deemed it sufficient to enumerate those letters which belong to each class, and to assign names to these classes without giving any reason for the selection. The subject is confessedly one of difficulty, and it is therefore with much doubt that the following system is proposed. In the pronunciation of the letters called *tenues*—viz., *k*, *t*, *p*,—the moveable organ, whether tongue or lip, comes into the minimum of contact with the organ struck, whether palate, teeth, or lip, and the stroke is rapid. In the pronunciation of the *medials*—*g* (as in *goose*), *d*, *b*,—the surface of contact is greater, the contact itself closer, and of longer duration Lastly, in the utterance of the aspirated letters, the organs are brought more or less closely together through the whole breadth of the mouth, so that the vibration of air passes through a long narrow fissure. If the pressure or approximation be of slight intensity, and of short duration, the series of aspirates, *y*, *ch* (as at the end of German or Scotch words), *th* as in *thing*, *ph*, *w* are produced. If the pressure be closer and more lasting, there result the aspirates *gh*, *th* as in *this*, and *v*. The former series might perhaps deserve to be called aspirated *tenues*; the latter, aspirated *medials*. The sibilants again seem to have a claim to be admitted under the genus aspirate. If this claim be allowed, *s* as in *such*, *sh* (or *ch* of the French *chemin*), *j* as in the French *jour*, may be called the sibilant *tenues*; and *ch* (as in the English *church*), *j* (as in the English *journey*), are the corresponding medial sibilants. The letter *h*, which has been omitted in our series, is only a faint *ch* (as pronounced by the Germans). Indeed, if the pedigree of this letter be traced upwards, it will be found to terminate in the Hebrew *cheth*. [See Alphabet, pp. 379, 380.] In the comparison of cognate languages, it is important to bear in mind—first, that the aspirated letters are often convertible with one another;

and secondly, that they are severally interchangeable with the medials and tenues of the same organ. Thus, 1st, *ch* of the Greek language often corresponds to *h* in the Latin: *cheim* (χειμ-ων, χειμ-ερινος) Gr., *hiem-s* Lat., *winter*; *chamai* Gr., *humi* Lat., *on-the-ground*; *cha* (χα-σκειν) Gr., *hia-re* Lat., *to gape*. [See Gutturals.] 2. *h* in Greek corresponds to *s* in Latin, *hepta* Gr., *septem* Lat., *seven*; *hex* Gr., *sex* Lat., *six*; *huper* Gr., *super* Lat., *above*, (*upper*.) 3. *th* in ordinary Greek to *ph* or *f* in the Æolic dialect and Latin; *ther* ord. Gr., *pher* Æolic Gr., *fera* Lat., *a wild beast*; *thlib* ord. Gr., *phlib* in Homer, *press*; *thura* Gr., *a door*, *fora-s* Lat., *out of doors*; *tharsus* (or *thrasus*) Gr., *fortis* Lat., *bold*; *thre* Gr., *fle* Lat., *bewail*. 4. *th* into *s*, as *sios*, *god*, in the Laconian dialect, instead of *theos*. 5. *th* in ordinary Greek to *ch* in other dialects: *ornith* ordinary Greek, *ornich* Doric, *a bird*. Hence in the same language *ith* (ιθ-μα) and *ich* (ιχ-νος) enter into the two forms which signify *a step*; *erch* and *elth* into the two forms of the verb signifying *to go*, ερχομαι, ελθων. Hence too the different forms of the Greek and Latin names for Carthage, *Carchedon* Gr., *Carthagon* Lat., in which the second interchange of *d* and *g* compensates for the inverse change of the aspirates *ch* and *th*. 6. *f* in Latin corresponds to *h* in Spanish, *faba* Lat., *haba* Sp., *a bean*; *fabula-ri* Lat., *habla-r* Sp., *to talk*; *fac-ere* Lat., *hac-er* Sp., *to do*; *fato* (*fatum*) Lat., *hado* Sp., *fate*; *formoso* (*formosus*) Lat., *hermoso* Sp., *beautiful*. For the relation of *sw* and *w* with *h*, see Digamma.

Secondly, the several aspirates are, as above stated, interchangeable with the medials and tenues of the same organ. Examples of these changes will readily suggest themselves in every language. The most deserving of attention are perhaps those which exist between the English and German:

initial *k*,	in German,	corresponds to	*ch*, *sh*,	in English.
final *g*	„	„	*w*, *y*,	„
final *ch*	„	„	silent *gh*, *ch*, *k*.	
final *t*	„	„	*th*, *d*,	„
initial *d*	„	„	*th* in *think*.	
final *d*	„	„	*th* in *the*.	
th	„	„	*d*	„
initial *z*	„	„	*t*,	„
final *tz*, *ss*	„	„	*t*,	„
final *b*	„	„	*v*, *f*,	„
pf	„	„	*p*,	„
final *f*	„	„	*p*,	„
initial *v*	„	„	*f*,	„

(See Grimm's *Deutsche Grammatik*, or Becker's *German Grammar*, English edit. p. 26.)

ASPOE, a small island, situated in the Gulph of Bothnia, belonging to the Russian province of Finland. It forms a parish, has a light-house, and contains about a hundred Finlanders. 60° 17′ N. lat., 26° 77′ E. long. (Klint.)

ASPREDO, in zoology, a genus of abdominal malacopterygious fishes, characterised by the horizontal flatness of the head, and the enlargement of the anterior part of the trunk, arising from an unusual development of the bones of the shoulder. They are further distinguished from the Silures of Linnæus (from which extensive genus, indeed, they were originally separated by that great naturalist himself) by the proportional length of the tail; by having the eyes placed in the upper surface of the head, and the intermaxillary bones concealed beneath the ethmoid, directed backwards, and furnished with teeth only along their posterior margin; and finally, they are remarkable as being the only known fish, not being cartilaginous, which have not moveable opercula, the bones of which these organs are composed being soldered on either side to the tympanum and preoperculum. The opening of the gills is consequently formed by a single slit in the skin immediately behind the posterior side of the head; and their membrane is composed of six branchiostegous rays. The lower jaw is transverse, and the upper projects considerably beyond it, and forms a small attenuated muzzle. There is but a single dorsal fin, which is of small extent, and situated on the fore-part of the body: the anal fin, on the contrary, is very large, and occupies the entire length of the tail. This genus contains but very few species, the principal of which, the *Silurus Aspredo* of Linnæus, inhabits the rivers and lakes of North America.

ASPROPOTAMO. [See Achelous.]

ASS, a well-known and useful domestic animal, whose good qualities are too frequently undervalued, from being contrasted with those of the horse, without considering the different nature of the treatment which these two quadrupeds receive—the care and attention bestowed upon developing the form and cultivating the spirit of the one, and the neglect and ill-usage to which the other is so generally subjected. Buffon has well observed, that the ass is despised and neglected only because we possess a more noble and powerful animal in the horse; and that, if the horse were unknown, the care and attention which is lavished upon him, being transferred to his now neglected and despised rival, would have increased the size and developed the mental qualities of the ass to an extent which it would be difficult to anticipate, but which eastern travellers, who have observed both animals in their native climates, and among nations by whom they are equally valued, and the good qualities of each justly appreciated, assure us to be the fact. Indeed, the character and habits of these two quadrupeds are directly opposed in almost every respect. The horse is proud, fiery, and impetuous, nice in his tastes, and delicate in constitution; like a pampered menial, he is subject to many diseases, and acquires artificial wants and habits, which are unknown in a state of nature. The ass, on the contrary, is humble, patient, and contented with scanty and coarse fare which other cattle reject; he bears with patience and fortitude the most cruel and oppressive treatment; yet he is more susceptible of strong attachment than the horse, has apparently more prudence and reflection, and is capable of a degree of education which would not be anticipated from the forlorn and dejected appearance which coarse food and harsh treatment have rendered habitual to him. In Persia, Arabia, and other eastern countries, however, the ass is a very different animal from what he is in Western Europe. There, instead of being neglected and despised, half-starved, and treated with cruelty, care is taken to cultivate the breed by crossing the finest specimens; even the wild ass is procured for this purpose, the pedigrees of the different races are carefully recorded, and the size, strength, and symmetry of the ass so much improved, that he is rendered equal to the horse for most purposes, and in some cases even his superior. 'The asses of Arabia,' says Chardin, 'are perhaps the handsomest animals in the world; their coat is smooth and clean; they carry the head elevated, and have fine and well-formed legs, which they throw out gracefully in walking or galloping. They are used only for the saddle, and are imported in vast numbers into Persia, where they are frequently sold for four hundred livres; and being taught a kind of easy, ambling pace, are richly caparisoned, and used only by the rich and luxurious nobles.'

The ass is, properly speaking, a mountain animal; his hoofs are long, and furnished with extremely sharp rims, leaving a hollow in the centre, by which means he is enabled to tread with more security on the slippery and precipitous sides of hills and precipices. The hoof of the horse, on the contrary, is round and nearly flat underneath, and we accordingly find that he is most serviceable in level countries; and indeed experience has long since taught us that he is altogether unfitted for crossing rocky and steep mountains. As, however, the more diminutive size of the ass rendered him comparatively less important as a beast of burthen, the ingenuity of mankind early devised a means of remedying this defect, by crossing the horse and ass, and thus procuring an intermediate animal, uniting the size and strength of the one with the patience, intelligence, and surefootedness of the other. The mule, indeed, appears to have been known at a very early period; and if we may believe an extract from the works of Mago, a Carthaginian writer on Husbandry, preserved by Columella, it would even seem that instances were not rare in Northern Africa of this animal being fruitful, and continuing its species: a phenomenon, however, which was as unknown among the Greeks and Romans as it is at the present day.

If any reliance can be placed upon negative evidence deduced from the writings of Moses, it would appear that the ass was a common domestic animal among the nations of Western Asia, many ages before the horse was reduced to subjection. The earliest express mention which the sacred historian makes of any kind of cattle subsequent to the deluge, is on the occasion of Abraham's visit to Egypt, when, to use the words of Scripture, 'Pharaoh entreated him well for Sarah's sake; and he had sheep, and oxen, and *he-asses*, and maid-servants, and *she-asses*, and camels. No allusion is here made to the horse; and it is not probable that Pharaoh would have neglected to include this noble and useful animal among the other riches which he bestowed upon Abraham, if the Egyptians themselves had possessed it in a state of domestication; nor is it likely, if he had, that the sacred historian, so minute in other particulars, would have passed over this in silence. The conclusion therefore would appear to be, that in the time of Abraham the horse was not domesticated in Egypt. It appears further, from the catalogue of Abimelek's presents to Abraham, from the enumeration of Abraham's effects on the marriage of his son Isaac, from the catalogues of Jacob's riches, of his present to his brother Esau, and of the spoils taken from the city of Sechem, that the horse was unknown to the Syrian nations for many ages after the time of Abraham; but on all these occasions the ass is invariably mentioned among the other species of domestic cattle which constituted the wealth of the patriarchs. Though thus early domesticated in the East, it was long before the ass was introduced among the inhabitants of Western Europe. Aristotle assures us that in his time there were no asses in Pontus, Scythia, or in the country of the Celts, that is in modern Germany and France; and we know that even in the time of Elizabeth this animal was extremely rare in England.

The wild ass, called Koulan by the Persians, is still common in many parts of central Asia. It stands much higher on its limbs than the common ass, its legs are longer and more slender, and it is altogether a more graceful and symmetrical animal. The mane is composed of short erect hair, of a dusky colour, and rather a woolly texture; the colour of the body is a uniform silvery grey, with a broad coffee-coloured stripe extending down the back, from the mane to the tail, and crossed on the shoulder by a transverse band, as in the domestic variety. The Koulan inhabits the parts of Central Asia, from the 48° of North latitude to the northern confines of India. They migrate from north to south according to the season. In summer they are commonly found about lake Aral, but in autumn they collect in vast troops under the conduct of a regular leader, and proceed towards the south, arriving at Cutch and Guzerat in October or November, and returning northward again in the middle of spring. The Persians and Tartars hold the flesh of the Koulan in high esteem, and hunt it in preference to all other descriptions of game. Olearius assures us that he saw no fewer than thirty-two wild asses slain in one day by the Schah of Persia and his court, the bodies of which were sent to the royal kitchens at Ispahan; and we know from Martial, that the epicures of Rome held the flesh of the Onager, or wild ass, in the same estimation as we do venison.

Cum tener est *Onager*, solaque lalisio matre
Pascitur: hoc infans, sed breve nomen habet.
Martial, xiii. 97.

From a passage in Pliny (lib. viii. c. 44) it would appear that the Onager inhabited Africa, and that the most delicate and best flavoured lalisiones, or fat foals, were brought from that continent to the Roman markets. Leo Africanus repeats the same story of wild asses being found in Africa, but no traveller has since met with them, and, as far as we at present know, the species is confined to Asia. It has even retired from Syria and Asia Minor, where it was formerly found. [See HORSE.]

ASSAFŒTIDA (in Botany). [See FERULA.]

ASSAFŒTIDA is a gum-resin, obtained from the roots of the *Ferula assafœtida*, a perennial plant growing in Persia, in Khorassan, and in the province of Lar. In its recent and purest state it is white and transparent, but by exposure to the air it becomes of a clear brown colour, sometimes verging to red or violet, and of a waxy appearance. At the ordinary temperature of the air it is of the consistence of wax, slightly viscid or glutinous, and becoming soft with the heat of the hand, by which the grains are united into smaller or larger lumps, which, when broken, contain many almond-like pieces. The portions which correspond to this description constitute the best kind of assafœtida, which is called assafœtida in grains.

The inferior sort is dark-brown, of a dull, fatty appearance, viscid, and greasy, containing portions of the stalks, and other impurities: it is called assafœtida in masses.

Sagapenum, the source of which is unknown, is by many supposed to be a kind of assafœtida.

The smell of assafœtida is penetrating, very disagreeable, and lasts some time. The taste is bitter, unpleasantly aromatic, of an alliaceous or garlic-like character. Its chief component parts are volatile oil, resin, and gum; and it is soluble in vinegar, proof-spirit, and yolk of egg. Triturated with water, it forms an emulsion, from which the resin is gradually precipitated. Assafœtida can only be powdered at the temperature of freezing (32° of Fahrenheit); but even after being powdered, though kept in a cool place, it is apt again to run into masses.

An artificial assafœtida is sometimes formed of resin and garlic juice; but this has only a weak smell, and is more perfectly soluble in alcohol.

Assafœtida acts on the human system as a stimulant, more especially of the nerves of the chest and abdomen. It also influences, like all gum-resins, the vessels distributed on the lower portion of the abdomen, or the pelvis. Though not so heating as its chemical composition might lead us to expect, it not only directs the blood more powerfully to these organs, but ensures its uniform supply. It is also a valuable antispasmodic, in irregular action of the muscles either of the respiratory or digestive organs.

Its power of at once rousing the nervous system and promoting the flow of blood towards the enfeebled stomach and bowels, render it very serviceable in imperfect digestion, attended with constipation.

From a knowledge of its powers in such cases, the Romans employed it along with their food, as the Persians still do.

In hysteria it is extremely useful, both during an attack of spasm, and during the interval between the paroxysms.

In colic, and even ileus, its action is often rapid and effectual, especially if thrown into the rectum: in this way cases of the most obstinate constipation, especially in hysterical females, have yielded to it.

In asthma, in the later stages of hooping-cough, and in the cough of old age, in cough occurring in weakly subjects, not connected with inflammation or tubercles, above all, in the cough of hysterical females, it is of very great service. In the last-mentioned case, it is improved by combination with myrrh and preparations of iron, as it likewise is when employed to act on the uterine system.

It is also employed externally, as a means of keeping up counter-irritation; and a convenient plaster may be formed by adding 1-12th part of camphor to 11-12ths of assafœtida. For internal exhibition, pills, or tincture, or watery solution (which must be used immediately after it is prepared) are the ordinary forms of administration. In cases of organic disease of the heart, especially enlargement, and in fulness or congestion of the brain or spinal chord, or in any organic disease of these, assafœtida is improper.

ASSAHAN, a district and town situated on a river of the same name, in the Batta country, on the north-east coast of Sumatra. The town is in 3° 1′ N. lat. and 99° 52′ E. long. The river, which is above 4000 feet wide at its mouth, is shallow, and is rendered difficult of access by an extensive sand-bank. The Portuguese had formerly a settlement up the Assahan river, and the remains of an old fortification still exist, about 70 miles from its entrance, where a colony of emigrants from Java was once established.

The commerce of Assahan was formerly very considerable, but has now much declined. It is principally carried on with the Malays of the opposite peninsula, and with the English settlements of Penang and Singapore. The articles of import are salt, opium, cotton goods, muskets, and gunpowder. The exports are various—dye-woods, rattans, wax, rice, and horses. A trade in slaves was formerly carried on from Assahan. As many as 300, mostly females, have been sent away in one year to Malacca; and it is curious to observe the small comparative value then placed upon human beings in the Eastern markets, where a horse sold for thirty dollars, while the price demanded by the merchants for their fellow-creatures varied, according to age and bodily capability, from twelve to forty dollars per head. Happily this trade has partaken of the general commercial depression.

The population of the whole district was estimated in 1822 at 70,000. Some, but not all, of the tribes who make up this number, are said to be addicted to cannibalism. (See Hamilton's *East India Gazetteer*.)

ASSASSINS, a military and religious order, formed in Persia in the eleventh century. It was a ramification of the Ismaelites, who were themselves a branch of the great Mohammedan sect of the Shiites, the supporters of the claims of Ali's posterity to the caliphate. [See ALI BEN ABI TA-

LEB.] But among the Ismaelites there were many who were Mussulmans only in appearance, and whose secret doctrine amounted to this: that no action was either good or bad in itself, and that all religions were the invention of men. These unbelievers were formed into a secret society by one Abdallah, a man of the old Persian race, who had been brought up in the religion of the Magi, and was a hater of the Arabs and of their faith. After several bloody insurrections against the Abbaside caliphs, the Ismaelites succeeded in placing on the throne of Egypt a pretended descendant of Ismael, the seventh Imaum in the line of Ali, from whom the Ismaelites had taken their name. [See ISMAELITES.] This descendant, whose name was Obeid Allah Mehdee, was the founder of the Fatemite dynasty, so called from Fatema, Mohammed's daughter. Under the protection of these princes a lodge of the secret doctrine was established at Cairo, and its members spread over a great part of Asia. Their ostensible object was to maintain the claims of the Fatemite caliphs to universal dominion, and to urge the destruction of the caliphs of Bagdad as usurpers. One of the adepts, Hassan ben Sabah, thought of turning these instruments to his own advantage. He had filled high offices under the sultan of the Seljucide Turks, but on being disgraced, he went to Egypt, where he was received with distinction by the caliph, became a zealous adherent of the Ismaelite lodge, and after many vicissitudes and wanderings obtained possession, by the aid of his brethren, of the hill-fort of Alamoot (or *vulture's nest*), situated to the north of Casvin, in Persia, and there (A.D. 1090) established an independent society or order, consisting of seven degrees, with himself at the head as sheikh al jebel, *i. e.*, sheikh of the mountain. Under him came three dai al kebir, the grand priors of the order; 3dly, the dais, or initiated masters; 4thly, the refeeks, or companions; 5thly, the fedavees, or devoted; 6thly, the laseeks, aspirants or novices; 7thly, the prophane, or common people. Hassan drew out for the dais, or initiated, a catechism consisting of seven heads, among which were—implicit obedience to their chief; secrecy; and lastly, the principle of seeking the allegorical and not the plain sense in the koran, by which means the text could be distorted into anything the interpreter pleased. This did away effectually with all fixed rules of morality or faith. But this secret knowledge was confined to a few; the rest were bound to a strict observance of the letter of the koran. The most effectual class in the order were the fedavees—youths often purchased or stolen from their parents when children, and brought up under a particular system of education, calculated to impress upon their minds the omnipotence of the sheikh, and the criminality as well as utter impossibility of evading his orders, which were like the mandates of heaven itself. These fedavees were clothed in white, with red bonnets and girdles, and armed with sharp daggers; but they assumed all sorts of disguises when sent on a mission. Marco Polo gives a curious romantic account of the garden at Alamoot, to which the fedavee, designed for an important mission, was carried in a state of temporary stupor produced by powerful opiates, and where, on awakening, he found every thing that could excite and gratify his senses. He was made to believe that this was a foretaste of the paradise of the prophet, reserved for his faithful and devoted servants, and thus became willing to encounter death, even under the most appalling forms, in order to secure a permanent seat in the abode of bliss. Marco Polo's narrative is confirmed by Arabian writers, and Von Hammer inclines to believe it true in the main; others attribute the visions in the garden to the effects of the intoxicating preparation administered to the fedavees. The name of *hashish*, which is that of an opiate made from hemp-leaves, is supposed to have been the origin of the word 'Assassins;' others derive the latter from Hassan ben Sabah, the founder of the order. The word becoming familiar to the crusaders was by them carried to Europe, where it was used as synonymous with that of *sicarius*, or hired murderer; but the Italians have adopted it to signify a robber on the high road, without necessarily implying the crime of murder.

The Assassins, either by force or treachery, gained possession of many other castles and hill-forts in Persia. The sultan Melek Shah attacked them, the doctors of the law excommunicated them, but the fedavees carried secret death among their enemies; the sultan's minister, Nizam ul Mulk, was stabbed, and his master soon after died suddenly, it was supposed by poison. The Assassins spread into Syria, where they acquired strongholds in the mountains near Tripoli; and the sultan of the Seljucides was glad to come to an agreement by granting them several districts. Hassan ben Sabah having extended his order over great part of the Mohammedan world, died at Alamoot in 1124, after thirty-five years' reign. He bequeathed his authority to Keah Buzoorg Oomeid, one of the dais of the order. Buzoorg renewed the war with the Seljucides, and Aboos Wefa, his Dai al Kebir in Syria, entered into a temporary alliance with Baldwin II. king of Jerusalem, through the agency of Hugo de Payens, grand master of the Templars, against their common enemies the Seljucide Turks. After this, the Assassins were sometimes on friendly terms, but oftener at variance, with the Christian princes of Syria and Palestine, as well as with their Mohammedan neighbours. To accomplish their object they never scrupled to resort to assassination. In 1126 the prince of Mosul was stabbed as he entered the mosque by Assassins disguised as dervises; soon after, a caliph of Bagdad was killed likewise, and also a sultan of Cairo, notwithstanding his Fatemite descent. In 1151 Raymond count of Tripoli was stabbed by the Assassins; it was suspected, at the instigation of his wife. At this time the Syrian branch of the Assassins had become in a manner independent of the Persian one. The sheikhs of the latter, successors of Buzoorg, continued to reside at Alamoot, but they were weak and profligate: one of them, Hassan, who had the rashness to disclose in public the mysteries of the order, was murdered by his son Mohammed, who was himself poisoned by his son Jellal-ed-deen, who succeeded him in 1177. Jellal-ed-deen was a man of more sense than his predecessors; he made his peace with the caliph, sent his harem on the great pilgrimage to Mekka, and received the appellation of New Mussulman. After a short but peaceful reign he was succeeded by his son Aladdin, who, being murdered, the office of sheikh al Jebel devolved upon Roked-ed-deen, Aladdin's son. By this time the caliph of Bagdad had applied to the great Mongol conqueror, Mangoo Khan, who sent his brother Hulakoo to exterminate the murderous sect. Alamoot was taken, and Roken-ed-deen was made prisoner; the fortress Kirdcoo resisted for three years, but at last all the haunts of the Assassins were taken, and the inmates were massacred without distinction, A. D. 1256.

The Syrian or western branch of the Assassins, however, continued to exist for some years later under their Dai al Kebir. Massyad, not far from Beyroot, was their principal stronghold. The history of this branch is the most familiar to Europeans, being much interwoven with that of the crusaders and of the great Sultan Sala-ed-deen. The latter was several times in danger from the daggers of the Assassins. The Dai al Kebir Sinan, a man who had a reputation for sanctity, sent in 1173 an embassy to Almeric, the Christian king of Jerusalem, offering, in his name and that of his people, to embrace Christianity, on condition that the Templars, who were their neighbours, should remit the annual tribute of two thousand gold ducats which they had imposed on them, and live in future in peace and good neighbourhood towards them. Almeric was delighted with the offer, and dismissed the envoy with honour. The envoy, however, on his return to his territory, was killed by a party of Templars, led by Gaultier du Mesnil. After this the Assassins resorted again to their daggers, which they had laid aside for many years. Among other victims, Conrad, marquis of Tyre and Montferrat, was murdered by two fedavees in the market-place of Tyre, 1192. The reasons for this murder, which some have ascribed to Richard of England, have been the subject of a long controversy, which Von Hammer does not succeed in elucidating. The Assassins kept the Christians of Tripoli in perpetual fear. They levied contributions on the Christian princes for the safety of their lives; and they even demanded it of St. Louis, king of France, on his passing through Acre on his return from the Damietta expedition. Louis, however, indignantly refused. At last the Syrian Assassins were conquered, and their stronghold taken, by Bibars, the Mamluke Sultan of Egypt, fourteen years after the destruction of the eastern branch by the Mongols. Many, however, found refuge in the mountains of Syria, and became mixed with the Yezeed Koords; and some of the tenets of the order are believed to linger still among them. (Hammer, *Geschichte der Assassinen;* also Sir John Malcolm's *History of Persia;* and Wilken's *History of the Crusades.*)

ASSAULT and BATTERY. An assault has been commonly defined to be 'an attempt or offer with force and violence to do a corporal hurt to another.' Thus, presenting a gun at a person within the distance to which it will carry, throwing a stone or other missile at him, drawing a sword and waving it, or even holding up a fist in a threatening manner, are given as instances of assault. An assault does not necessarily imply any corporal injury done to the party assaulted; pointing or snapping a loaded gun at a person behind his back, so that he is not aware of his danger, would be an assault, though no actual injury is sustained. But it has long been settled law, that no words, however insolent and provoking, unaccompanied by an act of violence, can amount to an assault.

A *battery*, which is said to imply an assault, consists of any kind of corporal injury, however small, designedly done to another by an actual contact with his person. The injury need not be done by the immediate hand of the party; nor is it material whether the act is wilful or not, provided it proceeds from a mischievous design. Thus, in a case where a lighted squib was thrown into a market-place, which was tossed about from hand to hand and at last struck a man in the face and put out his eye, it was holden to be an assault and battery by the first thrower.

A person who commits an assault and battery is liable to an action of trespass by the party injured, and also to a criminal prosecution for a misdemeanor and breach of the peace; but the proceeding by indictment and action for the same assault is always discouraged in practice · and where a defendant is found guilty upon an indictment, and the court is informed that an action has been brought for the same injury, a nominal sentence is usually passed, unless the prosecutor will consent to discontinue his action.

It is not uncommon to permit the prosecutor of an indictment for a common assault to compound the offence with the defendant even after he has been convicted; and upon the declaration of the former that he is satisfied, a nominal punishment only is imposed. This practice, which is called *speaking with the prosecutor*, has been introduced for the purpose of reimbursing the person really injured the expenses of the prosecution, and of compelling the offender to make him some compensation, without the circuity of a civil action. Though sanctioned by long usage, it is a relaxation of the strict rules of the criminal law, and is liable to much objection in principle, as enabling an individual to assume the character of a public prosecutor for the purpose of redressing a private wrong. This objection to the practice has been strongly animadverted upon by Mr. Justice Blackstone, and it is now much less frequent than formerly. (Blackstone's *Commentaries*, vol. iv. p. 363.)

The punishment of persons convicted of common assaults is fine and imprisonment at the discretion of the court, exercised upon the circumstances of each particular case. By a variety of statutes, assaults aggravated with respect to the place where, or the persons on whom, they were committed, were formerly punishable with great severity; most of these statutes were, however, repealed by the stat. 9 Geo. IV. c. 31, which authorizes an increased punishment upon certain specified cases of aggravated assaults. Thus, persons convicted of assaulting magistrates, officers, or other persons concerned in preserving wrecks, are, by the 24th section of that statute, liable to be transported for seven years, or to be imprisoned, with or without hard labour, at the discretion of the court. So also, by the 25th section, persons convicted (1) of any assault with intent to commit a felony; (2) of any assault upon a peace or revenue officer in the execution of his duty; (3) of any assault with intent to resist the lawful apprehension of the party assaulting for any offence against the law; (4) of any assault committed in pursuance of a conspiracy to raise wages, may be imprisoned, with hard labour, for any term not exceeding two years.

The statute of 33 Henry VIII. c. 12, which punishes assaults in the king's palaces with the loss of the right hand and perpetual imprisonment, has been repealed by the above statute of the 9 Geo. IV. c. 31; but it seems that the penalty of the loss of the right hand attached by the common law to assaults committed in the actual presence of the king, or in his constructive presence in the superior courts of law, still remains. This subject was much discussed in a case which occurred in 1799, when the Earl of Thanet, and several other persons, were convicted of a riotous assault and rescue in a court of Oyer and Terminer and Gaol Delivery at Maidstone. Upon their being brought up for judgment, the court of King's Bench entertained doubts whether it was not imperative upon them to pass the specific sentence of amputation; but the attorney-general entered a *Noli prosequi* as to those parts of the charge upon which the doubts had arisen. (See Howell's *State Trials*, vol. 27, p. 822.)

Actions for trivial assaults were formerly among the most frequent subjects of litigation in our courts of justice; and in order to discourage them, it was enacted by the statute of 22 and 23 Car. II., c. 9, that 'in all actions of assault and battery, wherein the judge at the trial of the cause shall not certify upon the record that an assault and battery were sufficiently proved, the plaintiff, in case the jury shall find the damages to be under 40*s*., shall recover no more costs than the damages so found shall amount unto.'

By a recent statute (9 Geo. 4, c. 31, sect. 27), persons guilty of common assaults may be convicted summarily by two magistrates, who are empowered to impose a fine not exceeding 5*l*., with the costs; and in case of non-payment, to commit offenders to prison for two months. By the 28th section of the same statute, a certificate under the hands of the convicting magistrates that the complaint was dismissed as trivial, or that the assault complained of was justified, or payment of the fine adjudged, or completion of the term of imprisonment for non-payment thereof, shall be a bar to all further proceedings, criminal or civil, for the same cause.

ASSAYING, a chemical operation, which differs from analysis only in degree. When an analysis is performed, the nature and proportions of all the ingredients of a substance are determined; but in assaying, the quantity of any particular metal only which the ore or mixture under examination may contain is ascertained, without reference to the substances with which it is mixed or alloyed.

The operations of assaying are sometimes conducted entirely in what is called the *dry way*, or by heat; at other times in the *moist way*, or by acids and other re-agents; and in some cases both methods are necessarily resorted to in assaying the same ore or mixture of metals.

The use of the term assaying is sometimes restricted to alloys or mixtures of gold and silver; but in the present article we shall point out the methods of assaying the ores of the following metals also—copper, iron, lead, tin, and zinc.

The assaying of silver and gold is effected by a process called *cupellation*. Cupels are small flat crucibles made by pressing bone ash, moistened with water, into circular steel moulds, and they are dried by exposure to the air. The principle upon which the operation depends is, that all metals with which gold and silver are usually alloyed, are convertible into oxides by exposure to atmospheric air at a high temperature, whereas the precious metals remain unacted upon.

To assay silver by cupellation, it is requisite to obtain lead as free as possible from silver; when it is procured by reducing litharge, it contains only about half a grain of silver in a pound; and this portion may be neglected. The silver to be assayed is flattened and made quite clean; about thirty-six grains are to be weighed and wrapped up in the proper quantity of lead, which depends upon that of the base metal in the alloy; this, if coarse, is harder than standard silver, of a brilliant glassy appearance, and is flattened with difficulty on the anvil; if soft, easily flattened, and if a dead-white colour, a nearer approach to purity is indicated; the quantity of lead must then be apportioned according to the experience of the assayer, and varies from three to fifteen times the weight of alloy to be operated on. It is to be observed, that cupels do not absorb more than their own weight of oxide of lead, and also that if the quantity of this metal be too large, some of the silver is carried with the oxide into the cupel, and a loss of product is incurred.

The alloy and lead are to be put into a cupel when made very hot in a small earthen oven, called a *muffle*, which is placed in the assay furnace; the mixture soon fuses, is covered with a coat of oxide of lead, becomes flattened, gives off fumes, and considerable motion ensues on its surface. The lead thus gradually oxidizing and fusing is absorbed by the cupel, and carries with it the baser metals with which the silver was alloyed. The alloy is at first flat, but becomes gradually convex, and presents continually increasing shining points; when this happens, the cupel is to be brought forward to the mouth of the muffle; the shining points disappear, the silver becomes iridescent, and the operation is complete. Care must be taken to allow the assay to cool very gradually, and its weight will denote the quantity of fine silver contained in the quantity of the alloy subjected to examination.

The assaying of gold is performed, to a certain extent, exactly in the same way as that of silver; and if the gold were alloyed only with copper, the process would be as simple as that of silver assaying. Usually, however, gold contains silver, and this cannot be got rid of by cupellation; the *parting* process is therefore had recourse to: this consists in dissolving the silver by dilute nitric acid, which leaves the gold perfectly pure, unless the silver is so small in quantity as to be protected by the gold from the action of the acid, which is very commonly the case. To obviate this difficulty the gold alloy, supposing it to weigh twelve grains, is to have from twenty-four to thirty-six grains of pure silver added to it, and to be cupelled with one hundred and eight grains of lead. The button obtained is to be flattened into a plate of about one inch and a half long, and four or five lines broad, returned to the furnace, kept for some time at a red heat, taken out and suffered to cool, and rolled up about the size of a quill. This is to be put in a matrass with about three times its weight of nitric acid, of sp. gr. 1.25, and heated on a sand-bath. By the action of the acid the silver is dissolved, and the *cornets*, as they are termed, of gold, are left of a dull-brown colour, and without any metallic appearance; these are repeatedly washed with distilled water, and heated in small clay crucibles to bright redness. The pieces of gold having thus acquired their usual appearance and properties, are to be weighed, the absolute loss in weight indicating the purity of the alloy subjected to trial.

Iron ores are chiefly of three kinds: the impure protocarbonate, commonly called the argillaceous iron ore; the peroxide, including the specular and hæmatite iron ores; the black, or magnetic ore, which is a compound of the protoxide and peroxide. The argillaceous iron ore is that which supplies by far the greatest proportion obtained in Britain; the hæmatite occurs in north Lancashire and many other places; the mines of Elba yield the specular ore, whilst the Swedish iron is obtained principally from the magnetic ore.

Various methods have been proposed for assaying these ores, but the principle is in all of them the same; it is that of separating the oxygen from the iron, by the greater affinity of charcoal for that element at high temperatures. The operation of the charcoal is frequently assisted by the use of a flux to combine with the earthy matter, and to convert it into such a glass as will let the melted metal easily fall through, and form, on cooling, a clean button. A flux composed of lime and bottle glass has been used, or the clay which accompanies the argillaceous iron ore is to be burnt and mixed with an equal weight of lime; 200 grains of the powdered ore may be mixed with an equal weight of this flux and forty grains of powdered charcoal; the mixture, put into a Cornish and Hessian crucible, is to be heated in a wind-furnace or a forge. It is not always easy to apportion the charcoal exactly to the oxide of iron in the ore; when it is either too large or too small, the product of iron is deficient, and this will be denoted by the imperfection of the glass.

In the supplement to the *Encyclopædia Britannica*, Mr. Mushet has given the results of using various fluxes with an iron ore that yielded forty-six per cent. of the metal; and it appears that the following mixture of the ore and substances, all of course reduced to powder, gave the largest proportion of iron: ore 200 grains, lime 100, borax 100, charcoal 40, gave 91 of metal; it is therefore evident that only one-half per cent. of iron remained in the glass.

According to M. Descotils (*Ann. de Chimie*, t. 84, p. 188), the earthy portion of the argillaceous iron ore is frequently such as to form a glass without adding any flux whatever to the charcoal. He used crucibles lined with a mixture of clay and charcoal; and thus, among many other assays, with nearly similar results, an ore which was found by analysis to contain about thirty-seven and three quarters per cent. of iron yielded thirty-six per cent. of the metal, and the glass was of excellent quality.

Copper ores, with reference to the mode of assaying them, may be divided into two classes—those that contain sulphur, and those that do not. The former class may be subdivided into such as also contain iron pyrites, arsenic, tin, lead, zinc, &c., with a considerable quantity of earthy matter; and such as are composed principally of a mixture of the sulphurets of copper and iron, with but small portions if any, of other metallic or earthy minerals.

To treat the first subdivision of the sulphureous ores (which constitute at least 99-100ths of all copper ores sold in Great Britain), a flux should be prepared by mixing the following ingredients in the under-mentioned weights:—

2 parts	.	.	Fluor spar,
1 ditto	.	.	Slaked lime,
1 ditto	.	.	Borax,
1 ditto	.	.	Red argol (impure tartar),
½ ditto	.	.	Nitre,

all finely powdered and well mixed.

The sample of ore being reduced to a coarse powder, take 400[*] grains of it, and calcine it in a Cornish or Hessian crucible, at a moderate red heat, for fifteen or twenty minutes, stirring it repeatedly with an iron rod flattened at the end. During this operation the ore will increase considerably in bulk, and it should never be continued after this begins to diminish. Having taken out the crucible in order to allow it to cool, fill the furnace[†] with fuel, and put on the cover to increase the heat. When cool, mix the ore, without taking it out of the crucible, with about 400 grains of the prepared flux, and cover the surface of the mixture with common salt; introduce it into the furnace, and continue it therein, at a white heat, until the whole is well melted, which will be known by the surface of the mass assuming a smooth and quiet aspect. If the furnace is in good condition, this will generally be effected in about twenty minutes. Should the operator have reason to think that the mixture in the crucible has not melted thin, so as to allow the metallic regulus to subside through the slag, he may project upon it a mixture of a scruple each of nitre, borax, and argol; and this may be again repeated if necessary, adding, however, ten grains of flour of sulphur. When thoroughly melted, pour the contents of the crucible into a hemispherical iron mould, previously warmed and greased; allow it to become solid, and then quench it in water. Separate the button of regulus from the slag with a small hammer; it ought to be round and well defined, of a reddish-brown colour with shades of blue, or else bluish white. When of the former colour, it contains a little more sulphur than the latter. Should the button of regulus exhibit a brilliant bluish-white surface, the slag should be re-melted with two drachms of red argol, and a scruple each of slacked lime and sulphur, which will give a small button of regulus to be added to the former. It may here be remarked, that a button of regulus with a nucleus of metallic copper should always be rejected, and a fresh assay commenced, calcining the ore less. And if, when the slag and button of regulus are quenched in water, it renders the latter immediately turbid, and of a dirty orange-yellow colour, it should also be rejected: the ore in this case also having been too much calcined, or too large a quantity of nitre used. On the contrary, if the regulus does not collect in a compact well-defined button, but spreads under the slag a considerable way up the sides of the mould, and of a dull-brown aspect, the ore has not been sufficiently calcined.

The regulus must now be calcined: for which purpose reduce it to powder, and expose it in a clean crucible to a very dull red heat, constantly stirring it. As the operation proceeds, the heat must be increased and the stirring continued, until the whole of the sulphur is dissipated. Especial care must be taken, particularly at the commencement of the operation, to prevent the regulus from clotting or sticking together, which is caused by excess of heat or want of stirring, and much retards the operation. The same remark applies also to the calcination of ores.

The crucible having been removed from the furnace, and allowed to cool, add to the calcined regulus about a drachm each of borax and red argol, with a scruple of nitre, covering the whole with common salt. Melt the mixture well, and pour it into a mould as before; quench it in water, and knock off the slag (which reserve) from the metallic button. The latter is now termed coarse copper, and requires to be refined; for which purpose return the crucible to the furnace, putting into it the button of copper, upon which, when melted, project about half a drachm of flux (prepared as below), and the like quantity of common salt. Shut up the furnace for about two minutes, or until the flux is well melted, and then pour out into the mould as before. Separate the flux (which reserve) from the button; and if the latter does not appear to be fine (or free from alloy), repeat the operation until it is. An unerring mark of fineness is a sinking or concavity in the centre of the upper surface of the 'assay,' or button; but so long as the upper surface is convex, it is not fine. If the button, when fine, instead of having a smooth brilliant surface, of a yellowish red colour, exhibits a roughish surface of a dark red colour, and having firmly attached to it bits of a dark red slag, the refining process has been pushed too far. The button being fine, take the slag which was reserved from melting the calcined regulus, together with the flux and slag from the refining process, and mix these with three drachms of red argol and a very little charcoal powder, and melt well in the crucible in which the refining is performed. This will give a small metallic button, which refine as before.

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[*] The weight used by assayers of copper ores is 400 troy grains, marked 100 (technically called *cents*), which is subdivided down to one, and that again to one-eighth. Ore giving a button that weighs ten three-eighths is said to produce ten three-eighths per cent., and so on. The average of all the copper ores smelted in Great Britain is about eight and a half per cent.

[†] The furnace used for assaying copper ores is a simple air furnace, about seven inches square and fourteen inches deep, communicating with a chimney by a lateral flue five inches wide by two deep. The fuel is coke, broken to pieces about the size of walnuts, the small sifted out. Cornish crucibles are used, and require neither stand nor cover, being kept with the mouth just above the surface of the fuel.

The flux above alluded to, which is used for refining, is prepared by burning together a mixture of three parts nitre, two parts red argol, and one part of common salt. This is best done by putting the ingredients into a large iron mortar, and stirring them with a red-hot poker until combustion ceases. The mass should be reduced to powder before it is quite cold, and preserved in a well-stopped bottle, or it will deliquesce. About half a drachm of this flux and of common salt are usually taken, and this will generally be a sufficient quantity, but as much should be used as will perfectly cover the button when it is poured into the mould, otherwise the metal will oxidize, which of course is to be avoided.

The ores of the second subdivision of sulphurets are best assayed by calcining them perfectly in the first instance, so that the first melting shall give a metallic button, instead of a regulus or sulphuret. To effect this, when the one has been calcined until the whole of the sulphur is driven off, it should be melted with a drachm each of slacked lime and fluor spar, the same quantity of borax and red argol, with a little nitre; and then proceeded with precisely as directed for calcined regulus.

Copper ores not containing sulphur, or only in very small quantity, may be calcined for a short time (a few minutes is sufficient), and melted as directed in the last section, except that the quantity of lime and fluor may be reduced, and some scales of iron from a smith's forge added.

Lead.—The principal ore of lead is the sulphuret, commonly called galena; but the carbonate, or white lead ore, is sometimes found in considerable quantity.

To assay the former ore. Take 400 grains coarsely powdered, mix it with 100 grains of iron in filings or small pieces, 100 grains of black flux, and 50 grains of cream of tartar; put the mixture into a Cornish or Hessian crucible that will hold double the quantity, and cover it with common salt to the depth of half an inch. Expose it to a yellowish-white heat for about ten minutes, or until the matter in the crucible has ceased to boil, and is become smooth; then either pour it out into a hemispherical iron mould warm and greased, or allow it to cool in the crucible.

If the ore is much mixed with iron pyrites, or earthy matter, the quantity of iron should be reduced, and a little fluor spar and borax added to the other ingredients.

The carbonate is best assayed by melting it with half its weight of black flux and a little cream of tartar, covering the mixture as before with common salt.

Tin.—The ores of tin are principally of two kinds, the oxide and the sulphuret; the latter is, however, very rare.

To assay the oxide of tin, or black tin, as it is commonly called, it requires only simple fusion with half its weight of black flux, one-eighth borax and the like of cream of tartar, covering the mixture in the crucible to the depth of half an inch with common salt.

The sulphuret, or pyritous tin ore. Let 400 grains be reduced to powder and carefully calcined, with occasional additions of small portions of charcoal powder, constantly stirring it with an iron rod, and so managing the fire as to prevent the ore from clotting. This operation should be continued until the ore ceases to emit either sulphureous or arsenical vapours. When thoroughly calcined, file off from the stirring-rod any portion of the ore that may adhere to it, adding it, of course, to that in the crucible. Add likewise 40 grains of lime, 20 grains of fluor spar, 150 grains of black flux, with a small quantity of nitre, borax, and cream of tartar; when these are well mixed, cover with common salt, and when melted quite smooth, allow the crucible to cool, when the tin will be found at the bottom.

Zinc.—The ores of zinc are of two kinds, the carbonate, or calamine, and the sulphuret, or blende.

There is perhaps no mode of directly assaying the ores of this metal, so as to obtain their metallic contents. That generally given in books of chemistry and metallurgy, viz., distillation of the roasted ore mixed with charcoal in an earthen retort, will be found universally to fail, either entirely or partially. Even in the treatment of these ores in the large way, the quantity of metal obtained seldom exceeds one half the quantity which they contain: the loss arises partly from the escape of uncondensed metallic vapour, and partly from unreduced oxide.

The best mode of making comparative assays of the ores of zinc is as follows: if the ore is the carbonate, or calamine as it is usually termed, reduce it to pieces of the size of hazel nuts, weigh thirty-two ounces avoirdupois, and expose it under a muffle, or in a large crucible, to a moderate red heat, until the pieces are red-hot throughout. When cold, reduce the ore, which will have become very friable, to a fine powder; re-weigh it and note its weight, mix it with its own bulk and one-half more of powdered charcoal, and press it down moderately tight into a Stourbridge clay crucible, which it should not fill nearer than two inches to the top. Then take a piece of moistened and tempered clay, in which a little charcoal-powder and sand have been mixed, roll it out to one-eighth of an inch thick, and cut out of it a round cake to fit into the crucible upon the mixture of calamine and charcoal, giving it a little concavity on its upper surface. Then weigh as much granulated copper as is equal to two-thirds of the *calcined* calamine, spread it upon the disc of clay in the crucible, cover it with charcoal-powder, and lute a clay cover to the crucible. Set the crucible in an air furnace, and expose it to a bright-red heat for three hours, and then increase the heat to a yellowish-white for another hour; then take out the crucible and allow it to cool, collect the brass which will have formed on the clay disc and weigh it; if its weight equals that of the *calcined* calamine, the latter may be considered of good quality for commercial purposes. The arrangement may be varied by mixing the granulated copper with the calamine and charcoal, instead of putting it on the clay disc; but when the operation is finished, it will be more trouble to collect the grains of brass.

This is an operation that requires considerable nicety in the management of the fire, for if too hot, the metallic zinc is vaporised faster than the copper can combine with it; and, on the other hand, if not hot enough, the oxide will not be reduced. Attention to a few trials will give the requisite judgment.

The sulphuret, or blende, is assayed in the same way, except as to calcination.

Blende must first be reduced to a fine powder and carefully calcined upon the floor of a muffle, so heated as to exclude any carbonaceous smoke or flame, stirring it constantly with an iron rod until it ceases to give any indication of sulphur. The powdered blende should not lie above one-fourth of an inch thick on the muffle, and the heat should be very gradually raised from a dull to a bright cherry red. When perfectly calcined, it must be treated in the same way as calcined calamine.

ASSEMANI, JOSEPH SIMONIUS, a learned Maronite native of Syria, who came to Rome towards the beginning of the 18th century, was made Archbishop *in partibus* of Tyre, and librarian of the Vatican, by Clemens XI. He was sent by that Pontiff on a literary mission to Egypt and Syria, in the years 1715—16, and he brought back to Rome many valuable MSS. He then set about compiling his *Bibliotheca Orientalis Clementino Vaticana*, four volumes folio, Rome, 1719-28, being a biographical account of the Syrian writers, divided into three classes, *i. e.* Orthodox, Jacobites, and Nestorians, with copious extracts in the Syriac text, and a Latin version, lists of their works, and comments on the same. He intended to proceed with the Arabian, Copt, and other Eastern writers, but nothing appeared in print beyond the Syriac. The fourth volume of the *Bibliotheca* is engrossed by a learned dissertation on the Syrian Nestorians.—2d. *S. Ephraem Syri Opera omnia quæ extant*, six volumes folio, Rome, 1732-46. This edition of the works of St. Ephraem, one of the old Syrian fathers, containing the Syriac text and a Latin translation, was begun by Ambarach, another learned Maronite living at Rome, and better known as Father Benedetti, being a member of the society of the Jesuits, and after his death was completed by Assemani. This work is much esteemed, and the Latin is better than that of the other works of Assemani, who was more skilled in the Oriental than in the Latin language.—3d. *Kalendaria Ecclesiæ universæ, in quibus Sanctorum nomina, imagines, festi dies, Ecclesiarum Orientis ac Occidentis, præmissis uniuscujusquè Ecclesiæ originibus, recensentur, describuntur, et notis illustrantur,* six volumes quarto, Rome, 1755-7.—4th. *Bibliotheca Juris Orientalis Canonici et Civilis,* four volumes quarto, Rome, 1762-4.

Assemani died at Rome in 1768, at the age of eighty. He left MSS., several historical dissertations, and other fragments, on the Christian population of the antient patriarchate of Antioch, on the nation of the Copts, on the Nestorians, and other Eastern sects, &c., which have been lately published by Monsignor Maï. In his lifetime he published a dissertation on the origin and religion of the ante-Mohammedan Arabs, which he appended to his translation of Benrahebo's Chronicle. Of Assemani's friend Ambarach, we may here mention, that he translated from the Arabic into Latin the work of Stephen, Patriarch of Antioch, on the Origin and the Liturgy of the Maronites. [See Maronites.]

ASSEMANI, STEPHANUS EVODIUS, nephew of the preceding, was made Bishop of Apamea, and succeeded his uncle as librarian of the Vatican. He published the following works. 1. *Bibliothecæ Mediceo-Laurentianæ et Palatinæ codicum MSS. Orientalium Catalogus,* two volumes folio, 1742, with notes by Gori.—2. *Acta Sanctorum Martyrum Orientalium et Occidentalium,* two volumes folio, Rome, 1748. To this work, which he compiled from MSS. in the Vatican, he added the Acts of St. Simon, called Stylite, in Chaldaic and Latin. He also began a general catalogue of the Vatican MSS. divided into three classes, Oriental, Greek and Latin, Italian and other modern languages, of which, however, he published only the first volume in 1756; a fire which broke out in his chambers having destroyed his papers. Maï has continued parts of this catalogue in his *Scriptorum Veterum nova collectio,* of which the eighth volume has been lately published. Another member of the same family, called Joseph Louis Assemani, published the Alexandrine Missal, with the liturgy of the various churches of Egypt, old and modern: *Missale Alexandrinum S. Marci, in quo eucharistiæ liturgiæ omnes antiquæ ac recentes Ecclesiarum Ægypti, Græce, Coptice, Arabice, et Syriace exhibentur,* quarto, Rome, 1734; and also a chronology of the Patriarchs of Chaldea. The Assemani had a rich collection of Arabic and Syriac MSS., which Clemens XIII. purchased for the Vatican Library. Monsignor Maï has lately given catalogues of them. The Syriac MSS. alone are 202 in number.

ASSEMANI, SIMONE, grand nephew of Joseph Simon, and like him born in Syria, came to Italy, and was many years professor of Oriental languages in the university of Padua. He published several works in Italian and in Latin on Arabian literature and history. 1. *Saggio sull' origine, culto, letteratura e costumi degli Arabi, avanti il pseudo profeta Maometto,* octavo, Padua, 1787.—2. *Catalogo dei codici MSS. Orientali nella biblioteca Naniana,* quarto, Padua, 1787-8. To this catalogue he added extracts from some of the works registered in it, such as the lives of several philosophers and a series of the Persian, Arabian, and Turkish monarchs, and also illustrations of the Cufic coins and other antiquities existing in the museum of the same family of Nani.—3. *Globus Cœlestis, Cufico-Arabicus,* quarto, Padua, 1790, being a description of the celestial globe in the Borgia museum at Velletri, with a dissertation on the astronomy of the Arabs. It was this Assemani who first exposed the imposture of the Maltese Vella, who pretended to have found, in an Arabic MS. in the convent of S. Martino at Palermo, a diplomatic code of the Sicilian Saracens. Vella made a translation of it, and published it at Palermo in 1789. (*Codice Diplomatico di Sicilia sotto il Governo degli Arabi,* 5 vols. 4to. Palermo, 1789-92.) The work was dedicated to the King of Naples. Assemani, to whom some of the proof sheets had been sent, pronounced the text to be unintelligible, except some lines which were Maltese instead of Arabic. At last Joseph Hager was sent for from Vienna to Palermo, and he having examined the MS. found it contained a narrative of the life of Mohammed, much interpolated with Maltese words, apparently with the intention of rendering the original text unintelligible. Vella's imposture being now made clear, he was sentenced to imprisonment. (*Cesarotti Opere,* volume xviii.; *Fundgruben des Orients,* volume i.; and also *Allgemeinen Literarischen Anzeigen* for 1795.)

ASSEMBLY, GENERAL, OF SCOTLAND. [See General Assembly.]

ASSEMBLY, NATIONAL. [See National Assembly.]

ASSEMBLY OF DIVINES. [See Westminster Assembly.]

ASSENT, ROYAL. When a bill has passed through all its stages in both houses of parliament, if it is a bill of supply, it is sent back to the charge of the officers of the House of Commons, in which it had of course originated; but if not a bill of supply, it remains in the House of Lords. The royal assent is always given in the House of Lords, the Commons, however, being also present at the bar, to which they are summoned by the Black Rod. The king may either be present in person, or may signify his assent by letters patent under the great seal, signed with his hand, and communicated to the two houses by commissioners. Power to do this is given by the 33d Henry VIII. chap. 21. The commissioners are usually three or four of the great officers of state. They take their seats, attired in a peculiar costume, on a bench placed between the woolsack and the throne. When the king comes down in person, he is seated on the throne robed and crowned. The bills that have been left in the House of Lords lie on the table; the bills of supply are brought up from the Commons by the Speaker, who, in presenting them, especially at the end of a session, is accustomed to accompany the act with a short speech. In these addresses it is usual to recommend that the money which has been so liberally supplied by his majesty's faithful Commons should be judiciously and economically expended; and a considerable sensation has been sometimes made by the emphasis and solemnity with which this advice has been enforced upon the royal ear. The royal assent to each bill is announced by the clerk of parliament. Having read the title, he says, if it is a bill of supply, '*Le roi remercie ses loyal subjects, accepte leur benevolence, et ainsi le veut;*' if any other public bill, '*Le roi le veut;*' if a private bill, '*Soit fait comme il est desiré.*' What is called an act of grace, that is, an act by which the royal favour or bounty is extended to any party, must be signed by his majesty before it is laid before parliament, where it is only read once in each house, and where, although it may be rejected, it cannot be amended. To such an act there is no further expression of the royal assent, but, having read its title, the clerk of the parliament says, '*Les Prelats, Seigneurs, et Commons, en le present parliament assemblés, au nom de touts vos autres subjects, remercient tres humblement votre majesté, et prient a Dieu vous donner en santé bone vie et longue.*'

When the royal assent is refused to a bill, the form of announcement is *Le roi s'avisera.* It is probable that in former times these words were intended to mean what they express, namely, that the king would take the matter into consideration, and merely postponed his decision for the present. There has been no instance of the rejection by the crown of any bill, certainly not of any public bill, which had passed through parliament, for many years. It is commonly stated, even in books of good authority (for instance, in so respectable a work as Chitty's edition of Blackstone), that the last instance was the rejection of the bill for triennial parliaments by William III. in 1693. Tindal, in his continuation of Rapin, says, 'The king let the bill lie on the table for some time, so that men's eyes and expectations were much fixed on the issue of it; but in conclusion he refused to pass it, so the session ended in an ill humour. The rejecting a bill, though an unquestionable right of the crown, has been so seldom practised, that the two houses are apt to think it a hardship when there is a bill denied.' But another instance occurred towards the close of the same year, which was more remarkable, in consequence of its being followed by certain proceedings in parliament, which was sitting at the time. This was the rejection of the bill commonly called the Place Bill, the object of which was to exclude all holders of offices of trust and profit under the crown from the House of Commons. It was presented to the king along with the land-tax bill; and the day after he had assented to the one and rejected the other, the House of Commons, having resolved itself into a grand committee on the state of the nation, passed the following resolution:—

That whoever advised the king not to give the royal assent to the act which was to redress a grievance, and take off a scandal upon the proceedings of the Commons in parliament, is an enemy to their majesties and the kingdom; and that a representation be made to the king, to lay before him how few instances have been in former reigns of denying the royal assent to bills for redress of grievances; and the grief of the Commons for his not having given the royal assent to several public bills, and in particular to this bill, which tends so much to the clearing the reputation of this house, after their having so freely voted to supply the public occasions.' An address conformable to the resolution was accordingly presented to his majesty by the whole house. The king returned a polite answer to so much of the address as referred to the confidence that ought to be preserved between himself and the parliament, but took no notice of what was said about the rejection of the bill. When the Commons returned from the royal presence, it was moved in the house 'That application be made to his majesty for a further answer;' but the motion was negatived by a majority of 229 to 28.

Mr. Hatsell, in the second volume of his Precedents (edition of 1818), quotes other instances of subsequent date to this. The latest which he discovered was the rejection of a Scotch militia bill by Queen Anne in 1707. In former times the refusal of the royal assent was a common occurrence. Queen Elizabeth once at the end of a session, out of ninety-one bills which were presented to her, rejected forty-eight.

It is the royal assent which makes a bill an act of parliament, and gives it the force of a law. As by a legal fiction the laws passed throughout a whole session of parliament are considered as forming properly only one statute (of which what are popularly called the separate acts are only so many chapters), it used to be a matter of doubt whether the royal assent, at whatever period of the session it might be given, did not make the act operative from the beginning of the session, when no day was particularly mentioned in the body of it as that on which it should come into effect. In order to settle this point, it was ordered by the 33d George III. chap. 13, that the clerk of parliament should for the future endorse on every bill the day on which it received the royal assent, and that from that day, if there was not in it any specification to the contrary, its operation should commence.

It appears that the several forms of words now in use are not, as has been sometimes stated, exactly the same that have been employed in this ceremony from the first institution of parliaments. For instance, it is recorded that Henry VII. gave his assent to the bill of attainder passed in the first year of his reign (1485) against the partisans of Richard III. in the more emphatic terms, *Le roy le voet, en toutz pointz*. On some occasions, of earlier date, the assent is stated to have been given in English. Thus, to a bill of attainder passed against Sir William Oldhall in 1453 (the 31st of Henry VI.), the clerk is recorded in the Rolls of Parliament to have announced his majesty's assent as follows: 'The king volle that it be hadde and doon in maner and forme as it is desired.' And in 1459, in the case of an act of attainder against the Duke of York, the Earls of Salisbury, Warwick, and others, the same king gave his assent in the following form: 'The king agreeth to this act, so that by virtue thereof he be not put from his prerogative to shew such mercy and grace as shall please his highness, according to his regalie and dignitie, to any person or persons, whose names be expressed in this act, or to any other that might be hurt by the same.'

In the time of the Commonwealth, an English form was substituted for those in Norman-French, which had been previously and are now in use. On the 1st of October, 1656, the House of Commons resolved 'that when the Lord Protector shall pass a bill, the form of words to be used shall be these, *The Lord Protector doth consent*.' In 1706, also, a bill passed the House of Lords, and was read a second time in the House of Commons, for abolishing the use of the French tongue in all proceedings in parliament and courts of justice, in which it was directed, 'that instead of *Le roy le veult*, these words be used, *The king answers Be it so;* instead of *Soit fait come il est desiré*, these words be substituted, *Be it as is prayed;* where these words, *Le roi remercie ses bons sujets, accepte leur benevolence, et ainsi le veult*, have been used, it shall hereafter be, *The king thanks his good subjects, accepts their benevolence, and answers Be it so;* instead of *Le roi s'avisera*, these words, *The king will consider of it*, be used. 'Why this bill was rejected by the Commons,' says Hatsell, 'or why its provisions with respect to proceedings in parliament were not adopted in an act which afterwards passed in the year 1731, "That all proceedings in courts of justice should be in English," I never heard any reason assigned.' For further information on this subject, see Hatsell's Precedents, especially vol. ii. pp. 338—351 (edition of 1818).

ASSER, אשי, *Rav Ashe*, properly **ASHI**, is erroneously written by English and French writers Asser. Ashi was the principal author of the Babylonian Talmud, so called from the place of his residence. He was born at Babylon A.D. 353. His Jewish biographers relate that he was appointed head of the college of Sora, in Babylon, at the age of fourteen; which, if this account be true, is an unparalleled instance of mental precocity. But whether or not full credit may be attached to this statement, Ashi was undoubtedly distinguished very early in life by intellectual powers and acquirements. He died A.D. 426, aged seventy-four.

Rabbi Abraham Ben Dior asserts, in his *Kabbalah*, p. 68, that since the days of Rabbi Jehuda Hannasi, or Rabbenu Hakkadosh, in no one but Ashi had been combined at once knowledge of the law, piety, humility, and magnificence. The expositions of the Mishna delivered by Ashi in his lectures to the students under his care were collected, and form the basis of the Babylonian Talmud. It was his practice to dictate to his pupils each year, in the month of February, a treatise, which he required them to study during six months, and when they returned to him in the month of August, to give him their views of its contents. He incited them to hold arguments on their several sentiments on the subject of the treatise, removed their doubts, and replied to their objections, or confirmed their opinions by the testimony of former sages. The heads of the classes explained at length to the younger students what had been stated succinctly by the master. Prizes were awarded to the most distinguished disciples. Ashi then delivered another treatise, which was in like manner studied during another six months, and in the month of February was discussed. From the matter thus collected, during a course of instruction which lasted sixty years, Ashi composed that part of the Babylonian Talmud which was immediately written by himself. It was continued by his disciples, the number of whom amounted to many thousands. (Compare the *Tsemach David*, first part, in the years 4127 and 4187; *Sepher Juchasin*, fol. 117; *Halichoth Olam*, p. 18; Wolfii, *Bibliotheca Hebræa*, tom. i. p. 224.)

ASSER, or **ASSERIUS MENEVENSIS**, called **ASKER** by Ingulphus, and **JOHN ASSER** by Bale and Pits, was a learned monk of St. David's, whence (the name of that place in Latin being written Menapia or Menevia) he obtained the appellation of Menevensis. Leland (*Comment. de Script.* i. p. 155) states him to have been of British extraction, and Bale (edit. Basil, 1557, p. 125) says that his instructor in learning at St. David's was John Erigena. We have his own authority (*De Reb. Gest. Ælfr.* ed. Wise, p. 49) for his being related to an archbishop of St. David's of the name of Novis.

Asser was invited to the court of Alfred the Great, as is generally believed, in or about the year 880, but probably earlier, merely from the reputation of his learning. His own account is (p. 47), that those who were sent to fetch him introduced him to the king at Dene, in Wiltshire, and that the king not only received him graciously, but, at the first interview, pressed him to reside constantly at court. Asser modestly declined the proposal, alleging that it would be a reproach to him to leave a place where he had been nurtured and ordained to the priesthood, for the sake of obtaining preferment elsewhere. King Alfred then desired that he would apportion his time between the court and his monastery, passing six months at one, and six at the other: but Asser was unwilling to comply even with this request, till he had consulted the brethren of his convent. He therefore set out for St. David's, but falling ill at Winchester, lay sick there more than a year. He afterwards pursued his journey, and at length obtained the consent of his brother-monks to accept the offer, as they promised themselves great advantages from the King's favour, and more especially against the oppressions of Hemeid, one of the petty princes of South Wales, who had occasionally persecuted their archbishop. They, however, requested Asser to prevail upon the king to let him reside quarterly at court and at St. David's, rather than that he should remain absent six months together.

When he came back, he found the king at a place called Leonaford, who received him with every mark of distinction, and with whom he remained at once eight months, reading with him such books as the king possessed. (*Ibid.* p. 50.) Asser states that, on the Christmas eve following, the king presented him with the monasteries of Amgresbyri (supposed to be Amesbury, in Wiltshire), and Banuwille (Banwell, in Somersetshire), together with a silk pall of great value, and as much incense as a strong man was able to carry; adding, that these were small things, and that hereafter he should have greater. In a short time Asser had the church of Exeter bestowed upon him; and, at a later period, the bishopric of Sherburn, which, however, he quitted, according to the writer of his life in the *Biographia Britannica*, in 883, though he always retained the title. Thenceforward he constantly attended the court, in the manner before stipulated, and is named as a person in whom he had particular confidence, by King Alfred in his will, which must have been made some time in or before 885, since mention is there made of Esna, bishop of Hereford, who died that year. He bequeathed to Asser one hundred mancuses. (*Will of K. Alfr.* publ. at Oxf. p. 20.) Asser is also mentioned by King Alfred in the epistle prefixed to his translation of Gregory's '*Pastorale*,' addressed to Wlfsig, bishop of London; and there the king does not call him bishop of Sherburn, but minum biꞅcepe, 'my bishop;' acknowledging the help received from him and others in that translation.

It seems to have been the near resemblance which the genius of Asser bore to that of the king which gained him so much of Alfred's confidence; and it was probably on this account that Asser drew up the Memoir of the Life of Alfred, which we still have, and which he dedicated and presented to the king in the year 893. In this work we have a very remarkable account of the manner in which the king and Asser passed their time together.

Asser says that, one day (it was on the feast of St. Martin), having cited in conversation a passage from a particular author, the king was pleased with it, and would have him write it down in the margin of a book which he carried in his bosom: but Asser finding no room to write it there, and yet being desirous to gratify his master, asked Alfred whether he should not provide a few leaves, on which to set down such remarkable things as occurred either in reading or conversation. The king was delighted with this hint, and directed Asser, without delay, to put it into execution. Pursuing this method constantly, their collection began to swell, till at length it became of the size of an ordinary psalter; and this was what the King called his 'Handbook,' or 'Manual.'

Asser appears to have continued at court during the rest of the reign of Alfred, and probably several years after; but where or when he died is doubtful. The Saxon Chronicle positively fixes the time to the year 910.

The preferments and the works of Asser have both been subjects of controversy. The writer of his life in the *Biographia Britannica* asserts him to have been archbishop of St. David's (Kippis's edit. i. 410), which is much disputed. It seems clear, however, that Asser the monk, who is spoken of as a reader in the public schools at Oxford (Harpsfield, *Hist. Eccles.* 161), if such a person did exist, was a different person from the bishop of Sherburn.

Bale and Pits give the titles of six works ascribed to our Asser. One is, of course, The Life of Alfred:' the others are, 1. 'A Commentary on Boethius;' 2. 'Annales Britanniæ;' 3. 'Aurearum Sententiarum Enchiridion;' 4. 'A Book of Homilies; 5. 'A Volume of Letters.' The Commentary on Boethius probably means nothing more than his explanation of that author to King Alfred when the king made his Saxon translation. The Annales were published by Gale in his Script. xv. at Oxford in 1691, but are believed to be the work of a pseudo-Asser. The Enchiridion is, beyond question, Alfred's Manual already noticed. The existence of the two last works, the Homilies and Letters, is unsupported by any other authority. Many other works (but without specification) are said by Bale and Pits to have been translated into English by Asser.

The '*Annales Rerum Gestarum Ælfredi Magni*' were first published by Archbishop Parker, at the end of Walsingham's *History*, fol. Lond. 1574, and reprinted by Camden in his *Anglia, Normannica*, &c. fol. Francof. 1603. They were again reprinted in an elegant octavo volume at Oxford, by Francis Wise, in 1772: the best edition.

The celebrated manuscript of Asser, formerly in the Cottonian Library, marked Otho A. xii, was burnt in the fire at Westminster in 1731.

(See the '*Annales*,' published by Wise: Tanner's *Bibliotheca Britannico-Hibern.* p. 53; *Biogr. Brit.* art. Ayserius; Chalmers's *Biogr. Dict.*)

ASSESSMENT OF TAXES. [See Taxes.]

ASSESSMENT OF DAMAGES takes place on a writ of inquiry before the sheriff or his deputy, and a jury of the county where an action is laid, in cases where the defendant suffers judgment by default, instead of pleading and joining issue in the action. In such cases, the defendant having admitted a liability to some extent, the only question is as to the amount; and the jury are summoned merely to enquire into and assess the damages, and not as on trials where issue is joined to try the issue *as well as* to assess the damages (*tam ad triandum quam ad inquirendum*). Such assessment is subject to be set aside on motion before the court where the action is brought, in case the jury are improperly returned, or the sheriff has misdirected them in point of law, or the damages are excessive. [See Writ of Inquiry.—Damages.]

ASSETS (from the Norman French *assetz*, sufficient) is the real and personal property of a party deceased, which, either in the hands of his heir or devisee, or of his executor or administrator, is chargeable with the payment of his debts and legacies. Assets are either *personal* or *real*. The former, embracing goods, chattels, debts, &c. devolve on the executor or administrator; and the latter (including all real estate) descend to his heir-at-law, or are devised to his devisee. Assets are also distinguishable into *legal*, or such as render the executor or heir liable to a suit at common law on the part of a creditor; and *equitable*, or such as can only be rendered available by a suit in a court of equity, and are subject to distribution and marshalling among creditors and legatees, according to the peculiar equitable rules of that court.

1st. As to *personal legal assets*. These include all goods, chattels, and moveables, which belonged to the deceased in *action* or *possession* at the time of his death, and which actually come to the executor's or administrator's hands; and also all things which come to the executors or administrators at any time *in lieu* of them. Thus, a lease made to executors, in pursuance of a covenant to grant a lease to the testator in his life; goods delivered to executors under a contract to deliver them to a testator; damages recovered by an executor for breach of a contract made with the testator, are *personal legal assets*. So the young of sheep or cattle of the testator born after his death; the profits made by his executor in carrying on his trade; the value of his mortgaged chattels, redeemed by the executor after his death, are assets of this description.

The locality of the property, in general, does not affect the question whether it is assets or not; it being a maxim that 'assets in any part of the world are assets in every part of the world.' Therefore, stock in foreign funds, or a leasehold for years in Ireland, must, in case of a deficiency of assets in this country, be sold by the executor to satisfy the creditors. By the 5th Geo. II. c. 7. s. 4, houses, lands, negroes, &c. in the plantations of the West Indies, are rendered personal assets, devolving on the executor for satisfaction of debts. And the 9th Geo. IV. c. 33, has produced the same operation on all real estates of British subjects (not being Mohammedans or Gentoos), situate in India within the civil jurisdiction of the British supreme courts at Fort William (Calcutta), Fort St. George (Madras), and Bombay.

As the law protects an executor or administrator from any personal charge so long as he acts rightfully, the assets which render him chargeable to a creditor are, of course, only such as *come to his hands*, and not necessarily all those of which the deceased may die possessed. It was said by Wentworth, a considerable authority on this subject, that if the testator at his death has sheep in Cumberland, bullocks in Wales, fat oxen in Bucks, money, household stuff, and plate in London, and the executor dwells at Coventry, viz. far from all these places, the executor has such an actual possession immediately on the testator's death, that he may maintain trespass against any one taking them away, and therefore it is doubtful whether these goods must not be considered to have actually come to his hands so as to be assets rendering him chargeable for payment of debts. But it seems now to be the better and more just rule, that if such property should be abstracted by any stranger either before it has been actually possessed by the executor or afterwards, so that it be without any fault of the executor, he will only be liable to account for the damages which he may actually recover against such stranger, notwithstanding such damages may be less than the actual value of the goods. And upon the same principle, goods stolen from the possession of the executor, without blame on his part, will not be considered assets, unless indeed he have neglected an opportunity of selling them for a good price. As to all such personal property of the testator as is merely in *action*, viz. debts and rights of suit, it only in general becomes assets when reduced into possession by the executor; but if he release any such claims, or take a bond for them to himself personally, they then become assets with which he is chargeable. As nothing but what is of pecuniary value is assets, if the deceased were entitled to the next presentation to a living, and died without presenting, the right in the hands of the executor would not be assets, because not legally saleable. It follows from the very definition of *assets*, that they do not embrace property which the testator possesses merely as a trustee, without having any personal beneficial interest therein; and upon the same principle, the executor cannot employ as general personal assets property which is in the testator's hands clothed with a specific trust or appropriation; for instance, bills or notes remitted to the testator to meet acceptances for any particular purpose; nor money received by the executor himself under a specific trust to apply it in payment of his testator's debts.

2. *Personal equitable* assets are such as can only be made available by the help of a court of equity, and which consequently cannot be given in evidence against an executor on his plea of *plene administravit* in a court of law. The distinction between the two classes is most important, and consists not merely in the mode of obtaining payment out of them by a creditor, but also in the scheme of their distribution for payment of debts. While legal assets must be applied in payment of debts, according to certain rules of priority (viz. 1. Funeral charges, &c.—2. Debts to the crown—3. Judgments—4. Recognizances, &c.—5. Rent and specialty debts, as mortgages, bonds, &c.—6. Simple contract debts—7. Legacies),—equitable assets are distributable among all creditors equally, the only distinction recognized in courts of equity being that *debts* are to be preferred to *legacies*. Equitable assets embrace money produced by sale of the testator's real estate, whether his interest in such estate were legal or equitable, and whether it be expressly devised to be sold for payment of debts or not; and the equity of redemption of a mortgage is equitable and not legal assets. So also is any fund over which a man has a general power of appointment, which he exercises; in which case the property will be equitably subject to the claims of his creditors, in preference to those of his legatees or appointees.

3. *Real Assets* comprise all such lands, tenements, &c. as descend to the heir at law of the deceased, and which at common law rendered him chargeable with specialty debts binding the heir. They embrace many things not strictly of a real nature. Thus an annuity, though a personal thing, is, if granted to a man and his heirs for ever, real assets, which descend to the heir; and this is also the case with things accessory to real estate, such as chimney-pieces, wainscots, doors, and other fixtures; and even deer in a park, hares and rabbits in a warren, fish in a private pond or fishery, are held to participate in the nature of real estate, and to descend to the heir as real assets. By the statute 29 Car. II. c. 3, estates *pur auter vie*, limited to the grantee and his heirs, or his heirs, executors, and administrators, during the life of a third party, are declared to be real assets in the hands of the heir. Terms of years being personal chattels, are in general personal assets in the hands of the executor or administrator; but terms which are created or assigned over *to attend the inheritance* (according to the common mode, in the absence of a general registry, used by conveyancers of protecting the inheritance from judgments and personal charges of the owner) in general follow the nature of the inheritance.

At common law, it was strictly only the real estate *descended* to the heir which was liable to any of his debts, and this only to debts by bond or specialty, in which the heir was specifically named. If, therefore, the debtor, after the Statute of Wills, 12 Henry VIII. c. 1, *devised* away his lands, his creditors were entirely defrauded of their debts. To remedy this evil, the 3d Will. and Mary, c. 14, s. 2, rendered such devises void as against creditors by bond or specialty in which the heir was bound, and enabled all such creditors to sue the devisee of the land jointly with the heir at law. And this act having been construed to apply to the case of creditors on *bond* only, has been wisely repealed, and the same provisions extended by the 1st William IV. c. 47, to creditors, not only on bonds, but on covenants, and all other specialties. But it is not merely all classes of *specialty* creditors that have now a remedy against the real assets of the debtor: the creditors by simple contract obtained such a remedy by the 47th Geo. III. st. 2, c. 74 (re-enacted by 1 Will. IV. c. 47); but this was confined to cases where the debtor, at the time of his death, was a *trader;* and none of the above provisions applied to copyhold estates. But now, by the comprehensive enactment of 3 and 4 William IV. c. 104, all the real estate of the debtor, whether *freehold*, *customary*, or *copyhold*, which he shall not, by his last will, have charged with payment of his debts, is rendered assets, to be administered in courts of equity for payment of his debts, as well those due on *simple contract* as on *specialty;* provided that in the administration of assets in courts of equity creditors by specialty in which the heir is bound shall be preferred to creditors by simple contract, or by specialty, in which the heirs are not bound. It is to be observed that this important enactment confines the remedy of simple contract creditors against the real estate to a court of equity, and does not enable a simple contract creditor to sue the heir or devisee at law.

We have hitherto treated of assets merely as regards the rights and claims of the creditor against the executors and administrators, and heirs and devisees of the debtor, in respect of assets personal or real come to their respective hands. It remains to notice the doctrine of the *exoneration of the real estate*, that is, the apportionment of the debtor's liabilities in a court of equity between the two funds of the deceased, the real and the personal estate, and also the *marshalling of assets*, in order to produce a full satisfaction of all creditors. Although a creditor by specialty has, where the deceased leaves both personal and real estate, his choice of remedies either against the one or the other, so that if he sue the heir at law he cannot be met by a plea that the deceased has left personal assets, yet it is a settled rule that the personal estate in the hands of the executor or administrator is the primary and natural fund for the payment of the debts of the deceased, of whatever description. If the creditor, therefore, proceeds against the real estate, descended or devised, the heir or devisee who has sustained the loss shall be allowed to stand in the place of the specialty creditor, and reimburse himself out of the personal estate in the hands of the executor; provided, of course, that such reimbursement will not prejudice any *creditor* of the deceased: and where the exoneration of the real estate is in favour of the *heir*, it must not disappoint the claim of any legatee, except the residuary legatee, nor the wife's claim to paraphernalia. But a devisee stands in a different situation from the heir; and if he is compelled to pay a bond debt of the devisor, it seems he is entitled to reimbursement out of the personal assets, to the disappointment of general legacies, and even (as it would appear) of specific legacies.

To entitle the heir or devisee to this exoneration out of the personal estate, the debt must be the *proper* debt of the deceased; for if it was a debt charged on the estate when the deceased purchased it, or a debt incurred for money borrowed to pay off then existing charges (whether debts or legacies), the land is then the proper fund for its discharge, and the heir or devisee must take the land *cum onere*, and cannot throw the burden on the personal funds. The rule is the same with respect to both debts and legacies, viz. that the personal estate is the primary and natural fund out of which they are to be paid, and that the real estate is only to be resorted to in aid of the personalty; and even though debts and legacies are, by the will, effectually charged on the real estate, this is only taken for a declaration by the testator that the real estate shall be liable in case of a deficiency of personal assets. But though it requires more than a mere charge of the real estate to exempt the personalty, still a testator is not debarred, if his intention be sufficiently expressed, from effecting such an exemption. As to the mode of expression in a will requisite to operate this effect, the cases have been very numerous and contradictory, and evidence *dehors* the will has been, in some of them (as it is now held, improperly), resorted to. In earlier cases it was held that *express* words were requisite; but it is now settled that the personal assets will be exempted, if there appear, from the whole testamentary disposition taken together, sufficient to convince a *judicial* mind that the testator meant not merely to charge the real estate, but so to charge it as to exempt the personalty.

Marshalling assets is that operation by a court of equity, by which claimants entitled to claim against both the real and personal estate of the deceased are compelled so to elect as not to defeat the claim of other claimants who have only one of these funds to resort to. It is a general rule of equity that if A. have two funds to resort to for his debt, B., having a claim on only one of those funds, may compel A. to have recourse to the other, provided it be necessary for the satisfaction of both. The doctrine and practice of marshalling assets as between creditors by *simple contract* and creditors by *specialty*, seems to be in a great degree superseded by the effect of the late statute 3 and 4 Will. IV. c. 104 (before stated), by which the former have acquired a claim against the freehold and copyhold as well as against the personal property of the deceased debtor. But the same rule of equity exists also in favour of *legatees*, and therefore if a creditor by bond, in which the heir is named, exhaust the personal estate instead of resorting to the heir, so as to leave nothing for payment of legacies, a legatee shall stand in the place of such bond creditor against the real assets *descended* to the heir. But if the real estate were devised to a stranger, it would be otherwise, for in that case it would not be equitable that a general legatee (nor as it seems a specific legatee) should obtain his legacy by throwing the specialty debts upon the *specific devisee* of the land. The principle of course applies as between a legatee and a simple contract creditor, where the latter has a claim upon the real assets, which the former has not; as where the testator's estate is generally devised charged with debts but not with legacies. [See Executors, Legacies, Wills and Testaments; and see Williams's *Treatise on the Law of Executors and Administrators*; Bacon's *Abridgment* (7th ed.), tit. *Executors and Administrators, Legacies, Mortgage.*]

ASSIDIANS (חֲסִידִים Chasidim Ἀσιδαῖοι, 1 Maccab. vii. 13. Chasidäer, *the pious*), from the root חָסַד, or rather from חֶסֶד, a term used to denote either a very good or a very bad action, but more frequently the former. It was a name given to the zealous defenders of the unity of the Deity and the belief of their ancestors, against the attempts of Antiochus Epiphanes and his successors to force the Jews into idolatry. The Assidians, or Chasidim, of those days, found a leader in Mattathias, who gave the signal for armed resistance against the Syrian tyrants, by killing the commander of the king's troops at the idolatrous altar in Modeim, near Joppa. Mattathias headed the Chasidim during four years against the Græcomania of those days. These four years are not included by Josephus in the hundred and twenty-six years of the Asmonean dynasty, which he commences from the time at which Judas Maccabi assumed the chief command.

Later Jews called those persons Chasidim who secluded themselves from worldly occupations and pleasures to devote their life solely to religious exercises and bodily chastisements, in the hope either of expiating their own sins or those of others, or of hastening the coming of the Messiah. These Chasidim studied the kabalah, and endeavoured by their mortification of the flesh to abstract the spirit from the body, and thus have liberty to enter into communion with God and angels. They fasted frequently, and asserted that they had visions.

Solomon Maimon informs his readers in his *Memoirs* (Berlin, 1792), that some of the Chasidim died in consequence of their austerities, and that others became deranged; he also states that not a few rendered their spiritual profession subservient to their temporal aggrandisement.

About the middle of the eighteenth century a new sect of Chasidim arose, who invented a more comfortable method of ascetic practice. They taught that the union of man with God was effected by contemplation, and that in order to fix the mind on God it is necessary to quicken sensation by the enjoyment of permitted indulgences. They asserted that mortification of the flesh disturbs that mental tranquillity which is necessary for the contemplation of God. These Chasidim considered that union with God subsists in common religionists only during seasons of prayer, and they taught that prayer should be performed with the greatest exertion and concentration of the mental faculties, in order to unite the praying spirit so intimately with God as to obtain power over all sublunary and celestial beings, and thus to realize all desires. The tsadik is always in communion with God.

After this sect became numerous, some of its members were considered representatives of God, and their words regarded as oracles. The influence of these representatives was based solely upon their appearance of sanctity, and not upon their mental superiority. They therefore endeavoured to bring science into disrepute.

The history of the modern Chasidim is briefly this: Israel Baalschem, *i. e.* בַּעַל־שֵׁם, *The Lord of the name, i. e.* θεουργὸς, *Theurgos*, whom Maimon erroneously calls Joel, lived A.D. 1740, in the town of Vlussy, in the circle of Czarkow, in Poland. His partizans assert that his birth was predicted to his father by the prophet Elijah, and that his mother was a hundred years old at the time of his birth, and his father still more advanced in years. While yet in his youth they relate that he overcame some evil spirits, or demons. Baalschem went afterwards to Medziboze in Podolia, whence he propagated his doctrines, which are contained in a volume written by himself, and edited by his grandson under the title ספר המדות. His testament has been published under the title צואת ריבש. His birth and miracles are described by his disciple R. Bär Linez, in a volume entitled שבחי הבעשט, *The Habitations of Besht*. The fifth edition was published A.D. 1815. The word בעשט, *Besht*, is formed from the initials of בעל שם טוב, *the Lord of the good name*, or, *the Lord of the name of God*.

From the word Besht, the modern Chasidim have been called Beshtians. The orthodox rabbins opposed in vain the spread of the Chasidim, or Beshtians, by anathema and excommunications. Baalschem based his doctrines upon the cabalistic book of Zohar זהר, recommending a contemplative, inactive life, and frequent bathing in spring water.

The Beshtians soon spread over Wallachia, Moldavia, Hungary, and Gallizia, but their principles were not admitted among the Jews in Germany, France, and Italy. This sect a long time concealed their doctrines and propagated their opinions rather by manuscript copies of their writings than by printed publications; but since 1817 they have printed and circulated more than twenty-five different volumes.

After the death of Baalschem, A.D. 1760, R. Bär of Madezicy, R. Mendel Przemislaw, and R. Melash of Lyzanz, endeavoured to govern the sect; not as combined triumvirs, but by each assuming the government of his own circle, under the title of צַדִּיק *tsadik, just or pious*. The title of צַדִּיק was formerly applied to Baalschem by way of distinction, but after his death each of his three most distinguished disciples endeavoured by its assumption to vindicate his own prerogative of conversing with spirits. In conversation the disciples of Baalschem are satisfied with the title of *Abbe* or teacher.

At the present time every shrewd individual, well read in the Talmud and in cabalistical writers, may by hypocrisy obtain the dignity of a צדיק, even if his morals are suspected. But the descendants of Besht have more facility in obtaining this dignity, because they are a kind of hereditary nobility among the Beshtians, the richest of whom feel themselves honoured by a degree of affinity with a צדיק tsadik. Besht himself taught in his ספר המדות that by honouring the descendants of the tsadik men might induce God to send the Messiah, and that the son of a tsadik is sanctified from his conception by the holy thoughts of his father, and may be called a son of God and נועם המלך.

The tsadik has no certain salary, but is supported by voluntary gifts, for which he grants his advice to the chasidim in all transactions of life. In case that his advice seems to be unproductive of good, the cause is thought to be in the sinfulness of the receiver, and not in the inappropriateness of the counsel.

The doctrines of the chasidim may be classed under the following three heads –

I. אֱמוּנַת חֲכָמִים וְהִתְקַשְּׁרוּת לַצַּדִּיק *faithfulness to wise men and attachment to the tsadik.*

II. דְּבֵקוּת לַשְּׁכִינָה *cleaving to the Shechinah.*

III. עזות, *courage.*

This courage may even become insolence and effrontery, so that the chasid may contradict the principles of truth, justice, equity, moderation, and decency, whenever these principles are in collision with the will of the tsadik and that of his sect.

In modern times the chasidim have left off the use of prayer books according to the German and Polish ritual, and have adopted the Spanish and oriental ritual, with which they have mixed many cabalistic elements.

It is the duty of the chasid to shout during prayer, to clap his hands loudly together, or to beat the wall with his hands, to jump about and to move the body as in convulsions. Whoever shouts during prayer with all his might, shakes his whole body, and claps his hands, averts the wrath of God and strengthens his own memory. The chasid must not be prevented by the ridicule of others from obeying in this respect the precepts of the tsadik.

The chasidim do not like to assemble in the common synagogues. In every place where ten chasidim reside they have a room called klossel (clausa) for prayer and conversation, both sacred and profane. The chasidim bathe frequently. (See Peter Beer in Ersch and Gruber's *Encyclop.*, and *Geschichte der Lehren und Meinungen aller bestandenen und noch bestehenden religiösen Secten der Juden, und der Geheimlehre oder Kabbalah*, von Peter Beer. Brünn, 1823. Second volume, p. 197—259.)

ASSIENTO TREATY, in Spanish, **EL ASIENTO DE LOS NEGROS**, and **EL PACTO** or **TRATADO DEL ASIENTO**, that is, the compact for the farming, or supply, of negroes. It is plain that the word *Assiento*, though occasionally signifying an assent or agreement, cannot, as is sometimes stated, have that meaning in this expression. Spain, having little or no intercourse with those parts of Africa from which slaves were obtained, used formerly to contract with some other nation having establishments on the western coast of that continent for the supply of its South American possessions with negroes. Such treaties were made first with Portugal, and afterwards with France, each of which countries, in consideration of enjoying a monopoly of the supply of negroes to the South American dominions of Spain, agreed to pay to that crown a certain sum for each negro imported. In both cases the Assiento was taken by a commercial association in France—by the Guinea Company, which thereupon took the name of the Assiento Company (Compagnie de l'Assiente). Both the Portuguese company and the French were ruined by their contract. At the peace of Utrecht, in 1713, the Assiento, which the French had held since 1702, was transferred to the English for a period of thirty years. In addition to the exclusive right of importing negroes, the new holders of the contract obtained the privilege of sending every year a ship of 500 (afterwards raised to 600) tons to Spanish America. with goods to be entered and disposed of on payment of the same duties which were exacted from Spanish subjects; the crown of Spain, however, reserving to itself one-fourth of the profits, and five per cent. on the remaining three-fourths. The contract was given by Queen Anne to the South Sea Company, which, however, is understood to have made nothing by it, although it was calculated that there was a profit of cent. per cent. upon the goods imported in the annual ship. which usually amounted in value to about 300,000*l.* So much of this sum as fell to the share of the company was either counterbalanced by the loss attendant on the supply of the 4800 negroes which they were bound to provide every year, or went chiefly into the pockets of their South American agents, many of whom in a few years made large fortunes. The war which broke out in 1739 stopped the further performance of this contract when there were still four years of it to run; and at the peace of Aix-la-Chapelle, in 1748, the claim of England to this remainder of the privilege was given up. Spain, indeed, complained, and probably with justice, that the greatest frauds had been all along committed under the provision of the treaty which allowed the contractors to send a shipload of goods every year to South America. It was alleged that the single ship was made the means of introducing into the American markets a quantity of goods amounting to several times her own cargo. The public feeling in Spain had been so strongly excited on the subject of this abuse, that it would have been very difficult to obtain the consent of that country to a renewal of the treaty.

ASSIGNAT. One of the earliest financial measures of the constituent assembly, in the French revolution, was to appropriate to national purposes the landed property of the clergy, which, upon the proposition of Mirabeau, was by a large majority declared to be at the disposition of the state. (Thiers, *Histoire de la Révolution Française*, vol. i. p. 194, 2d ed.) Shortly afterwards, the assembly, desirous to profit by this measure, decreed the sale of lands belonging to the crown and the clergy, to the amount of 400 millions of francs, or about sixteen millions sterling (Ib. p. 212). To sell at once so large a portion of the surface of France, without lowering the price of land by overloading the market to such an unexampled extent (see Thiers, vol. vii., p. 377), and moreover in a time of mistrust, insecurity, rapid political change, and almost of civil war, was an object of no very easy attainment. It was first proposed that the lands should be transferred to the municipalities, which, not being provided with ready money, might give the state a bond or security for the price, and the state would pay its creditors with these securities, which could, in process of time, be realized, as the municipalities were able successively to sell, at an advantageous price, the lands thus made over to them. The holders of the securities would thus have a claim not on the government but on the municipal bodies, which would be compellable by process of law to pay; and the creditor might moreover extinguish the debt by buying the lands when put up to sale, and by offering the security in payment. But it might happen that the holder of such securities would be unable to realize them, and might not be willing to purchase any of the lands of the state: in order, therefore, to obviate this objection to the securities in question, it was proposed that they should be transferable and be made a legal tender.

There was also another motive for the adoption of this latter expedient. In consequence of the want of confidence and stagnation of trade which prevailed in France at this time, money had become extremely scarce, and much of the current coin had been withdrawn from circulation: the king and queen had even been forced to send their plate to the mint. (Thiers, vol. i. p. 100.) Under these circumstances, it was determined to issue a paper-money, based on the security of the unsold lands belonging to the state. The notes thus issued (each of which was for 100 francs, equal to 4*l.*) were called *assignats*, as representing land which might be transferred or *assigned* to the holder; and all notes which came back in this manner to the government in payment for national lands were to be cancelled. They moreover bore an interest by the day, like English exchequer bills. The object of this measure was, therefore, to obtain the full value of the confiscated lands of the clergy (which in the actual state of France was impossible), and to supply the deficiency of coin in the circulation (arising from a feeling of insecurity) by a forced issue of inconvertible paper-money, which, as was predicted by M. de Talleyrand, the Bishop of Autun, would inevitably be depreciated, and cause misery and ruin to the holders of it. (Thiers, vol. i. p. 233-7, and note xviii. p. 382.) The first issue of assignats was to the amount of 400 millions, bearing interest; shortly afterwards 800 millions in addition were issued, but without the liability to pay interest (ib. p. 256). The last of these issues was made in September, 1790. But as in the beginning of the following year the legislative assembly sequestered the property of all the emigrants, a numerous and wealthy class, for the benefit of the state (Thiers, vol. ii. p. 51), it was thought that the amount of the national securities having been increased, the issues might be safely increased likewise: accordingly, in September 1792, although 2500 millions had been already issued, a fresh issue to the amount of 200 millions was ordered by the Convention. (Thiers, vol. iii. p. 151.) Towards the end of this year, the double effects of the general insecurity of property and person, and of the depreciation of assignats caused by their over-issue, was felt in the high price of corn, and the unwillingness of the farmers to supply the markets with provisions. Wholly mistaking the causes of this evil, the violent revolutionary party clamoured for an assize, or fixed maximum of prices, and severe penalties against *accapareurs*, or engrossers, in order to check the avarice and unjust gains of the rich farmers. The Convention, however, though pressed both by factious violence and open insurrection, refused at this time to regulate prices by law. (Thiers, vol. iii. p. 311-7.) Prices, however, as was natural, still continued to rise; and although corn and other necessaries of life were to be had, their value, as represented in the depreciated paper currency, had been nearly doubled: the washerwomen of Paris came to the Convention, to complain that the price of soap, which had formerly been fourteen sous, had now risen to thirty. On the other hand, the wages of labour had not risen in a corresponding degree (see Senior on *Some Effects of Government Paper*, p. 81): so that the evils arising from the depreciation of the assignats greatly aggravated the poverty and scarcity which would, under any circumstances, have been consequent on the troubles and insecurity of a revolution. The labouring classes accused the rich, the engrossers, and the aristocrats, of the evils which they were suffering, and demanded the imposition of a maximum of prices. Not only however in the Convention did the most violent democrats declare loudly against a maximum, but even in the more popular assembly of the commune, and the still more democratic club of the jacobins, was this measure condemned, frequently amidst the yells and hisses of the galleries. As the Convention refused to give way, Marat, in his newspaper, recommended the pillage of the shops as a means of lowering prices: a measure immediately adopted by the mob of Paris, who began by insisting to have goods at certain fixed prices, and ended by taking the goods without paying for them. (Thiers, vol. iv. p. 38-52.) These and other tumults were however appeased, partly by the interference of the military, and partly by the earnest remonstrances of the authorities: but the evil still went on increasing; corn diminished in quantity and increased in price; the national lands, on account of the uncertainty of their title and the instability of the government, were not sold, and thus the number of assignats was not contracted and they were continually more and more depreciated.

At length the Convention, thinking that the depreciation might be stopped by laws, made it penal to exchange coin for paper, or to agree to give a higher price if reckoned in paper than if reckoned in coin. Still the over-issue had its natural effects: in June, 1793, one franc in silver was worth three francs in paper; in August it was worth six. Prices rose still higher: all creditors, annuitants, and mortgagees were defrauded of five-sixths of their legal rights; and the wages of the labourers were equal in value only to a part of their former earnings. The Convention, unable any longer to resist, in May, 1793, passed a decree which compelled all farmers to declare the quantity of corn in their possession, to take it to the markets, and sell it there only, at a price to be fixed by each commune, according to the prices of the first four months of 1793. No one was to buy more corn than would suffice for a month's consumption, and an infraction of the law was punished by forfeiture of the property bought and a fine of 300 to 1000 francs. The truth of the declaration might be ascertained by domiciliary visits. The commune of Paris also regulated the selling of bread; no person could receive bread at a baker's shop without a certificate obtained from a revolutionary committee, and the quantity was proportioned to the number of the family. A rope was moreover fixed to the door of each baker's shop, so that as the purchasers successively came, they might lay hold of it, and be served in their just order. Many people in this way waited during the whole night: but the tumults and disturbances were so great that they could often only be appeased by force, nor were they at all diminished by a regulation, that the last comers should be served first. A similar maximum of prices was soon established for all other necessaries, such as meat, wine, vegetables, wood, salt, leather, linen, woollen, and cotton goods, &c.; and any person who refused to sell them at the legal price was punished with death. Other measures were added to lower the prices of commodities. Every dealer was compelled to declare the amount of his stock; and any one who gave up trade, after having been engaged in it for a year, was imprisoned as a suspected person. A new method of regulating prices was likewise devised, by which a fixed sum was assumed for the cost of production, and certain percentages were added for the expense of carriage, and for the profit of the wholesale and retail dealers. The excessive issue of paper had likewise produced its natural consequence, over speculation, even in times so unfavourable for commercial undertakings. Numerous companies were established, of which the shares soon rose to more than double or treble their original value. These shares being transferable, served in some measure as a paper-currency; upon which, the Convention thinking that they contributed still further to discredit the assignats, suppressed all companies whose shares were transferable or negociable. The power of establishing such companies was reserved to the government alone.

In August, 1793, there were in circulation 3776 millions of assignats; and by a forced loan of 1000 millions and by the collection of a year's taxes, this amount was subsequently reduced to less than two-thirds· the confidence moreover inspired by the recent successes of the republic against its foreign and domestic enemies tended to increase the value of the securities on which the paper-money ultimately reposed: so that towards the end of 1793 the assignats are stated to have been at par. This effect is attributed by M. Thiers, in his *History of the French Revolution* (vol. v. p. 407), to the severe penal laws against the use of coin: nevertheless we suspect that those who made this statement were deceived by false appearances, and that, neither at this nor any other time, not even at their first issue, did the real value of assignats agree with their nominal value. (Thiers, vol. v. pp. 145-62, 196-208, 399-413.) However, this restoration of the paper-currency, whether real or apparent, was of very short duration, as the wants of the government led to a fresh issue of assignats: so that in June, 1794, the quantity in circulation was 6536 millions. By this time the law of the maximum had become even more oppressive than at first, and it was found necessary to withdraw certain commodities from its operation. Nevertheless, the commission of provisions, which had attempted to perform the part of a commissariat for the whole population of France, began to interfere in a more arbitrary manner with the voluntary dealings of buyers and sellers, and to regulate not only the quantity of bread but also the quantity of meat and wood which each person was to receive. (Thiers, vol. vi. pp. 146-51, 307-14.) Other arbitrary measures connected with the supply of the army, as compulsory requisitions of food and horses, and the levying of large bodies of men, had contributed to paralyse all industry. Thus not only had all commerce and all manufactures ceased, but even the land was in many places untilled. After the fall of Robespierre, the Thermidorian party (as it was called), which then gained the ascendency, being guided by less violent principles, and being somewhat more enlightened on matters of political economy than their predecessors, induced the Convention to relax a little of its former policy, and succeeded in first excepting all foreign imports from the maximum, and afterwards abolishing it altogether. The transition to a natural system was however attended with great difficulty and danger, as the necessary consequence of the change was a sudden and immense rise of the avowed prices; and trade having been so long prevented from acting for itself, did not at once resume its former habits; so that Paris, in the middle of winter, was almost in danger of starvation, and wood was scarcely more abundant than bread. As at this time the power of the revolutionary government to retain possession of the lands which it had confiscated, and to give a permanently good title to purchasers, was not doubted, it is evident that a fear lest the national lands might not ultimately prove a valuable security did not now tend to discredit the assignats: their depreciation was solely owing to their over-issue, as compared with the wants of the country, and their inconvertibility with the precious metals. The government however began now to find that, although it might for some time gain by issuing inconvertible paper in payment of its own obligations, yet when the depreciated paper came to return upon it in the shape of taxes, it obtained in fact a very small portion of the sum nominally paid. Consequently they argued that, as successive issues depreciated the currency in a regular ratio (which however is very far from being the case), it would be expedient to require a larger sum to be paid for taxes according to the amount of paper in circulation. It was therefore decreed that, taking a currency of 2000 millions as the standard, a fourth should be added for every 500 millions added to the circulation. Thus, if a sum of 2000 francs was due to the government, it would become 2500 francs when the currency was 2500 millions, 3000 francs when it was 3000 millions, and so on. This rule however was only applied to the taxes and arrears of taxes due to the government, and was not extended to payments made by the government, as to public creditors or public functionaries. Nor did it comprehend any private dealings between individuals. (Thiers, vol. vii. pp. 40-51, 132-41, 232 89, 368-85, 420-8.) Iniquitous as this regulation was, as employed solely in favour of the government, it would nevertheless have been ineffective if its operation had been more widely extended; for the assignats, instead of being depreciated only a fifth, had now fallen to the 150th part of their nominal value. The taxes being levied in part only in commodities, and being chiefly paid in paper, produced scarcely any thing to the government; which had however undertaken the task of feeding the city of Paris. Had it not in fact furnished something more solid than depreciated assignats to the fundholders and public functionaries, they must have died of starvation. Many, indeed, notwithstanding the scanty and precarious supplies furnished by the government, were threatened with the horrors of famine; and numbers of persons threw themselves every evening into the Seine, in order to save themselves from this extremity. (Storch, *Economie Polit.*, vol. iv. p. 168.)

To such a state of utter pauperism had the nation been reduced by the mismanagement of its finances and the ruin of public credit by the excessive issues of paper, that when the five directors went to the Luxembourg in October 1795, there was not a single piece of furniture in the office. The doorkeeper lent them a rickety table, a sheet of letter-paper, and an inkstand, in order to enable them to write their first message to announce to the two Councils of State that the Directory was established. There was not a single piece of coin in the treasury. The assignats necessary for the ensuing day were printed in the night, and issued in the morning wet from the press. Even before the entry of the directors into office, the sum in circulation amounted to 19,000 millions: a sum unheard of in the annals of financial profligacy. One of their first measures, however, in order to procure silver, was to issue 3000 millions in addition, which produced not much more than 100 million francs.

In this formidable state of things the next measure adopted was worthy of the violent and shortsighted administration from which it emanated. A forced loan of 600 millions was raised from the richest classes, to be paid either in coin, or in assignats at the *hundredth* part of their nominal value. So that if the current paper was 20,000 millions, a payment of 200 millions would be sufficient to extinguish the whole. The government however refused to sanction this principle as against itself; for in paying the public creditor, it gave the assignat the *tenth* part of its nominal value. The land-tax and the duties in farm were required to be paid half in kind and half in assignats; the custom-duties, half in corn and half in assignats. In the mean time, until the funds produced by this loan, which was enforced with great severity, could be at the disposition of the state, the government went on issuing assignats till they had absolutely lost all value, and had become waste paper. It therefore anticipated its resources by issuing promissory notes payable in specie, when the forced loan should be collected, and with difficulty prevailed on bankers to discount them to the amount of 60 millions. At this time the Directory gave up the task of supplying Paris with bread, and allowed the bakers' shops to be opened as before: an exception being made in favour of the indigent, and of fundholders and public functionaries whose annual incomes were not more than 5000 francs. The payment of the loan, however, went on slowly, the produce of the government bills was exhausted, and fresh funds were required. Again the resource of assignats was resorted to, and in two months the currency had been raised to 36,000 millions by the issue of 20,000 millions, which even to the government were not worth the 200th part of their nominal value.

By this time some new financial expedient became necessary. It was expected that, by payments of taxes and of the forced loan to the government, the paper in circulation would soon be reduced to 24,000 millions. It was therefore determined to make a new issue of paper, under the name of *mandats*, to the amount of 2400 millions. Of this sum 800 millions were to be employed in extinguishing 34,000 millions of assignats, which were to be taken at a thirtieth part of their legal value: 600 millions were to be allotted to the public service and the other 1200 millions retained in the public coffers. These mandats were to enable any person who was willing to pay the estimated value of any of the national lands to enter at once into possession; and therefore they furnished a somewhat better security than the assignats, as these could only be offered in payment at sales by auction; and consequently the price of the lands rose in proportion to the depreciation of the paper. The estimate of the lands having been made in 1790 was not true in 1795, at which time they had in some cases lost a half, in others two-thirds or three-fourths of their former value. The mandat of 100 francs, however, at its first issue, was worth only fifteen francs in silver; and the new paper was soon so much discredited that it never got into general circulation, and was not able to drive out the coined money which was now almost universally employed in transactions between individuals. The only holders of mandats were speculators, who took them from the government and sold them to purchasers of national lands. By this entire discredit of the government-paper the prosperity of individuals had been in some measure restored, and trade revived a little from its long sleep. The government was destitute of all resource; its agents received nothing but worthless paper, and refused any longer to do their duties. The armies of the interior were in a state of extreme misery; while those of Germany and Italy were maintained only from the countries where they were quartered. The military hospitals were shut, the gens-d'armes were not paid or equipped, and the high roads were infested with bands of robbers, who sometimes even ventured into the towns.

In a short time the government were forced to abandon the mandats, as they had abandoned the assignats, and to declare that they should be received in payment of taxes and national lands only at their real value. Having fallen to near a seventieth of their ostensible value, they were, in the course of 1796, returned to the government in payment of taxes and for the purchase of lands; and with them ended the revolutionary system of paper-money, which probably produced more wide-spreading misery, more sudden changes from comfort to poverty, more iniquity in transactions both between individuals and the government, more loss to all persons engaged in every department of industry and trade, more discontent, disturbance, profligacy, and outrage, than the massacres in September, the war in La Vendée, the proscriptions in the provinces, and all the sanguinary violence of the Reign of Terror.

From the extinction of the mandats to the present time the legal currency of France has been exclusively metallic. (Thiers, vol. viii. pp. 85-9, 103-19, 158-62, 177, 183-91, 334-44, 423-4: Storch, *Cours d'Econ. Pol.*, vol. iv. p. 164.)

ASSIGNEE—of a bankrupt. [See BANKRUPT.]

ASSIGNEE—of an insolvent debtor's estate. [See INSOLVENT DEBTOR.]

ASSIGNEE—of bill of lading. [See BILL OF LADING.]

ASSIGNEE—of a lease is the party to whom the *whole* interest of the lessee is transferred by assignment, which assignment may be made without the privity or consent of the lessor, unless the lessee is expressly restrained by the lease from assigning over. The assignee becomes liable to the lessor, from the date of the assignment, for the payment of the rent and performance of the covenants in the lease; but such liability is limited to breaches of covenant during the existence of the assignee's interest, and may be got rid of by assigning over all his interest, and this even to an insolvent; for his liability, arising only from *privity of estate*, that is, from the actual enjoyment of the premises leased, ceases with such enjoyment; whereas the lessee remains liable to the rent and covenants during the whole term. It results also from the circumstance of the assignee's liability arising from *privity of estate*, that he is not liable to mere personal covenants which the lessee may have made with the lessor (as *e. g.* to build on premises not demised, or to pay a sum of money in gross), but only to such covenants as run with the land, as for instance, covenants to pay rent, to repair, to reside on the demised premises, to leave part of the land in pasture, to insure premises situate within the weekly bills of mortality, to build a new mill on the site of an old one, &c. [See, further, COVENANT.] The assignee, in order to become liable to the covenants, must take the whole estate and interest of the lessee; for if the smallest portion is reserved, he is merely an under-lessee, and not responsible to the original lessor. The interest of the assignee must also be a legal, not merely an equitable interest; and therefore if the lessee devise the premises leased to trustees in trust for A B, A B will not be chargeable as the assignee of the lessee's interest. The interest must also be an interest in lands or tenements; for if a lease is made of chattels (as for instance, of sheep or cows, which sometimes happens), and the lessee covenant for himself and his assigns to redeliver them, the assignee is not liable to the owner on this covenant; for there is no privity between the assignee and the owner, such privity only existing where the subject of the demise is real estate. Wilmot, C. J. says, in Bally v. Wells, 'The covenant in this case is not collateral; but the parties, that is, the lessor and assignee, are total strangers to each other, without any line or thread to unite and tie them together, and to constitute that privity which must subsist between debtor and creditor to support an action.'—(Wilmot, 345.) The assignee may acquire his interest by operation of law as well as by an actual assignment from the lessee, and therefore a tenant by *elegit*, who has purchased a lease under an executor, is liable as assignee to the lessor in respect of his privity of estate. [As to the liability of assignees of bankrupt on the leases of the bankrupt, see Bankrupt.]

ASSIGNMENT, a deed or instrument of transfer, the operative words of which are to 'assign, transfer, and set over,' and which passes both real and personal property. Estates for life and estates for years are the principal real interests which are passed by an assignment; and by the statute of Frauds and Perjuries (29 Car. II.) the assignment of such estates is required to be in writing. An assignment differs from a lease, in being a transfer of the entire interest of the lessor; whereas a lease is carved out of a greater estate, creates the relation of landlord and tenant, and reserves to the lessor a reversion after its expiration. If, however, a deed in effect passes the whole interest of the tenant, it operates as an assignment, though it be in form a lease, and though it reserve a rent. As if A having a term of twenty years in land, grants to B the whole twenty years, reserving a rent: in such case B is assignee of the whole term and interest, and not under-lessee to A; and A, for want of having any reversion, cannot distrain for the rent (a distress being only enforceable where the landlord has a reversion expectant on the determination of the tenancy). A, in such case, can only sue B for the rent as for money due upon a contract. In all under-leases, therefore, it is necessary that part (a day will suffice) of the original term should remain in the lessor.—See Sheppard's *Touchstone*, 266; Black. *Comm.* v. ii. 326; Bac. *Ab.* (7th edit.) tit. *Assignment*. [See Bill of Sale.]

An Assignment of Goods, Chattels, &c., is frequently made by bill of sale, as to which, see Bill of Sale. As to all goods and chattels *in possession*, no objection ever existed to their transfer and assignment by deed or writing; but with respect to things *in action* (as debts, contracts, right of entry, and suit), according to an antient rule of the common law, now considerably modified, they could not be assigned over by the party to whom they were due, since the assignment gave to a third party a right of action against the debtor, and thus led to the offence of maintenance—*i. e.* the abetting and supporting of suits in the king's courts by others than the actual parties to them. In the courts of common law this rule exists (with some exceptions) at the present day. Thus, if the obligee in a bond assign over the bond to a third party, the assignee cannot sue on the bond at common law in his own name; but such an assignment generally contains (and ought always to do so) a power of attorney from the obligee to the assignee, to sue in the obligee's name on the bond. Courts of equity have always protected such assignments, and regarded the assignee, for valuable consideration, as the actual owner of the bond; and the courts of common law so far recognise the right of the assignee, that if the obligor, *after notice* of the assignment, pay the money on the bond to the obligee, the courts will not permit him to plead such payment to an action brought by the assignee in the obligee's name on the bond. In order to constitute a good equitable assignment of a bond, or chose in action, writing is not necessary. A personal trust or confidence cannot be assigned over, however able the assignee may be to execute it; and therefore all trust deeds and settlements contain express provisos for the retiring of trustees, and for fresh appointments, with the consent of the *cestui que trusts*. Neither the future whole-pay nor the future half-pay of an officer are capable of being assigned, it being considered contrary to public policy that a stipend given to a man for his public services should be transferred to another man not capable of performing them. The exceptions to the rule that *choses in action* are not assignable at law are many. The king might at all times become the assignee of a *chose in action;* and after such an assignment was entitled to have execution against the body, lands, and goods of the debtor. But this prerogative, having been abused by the king's debtors, was restrained by stat. 7 Jac. I. c. 15, by a privy seal, in 12 James I., and by rule of court of 15 Car. I.; and the practice of actually assigning debts to the king by his debtors has long become obsolete. Bills of exchange are assignable by indorsement, in virtue of the custom of merchants [see Bill of Exchange]; and promissory notes, by virtue of the 3 and 4 Ann. cap. 9. Bail bonds are assignable by the sheriff to plaintiff in the suit under 4 Ann. c. 16. s. 20. [See Bail.] Replevin bonds, by the 11 Geo. II. c. 19. [See Replevin.] The petitioning creditor's bond under a fiat of bankruptcy, by 6 Geo. IV. c. 16. [See Bankrupt. See, further, Bond, Chose in Action, Insolvent Debtors.]

ASSINIBOIN RIVER. [See Red River.]

ASSINIBOINS, a tribe of North American Indians, on and near the Assiniboin River.

ASSINT, or ASSYNT, a parish in the northern Highlands of Scotland. It is situated on the west coast of the county of Sutherland, adjoining Ross-shire, and has several islands belonging to it. It extends thirty-five miles in length, and twelve in breadth. It is extremely mountainous. Ben More, Assynt, which is the highest mountain in the county, is about 3200 feet above the level of the sea: it consists of quartz rocks. The other remarkable mountains, Soulven and Quen'iag, which are nearer the coast, consist of the old red sandstone, which assumes the most singularly picturesque shapes, and the beds continue in a remarkably horizontal position, though separated from each other by several miles. The space at the foot of the mountains is generally moss. The surface fit for tillage is very limited the cultivated spots seldom exceeding a few yards in extent. The occupation of the poorer inhabitants is fishing especially herring, cod, and ling, and the rearing of cattle. The greater portion of the parish, however, is divided into extensive sheep-walks, stocked with the improved Cheviot breed. Oats, bear, and potatoes form the food of the people, and are the objects of their cultivation.

This district belonged antiently to the Earls of Sutherland, but passing successively through the families of Moray, Kinnaird, Macleod, and Mackenzie, it reverted to the same family about a century back, being now the property of the Duchess Countess of Sutherland. There is no wood, properly speaking, but there are considerable districts covered with natural birch, intermixed with the oak, the hazel, the mountain-ash, and the honeysuckle.

A considerable portion of the interior is composed of primitive limestone; marbles of various qualities and colours have been worked, but as they contain small particles of quartz, they are too difficult to saw to come into use.

The parish is now intersected with about forty miles of excellent road, constructed entirely by the late Duke of Sutherland, which has altogether altered the condition of the people and their future prospects.

The coast is rocky and precipitous, with strong tides and a stormy ocean; but it possesses several safe boat harbours; Loch Inver on the south, and Kylesku on the north, are safe roadsteads for larger vessels, and are frequented in spring and autumn in the fishing season.

The parish church was inconveniently situated, so that many of the parishioners never saw it. The minister had, however, one or two preaching stations: but the deficiency of religious instruction has been more effectually supplied by the building of a new church at Store, under the direction of the Parliamentary Commissioners for building churches in the Highlands and Islands of Scotland, with the aid of the late Duke of Sutherland and his duchess, then Marquess and Marchioness of Stafford. Another new place of worship has also been erected by their aid and by subscription at Loch Inver. There are seven schools in Assynt, besides the parochial school; and the public and private scholars in the parish amount to between 500 and 600. The whole population is 3161. Gaelic is the language chiefly read and spoken. (Sir John Sinclair's *Statistical Account of Scotland; Parliamentary Reports*, &c.)

ASSI'SI, a town of the Papal state, in the province of Umbria, and in the administrative delegation of Perugia. It is built on a hill, and near though not upon the high road from Perugia to Foligno, in 43° 5′ N. lat., and 12° 33′ E. long. It commands a full view of the fine valley of Foligno, watered by the Topino, one of the tributaries of the Tiber. Assisi was the birth-place of St. Francis, the founder of the mendicant order which bears his name, of which it is considered as the metropolis. The Sacro Convento or church and monastery in which St. Francis was buried, is a large and splendid building. Two miles from Assisi, by the side of the high road, is the noble church of La Madonna degli Angeli, raised by the architect Vignola, in the centre of which stands the rustic oratory where St. Francis first began his ascetic course of life. It is called the Portiuncula, from its having been the first portion, or property belonging to the order. [See **Francis, Saint.**] On the 2nd of August multitudes of pilgrims resort to this sanctuary. Assisium was a Roman municipium, and a place of considerable importance, as may be inferred from the remains of the forum, the thermæ, the aqueducts, and other ruins which are still seen. But the finest piece of antiquity it contains is the Temple of Minerva, transformed into a church dedicated to the Virgin; the portico, which has remained entire and in good preservation, is considered to be the finest specimen of the kind in Italy, after the Pantheon. It consists of six fluted Corinthian columns, with architrave, frieze, and cornice, surmounted by a pediment. The whole is made of travertino; the proportions are good, and the capitals and other ornaments are of fine workmanship. The inscription on the frieze, which was of brass characters, has been unfortunately lost. Only three sides of the antient cella remain, the posterior part having been lengthened when converted into a church. The columns, including base and capital, are thirty-five feet in height. This portico had been much neglected and injured, until 1753, when the Congregation of the Oratory having purchased it of the Capuchin friars for 2000 scudi, the Superior, Father Fisenodler, of Munich, restored the portico to its original appearance, and cleared it of some adjacent hovels. The house of the Congregation and the public schools are now annexed to the church. Antolini has given a description of the temple, with plates. Among other scattered remains of antiquity is a fine sarcophagus, with a rilievo representing Diana and Endymion; it forms now the table of one of the altars in the church of St. Ruffino. Several antient vases are used as public fountains.

Assisi is a bishop's see. Its population is about 4000. The country around abounds with olive trees, and there are mineral waters in the neighbourhood.

ASSIZE. This word has been introduced into our legal phraseology from the French *assis*, and is ultimately derived from the Latin verb *assideo*, to sit by, or, as Lord Coke translates it, to sit together. The word *assido* is also to be found in legal records and has in law-latin a different meaning from *assideo*, signifying to assess, fix, or ordain. Thus in the *postea*, or formal record of a verdict in a civil action, it is said that the jury find for the plaintiff, *et assidunt damna ad decem solide*; 'and they assess the damages at ten shillings;' and then the judgment of the court is given for the damages 'per juratoris in formâ prædictâ *assessa*.' It is possible that the word assize, in cases where it signifies an ordinance, decree, or assessment, may be derived from this word. This etymology is not, however, given by Du Cange, Spelman, or any learned writer on this subject; though it obviously leads much more distinctly to several meanings of the word assize than the derivation from *assideo*. With reference to English law, the word assize has been called by Littleton *nomen æquivocum*, on account of its application to a great variety of objects, in many of which neither the etymology of the word nor its original meaning can be readily traced. In this article it is proposed to enumerate and explain in a summary manner the various significations of the term.

1. The term assize also signified an ordinance or decree made either immediately by the king, or by virtue of some delegation of the royal authority. Thus the Assizes of Jerusalem were a code of feudal jurisprudence for the new kingdom of Jerusalem, formed in 1099 by an assembly of the Latin barons, and of the clergy and laity under Godfrey of Bouillon. (Gibbon's *Decline and Fall*, vol. xi. p. 93.) In this sense also, in antient English history, Fleta speaks of 'the laws, customs, and *assizes* of the realm' (lib. i. cap. 17); and the ordinances made by the great council of nobles and prelates assembled by Henry II. in 1164, and commonly known as the 'Constitutions of Clarendon,' are called by Hoveden '*Assisæ* Henrici Regis factæ apud Clarendonum.' In like manner the assizes of the forest were rules and regulations made by the courts to which the management of the royal forests belonged.

2. Analogous to these were the assizes or ordinances regulating the price of bread, ale, fuel, and other common necessaries of life; called in Latin *assisæ venalium*. The earliest express notice of any regulation of this kind in England is in the reign of King John (1203), when a proclamation was made throughout the kingdom enforcing the observance of the legal assize of bread; but it is probable that there were more antient ordinances of the same kind. In very early times these 'assisæ venalium' appear to have been merely royal ordinances, and their arrangement and superintendence was under the direction of the clerk of the market of the king's household. But at a subsequent period many statutes were passed regulating the assize of articles of common consumption; the earliest of these is the assize of bread and ale, 'assisa panis et cervisiæ,' commonly called the stat. of 51 Henry III. though its precise date is somewhat doubtful. The provisions of the act with regard to ale, establishing a scale of prices varying with the price of wheat, were altered in some measure by 23 Henry VIII. c. 4, which left a discretionary power with the justices of the peace of fixing the price of ale within their jurisdiction [see **Ale**]; but the assize of bread was imposed by this act, and enforced from time to time by orders of the privy council until the reign of Queen Anne. In cities and towns corporate the power of regulating the assize of bread and ale was frequently given by charter to the local authorities, and the interference of the clerk of the King's household was often expressly excluded. Books of assize were formerly published, under authority of the privy council, by the clerk of the market of the king's household, and there is one still in existence which was printed in the reign of Henry VIII. The stat. 8 Anne, c. 19, repealed the 51 Henry III. and imposed a new assize of bread, making various other regulations respecting it. Several subsequent acts have been passed on the subject; but by the 55 Geo. III. c. 99, the practice was expressly abolished in London and its neighbourhood, and in other places it has fallen into disuse. There was also an assize of wood and coal (stat. 34 and 35 Henry VIII. c. 3); and so late as the reign of Queen Anne, we find an act (9 Anne, c. 20) enforcing former regulations for the assize of billet. Besides these, various other articles—wine, fish, tiles, cloths, &c., have at different times been subject to assize. The object of these regulations was the prevention of fraud and monopoly; and it is not surprising that in the early stages of legislation it should have appeared to be one of the first duties of government to secure to its subjects the prime necessaries of life at a reasonable and uniform rate. But subsequent experience and more enlightened views have shown, that to attempt to fix by law the prices of commodities, is not only useless and mischievous, but in many cases impracticable; and that when government has established an uniform scale of weights and measures, and, so far as it can be done, an uniform measure of value, the rest may safely be left to competition, and to the mutual bargaining which takes place between the buyer and the seller.

3. The word assize also denoted the peculiar kind of jury by whom the writ of right was formerly tried, who were called the grand assize. The trial by the *grand assize* is said to have been devised by Chief Justice Glanville, in the reign of Henry II., and was a great improvement upon the trial by judicial combat, which it in a great degree superseded. Instead of being left to the senseless and barbarous determination by battle, which had previously been the only mode of deciding a writ of right, the alternative of a trial by the grand assize was offered to the tenant or defendant. Upon his choosing this mode of trial, a writ issued to the sheriff directing him to return four knights, by whom twelve others were to be elected, and the whole sixteen composed the jury, or grand assize by whom the matter of right was tried. The late act of parliament, 3 & 4 Will. IV. c. 27, has now abolished this mode of trial, the cumbrous machinery of which was entirely unfit for the habits of modern society. [See **Jury.**] By the law of Scotland, the jury, in criminal cases, are still technically called the assize.

4. The common and popular use of the term assize, at the present day in England, is to denote the sessions of the judges of the superior courts, holden periodically in each county for the purpose of administering civil and criminal justice. These assemblies no doubt originally derived their denomination from the business which was at first exclusively imposed upon them, namely, the trial of writs of assize. According to the common law, assizes could

only be taken (*i. e.* writs of assize could only be tried) by the judges sitting in term at Westminster, or before the justices in eyre at their septennial circuits. This course was productive of great delay to suitors, and much vexation and expense to the juries, or grand assize, who might have to travel from Cornwall or Northumberland, to appear in court at Westminster. To remedy this grievance, it was provided by Magna Charta, in 1225, that the judges should visit each county once in every year, to take assizes of novel disseisin and mort d'ancestor. From this provision the name of justices of assize was derived; and by several later acts of parliament various authorities have been given to them by that denomination. By the 13 Edward I. c. 3, (commonly called the statute of Westminster 2), it was enacted, that the justices of assize for each shire should be two sworn judges, associating to themselves one or two discreet knights of the county; and they are directed to take the assizes not more than three times in every year. By the same statute, authority is given them to determine inquisitions of trespass and other pleas pleaded in the courts of King's Bench and Common Pleas. From this important act of parliament the jurisdiction of the judges of assize to try civil causes, other than the writs of assize above mentioned, originally arose; and as, with some modifications, it forms the basis of their civil authority at the present day, it may be desirable to endeavour to explain the complex and argumentative process by which the provisions of the statute are practically effected. Besides the general authority to determine civil issues, it was provided by the statute of Westminster 2, that no inquest in a civil action should be taken by the judges of the superior courts when sitting at Westminster unless the judicial writ which summoned the jury for such inquest appointed a certain day and place for hearing the parties in the county where the cause of action arose. Thus, if a suit arose in Cornwall, the writ from the superior court must direct the sheriff of that county to return a jury at Westminster for the trial of the inquest in the next term, '*unless before*' (*nisi prius*) the term, namely on a certain day specified in the writ, the justices of assize came into Cornwall. This was sure to happen under the directions of a previous clause in the statute of Westminster 2, in the course of the vacation before the ensuing term, and the jury were then summoned before the justices of assize in Cornwall, where the trial took place, and the parties avoided all the trouble and expense of conveying their witnesses and juries to London. The jurisdiction of the judges of *nisi prius* is therefore an annexation to their office of justices of assize; and thus, from the alteration in the state of society since the above laws were made, the principal or substantial part of their jurisdiction has, by the discontinuance of writs of assize, become merely nominal, while their annexed or incidental authority has grown into an institution of immense practical importance.

For several centuries, until a few years ago, the whole of England was divided into six circuits, to each of which two judges of assize were sent twice a year. Previously to the year 1830, the Welsh counties and the county palatine of Chester were independent of the superior courts at Westminster, and their peculiar judges and assizes were appointed by the crown under the provisions of several statutes. This separation of jurisdiction being found inconvenient, the statute 1 William IV. c. 70 increased the number of judges of the superior courts, and enacted that, in future, assizes should be held for the trial and despatch of all matters criminal and civil within the county of Chester and the principality of Wales under commissions issued in the same manner as in the counties of England. Since the passing of this statute, therefore, the assizes throughout the whole of England and Wales (excepting London and Middlesex, where the administration of justice is regulated by peculiar customs and acts of parliament) have been holden twice a year in each county upon a uniform system. In addition to these ordinary assizes, a third assize for the trial of criminals has for the last ten years taken place in the counties of Hertford, Essex, Kent, Sussex, and Surrey.

The judges upon the several circuits derive their civil authority ultimately from the antient statutes of assize and *nisi prius* in the manner before described; but they have also a commission of assize which is issued for each circuit by the crown under the great seal. This commission pursues the authority originally given by Magna Charta and the statutes of *nisi prius*, and seems to have been nearly in the same form ever since the passing of those statutes. It is directed to two of the judges and several serjeants (the latter deriving their authority to be judges of assize from the statute 14 Edward III. c. 16, which mentions 'the king's serjeant sworn,' under which words Lord Coke says that any serjeant at law is intended (2 Inst. 422), and commands them 'to take all the assizes, juries, and certificates, before whatever justices arraigned.' Under the direct authority given by these words, the commissioners have in modern times nothing to do, the 'assizes, juries, and certificates' mentioned in the commission having only a technical reference to the writs of assize, now wholly discontinued. It is stated in most of the common text books that the judges of assize have also a commission of *nisi prius*. This is, however, a mistake, no such commission being known in our law, and the only authority of the judges to try civil causes being annexed to their office of justices of assize in the manner above described.

In certain cases, the justices of assize, as such, have by statute a criminal jurisdiction; but the most important part of their criminal authority is derived from other commissions. The first of these is a general commission of Oyer and Terminer for each circuit, which is directed to the lord chancellor, several officers of state, resident noblemen and magistrates, and the king's counsel and serjeants on their respective circuits; but the judges, king's counsel, and serjeants, are always of the quorum, so that the other commissioners cannot act without one of them. This commission gives the judges of assize express power to try treason, felony, and a great variety of offences against the law of England, committed within the several counties composing their circuit. [See OYER AND TERMINER.]

The judges of assize have also commissions of gaol delivery, which in their legal effect give them several powers, which, as justices of Oyer and Terminer only, they would not possess. They are directed to the judges, the king's counsel, and serjeants on the circuit, and the clerk of assize and associate. Every description of offence is cognizable under this commission; but the commissioners are not authorized to try any persons except such as are in actual or constructive confinement in the gaol specifically mentioned in their commission. There is a distinct commission under the great seal for the delivery of the prisoners in each particular gaol. [See GAOL DELIVERY.]

The judges on their circuits have also a commission of assize. In addition to the above authorities, the judges of the superior courts on the circuits are also fortified by the commission of the peace. The judges of the King's Bench, Common Pleas, and Exchequer, for the time being, are always inserted in the commissions of the peace periodically issued for each English county; and consequently they may exercise all the powers and functions communicated by the commissions of the particular counties which compose their respective circuits.

In practice, the judges of the courts at Westminster choose their circuits by arrangement among themselves on each separate occasion. They are then formally appointed by the king under the sign manual; and the several commissioners are afterwards made out in the Crown Office of the Court of Chancery from a fiat of the lord chancellor.

ASSOCIATION is one of the mental phenomena. It does not rank among the primary powers of the mind, like sensation, perception, and judgment, because it does not form one of the separate steps of all mental operations; nor do its functions consist, like those of memory, in re-embodying past impressions. It acts as an agent to all these powers, though not a power itself. The office which it performs is to connect and arrange rather than to originate ideas. By its influence over the sensations, perceptions, and judgments, it regulates the succession of the thoughts. When one thought is suggested by another, or when a train of past images is summoned by something present, whether spontaneously or by an exertion of memory, the process by which this effort is made is called association. Dr. Brown has designated it 'the principle of suggestion;' a term which, if its operations were discriminative and voluntary, would be preferable to the one in present use. But suggestion implies deliberation, choice; whereas, it is the province of association to awaken perceptions, not to perceive; to link the thoughts, not to think; to lead the memory to successive images and trains of ideas, between which there is a bond of connexion, not always obvious, but when discovered, traceable to one or other of those affinities, analogies, or contrasts by which the principle of association acts. Mr. Hume was the first writer who traced the influences of our associations to certain principles, which he denominated 'resemblance, contiguity in time or place, and cause or effect.' 'Contrast' has since been added to these, which completes the classification of those sympathies and predilections, seated in the mind and acting with all the force and certainty of established laws.

It is not pretended that there may not be large classes of our associations not referable to any of these principles, such as the names of things, the terms of art, the words by which we designate moral and intellectual qualities and operations; in short, the whole vocabulary of language, in which there is little or no connexion either in the way of resemblance, contiguity, cause, effect, or contrast with the objects or ideas represented, although none of them ever fail to summon up the images of the things for which they stand. Anomalies like this, when reducible to certain limits, establish rather than invalidate the laws to which they form an exception. Even the terms of a language, when once connected with their representative objects, offer one of the most remarkable illustrations of simple association. In the word *flower*, for instance, there is nothing to stamp upon the mind any particular image. To one who was ignorant of language it would convey no idea: but let the word be explained, let it once be associated with its representative genus of objects, and it instantly calls up the picture of some beautiful plant in blossom whenever the name is seen or pronounced. The distinction between association and memory is here plainly visible. The knowledge of the term *flower* is an act of memory; the knowledge of the object which it represents implies also an act of memory; but the connexion between the name and the object, and still more, between the name and the particular flower that blooms before the mind's eye, are the results of association.

Mr. Hume has annexed to his enunciation of the three principles above enumerated an example illustrative of each 'That these principles,' he observes, 'serve to connect ideas will not, I believe, be much doubted. A picture naturally leads our thoughts to the original. The mention of one apartment in a building naturally introduces an inquiry or discourse concerning the others. And if we think of a wound, we can scarce forbear reflecting on the pain which follows it.' The first of these illustrations is founded upon the law of resemblance; the second, upon the law of contiguity; the third, upon the law of causation. 'But,' continues he, 'that this enumeration is complete, and that there are no other principles of association except these, may be difficult to prove to the satisfaction of the reader, or even to a man's own satisfaction.'

To whatever principles or laws we ascribe the association of ideas, it is evident enough that there is not only a bond of connexion amongst them, but a bond of order. The greatest irregularity and confusion would obviously prevail in our mental operations, without some regulating principle. That principle is association. It is to mind what the law of attraction is to matter. It draws together ideas connected by common affinities, and repels others that cannot coalesce. When we contemplate the vast number of different impressions made upon the mind in the course of every day, which have to be referred to again, what a confusion would be created, were there not some property in the ideas by which they arrange themselves according to certain invariable laws and relations, designed not only to preserve them, but to promote their restoration at a future period. This reproduction of our thoughts in so perfect a manner, in the order in which they are wanted, comprises one, and not the least remarkable, of the phenomena of association. Most of our ideas are reproduced with facility, but occasionally it is with difficulty they are recovered, owing either to indistinctness in the original impression, or to an imperfection of the associating faculty itself, which is not equally acute in every individual, nor equally active at all times in the same individual.

Sometimes trains of associations *involuntarily* convey the thoughts to subjects foreign to our wishes. They run away, as it were, with our ideas; and, regardless of the unities of time or place, awaken images and recollections which not only startle us by their abruptness, but occasion us at times no little trouble to account for their presence. This mental phenomenon admits of easy explanation. While the volitions of thought are intensely directed to a particular subject, the associations act in subordination to that which is, for the time, 'the ruling idea of the mind', when this mental intensity subsides, and the attention ceases to concentrate the faculties of thought, the mind relapses into that desultory state which is its ordinary mood in the absence of excitement. Hence the attention which fixes the thoughts controls the associations; the relaxation of attention which allows the thoughts to wander grants the same license to the associations. A striking illustration of this fact is to be found in what are called reveries—a state of mental ennui, in which the mind shrinks from exertion, and resigns itself to the guidance of the associations. In sleep, this emancipation from mental direction is still more complete; in consequence of which, the order and perspicuity of thought, so conspicuous while attention presides over intellectual exertion, are deranged. Strange contradictions and anomalies present themselves, announcing the suspension of that faculty whose office it is to restrain the wild and involuntary action of the associating power.

It should be added, however, that, although our associations roam at large during slumber, and although they may occasionally refuse to come and go at our bidding at other moments, yet they are capable of being controlled and regulated to a very high degree. A habit of attention is the governing power. Attention implies abstraction from desultory thoughts, and the act of mental direction to a particular subject. The influence of this habit keeps the associations under control; the want of it renders our waking thoughts little less incongruous than the dreams of sleep. It is one of the singular properties of association that it acts upon the moral as strongly as upon the intellectual part of our nature. Not to speak of its influence upon the generous and noble dispositions of the mind, the passions are perverted by an unlicensed association of ideas. Mr. Locke gives an example of this tendency, in reference to the origin of superstitious fear—a weakness less prevalent in the present than in the past generation. He alludes to the vulgar belief in ghosts as spirits of the night. 'The ideas of goblins and sprites have really no more to do with darkness than with light; yet let but a foolish maid inculcate these often on the mind of a child, and raise them there together, possibly he shall never be able to separate them again as long as he lives; but darkness shall ever afterwards bring with it those frightful ideas, and they shall be so joined that he can no more bear the one than the other.'

To avoid this and other errors to which the mind is exposed by an undisciplined use of the associating faculty, the greatest pains ought to be taken to render it not only subordinate but obedient to reason; to place it under the guard of attention, and to fill the intellectual storehouse with such ideas as shall only awaken pure and pleasing associations.

In relation to the phenomena of associations, it is worthy of remark that we are indebted to modern philosophy for the development if not for the discovery of them all. The original elucidation of the principle is ascribed to Mr. Locke, who, in one of the later editions of his 'Essay on the Human Understanding,' added a new chapter entitled 'Of the Association of Ideas,' in which the laws of this power are noticed, and some of its phenomena explained. Soon after, Dr. Hartley in his 'Observations on Man,' investigated the principle more thoroughly, and carried its application from simple ideas to the actions and affections, tracing all the intellectual and moral phenomena up to this source. Mr. Hume, in one of his 'Essays' published almost contemporaneously, showed that the three connecting principles of all ideas are the relations of resemblance, contiguity, and causation, to which some subsequent writer appended a fourth, viz. contrast. In the works of these philosophers is comprised all that is known in reference to the doctrine of association, later writers having done little more than expand or illustrate the views of their predecessors.

ASSOCIATION, AFRICAN. [See AFRICAN ASSOCIATION.]

ASSONANCE, *asonancia*, in Spanish romantic and dramatic and in several species of lyric poetry, is a peculiar correspondence in sound in the termination of verses, less complete than that of rhyme. In rhyme (called in Spanish *consonancia*) the vowel in the last accented syllable and all the subsequent consonants and vowels are required to be the same as in the co-rhyming verse; but in *assonance*, though the vowels of the last accented syllable and in all subsequent syllables are the same, the consonants may and ought to be different. Thus, *bárbaro*, which has the accent on the antepenultima, is an assonant with *cálamo* and *plátano*. *Búscas*, which is accented on the penultima, is an assonant with *cúran* and *súya*. (So in English, *hardy*, *manly*, and *carry*, would be assonants; in German, *toben*, *hoffe*, *oder*.) Corazón, which is accented on the last syllable, is assonant with amór, españól, flor, voz.

Assonants are not, like rhymes, exhibited in insulated pairs, but are continued through the whole poem, or, in dramatic compositions, through an entire act or day (*jornada*), without any other change than the alternation of blank verse with the assonants. Thus, the first, third, fifth, seventh lines, &c. of the act are blank verse, and the second, fourth, sixth, and eighth lines, &c. are all assonants to each other; unless indeed the blank line and the assonanted line which follows it be considered as constituting one long line, terminating with an *asonante*, as in the Arabian prototype supposed to be discovered by Sarmiento in some of the metrical parts of the Koran.

But for this constant recurrence of the same assonance through a long succession of alternate lines, the ear would probably be little struck with this faint species of rhyme, even when proceeding from the mouth of a Spaniard, in which the vowels are so fully and broadly sounded, without being contracted by the use of double consonants, which, while they add to the brilliancy of Italian versification, appear to render it less susceptible of this delicate species of embellishment, so peculiarly adapted to the use of the drama, for which rhyme is perhaps too prominent and too ostentatious an ornament.

Calderón, and the other classical dramatists of Spain, always use *asonantes*. The *asonante* of the drama is that in which the accent is on the penultima, the verse consisting of eight syllables.

In lyric poetry, rhyme is more frequently adopted; but the *endecha*, a species of elegy, and some other lyric measures, require the assonant. The following extracts from romances contain lines alternately blank and assonanted, as is always the case in romantic and in dramatic poetry. In the first of these examples the accent is on the penultima; in the second, on the last syllable:—

Salió el gallardo Aliatar
Con cien Moriscos gall*ardos*
En defensa de Motril
Y socorro de su herm*ano*.

A caballo salió el Moro,
Y otro dia desdich*ado*
En negras andas le vuelven
Por donde salió á cab*allo*.

Maldeciré mi hermosura,
Y tambien mi moced*ad*,
Maldeciré el triste dia
Que con vos quise cas*ar*.

The next is an example of double assonants:-

Aguárdate, dixo el p*avo*
Al cuervo de l*éjos*.
Sabes lo que estoi pens*ando*?
Que eres negro y *feo*.

Escucha; tambien rep*aro*,
Le gritó mas *recio*,
En que eres un paxarr*aco*
De mui mal agü*ero*. *Yriarte*

ASSOUAN. [See SYÉNE.]

ASSUMPSIT is the technical term denoting one of those specific forms of action which were provided, at a very early period of the history of English law, as the course by which redress for particular injuries must be pursued. It is so called from the past tense of the Latin word *assumo*, barbarously applied to signify 'I undertake'; and is taken from the use of this word, describing the defendant's undertaking, in the old Latin pleadings. Thus, the form would be 'that in consideration that the plaintiff had furnished goods to the defendant, the latter undertook, or rather took upon himself (*super se assumpsit*) to pay the former so much money.' The action of assumpsit is exclusively used for the recovery of damages occasioned by the breach of a simple contract; that is, a contract not under seal nor of record; and is now more generally adopted than any other form of action in such cases. It cannot, however, be sustained, unless there has been an express promise to pay money (as in the case of a promissory note), or to do any other act; or unless circumstances have occurred which in reason and justice have created a liability, and from which therefore the law will imply a contract. An example of the latter occurs in the familiar instance of the delivery of goods by a tradesman to a customer; in which case, though no express promise to that effect has been made, it is an inference of law that the customer has promised to pay for them as much as they are worth; and, accordingly, the plaintiff's declaration, or formal relation of his cause of action upon the pleadings, would state the debt generally, and also an *actual* promise to pay it. This would be called an *assumpsit* on a *quantum valebant*. If the consideration were the personal services of the plaintiff, given for the benefit of the employer the latter is supposed to promise to pay as much as the plaintiff 'reasonably deserved to have;' and then the action is called an *assumpsit* upon a *quantum meruit*. So also the character and relative situations of parties will often raise a legal liability, from which an *assumpsit* or undertaking will be implied in the absence of any express contract. Thus, an innkeeper is bound to secure the goods of his guests; in consequence of this liability, the law supposes him to promise to do so; and if the goods are lost or injured, he is liable to an action of assumpsit for the damage which the owner may have sustained. In like manner, it is the duty of surgeons and attorneys to use proper care and skill in the service of those who employ them in their respective callings, and being in legal consideration supposed to promise to do so, they are liable to be called upon in an action of assumpsit to make compensation in damages for any negligence or want of skill. Where the undertaking, whether express or implied, is founded upon an antecedent debt for an ascertained sum, the action is called *indebitatus assumpsit*. This form of action is of comparatively modern invention, being introduced for the purpose of enabling plaintiffs to evade the *wager of law*, which was allowed in actions of debt on simple contract until the late statute of 3 and 4 William IV. c. 42.

ASSUMPTION, or ASUNCION, the capital city of Paraguay, in South America. It is situated on the eastern bank of the River Paraguay, between the Confuso River on the north, and a branch of the Pilcomayo on the south, both which streams fall into the Paraguay. The city, which stands upon a commanding spot, was built in 1535 by a colony of Spaniards under Juan de Salazar; and from the convenience of its situation speedily became a place of some consequence. It was nearly destroyed by fire in 1543, the greater part of the houses being built of wood. From this calamity it speedily recovered; and in 1547 was a place of sufficient importance to be erected into a bishopric. It contains a beautiful cathedral, besides three parish churches and four convents and monasteries. It once contained a college of jesuits. The present population is understood to be comparatively small; not more than 400 or 500 families are said to reside within the city, but a much larger number resort to it for the purpose of traffic, who live in the surrounding country, where the houses, having small farms attached to them, are very numerous. Assumption carried on a considerable trade in the export of hides, tobacco, and sugar; but its principal trade was furnished by the leaves of a species of herb called *matte*, more generally known by the name of Paraguay tea, which article used to be packed in hides and sent for sale to Buenos Ayres, and thence distributed to various parts of Chili and Peru. Great numbers of horned cattle, horses, mules, asses, sheep, and goats, are bred by the farmers, who grow wheat, maize, sugar, tobacco, cotton, mandioc, potatoes and other vegetables. Honey and wax are produced in abundance; and the rivers supply large quantities of fish.

The air in and about Assumption is generally temperate and genial; for the greater part of the year the wind blows from the south.

In the course of the convulsions and revolutions which of late years have disturbed so large a part of South America, Paraguay has become subject to a ruler who has so successfully discouraged all intercourse with foreign countries, as well as with the surrounding states, that the world has been for some time kept in utter ignorance of the state of the country, and the progress and condition of the inhabitants.

The city is in 25° 16′ S. lat., and 57° 37′ W. long.

(See Henderson's *History of Brazil*, and Thompson's *Alçedo.*)

ASSURANCE. Of late years it has become usual with writers on life contingencies to speak of *assurances* upon lives, instead of *insurances*, reserving the latter term for contingencies not depending on life, as against fire, losses at sea, &c. [See INSURANCE, ANNUITIES, &c.]

ASSYE, a small town, about twenty-eight miles north of Jaulna, in the province of Bahar, in Hindustan. This place is principally known as having been the scene of a battle fought on the 23rd of Sept. 1803, between the English army, under the present Duke of Wellington, then General Wellesley, and the confederate armies of Dowlut Row Scindia and the Rajah of Nagpore. On this occasion, the troops under General Wellesley consisted of 2000 European and 2500 native soldiers, while the armies to which these were opposed amounted to 30,000 men. Notwithstanding this great disparity of numbers, the battle was forced on by the English general, who found the enemy encamped on the bank of the Kaitna river, which he crossed for the purpose of the attack. It was only by the most determined bravery on the part of the British that they could hope to succeed against such a disparity of numbers; and accordingly, although the cattle employed in bringing on the artillery were soon so far destroyed or disabled that the use of the guns was abandoned, the troops advanced with a steadiness which overawed the enemy, who gave way in all directions, leaving ninety-eight pieces of cannon and seven standards in the hands of the English, and 1200 men dead on the field. The loss on the part of the British was also very great, 428 being killed and 1138 wounded; so that more than one-third of the corps was included among the killed and wounded. (See Mill's *History of British India.*)

ASSY'RIA is the name of an antient empire in western Asia, which ceased to exist before the epoch at which the authentic history of the East is usually considered to commence. As a geographical term, the name Assyria is used in different acceptations. Greek and Roman historians commonly employ it as a general designation of the countries of Babylonia, Mesopotamia, Aturia, and Adiabene; but frequently extend its limits so as to make it comprehend even part of Asia Minor. The Greeks were accustomed to use the name Syria and Syrians in a very vague sense: Herodotus applies the term Syrians to the Cappadocians (i. 6, and i. 72), and he remarks that the Assyrians in the army of Xerxes were by the Greeks called Syrians, while the Eastern nations named them Assyrians (vii. 63). Arrian, on the other hand (who was for some time governor of Cappadocia, and cannot be supposed to have been ignorant of the name of a country so near his own province), in several passages employs the word Assyria where we should have expected he would say Syria; for instance, when he makes Cilicia border on the east upon Assyria (ii. c. 5 and 6). Herodotus does not appear to have given this indefinite sense to the word Assyria: in one passage (ii. 30), the Arabii and Assyrii are named together as bordering upon Egypt; but here Valckenaer and Schweighæuser agree that the reading is incorrect, and that *Syrians* should be substituted for *Assyrians.* (But see ii. 141.)

Ptolemæus (vi. 1) and the Roman historians confine the name Assyria to a province in the northern part of the Assyrian empire, namely, to the country east of Mesopotamia and the Tigris, which is separated on the north by the Niphates mountains from Armenia, and on the east by the chain of the Zagros from Media; Susiana and Babylonia constitute its southern frontiers. This portion of the antient Assyrian empire, which comprehends part of the modern Kurdistan, seems to be meant by Herodotus (i. 102) when he speaks of 'those Assyrians that had in their possession the town of Ninus.' The country is divided into three parts by two rivers which rise in the Zagros mountains, and, after traversing Kurdistan, fall into the Tigris. The first is the Lycus, the Zabatus of Xenophon, and the modern Greater Zab: the Ten Thousand Greeks crossed this river in their retreat, probably near the place where it joins the Tigris, and here they found its breadth four plethra, or four hundred Greek feet. (Xen. *Anab.* ii. c. 5.) The second river, the Caprus, also named Zabas, or Anzabas, by the later Greek and Roman writers, is probably the present Lesser Zab: it is not noticed by Xenophon, though he must have passed it towards the end of his first day's march after crossing the Tigris. (See *Anab.* ii. c. 4.) The country to the north-west of the Lycus, or Zabatus, is by the antients called Aturia; that to the south-east of that river, as far as the Caprus, is named Adiabene; to the south of the Caprus we find the province of Apolloniatis, farther to the east Chalonitis, and Sittacene towards the confines of Susiana. Ammianus Marcellinus observes (lib. xxiii. c. 20) that the province of Adiabene derives its name from the two rivers between which it is enclosed, the Diaba and Adiaba, *i. e.* the present Greater and Lesser Zab. The Arabian name of Adiabene is Zawabiah, which is likewise a derivation of the word Zab. (See Assemani, *Bibliotheca Orientalis*, t. iii., ii. p. 711.)

The name Aturia, or Assyria, as is observed by Dion Cassius (lxviii. c. 28), is a mere dialectic variety of pronunciation instead of Assyria; and the province thus designated probably was the original central point from which the power as well as the name of Assyria was subsequently spread farther to the south and west. After the dissolution of the Assyrian monarchy through the revolt of the Medes, the name Assyria was again restricted to this northern province, while the southern parts were designated either Babylonia, from the name of the principal town, or Chaldæa, from the name of its inhabitants. Through the conquest of Cyrus, both parts were re-united, and formed one of the most important satrapies of the Persian empire, which we find sometimes named Babylonia and sometimes Assyria. This apparent confusion of the names Babylonia and Assyria is observable even in the later history of these regions, during the wars between the Romans and Parthians. That the province of Adiabene was once comprised under the appellation of Assyria, is distinctly asserted by Pliny (*Hist. Nat.* v. c. 12).

For a detailed account of the natural features of the Assyrian empire we must refer the reader to the articles BABYLONIA, MESOPOTAMIA, and KURDISTAN; in the present notice we confine ourselves to pointing out some of the more important antient sites of the country.

The celebrated antient capital, Ninus, founded by the king of the same name, was situated, according to Strabo (xvi. c. 1, t. iii. p. 334, ed. Tauchn.), in the plains of Aturia, on the river Tigris. The same author says that it fell into decay immediately after the dissolution of the Assyrian monarchy through the Medes yet Tacitus (*Annal.* xii. c. 13) speaks of the *urbs Ninos, vetustissima sedes Assyriæ*, as of a town still existing at his time. In the history of Alexander the Great the town is not noticed, although in his march along the banks of the Tigris, previous to the battle of Gaugamela, he must have been very near the spot where it is supposed to have stood. Its ruins are conjectured by some to be those discovered on the eastern side of the Tigris opposite Mosul; others think that the site of Ninus must be sought farther to the south, as, according to Ptolemy, its distance from the junction of the Zabatus and Tigris was only a few miles.

This town of Ninus must, according to Mannert, be distinguished from another city of the same name, and the Nineveh of Scripture, which was situated in the southern part of Mesopotamia, at no great distance from Babylon. Herodotus, in two different passages (i. 193, ii. 150), distinctly says that it stood on the Tigris; Diodorus (ii. c. 7), on the authority of Ctesias, places it on the Euphrates. A mass of ruins, commonly called the Tower of Nimrod, at a distance of about twelve English miles north-west of Bagdad, is supposed by some, but perhaps without good reason, to mark the site of this city.

The town of Babylon stood, according to Herodotus (i. 180), on both sides of the Euphrates. The account given by him, as well as by Diodorus (ii. c. 7) and Strabo (xvi. c. 1, t. iii. p. 335, ed. Tauchn.), of its extent, and of the immense size of its walls, is probably exaggerated: but even its present remains prove that it must have been a place of extraordinary magnitude. These have been found at no very great distance towards the north from Kufa, on the Euphrates: the present town of Hillah is situated in the midst of the ruins. (See Rich's *Memoirs on the Ruins of Babylon*, London, 1818.)

Seleuceia was founded by Seleucus Nicator, probably soon after the battle of Ipsus. It was situated on a large canal (the Nahr Malcha, or Royal Water), which joined the Euphrates and Tigris, and, according to Pliny (vi. c. 26), at the point where the canal united with the latter stream. On the opposite (the eastern) side of the Tigris stood the town of Ctesiphon, and a little farther to the south that of Coche or Choche. The foundation of Ctesiphon had been laid by the Macedonians; it did not, however, rise to importance till the time of the Parthian kings, who chose it for their summer residence. (Strabo, xvi. c. 1, t. iii. p. 344, 345, ed. Tauchn.) The ruins of Takht-i-Kesra, on the eastern side of the Tigris, are supposed to mark the situation.

The principal town of the province of Adiabene was Arbela, a name which has been preserved in that of the modern village of Erbil. [See Arbela.] Curtius (v. 1) notices a copious well of naphtha at Mennis, in the neighbourhood of Arbela: the country around these places still abounds in mineral oil and asphaltum.

The province of Apolloniatis derives its name from that of its principal town, Apollonia: but of the history and precise situation of this place little is known.

History of Assyria.—In the book of Genesis (c. x. v. 10) the state of Assyria is represented as having sprung from that of Babylonia founded by Nimrod. 'The beginning of his dominion,' says the Hebrew text, 'was Babel, Erech, Accad, and Chalneh, in the country of Shinear. From this country Ashur went forth and built Nineveh and Rechobot, and Calach, also Resen, between Nineveh and Calach; this is a great city.' The Hebrew chronicles leave us in the dark with reference to the history of Assyria till the earlier part of the eighth century before our æra. From this time downwards, the names of several kings of Assyria are mentioned. The earliest of them is Phul, the contemporary of Menahem the king of Israel (died B.C. 761), whose dominions he invaded and rendered tributary (2 Kings xv. 19). Tiglath Pileser ruled over Assyria while Pekah (d. B.C. 740) was king of Israel, and Ahaz (d. B.C. 728) king of Juda: he assisted the latter in a war against Pekah and Resen the king of Aram (Syria), invaded their dominions, and led many of their subjects away into captivity. It appears that Tiglath Pileser was induced to take the part of Ahaz against his rival king by the present which Ahaz had made him of the gold and silver found in the temple and in his treasury (2 Kings xvi. 8, 9; xv. 29). Salmanassar, the contemporary of Hosea the king of Israel, and Hiskia (Hezekiah) the king of Juda, put an end to the kingdom of Israel by conquering, after a siege of three years, its capital Samaria (B.C. 722), and leading away the remaining inhabitants of the country as captives into various eastern provinces of his dominions (2 Kings xvii. 5, 6; xviii. 9—11). Among the eastern countries subject to Salmanassar, besides some names not yet well ascertained, Media (Madaï) is mentioned (2 Kings xvii. 6; xviii. 11). The immediate successor of Salmanassar seems to have been Sanherib (Sennacherib), who undertook an expedition against Egypt (B.C. 714), in which he invaded Judæa and besieged Jerusalem, but failed in his attempt to take it. (2 Kings xviii. 13; xix. 36; 2 Chron. xxxii. 1—21.) After his return to Nineveh, his capital, Sanherib was killed by two of his own sons, Adrammelech and Shar-Ezer, who after the perpetration of this act fled into the country of Ararat (Armenia), while Esarhaddon, another son of Sanherib, succeeded him on the throne. A king of Assyria named Sargon is mentioned by the prophet Isaiah (xx. 1), who is conjectured by Winer (*Biblisches Real-Lexicon*, i. 119) to have reigned for a short period between Salmanassar and Sanherib.

The only one of these kings whose name has yet been found in the writings of the antient Greek historians is Sanherib, whom Herodotus (ii. c. 141) mentions under the name Σαναχάριβος, and designates as a king of the Arabii and Assyrii, who led an unsuccessful expedition against Egypt during the reign of King Sethos. Herodotus either wrote, or intended to write, a separate work on the Assyrian empire (see Herod. i. 184), and he accordingly adverts but incidentally to the history of that kingdom. Besides Sennacherib he only notices Ninus, the founder of the empire (i. 178), and the last king, Sardanapalus (ii. 150). Diodorus (*Bibl. Hist.* ii.), who chiefly follows Ctesias as his authority, Julius Africanus, Eusebius (*Chron. Armen.* p. 44, &c. ed. Mai and Zohrab, Milan 1818), and Syncellus (*Chronogr.* p. 73, 77, ed. Goar, Venet. 1729, fol.) commence the line of Assyrian kings with Belus and Ninus, and conclude it with Sardanapalus (also named Thonosconcoleros), who, according to Eusebius, was a contemporary of Lycurgus and of Jeroboam II., the king of Israel (d. B.C. 784).

According to Diodorus, Ninus was the first Assyrian king who distinguished himself by conquest so as to be remembered in history. Assisted by Ariæus, an Arabian chief, he conquered Babylonia, made Armenia tributary, subjected Media to his dominion, and compelled all the nations of south-western Asia, with the exception only of the Indi and the Bactrians, to acknowledge the supremacy of the Assyrians. He afterwards founded a magnificent city which he called after his own name, Ninus. A second expedition which he undertook against the Bactrians proved more successful than the first had been. He conquered the country, and married Semiramis, then the wife of Onnas, the governor of a Bactrian fort. The fabulous account which Ctesias has given of the birth, education, and early life, as well as of the subsequent exploits of Semiramis (Diodor. ii. c. 4, &c.; compare Bæhr's *Ctesias*, p. 393, &c.), is quite sufficient to remind us that this portion of the Assyrian history bears a decidedly mythological character, and ought therefore to be received with great caution. Semiramis succeeded Ninus on the throne. Diodorus, apparently on the authority of Ctesias, ascribes to her the foundation of the great city of Babylon on the Euphrates. Herodotus (i. 184) calls her a queen of Babylon who made embankments on the river to protect the adjacent country from inundations. Armenian writers make Semiramis the founder of another magnificent town near the lake of Wan, which they call after her name Shamiramakert: the ruins of this town were recently discovered by the German traveller Schulz. [See Armenia, p. 361.] Diodorus gives, chiefly from Ctesias, an account of the conquests and warlike achievements of Semiramis, which it is very amusing to read, but which evidently partakes in a high degree of the mythological character that pervades the earlier periods of history generally. She subdues Media, Persia, Egypt, and Ethiopia, but is defeated in an attempt to conquer India. She returns to Bactra, her residence resigns the government into the hands of her son Ninyas and dies in the sixty-second year of her age. Unlike his martial parents, Ninyas confined himself to his palace at Ninus, and indulged his fondness for the enjoyment of an inactive and luxurious life. The successors of Ninyas, during thirty generations, followed his example. Teutamus (or Teutanus, as the name is written in some copies of Syncellus), the twentieth successor of Ninyas, is reported to have been contemporary with the war of Troy, whither he sent troops under the command of Memnon the son of Tithonus. The names of the other Assyrian kings are not mentioned by any extant Greek or Roman historian; a list of them is, however, preserved in the Armenian translation of the chronological work of Eusebius (p. 44, &c. ed. Mai and Zobrab). The last of them was Sardanapalus, the thirtieth in succession after Ninus, who even surpassed his predecessors in indolence and voluptuousness. This encouraged the revolt of the Mede Arbaces, who succeeded in putting an end to the dominion of the Assyrians in western Asia.

According to the statement of Herodotus regarding the duration of the subsequent Median empire, as elucidated by Volney in his *Chronologie d' Hérodote* (p. 83, &c., Paris, 1809), the revolt of the Medes (under Arbaces) took place in the year 717 before Christ; and as the same antient historian (Herod. i. 95) assigns to the empire of the Assyrians a duration of 520 years, it follows that he conceived their dominion to have lasted from the year 1237 till B.C. 717.

Ctesias gives to the Assyrian monarchy a duration of upwards of 1300 years, and differs moreover from Herodotus with regard to the period of its overthrow by the revolt of Arbaces; for he makes the dominion of the Medes last 282 years, and as it may be considered as almost certain that the dissolution of the Median kingdom by Cyrus took place in or about B.C. 561, it follows that its commencement, and the end of the Assyrian empire, are, by the statements of Ctesias, thrown back to the year B.C. 843. Heeren considers the statement of Ctesias as erroneous, and conjectures that the error might have arisen from his having counted some of the Median kings twice over. (*Göttinger Gelehrte Anzeigen*, 1810, No. 4.; Bæhr's *Ctesiæ Cnidii Reliquiæ*, p. 441.) Syncellus assigns to the Assyrian empire a duration of 1460 years, from A.M. 3216 to 4675, and states the number of its kings at forty-one. (Syncell. *Chronogr.* p. 77 and 132, ed. Goar.) According to the Armenian Chronicle of Eusebius (p. 37, &c. ed. Mai and Zohrab), the Assyrian kingdom lasted 1280 years.

With a view to reconcile the data concerning the history of Assyria which occur in the Old Testament with the accounts given of it by the antient Greek writers, modern historians have assumed the existence of a second Assyrian dynasty subsequent to the revolt of Arbaces and the fall of Sardanapalus. This assumption is supported by some passages of Herodotus, in which Assyria is alluded to as a separate state even after the revolt of the Medes. It appears from his statements (see especially Herod. i. c. 95. 102. 106) that by the dissolution of the Assyrian empire, not only the Medes, but likewise the Babylonians and other nations that had formed part of it, resumed their previous separate and independent existence, and that besides the kingdom of Media there continued to be a Babylonian and an Assyrian state. Wars between the Medes and Assyrians are often alluded to. At last the state of Assyria seems to have yielded to the ascendancy of the Medes: Herodotus notices the capture of Ninus by the Medes (i. c. 185) during the reign of Nitocris in Babylon. This event probably led to the final incorporation of Assyria in the Median and subsequently in the Persian monarchy.

ASTACOLITES, in Zoology, one of the names given by antient geologists to the fossil remains of the long-tailed or lobster-like crustaceans.

A'STACUS (Leach, Desmarest), in Zoology, a genus of long-tailed crustaceous animals, formed by Gronovius from the genus *Cancer* of Linnæus and of antient authors, which also comprised the short-tailed crustaceous decapods, with the exception of *Hippa*. Fabricius broke it down into the genera *Pagurus*, *Galathea*, and *Scyllarus*; leaving *Astacus* to represent a certain number of crustaceans, from which he afterwards, having the advantage of Daldorff's labours, separated the genera *Palinurus*, *Palæmon*, *Alpheus*, *Peneus*, and *Crangon*. Our countryman Leach, in adopting the genus as left in its last shape by Fabricius, separates from it the genus *Nephrops*, of which there is only one species recorded, the Norway lobster, *Nephrops Norvegicus*. Desmarest adopts the views of Leach, and the genus *Astacus* is now reduced to very few species.

Of these the most interesting, from their commercial value as food, are the common lobster, *Astacus marinus*, and the crawfish, *Astacus fluviatilis*.

The former is found in the greatest abundance on the rocky coasts of this kingdom, in clear water of no very great depth, at the time of depositing its eggs, about the middle of summer. Pennant mentions the great quantities supplied to the London markets, in his time, from the Orkneys and the eastern coasts of Scotland; and states the number annually brought in well-boats from the neighbourhood of Montrose alone at sixty or seventy thousand. But almost incredible as the consumption of this species is, Nature has provided for its security by the most profuse fecundity. Doctor Baster says that he counted 12,444 eggs under the tail of one female lobster, besides those that remained in the body unprotruded.

Lobsters are very voracious, and the fishery for them is carried on sometimes by means of traps, or ‘ pots, (as they are called in some places) made of twigs, baited with garbage, lowered into the sea and marked by a buoy; sometimes by nets baited with the same materials; and, in some countries, by torch light, with the aid of a wooden instrument which acts like a forceps or a pair of tongs.

One of the best narratives of the habits of the lobster extant, is to be found in the following letter from Mr. Travis, of Scarborough, to Mr. Pennant, dated on the 25th October, 1768:—

‘ We have vast numbers of fine lobsters on the rocks, near our coast. The large ones are in general in their best season from the middle of October till the beginning of May. Many of the small ones, and some few of the larger sort, are good all the summer. If they be four inches and a half long, or upwards, from the tip of the head to the end of the back shell, they are called sizeable lobsters. If only four inches, they are esteemed half size; and when sold, two of them are reckoned for one of size. If they be under four inches, they are called *pawks*, and are not saleable to the carriers, though in reality they are in the summer months superior to the large ones in goodness. The pincers of one of the lobster's large claws are furnished with knobs, and those of the other claw are always serrated. With the former it keeps firm hold of the stalks of submarine plants, and with the latter it cuts and minces its food very dexterously. The knobbed, or numb claw, as the fishermen call it, is sometimes on the right and sometimes on the left, indifferently. It is more dangerous to be seized by them with the cutting claw than the other; but, in either case, the quickest way to get disengaged from the creature is pluck off its claw. It seems peculiar to the lobster and crab, when their claws are pulled off that they will grow again, but never so large as at first.

‘ The female or hen lobster does not cast her shell the same year that she deposits her *ova*, or, in the common phrase, is in *berry*. When the *ova* first appear under her tail, they are very small and extremely black; but they become, in succession, almost as large as ripe elder-berries before they be deposited, and turn of a dark brown colour, especially towards the end of the time of her depositing them. They continue full and depositing the *ova* in constant succession, as long as any of that black substance can be found in their body, which, when boiled, turns of a beautiful red colour, and is called their *coral*. Hen lobsters are found in berry at all times of the year, but chiefly in winter. It is a common mistake, that a berried hen is always in perfection for the table. When her berries appear large and brownish, she will always be found exhausted, watery, and poor. Though the *ova* be cast at all times of the year, they seem only to come to life during the warm summer months of *July* and *August*. Great numbers of them may then be found, under the appearance of tadpoles, swimming about the little pools left by the tides among the rocks, and many also under their proper form, from half an inch to four inches in length.

‘ In casting their shells, it is hard to conceive how the lobster is able to draw the fish of their large claws out, leaving the shells entire and attached to the shell of their body; in which state they are constantly found. The fishermen say the lobster pines before casting, till the fish in its large claw is no thicker than the quill of a goose, which enables it to draw its parts through the joints and narrow passage near the trunk. The new shell is quite membraneous at first, but hardens by degrees. Lobsters only grow in size while their shells are in their soft state. They are chosen for the table by their being heavy in proportion to their size, and by the hardness of their shells on their sides, which, when in perfection, will not yield to moderate pressure. Barnacles and other small shell-fish adhering to them are esteemed certain marks of superior goodness. Cock-lobsters are in general better than the hens in winter; they are distinguished by the narrowness of their tails, and by their having a strong spine upon the centre of each of the transverse processes beneath the tail which support the four middle plates of their tails. The fish of a lobster's claw is more tender, delicate, and easy of digestion, than that of the tail. Lobsters are not taken here in pots, as is usual where the water is deeper and more still than it is upon our coast. Our fishermen use a bag-net fixed to an iron hoop, about two feet in diameter, and suspended by three lines like a scale. The bait is commonly fish-guts tied to the bottom and middle of the net. They can take none in the daytime, except when the water is thick and opaque: they are commonly caught in the night; but even then it is not possible to take any when the sea has that luminous appearance which is supposed to proceed from the *Nereis noctiluca*. In summer, the lobsters are found near the shore, and thence to about six fathoms depth of water; in winter, they are seldom taken in less than twelve or fifteen fathoms. Like other insects,* they are much more active and alert in warm weather than in cold. In the water they can run nimbly upon their legs or small claws, and, if alarmed, can spring tail foremost, to a surprising distance, as swift as a bird can fly. The fishermen can see them pass about thirty feet, and by the swiftness of their motion, suppose they may go much farther. *Athenæus* remarks this circumstance, and says, that *the incurvated* lobsters *will spring with the activity* of dolphins. Their eyes are raised upon moveable bases, which enables them to see readily every way. When frightened, they will spring from a considerable distance to their hold in the rocks; and what is not less surprising than true, will throw themselves into their hold in that manner through an entrance barely sufficient for their bodies to pass, as is frequently seen by the people who endeavour to take them at *Filey Bridge*. In frosty weather, if any happen to be found near the shore, they are quite torpid and benumbed. A *sizeable* lobster is commonly from one pound to two in weight. There was one taken here this summer which weighed above four, and the fishermen say they have seen some which were of six pounds, but these are very rare.'

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* When this letter was written the crustaceans generally were classed with insects; but modern investigation has proved that they essentially differ in their organization from those animals.

There is no doubt that the lobster changes its crust annually; but the mode in which this operation is performed is not satisfactorily known. Some suppose that the old crust is thrown off, and that the animal retires to some lurking place to avoid the voracity of his crust-clad fellows, till his new covering acquires sufficient hardness; others contend that the process is one of absorption, and these ask, in proof of their views of the case, what becomes of the old crusts if there is a true ecdysis or moult, for that the sea-coast at the moulting period would be strewed with them? The most probable conjecture is, that the crust sloughs off piecemeal as it does in the crawfish. Lobsters, in common with most of the crustaceans, have the power of reproduction to a great extent. If a claw be torn off, it is renewed; and if it be injured, the animal will sometimes throw it off by an effort. It seems that any violent shock to the nervous system will cause this act. If a lobster be thrown into boiling water, it will generally throw off its large claws on the instant; and the same effect has been produced by plunging the animal, when in full life, into spirit. Pennant goes so far as to make them out to be very nervous subjects indeed. 'Lobsters,' says he, 'fear thunder, and are apt to cast their claws on a loud clap. I am told they will do the same on firing a great gun; and that when men-of-war meet a lobster-boat, a jocular threat is used, that if the master does not sell them good lobsters they will *salute him*.'

That the lobster was well known to the antients appears from the quotation in Mr. Travis's letter, and from many other evidences. It will be sufficient to add that, under the name of ἀστακὸς, Aristotle, in the second chapter of the fourth book of his *History of Animals*, gives a most faithful and elaborate account of the species which is still an inhabitant of the Mediterranean.

The crawfish, *Astacus fluviatilis*, is to be found in the fresh waters of Europe and the north of Asia. It thrives best in rivers, where, in holes in the banks and under stones, it lies in wait for the small molluscous animals, little fishes, the larvæ of insects, and decomposing animal substances, which form its prey. Desmarest says that it will live for upwards of twenty years, and that it becomes large in proportion to its age; that, towards the end of spring, it casts off the pieces which form its shell, and, some days after, becomes covered with a crust as solid as the former one, but larger, sometimes by as much as one-fifth. The eggs, which are excluded about two months after impregnation, are collected under the lower part of the body or tail, as it is popularly called, after the manner of the hen-lobster. From these proceed the young crawfishes, which are very small and soft, but which bear an exact resemblance to the parent, under whose tail they are nursed for several days.

The crawfish is taken either by nets or by bundles of thorns, in which flesh in a state of decomposition is placed. It is also taken by inserting the hand into the hole which it inhabits; and, at night, it is caught by means of lighted torches. Plot, in his *History of Staffordshire*, quotes Cardan, who says, that this species is a sign of the goodness of water; for in the best water they are boiled into the reddest colour. [See CRUSTACEA.]

ASTARTE, Achtoret or Achtaroth, one of the deities of Phœnicia, of whose attributes and character we are unable to give a detailed account, from the scantiness of the information transmitted respecting her. The author of the treatise *De Deâ Syriâ*, usually ascribed to Lucian, says, that she is the same as the Greek Selene (moon); but Cicero (*Nat. Deor.* iii. 23) considers her as the fourth Venus, the wife of Adonis. Herodian (v. 15) tells us that the Africans call her Urania, which, however, is a Greek name, and the Phœnicians, Astroarche (queen of stars). By others she is thought to be the Here (Juno) of the Greeks, but we think the opinion of Cicero is most consistent with the few facts we know respecting her, and that she was nothing else than the planet Venus, whom the Phœnicians worshipped as Astarte. She is frequently mentioned in the Holy Scriptures in connexion with Baal, as seducing the Israelites from their duty. (Judges ii. 13, iii. 17; 1 Sam. vii. 4. xii. 10.) Astarte had a magnificent temple at Sidon, where she seems to have been the principal divinity. Some mythologists speak of Hierapolis in Syria as the central point of her worship, but they have confounded her with Derceto. The island of Cyprus received her religious rites from Phœnicia, and this divinity became known there as Aphrodite. The rose and the lotus were sacred to her, and, among animals, the lion, the horse, the boar, the lobster, and the pigeon. (See Selden, *De Diis Syriis, p.* 244; Höck, *Creta*, Göttingen, 1823; Münter, *Der Tempel der Himmlischen Göttinn zu Paphos*, Kopenhag, 1824.)

ASTARTE, in Zoology, a genus of bivalves or conchifers, with two muscular impressions and a simple mantle-line. The hinge has two divaricated teeth in the right-hand valve; in the other, one distinct and one obsolete tooth, and the rudiment of a lateral tooth. The ligament is external.

The species consist of some of the *Veneres* of Montagu, one of which is a *Crassina*. (Lam.) Some of them are English shells, and they are generally found on the sandy mud of coasts at a depth which ranges from near the surface to ten fathoms.

The crag, the green-sand, and some of the old fossiliferous beds, afford many species.

ASTBURY, a parish in Cheshire, (with a population in 1831 of 14,673) in which is the town of Congleton. [See CONGLETON.]

ASTER, a genus of plants belonging to the natural order Compositæ, and comprehending a great multitude of species scattered over all parts of the world, especially North America and New Holland. Many of them are handsome herbaceous plants, others are small-leaved shrubs, and the remainder are mere weeds. They are not of sufficient importance to claim any special notice in this work; the best account of them is the *Genera et Species Asterearum*, by Nees v. Esenbeck.

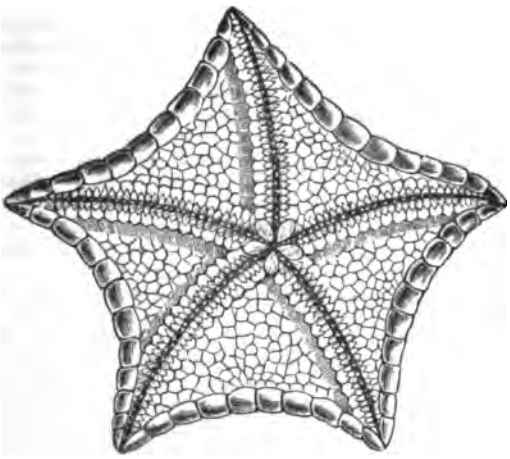
ASTE'RIAS (Lam.), a genus of radiated animals widely diffused over the seas. The Linnæan genus comprised every form of radiation which appears in the tribe, but the genus *Asterias* of Lamarck includes only the starfishes properly so called. These are divided into two sections, 'the scutellated starfishes,' and 'the radiated starfishes.' The former have an angular body, the lobes or rays of which are short, their length not exceeding the diameter of the disk: the latter have a body furnished with elongated rays, whose length far exceeds the diameter of the disk.

Tiedemann has given the anatomy of these animals in a most elaborate and accurate work, and shown the adaptation of their organisation to their locomotion and general habits.

Each ray is furnished with a longitudinal furrow on its lower side, and this furrow is pierced laterally with small holes, through which pass the feet or tentacula, which are membranous, cylindrical, and terminated each of them with a little disk, which performs the office of a cupping glass, somewhat in the same manner as the acetabula or suckers of the cuttle-fishes. By elongating or shortening these numerous little organs, and by fixing them by means of their terminal disks, the progressive motions of the starfish are regulated. The rest of the lower surface is furnished with small moveable spines, which also assist progression. The whole surface is also pierced by pores, through which pass tubes much smaller than the feet, serving probably to absorb the water, and to introduce it into the general cavity, for the purposes of a kind of respiration. A large stomach lies close to the mouth; and two ramified cæca, each suspended to a kind of mesentery, are given off to each ray, which is also furnished with two ovaries, by means of which the animals are supposed to reproduce their species without the aid of a second individual. A fine chord, which surrounds the mouth, and sends a branch to each arm, is considered as the development of their nervous system.

Asterias tessellata may be taken as an example of the scutellated division. It is a widely diffused species. Of the radiated division, *Asterias glacialis*, common starfish or five-finger, may be selected as an illustration. This is common in our seas, and is supposed to be very destructive to oysters. Bishop Sprat, in his history of the Royal Society, where he treats of the common oyster, has the following passage 'There are great penalties, by the Admiralty Court, laid upon those that fish out of those grounds which the court appoints, or that destroy the *cultch*, or that take any oysters that are not of size, or that do not tread under their feet or throw upon the shore, a fish which they call a *five-finger*, resembling a spur-rowel; because that fish gets into the oysters when they gape, and sucks them out.'

Some of the species are subject to the attacks of a para-



[Asterias tessellata.]

the testaceous mollusc (*Stylifer*, Brod.), which burrows in their integument, and there remains in a kind of cyst. [See Comatula. Euryale, Gorgonocephalus, Ophiura.]

ASTERISM, *a collection of stars*, formerly used for *constellation*, but now appropriated to signify any small cluster, which it is either desirable to distinguish from the rest of the constellation in which it lies, or which is not a part of any particular constellation.

ASTEROIDS. The small planets have been sometimes designated by this name. [See Juno, Vesta, Ceres, Pallas.]

ASTHMA. [See Bronchi'tis.]

ASTI, the province of, one of the six intendenze or subdivisions of the division of Alessandria, in Piedmont. It is bounded on the west and north by the province of Turin, on the south by that of Alba, on the south-east by Alessandria Proper, and on the north-east by the province of Casale. It is watered by the Tanaro and its tributaries. The ground is hilly, and well adapted for the cultivation of the vine. A sort of sparkling fine-flavoured white wine, somewhat resembling champagne, is made here, and known by the name of *vino d'Asti*; the soil is also fertile in corn and fruit-trees, especially mulberries, whose leaves serve to feed the silk-worms. The province of Asti contains, besides the capital, several small towns—such as Villanova, S. Damiano, and Montechiaro, and eighty-seven communes, with 118,000 inhabitants.

ASTI, the town of, lies on the left or northern bank of the Tanaro, on the high road from Turin to Alessandria, and nearly half way between these cities, in 44° 57′ N. lat., and 80° 12′ E. long. Asta was a town of the antient Ligurians: it was taken and devastated by the Gauls, under Bellovesus, about B.C. 400; it afterwards made alliance with Rome, and submitted to Hannibal on his invasion of Italy. In the subsequent war of Rome against the Ligurians, Asta submitted to the Romans, but retained its municipal rights. The Romans soon after founded in its neighbourhood the colony of Pollentia, not far from the confluence of the Stura and the Tanaro. Asta having been again taken and destroyed, in a new irruption of the Gauls, was rebuilt by Pompey the Great, on his return from Spain, B.C. 60, and assumed the name of Asta Pompeia. Vespasian at a later date sent many families from Rome to Asta. Asta was devastated by the Goths, under Alaric, and restored by Narses; and taken again by Alboin, who put to death many of the inhabitants. It was erected into a duchy by the Longobards. It afterwards submitted to Charlemagne, and under his indolent successors governed itself, with its consuls, as a republic, like most Italian cities, under the influence of its bishops. In 1060, the people of Asti, after many quarrels with those of Pollentia, about the limits of their respective territories, being reinforced by the citizens of Pavia, took Pollentia, killed many of its inhabitants, completely destroyed the town, leaving not a house standing, and threw the materials into the Tanaro. When the Emperor Frederic I. of Hohenstauffen came to Italy, the Marquis of Monferrat, who wished to extend his jurisdiction over Asti, but found opposition from the citizens, complained of them to the emperor, who placed the town under the ban of the empire; and having taken it, set it on fire, when many people perished by the sword or in the flames, A.D. 1155. Asti afterwards joined the Lombard league; at this time several of its families migrated to the new town of Alessandria, and the Bishop of Asti repaired to Constance, where the peace between the emperor and the Italian towns was signed. After this, Asti attained a considerable degree of prosperity, its citizens surrounded it with walls, and (after the then fashion in North Italy) had their podestà, or chief magistrate, chosen out of another town, and their council of trust composed of nobles and plebeians. They had frequent wars with the Marquisses of Monferrat, as well as with the Marquisses of Saluzzo; the latter of whom made peace, by receiving from the city the investiture of certain lands, for which they acknowledged themselves its vassals. The people of Asti had once manufactures of cloth; but their wealth was chiefly derived from banking or money-lending, for which business they had counting-houses in France, Flanders, and other countries. In 1248 they built the town of Villanova d'Asti, which was to them a sort of colony. About this time the factions of the Guelphs and Ghibelines broke out in Asti, and distracted the citizens for many years after; sometimes one faction prevailing, and sometimes the other, and each by turns driving its antagonist out of the city. Tired of these civil struggles, the people of Asti chose for their captain one of the princes of the house of Savoy, who obtained the investiture of it from the Emperor Henry VII., in 1313; but soon after the people revolted, and gave themselves up to Robert, King of Naples. Asti afterwards fell into the hands of the Visconti of Milan; and Duke Gian Galeazzo, in 1387, gave Asti as a dowry to his daughter Valentina, on her marriage with Louis, brother of Charles VI. of France. It remained in the possession of the French till 1529, when it was given up to the Emperor Charles V., by the peace of Cambrai. Charles gave Asti to his relation Beatrix of Portugal, who married Charles III., Duke of Savoy; since which it has remained attached to the dominions of that house.

Asti is a large city, but not peopled in proportion to its size. In the quarter where the palaces of the nobility are, the streets are rather wide, but little frequented. The most remarkable palaces are those of Trinco, Rovero, Bristagni, Massetti, and Alfieri, in the last of which Vittorio Alfieri was born in 1749. The rest of the town is badly built, and there is not much appearance of trade or industry. Of the churches, the most remarkable are the cathedral S. Secondo, which is dedicated to the first bishop of Asti, and la Consolata. Asti is a bishop's see, and the residence of the intendente of the province. It has eight parish churches, a court of justice, and a royal college, with chairs of philosophy, theology, and surgery. Its population in 1825 was stated in the *Royal Sardinian Calendar* at 22,000 inhabitants.

ASTLE, THOMAS, the author of a work on the *Origin and Progress of Writing*, and of various other antiquarian publications. He was the son of Daniel Astle, who was keeper of Needword Forest, and whose ancestors were proprietors of the manor of Fauld in Staffordshire. Thomas appears to have been born at Yoxall, in that county, in 1734. At the usual age he was sent to the office of an attorney in his native town, but his taste inclining him more to the study of general antiquities than to his profession, he came up to London; where, about the year 1763, he became known to Mr. Grenville, then First Lord of the Treasury and Chancellor of the Exchequer, and was employed by him in the arrangement of papers, and other business which required a knowledge of antient hand-writing. Soon after this, Mr. Astle married the only daughter of the Reverend Philip Morant, the author of the *History of Essex*, and by this connexion he eventually inherited the property of his father-in-law, which was considerable. In 1765 he was appointed by Mr. Grenville to the office of receiver-general of sixpence in the pound on the civil list. In 1770, on the death of Mr. Morant, who had till then superintended the printing of the Antient Records of Parliament begun five years before, Astle was appointed by the House of Lords to take his place, and he presided over the publication till its completion in 1775. He was then made chief clerk in the Record Office in the Tower; and some years after he succeeded to the place of Keeper. He was, besides, a Fellow of the Royal and Antiquarian Societies, and, till his death, one of the Trustees of the British Museum. He died at his house at Battersea Rise, near Clapham, on the 1st of December, 1803. Mr. Astle is the author of a number of articles in the *Archæologia*, and also of several separate publications, a list of which may be found in Watt's *Bibliotheca Britannica*, and in Chalmers's *Biographical Dictionary*, from the last of which authorities we have taken the facts in this notice. The work by which he is best known is his *Origin and Progress of Writing*, first published in quarto in 1784, and again in 1803, in the same form. The latter edition appears to be an exact copy of the former, except that it contains an engraved portrait of the author, and an appendix 'On the Radical Letters of the Pelasgians, and their Derivatives,' a tract of a few pages, which had been first printed in part in the seventh volume of the *Archæologia* in 1785. Watt mentions what he calls 'an improved edition' of the work on Writing, published in 4to. in 1794, which we have not seen. He afterwards calls the edition of 1803 the second edition. Besides the works enumerated by Chalmers and Watt, there is a reprint, in 4 vols. 4to., published in 1807 and following years, of Grose's *Antiquarian Repertory* (first published in 1775), on the title-page of which the name of Astle is given as one of the compilers along with that of Grose. Mr. Astle's library, which was very curious, was purchased by the Royal Institution for a thousand pounds.

ASTOLPHUS succeeded his brother Ratchis as king of the Longobards A.D. 750, Ratchis having voluntarily abdicated, and retired into the monastery of Monte Casino. Astolphus, who was bold and ambitious, aimed at driving away the Greeks from Italy; he took Ravenna, expelled the Exarch, and conquered the Pentapolis, which comprised part of the present March of Ancona. In 752 he turned his arms against the duchy of Rome, which still acknowledged the authority of the eastern empire, tempered however by the influence of the popes. Stephen II. sent ambassadors to Astolphus with splendid gifts, and obtained a truce for forty years. Four months after, however, Astolphus broke the truce, and required the Romans to swear allegiance to him, and pay a capitation tax; threatening them with fire and sword in case of non-compliance. Pope Stephen, despairing of assistance from the indolent Byzantine court, had recourse to Pepin, king of the Franks, and he himself repaired to Paris, where he crowned Pepin, and bestowed on his two sons Carlomann and Charles (afterwards Charlemagne) the title of Patricians of Rome, A.D. 753. Pepin now invited Astolphus to restore the Exarchate to the empire, and to let Rome enjoy peace, but his request failing of effect, he assembled his barons, marched an army into Italy, defeated Astolphus, and besieged him in the city of Pavia. A treaty was concluded through the pope's mediation, by which Astolphus agreed to the above conditions. Pepin then returned into France. This was the first interference of the French in the affairs of Italy.

Astolphus did not keep his word, but in 755 marched against Rome, and laid siege to it. The pope wrote to Pepin, who crossed the Alps a second time, and again besieged Astolphus in Pavia. Astolphus now sued for peace; he paid a large sum to Pepin for the expenses of the war, and gave up the Exarchate, including Comacchio, as well as the Pentapolis, which were not restored by Pepin to the empire, but bestowed by him on the see of St. Peter. Pepin sent the abbot of St. Denis, who received the keys of the various towns from Astolphus's commissioners, and deposited them on the altar of St. Peter at Rome. This was the origin of the temporal power of the popes, as independent sovereigns. A difference of opinion exists with regard to the terms of this donation, the act of which, if it ever existed in writing, has been lost. The territory thus given up, however, included the country of Ravenna and the province since called Romagna. The duchy of Rome was not included in it. Astolphus died in 756, owing to a fall from his horse. Having no son, he was succeeded by Desiderius, one of the Longobard dukes. Astolphus, during his quarrels with the pope, founded several monasteries, in one of which his daughters took the veil. (Muratori, *Annali d'Italia; Mosheim's Ecclesiastical History.*)

ASTON. [See BIRMINGHAM.]

ASTORGA, the **ASTU'RICA AUGUSTA** of the Romans, once the capital of the Astures, and now an episcopal town in the kingdom of Leon. Pliny (iii. 3) calls it a magnificent city. It is situated near the Tuerto, in a plain, bounded on the N. and N.W. by the mountains of Asturias; it is about twenty-six miles W. by S. of Leon, and lies in 42° 27′ N. lat., 6° 10′ W. long. Its vega, or plain, is very extensive and fertile, and produces excellent wheat, rye, barley, flax, and pasture. The town, which is surrounded by a wall now in ruins, contains 3972 inhabitants, including the suburbs, four parishes, and two convents. The chapter consists of the bishop, twelve dignitaries, and twenty-two canons, all resident. The diocese contains 913 parishes. The cathedral is Gothic, and deserves to be visited on account of its altar mayor, or high altar, which is one of the best works of the famous Gaspar Becerra. This altar was built in 1569, and cost 30,000 ducats (about 3300*l.*). There is also at Astorga a castle belonging to the marquis of that name, which is in a state of dilapidation.

It was at Astorga that Napoleon assembled his army, consisting of 80,000 men, with 200 pieces of cannon, when in pursuit of General Moore, on the 1st of January, 1809. In September of the same year it was occupied by the Spanish general, Santocildes. The old ramparts were strengthened by fresh works, and the place garrisoned with 2000 men. On the 22d of March, 1810, it was invested by General Junot. Santocildes, with provisions scarcely sufficient for twenty days, without ammunition, or a force to protect the place and divert the enemy outside of the walls, defended it against the vigorous attacks of the French for nearly a month. On the 20th of April, the French being already masters of the suburbs of Puerta-de-Hierro, Retebia, and San Andres, the Spanish general offered to capitulate. Junot refused the terms proposed, and the place was carried by assault on the evening of the 21st. In 1812, Santocildes, with the Galician army, succeeded in reducing the place again, and made prisoners of the garrison, amounting to 1200 men.

(See Miñano; Ponz, *Viage de España*, tom. xi. carta 6 No. 92—99; Napier's *History of the Peninsular War*, vol. iii. book x. ch. vii.; *Annals of the Peninsular Campaigns.*)

ASTRABAD, or **ASTERABAD**, a province of small extent in the N.E. part of Persia. It is bounded on the north by the Caspian Sea and the Desart, on the south by the Elburz mountains, on the west by Mazanderan, and on the east by the river Gourgan, which is by some writers called Jorjan.

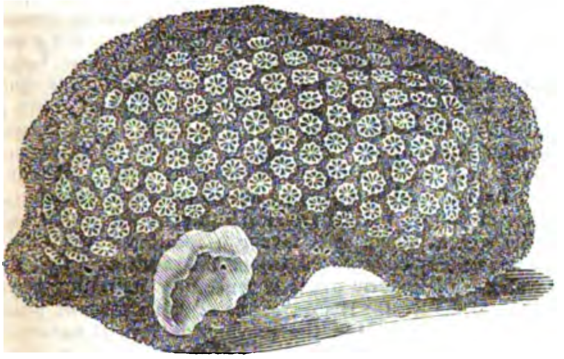
Except in the immediate neighbourhood of its rivers, the country is of a mountainous character. The level lands are pleasant, and extremely fruitful, producing, among other things, grapes of an uncommon size. In other parts the soil is sandy and sterile.

The province is nearly surrounded by rivers, which abound with fish, principally sturgeon and salmon. The chief town, also called Astrabad, is ten miles from the shores of the Caspian, and stands in 36° 50′ N. lat., and 54° 35′ E. long. The site of Astrabad has been placed so far from the sea, though the shores of the Caspian offered such great advantages, both in a commercial and military point of view. The town is believed to owe its origin to Yezzid ibn Mehloob, an Arab general, and to have been built towards the end of the first century of the Mohammedan æra. The circumference of the place is about three miles and a half; the whole of this extent is surrounded by a high and thick wall, which is now in a ruinous condition. The streets are for the most part paved, and their cleanliness is promoted by a drain which runs through the centre of them. The town does not contain any public buildings which are worthy of remark.

A lake, which extends from a point three miles north-east of Astrabad towards the Caspian, has usually been considered as a gulf of that sea, and is so laid down in some maps. Lieutenant Conolly, whose travels in that quarter have recently been published, says that the waters of this lake do not approach nearer to the Caspian than three miles, and have no communication with it. He adds, that 'the water being confined, stagnates in summer, and the inhabitants of Astrabad suffer from the malaria that is caused by it.'

Astrabad is a frontier town, and chiefly inhabited by Kujurs, from which tribe the present shah of Persia has his origin: it is governed by a prince of the blood royal. The country on the northern bank of the Gourgan, ten miles from Astrabad, is inhabited by Turcomans, who are only in name tributary to the Persian government, and carry on against their more settled neighbours a constant petty predatory warfare, seizing Persian subjects whenever they can find opportunity, and selling them into slavery. (See Fraser's *Historical and Descriptive Account of Persia*; Lieutenant Conolly's *Overland Journey to the North of India.*)

ASTRÆA (zoology), a genus of fixed polypifers, sometimes incrusting marine bodies, sometimes collected in an hemispherical or globular mass which is sometimes, but rarely, lobated. The upper surface is covered with orbicular or subangular starry disks, which are lamellar and sessile. Each disk is the seat of a polype, with a single row of numerous arms, in the centre of which is the mouth. Lamarck divides these corals into two sections: the first, consisting of species whose starry disks are separated from each other, leaving interstices between them; and the second, of species whose starry disks are contiguous. Of the first section, *Astræa rotulosa*, an inhabitant of the West Indian seas, is an example: of the second, *Astræa favosa*, common in the seas of the East Indies, affords a good illustration. The species are numerous.



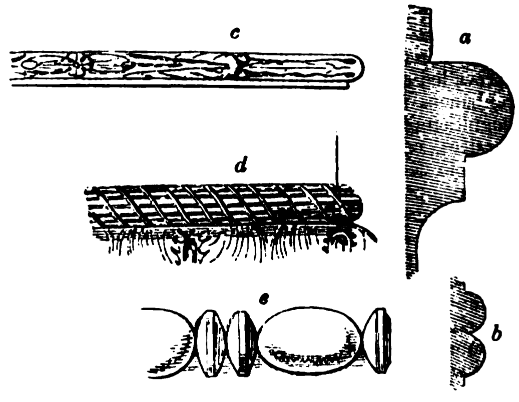
[Astræa rotulosa.]

[Astræa favosa.]

ASTRAGAL, a moulding used in architecture, and applied principally to the upper ends of the shafts of columns and to their bases. It is also used in the entablatures of the Roman Doric, the Ionic, Corinthian, and Composite orders. The term is derived from the Greek ἀστράγαλος, which signifies the bone on which the tibia rests, and sometimes a vertebra. The form of this moulding is semicircular, projecting from a vertical diameter. The surface is usually worked plain, although there are Roman examples of its being carved to represent leaves, as in the arch of the goldsmiths at Rome, or reeds bound together, as in the pedestal of Trajan's column. The astragal cut into beads is common to Greek and Roman architecture.

The apparent use of the astragal is, to bind the parts of columns and entablatures together, for which purpose it is employed both at the top of the shaft where the capital commences, and at the bottom where the base terminates. Many of the parts also of the entablature are bound together with the astragal moulding.

In Egyptian architecture, bands curved after the manner of astragals seem to bind the reeds of which the shaft of the column often appears to be formed. In the monument of Lysicrates at Athens, supposed to be one of the oldest examples of the Corinthian order, it has been conjectured that the hollow between the top of the shaft and the lower part of the capital of the column formerly received a metal ring of the form of an astragal, by which means, if the conjecture be well founded, the parts, from the contrast of colour, would appear to be more *distinctly bound together*. The most remarkable example of the use of the astragal in Grecian architecture is in the base employed in the Ionic temple of Minerva Polias at Priene; which has been imitated by Mr. Cockerell in the portico in the front of Hanover Chapel, Regent-street. In the temple of Jupiter Olympius, at Athens, the astragal at the top of the column appears to have a channel cut underneath it. (See Stuart, vol. iii.) This, however, is very unusual.



Sections of astragal mouldings, and elevations of astragal mouldings carved:—*a*, section of an astragal from the three columns of the temple of Jupiter [Stator], in the Campo Vaccino, at Rome; *b*, astragal used in the base of the Ionic order of the temple of Minerva Polias at Priene; *c*, enriched astragal used in the arch of the goldsmiths at Rome; *d*, enriched astragal of the pedestal of Trajan's column at Rome; *e*, astragal cut into beads.

For the application of the astragal in architecture, see Base, Capital, Entablature, and Fillet.

ASTRA'GALUS, an extensive genus of leguminous plants, the most remarkable species of which is the *Astragalus verus*, from which the substance called gum tragacanth is obtained. This is a small bush, with pinnated gray leaves, terminated by a spiny midrib, and half covering clusters of axillary pale yellow flowers: it is found in many parts of the Levant. Although the principal part of the tragacanth of commerce is said to be furnished by this species, it is certain that it is also procured from several others, such as *A. creticus*, which is the Poterion of Dioscorides, and *A. aristatus*, which still bears in the Peloponnesus the classical name of Tragakantha.

A few kinds of astragalus are cultivated in gardens; but they are for the most part mere botanical curiosities: the most complete account of them will be found in the second volume of De Candolle's *Prodromus*.

ASTRAKHAN, formerly called Astorokan, a khannate or kingdom in the western part of the Asiatic possessions of the Russian crown, extends northward from the banks of the Terek to the sources of the Ufa in the Yekaterinburg chain of the Ural range, and eastward from the mountains of the Volga to the south-western limits of Siberia. It lies therefore between 43° and 54° N. lat., and 44° and 60° E. long. It was one of the numerous sovereignties which Gengis-Khan and his successors incorporated with the gigantic empire of the Moguls, erected by them in the first half of the thirteenth century, but was wrested from it by Batu, his grandson, the great chief of the 'Golden Horde,' and united with the independent monarchy of Kapshak, which had the Jaik or Ural and Dnieper for its boundaries, and fell to pieces in the middle of the fifteenth century. For the next hundred years, the territory of Astrakhan, following the example of the Crimea, Kasan, and Nogay Tartary, maintained itself as a separate state under khans of its own; and the owners of a soil 'where none but swords and lances had grown, now prospered by the arts of peace.' But Astrakhan commands the western shores of the Caspian, and the mouths of the great Volga—two natural advantages of themselves sufficient to awaken the cupidity of a formidable and encroaching neighbour. In 1552 the khannate of Kasan had been added by Ivan, the great Tzar of Muscovy, to his extensive conquests; and two years afterwards, an insult to the envoy of Ivan the Second, his successor, from the khan of Astrakhan, afforded a pretext for the subjugation of the principality itself. A Russian army was sent against the town;

the khan and his subjects took to flight, and Ivan's forces entered it, as Napoleon's entered Moscow two hundred and sixty years afterwards, greeted by naked walls and tenantless buildings. Ivan repeopled the town, and prevailed upon five hundred nobles and ten thousand Astrakhanese to swear fealty to him; the oath containing a recognition of his subjects' title to the same privilege as the natives, of using the whole line of fishery down the Volga from Kasan to the Caspian sea. Ivan was indeed ever intent upon opening new sources of trade and affluence for his subjects, as well as of political dominion for his successors. The conquest of this country was considered of so splendid a nature by the grand duke himself, that, when signing public documents, he afterwards attached its date, in conjunction with that of the conquest of Kasan, to his autograph. The khannate was comprehended in the same government with the Caucasian territories, until the year 1801, at which time part of it (the province of Caucasia or Georgiewsk) was annexed to the government of the Caucasus, and the remainder divided into three distinct governments; those of Astrakhan, Saratoff, and Orenburg. The latter have a surface exceeding that of the French or Austrian dominions, whilst their population scarcely exceeds a fifteenth part of the population of either of those monarchies; for the three governments, though extending over a space of upwards of three hundred thousand square miles, according to Weydemeyer, Hassel, and others, do not contain more than 2,600,000 inhabitants. As each of the present subdivisions of this khannate will form the subject of a separate description, we have here said as much as is requisite by way of introduction to them.

Astrakhan, the least and southernmost of the three governments, extends in a northerly direction from the banks of the lower Kuma and Manysh to the frontiers of the government of Orenburg, and eastward from the borders of that of Saratoff to the line of the Ural, next to the steppes of the Kirghish-Cossacks; it is comprised between the 45th and 52d degrees of N. lat., and the 44th and 52d degrees of east longitude, and contains an area estimated at eighty-four thousand square miles, the south and south-eastern parts of which are bounded by the Caspian. The land is, with little exception, an enormous plain, lying below the level of the ocean and Black Sea. It is divided into two parts, or steppes, by the monarch of European rivers, the Volga (a name derived from the Sarmatian, signifying 'the Great'), which winds through Astrakhan from north-west to south-east, for at least two hundred miles; the high and precipitous character of its right bank in some parts contrasting singularly with the low land which spreads out upon its left. The soil is saturated in almost every direction with salt; the very atmosphere, the rain, and dew, are charged with it; and briny lakes are of frequent occurrence. This immense plain lies so low on the 'Kalmutzkaian,' or eastern side of the river, that the waters of the Caspian are driven over it for many miles, when the wind has blown for any length of time from the south-east; even vessels are at times borne by the overflow some miles inland, and stranded in the midst of the steppe, where the only alternative is to break them up. 'Here,' says Potocki, 'where the eye has no object to dwell upon but the azure sky, the steppe and lakes encrusted with salt, I was astonished to meet with a large ship lying on her beam-ends in the heart of the steppe, between Batkaly and Talagai. I learnt that, a year before, a south-easter, which had prevailed for several weeks, had inundated the country, and forced several vessels a distance of seventy versts (forty-six miles) from the shore. All but the ship in question had been taken to pieces and removed.' This traveller confirms what Pallas and Gmelin had observed before him on the optical deception which the Astrakhan steppes present: the range of sight is extended, and every object is increased in apparent magnitude. In his own case he mistook human beings for obelisks, and low heath-bushes for 'Karatshus' of ten feet height; the laden camel became, to appearance, a moving mountain. When on the Caspian, another optical deception accompanied the rising of the sun: the coast and vessels upon it seemed elevated high in the air. Even the horses in the steppe took fright at the whirlwind of trees which apparently drove across the waste; yet they were but bushes, which the blast had torn up by the roots and scattered over it. At Yenotayewsk, where the Volga winds between five islands, this portion of the steppe assumes a bluish or bluish-green tint, which it acquires from the abundance of an extremely aromatic species of wormwood. Neither wood nor forest are found throughout the whole province, nor a tree on any spot, except a few groups of oaks, poplars, birches, elms, and wild mulberry-trees, along the banks of some of the rivers. When, however, the snows dissolve, the dry and arid steppes put on, in many parts, a gay and verdant appearance; a carpet of flowers is spread over them, and they afford a rich and refreshing pasture for the cattle, whilst the low land, which is irrigated by the adjacent streams, produces excellent grass—a valuable resource for pasture in summer, and, when cut and dried, for winter stock. Though ill-adapted to the purposes of agriculture, the Astrakhan steppes abound, in the summer season, with choice herbs, asparagus, capers, horse-radish, leeks, and liquorice; the latter, which thrives luxuriantly along the banks of the Volga, attains a height of nearly four feet, and the root is equal in size to a stout man's arm; this root is carried down to Astrakhan, where the juice is expressed, and sold in considerable quantities. The salsola also is of exuberant growth, and affords a supply of excellent soda. Here and there hills of sand and gypsum occur, some few of them in extensive ranges, particularly the Tshipshatshi group, east of the Volga, which is a favourite resort for the native dealers; it may be observed too of the sand-hills, that the prevalence of easterly winds is constantly impelling them farther to the west. Rocks, either of lime-stone or sandstone, rarely occur; but the province is full of extensive moors, the soil of which consists of a deep spongy saline loam, which bears no vegetation whatever on its surface; its edges only are skirted with saline plants. A country which both Georgi and Pallas conceive to have formed part of the bed of the Caspian in past ages, cannot fail to be rich in one mineral production at least—the salt, which both the Caspian shore and the soil, lakes, and moors of Astrakhan afford in exhaustless quantities and of superior quality, is perhaps the most valuable commodity which this province possesses. The bottom of many of its lakes, such as the Etsen, Bagd, and especially the Sakrysky, which yields upwards of a million of pounds weight annually, is one mass of crystallized salt; the Tshipshatshi is a perfect mountain of salt, and the summit of Bogdo-oola (about 48° N. lat. 46° 40′ E. long.) is crowned by a hill composed entirely of this valuable mineral. The soil is rich likewise in saltpetre, and the works established five and twenty miles north of the capital have alone, and for many years past, produced a thousand tons and more in the twelve months. There are but few districts in Astrakhan which have any claim to be called fertile, and even these owe their fertility to artificial means. They are situated chiefly in the immediate neighbourhood of the Volga, Akhtuba, and Ural, and consist of plots of arable and garden ground, the produce of which is considerable, owing to a judicious system of irrigation. These are the only spots in the province where fruit, vegetables, grain, or vines,[*] are cultivated. Of all its vegetable productions, there is none more remarkable than the great water-lily, the *nymphæa nelumbo* of Linnæus, which, we are told, is not found in any other part of the Russian empire, except at a place about five miles from the city of Astrakhan. Erdmann, who visited the spot in 1811, reports, that its leaves are two feet in diameter, and float upon the surface of the water; the stalk which bears them rises perpendicularly between six and eight feet from the bed of the water, and forms so complete a carpet, that its surface is scarcely discernible: from between these leaves issue stout runners, which terminate in a splendid rose-coloured flower of delicious fragrance. The plant is held in deep veneration by the Hindoos and natives of Tibet, from a belief that their divinities re-appear after death in the shape of these richly-scented flowers. The nuts, or capsules, of the plant are also in great request among them; and the flowers are distilled at Astrakhan into a water, which has the taste of amber, and, used as a cosmetic, gives softness to the skin. The mulberry and tobacco plant have been cultivated of late years with partial success; some cotton is grown on the line of the Volga, and madder has been introduced on its banks. The annual produce of maize and other grain is 11,000 chetwerts (about 8000 quarters). The whole province, in short, whether the eye ranges over the Astrakhanian steppe south-west of the Volga, or the Kalmutzkaian east of it, would appear to approximate, in its general features, to the regions of the Nile: the rain scarcely ever descends upon it, its noble stream irrigates the soil with periodical inundations, and its people live under tents, herding with the camel and the zebra; 'yet no two climates under the sun,' observes Potocki, 'can offer a greater contrast; the physiognomy of the two countries is entirely dissimilar.'

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[*] Humboldt, indeed, reports (in his *Geology and Climatology of Asia*) that finer grapes do not exist, even in Italy or the Canaries, than at Astrakhan; but these, as well as other fruit and vegetables, however fine to the eye, are watery and insipid to the palate. The wine which is produced here is of equally indifferent quality; and we believe it to be well ascertained, that no juice of the grape which may be termed potable can be produced, unless the average temperature of the year is at least 47½° or 48°.

The climate of Astrakhan is a 'climate of extremes;' it is generally warm, and unhealthy for those not inured to it from their childhood, in consequence of the vapours constantly exhaling from the greater part of its surface. A dry and parching heat prevails in summer, when the thermometer frequently stands, even in the shade, at 100° of Fahrenheit; yet the nights are in general nipping, and the winds deposit the saline particles with which the air is charged in such profusion, that every object appears veiled in the morning with hoar-frost. Autumn is of short duration: the winter colds, when the north wind blows, sink the quicksilver to 30° below zero, and the principal arm of the Volga, with a breadth of 750 yards, becomes covered with ice capable of sustaining loaded sledges. The various streams throughout Astrakhan are commonly closed at the end of November, but the February thaws invest the face of nature with so instantaneous a spring, that, wherever the soil is not barren, it smiles with renovated verdure under the influence of a few days' sun.

The productiveness which nature seems to have denied to the land, she has lavished upon the coasts and rivers. The great element of the prosperity of Astrakhan is the waters of the Volga, which is scarcely equalled by any other stream in the world for abundance of fish. This noble river, whose course is diverted by the mountains of its own name, which are a branch of the extensive line of the Ural, from a northerly to a south-easterly direction, at a short distance before it enters the western frontier of this province, flows through it in constantly increasing breadth and with a more winding course; before its fall into the Caspian, about thirty miles below Astrakhan, it branches into eight principal arms and sixty-five subsidiary outlets, forming this quarter of the province into a delta of seventy islands. In the spring of the year its fishing grounds, particularly between the sea and the capital, are so abundantly stocked with the sturgeon, *sevruga*, *sasan* (carp ?), pike, seal, salmon, shad, and every other species which inhabit the Caspian, as to employ upwards of five thousand vessels, and twice that number of persons, who are brought by the fisheries from remote places. The isinglass and sturgeons' roe, or caviar, which add to the luxuries of our English tables, are chiefly the fruits of Tartar and Kalmuck industry. The whole produce of the Astrakhan fisheries along the Volga has been estimated as yielding a clear annual profit of 220,000*l.* to those concerned in them. The traffic on this river is another source of prosperity to the province; above five thousand *ladia*, *kayouki*, and *nosedi* (ships, barks, and rafts), freighted with their respective cargoes of salt, grain, and timber, descend this stream in the course of the year, but from the difficulties of the voyage up the river, most of them are broken up and sold at Astrakhan, the 'Alexandria,' as it has been denominated, 'of the Scythian Nile.'

An expanse of sand and swamps above 250 miles in breadth, extending north-east of the delta, separates the Volga from the Ural, which forms the eastern boundary of Astrakhan and the western limit of the Kirghish-Cossack steppe: the waters of the latter stream are moderately clear, abound in fish, and are navigable for barks up the whole of its tortuous course northwards from the Caspian, and beyond the point where it quits this province to enter that of Orenburg, a distance of at least 400 miles. Both banks of this river are lined by a dreary waste of rushes, and (west of it, in the Astrakhan districts) are inhabited by the Cossacks of the Ural, who resort to its banks at certain seasons of the year for the purpose of fishing. They sell their fish in the interior of Russia, frequently to the extent of two millions of roubles (90,000*l.*) per annum. The scene which occurs at the winter fishery is of a singular description, for the fish must be taken under the ice. Several thousands of Cossacks, duly licensed, hasten to the spot in their sledges, each provided with a pronged instrument, pikes, and other weapons; they station themselves on their arrival so as to form an extended line, from which none dare advance a single step under pain of having their instruments broken over their heads by the guards appointed to preserve order. The signal for the onslaught is made by the attaman of the fishery starting forward in his sledge: the whole line then breaks ground, and each rushes onwards to some spot in the frozen stream, where he effects an opening in the ice, and in a moment thousands of pikes are in motion. The dealers from the interior follow at the fisherman's elbow, and bargain for the fish before it is caught, a salvo, however, being made in behalf of the emperor, to whom the first fruits of the fishery belong. The chancery of the Uralian army derives a revenue of 4000*l.* a year from the several fisheries. But 'it frequently happens,' as a recent *Report on the Fisheries of the Caspian* observes, 'that during this (winter) fishing a violent wind blows off shore, and drives the ice, with both fish and fishermen on it, out to sea; the poor fellows are inevitably doomed to a watery grave, unless the wind should shift and blow them on shore again. We are assured by the most experienced fishermen, that their horses have a foreboding of this wind's coming on, suddenly show great uneasiness, and become almost unmanageable. Their masters, who are anything but indifferent to this signal, at once abandon their post, and hasten back to land; the sagacious animals appearing full as eager as themselves to gain it.' The other streams of note which water Astrakhan are the Akhtuba, a considerable arm of the Volga, which branches off from the left bank six miles above Tzaritzyn, runs for 280 miles close to and parallel with the main stream, and falls into the Caspian near Krasno-yarsk; and the Greater and Lesser Uzeen, which rise in the province of Saratoff, and, like many other inconsiderable rivers in this region, lose themselves in lakes on the steppes. The latter, among which we may name the Bogdo, Bashushatskoi, and Kamysh-Samara, are so many storehouses of salt, and are turned to good account by the Astrakhanese.

In the low lands on the banks of the Volga fossil elephant bones are occasionally found. Among other existing animals, there are in Astrakhan the wild ass, camel, and antelope-saiga [see ANTELOPE, p. 73], whose horns are semi-transparent; there are also the bustard, kite, falcon, pheasant, and snipe. The tarantula, scorpion, and locust, occur in Astrakhan; and Pallas speaks of having seen many porcupines with ears, one of which he observed in the act of devouring a living serpent by the tail, which could neither resist nor extricate itself. The natives are herdsmen and graziers as well as fishers; droves of horned cattle are kept wherever there is pasture, and are turned out half-starved from their wretched winter-quarters as soon as the snow has disappeared. Goats are also reared, not so much for the sake of their milk or flesh, as of their hides, with which the Russian prepares morocco-leather: there is a fine species of hair too, which either falls from the animal's back, or is combed from it, out of which a stuff of beautiful texture is occasionally woven. But the greatest resource possessed by the rural population and nomadic tribes of the province is their flocks. These consist principally of a native breed, the Kirghisian or Astrakhan species; it is of larger size than any other sheep in Asiatic Russia, somewhat resembles the deer in shape, has a wild appearance, and is distinguished by its immense bushy tail, which has been found in some instances to weigh as much as forty pounds. When full-grown, the wool of this breed is short and coarse; but the lamb yields a fine and beautiful fleece, which the dealers call a 'crimmel,' the bulk of them being imported from the Crimea. The richer class of proprietors in this and other western provinces of Asiatic Russia have begun of late years not only to introduce the Merino, Saxon, Silesian, and other finer-fleeced breeds among their flocks, but to cross and improve the native sheep with them. To the Kalmuck, Tartar, and Cossack, however, there is no animal in Astrakhan so valuable as the horse; the Kalmuck, in particular, uses the flesh and milk for the support of his household, the skin for his clothing, and the sinews for his ropes, tackle, &c. The Kalmuck species is diminutive, fiery yet tractable, and very hardy; even in winter they are wholly dependent upon what the snow-coated steppe may afford, and are consequently ill-conditioned in general, and wild; they herd close together both for society and defence, and each party is subordinate to one of the males as their leader. When attacked by wolves or other wild beasts, they collect into a body, and repel the attack of the enemy with their heels. The whole number of domesticated animals in the province has been estimated by a recent writer at 4,000,000 sheep, 1,000,000 horses, 500,000 camels, and 200,000 horned cattle.

The population of Astrakhan is composed of a motley group of Russians, Cossacks, Tartars, Kalmucks, Armenians, Indians, and other settlers from various parts of Europe and Asia, whom the highest estimate does not state as exceeding 225,000 individuals, and the lowest, which, as it is made on native authority, is probably nearest to the fact, sets down at 80,000. Nearly one-half of this population would appear to consist of Kalmucks, who occupy large tracts to the east of the Volga; the number of their kibitkes, or tents, being computed at 13,100. Another considerable portion of the population is composed of the Cossacks of the Ural, who are esteemed the finest, the wealthiest, and the bravest Cossack corps in the Russian service, whence they have acquired the appellation of 'the Eye of the Army,' and garrison the small forts along the line of their native river; some have estimated the number of their fighting-men at 20,000, but this would give an amount of population to this single race of Astrakhanese, which would far exceed any estimate yet formed of their numbers. Independently of these, there are a few colonies of Tartars of Kasan extraction, about 1600 yurtas or tents of Nomadic Kunduroff-Tartars, or Manguttes, descendants of the Nogay horde, who lead a wandering life in the regions of the Lower Akhtuba; and, as some writers report, 12,000 kibitkes of Bukay-Tartars, who settled in the districts between the Volga and the Lesser Uzeen about thirty years ago, and made an attempt to remove to the steppes east of the Ural in the year 1829, but were forced back by superior force.

To the principal branches of industry already enumerated we may add the manufacturing of magnesia, tallow, and soap, in considerable quantities, distilleries of brandy and spirits, some large leather, and a few silk and cotton, manufactories. Astrakhan soap is in much request among the Russians on account of its firm substance and fragrant scent. The Volga, which secures a ready access to the eastern shores of the Caspian Sea, has hitherto rendered the capital of this province the principal seat of the traffic carried on between Asia and the Russian dominions.

Astrakhan is politically divided into four circles: Astrakhan, Krasno-yarsk, Yenotayewsk, and Tsherno-yarsk; but there are no spots in it deserving of any distinct notice excepting the capital, from which the whole province derives its name, and Uralskoi, the chief town of the Cossacks of the Ural. Of the remainder, the short account which follows will convey a sufficient idea. At a distance of somewhat less than five miles above the city of Astrakhan, we find *Kalmüzkoi-Basar*, a place on the right bank of the Volga, in which all sale and barter between the townsmen and the wandering people of the steppes is carried on. In the market-place stands the Russian, with his brandy, bread, and coarse household stuff; the Armenian with his wine and inferior stuffs for clothing; the Tartar, in quest of sheep for the Astrakhan market; and the Circassian, hard at work in making ironware and leather articles. Here the Kalmuck also resorts with his supply of domestic manufactures, cattle, and felt. 'These sons of the steppe are seldom a match for their customers,' says Potocki. 'Here you may see Tartars from Kuma, Kuban, and the Five Mountains; Truchmens, Nogays, Kiptshaks, and Cossacks from the Jaik;' but, above all, it was this traveller's fortune to meet a Kirghisian embassy in the Bazar, 'who had but little of the air of diplomatists about them.'

About nineteen miles to the north-east of Astrakhan lies 'Krasnoi-yar,' the capital of the circle of that name; a small town of about 2000 inhabitants, with two churches, built on an island formed by the Algara, the Akhtuba, and Basan, three arms of the Volga, and surrounded by dilapidated walls with wooden towers, which were constructed by the Tzar Alexis Michailovitsh to protect the town against the incursions of the Cossacks and Kalmucks. The inhabitants live comfortably upon the produce of their fishery, and of their gardens, orchards, and vineyards, which are situated on each side of the hills, east of the town. It is celebrated for its asparagus, the eatable stem of which is above twenty inches in length.—'Yenotayewsk,' another capital of a circle, situated on the steep right bank of the Volga, is the seat of a tribunal, which has jurisdiction over the 4900 kibitkes of Kalmucks who pass the winter in its vicinity it is a circle of houses, built round a small fortress, and inhabited by Cossacks and traders.—'Tsherno-yar, also the capital of the circle in which it lies, and a well-fortified town, is likewise on the right bank of the Volga, about 150 miles north-west of Astrakhan. It consists of 300 houses, is built in the shape of a polygon, with five entire and two semi-bastions, has a stone church embellished with two towers, having gilt cupolas, is an opulent place, and contains between 1500 and 2000 inhabitants. The circle of Krasno-yarsk comprehends the tract of country which lies along the course of the Ural, and is inhabited by the Cossacks who take their name from that river. At its influx into the Caspian stands the small but strong fortress of 'Guri-Gorodok,' built upon an island, thirteen miles up the river and 500 south-west of Orenburg, under the government of which province it was placed in 1753. The inundations, which cover the whole face of the island in the spring, render it in the highest degree unhealthy; it is consequently inhabited by few individuals besides those composing a regiment of Cossacks and a company of infantry. A redoubt, called the Guriewskoi-Redout, lies about twelve miles farther up the river. Along the line of the Ural are numerous *Watagys*, or fishing villages, erected for the fishermen of the crown, containing dwellings, storehouses, workshops, rope and net yards, every convenience for boiling down oil and making caviar, and even cellars for ice, which is used for keeping the fish fresh. (Georgi, Pallas, Gamba, Potocki, Sommer, Stein, &c.)

ASTRAKHAN (city). The present capital of the government of this name is about six miles higher up the Volga, as some maintain, than the Astrakhan, or rather Adshotarkhan, which was the metropolis of the antient kingdom, and, according to Forster, was demolished, together with Sarai, its neighbour (the 'urbs magna, sedes regia Tartarorum' of Abulfeda), by Timour in the winter of 1395. Other writers however are of opinion that the antient capital stood between the banks of the Akhtuba and the Volga, forty-six miles higher than the present city, on a spot which was occupied by a manufactory of salt petre some years ago. Both of these conjectures rest on plausible grounds, for both sites contain the remains of extensive buildings; and each of these masses of ruins has contributed large portions of the stone with which the public edifices in the modern capital are constructed. Astrakhan, which is become the principal seat of Russian intercourse with Asia and the storehouse of fish for the whole empire, stands on the island of Zaietchy Bugor, or 'the Hare's Mound,' which lies between the small river Kutum and the Volga, about thirty miles from its mouth, and 820 miles south-east of Moscow. It has a navigable communication also with St. Petersburg, from which it is upwards of 1200 miles distant; yet its importance must always remain of a limited character. Astrakhan ranks however as the eighth town in the Russian dominions; its stationary population being about 40,000,* and its whole circumference rather more than three miles. The uneven ground on which it stands, its half-decayed battlements, and a multitude of steeples, minarets, and cupolas, give it a handsome appearance at a distance; and the effect is heightened by contrast with the flat marshy ground which surrounds it. The climate of such a site cannot rank among the healthiest; and it is liable, moreover, to very sudden changes of temperature: yet, as the average population throughout the year, including the thousands who resort to the spot in the fishing seasons, cannot be under 50,000, and the average deaths do not, according to Gamba, exceed 1400, the mortality, which amounts to 1 individual in about 36, is not much greater than that for all Russia, which amounts to 1 in 38; or even for France, where Bickes estimates it at 1 in 39. A long canal traverses Astrakhan from east to west, the direction of its greatest length. The town is irregularly built, and the houses present a singular medley of European and Asiatic taste; they are constructed principally of wood, and are in number between 4000 and 4200. Astrakhan is the seat of an Armenian as well as Greek archbishopric, under the former of whom there are four, and under the latter twenty-five, churches; besides these, the Roman Catholics, Lutherans, and Hindoos, have each their separate place of worship, and the Mohammedans have nineteen mescheds or mosques. There is a Scotch mission too in the town, which, Keppel tells us, is a branch of a colony at Karass in Circassia or Cabardia, whose affairs are managed by their own laws, except in criminal cases; they are at liberty to make converts of Mohammedans or heathens; pay no taxes but about five kopecks (one halfpenny) for each acre of arable land, and are authorized to purchase Russian or Georgian slaves, provided they emancipate them at the end of five years. Independently of an academy for marine cadets and a Greek seminary for ecclesiastics, there are a high-school, a district grammar-school, and four inferior schools in the town for the education of native-born subjects: two printing-houses (a Russian and an Armenian) are sufficient to supply its present wants. The chief architectural ornaments of Astrakhan are the 'Kreml' or citadel, which contains the cathedral and barracks; the 'new' or 'white' town, so called from its being embellished with the principal government buildings and the three factory halls, one for the use of the Russian, another for the Asiatic, and a third for the Hindoo dealers; the beautiful street inhabited by the Persian merchants, on each side of which runs an arcade, supported by handsome columns; and the cathedral, which was erected in 1696, and, like most ecclesiastical edifices in Russia, consists of a massive parallelogram with four small cupolas on the roof, and a large one in the centre, from which the building receives its light. The interior is splendidly though not very tastefully decorated: but it is prized among the followers of the Greek faith principally on account of its holy treasures—an effigy of the Virgin Mary, whose paraphernalia are said to have cost 800*l.*; six valuable mitres inlaid with pearls and precious stones of extraordinary size; a baptismal font of massive silver, ninety-eight pounds in weight; and some fifty or more splendid attires for the celebration of the mass, one of which has been four centuries in use. The Jesuits' and Greek-Armenian churches are also handsome structures; but the most singular building is a beautiful meschech of free-stone, lately erected by a wealthy private individual, which differs in every respect from the usual form of Mohammedan mosques, and resembles the Christian churches of the East in shape. The 'Kreml' is an antient Tartar fortress, surrounded by stone walls and battlements eighteen feet high. The remainder of the town comprises sixteen 'slobods' or suburbs, beyond which the progress of modern improvement has transformed moor and swamp into places of public resort and agreeable promenades. Warazi, a Greek of large property, has been the great reformer of Astrakhan in every thing concerning the improvements outside of the town; which are not only extensive, but judiciously planned and executed.

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* In 1827 Weydemeyer stated the number of inhabitants to be 37,000, which is double the number which the town contained at the close of the last century, when Georgi says the official return reported it to be only 18,023.

It has been calculated that, in the fishing season, the population of Astrakhan is increased by at least 30,000 souls; a motley concourse, collected from almost every quarter of Asia and Europe, of whom nearly one-third are Russians. The latter, with the exception of a few noblemen, and the military and civilians, are exclusively traders, and many of them in affluent circumstances. 'You cannot form an idea,' says Gamba, who visited Astrakhan in 1820, 'of the throng of splendid equipages which make their appearance on festive occasions, particularly at Easter. The dress of the women is of the most sumptuous description at these seasons: they are attired in a robe of gold or silver tissue; and the head, arms, neck, and waist, are covered with pearls and precious stones.' The Russian of Astrakhan has, however, adhered in general to his old customs and predilections; he remains no less an enemy than ever to a shaven chin and the fumes of tobacco, or any other innovation: he has continued stationary in taste, and in intellect too, if it be true, as Erdmann reports, that 'his only resource, when in society, is eating, drinking, and card-playing.' The Tartar inhabitants of the town are stated by Gamba at 10,000; they are of three distinct races, the Ghilan (of Western Persia), Bucharian, and Agriskhan (or 'mixed race,' being the issue of Hindoos settled in Astrakhan and Tartar women), each of whom occupy a separate division of the Tartar slobod. These settlers are highly commended by the same writer for their unswerving integrity. The Armenians are among the richest traders in the town: a considerable proportion of them have laid aside their robes, caftans, broad trowsers, small boots, and high fur caps, and adopted the European costume; but their wives and daughters still move about, covered from head to foot with an enormous white veil, which conceals the whole person except a small part of the face. The Georgians of Astrakhan are mostly mechanics, and the better class of them are very cleanly, and show much taste in their household arrangements. As temporary residents only we may include the dealers who visit Astrakhan from China and Bucharia; the Kalmuck, too, is accounted a stranger, although he has his wooden hut or felt tent permanently standing in the outskirts of the town. Fishing is his constant occupation. The Hindoo population, though on the increase, does not exceed three or four hundred: most of this race are natives of Multan and Lahore, and they bear the reputation of living but for the gratification of two master-passions—love of flowers and love of money. Their stores in the Indian bazaar have, each of them, a flower-bed in front; and they are never without a nosegay between their fingers, which goes the round of every customer's nose. Their business is to lend money on as usurious terms as possible, and their accumulations being seconded by the utmost simplicity and parsimony in their mode of living, they rise quickly into affluence. We need only allude to the European residents as a motley assemblage of traders, artizans, teachers, government officers, and artists from north, south, east, and west.

The establishments for weaving silks and cottons at Astrakhan are nearly one hundred in number; it manufactures also considerable quantities of leather, particularly a superior description of morocco and shagreen, as well as tallow and soap. The numerous gardens in the town and its environs produce, by means of irrigation, several fine species of fruit, especially grapes, of which above a dozen sorts are frequently seen in a single ground: these are dried, and form a considerable article of export to the interior of Russia. In all respects, this place has long held the same station with regard to the trade of the south, which St. Petersburg, Riga, and Archangel occupy with regard to that of the north, of Russia: but its commerce is greatly on the decline, for in 1824 it employed between four and five hundred vessels of all sizes, which landed merchandise in the town to the amount of 340,000*l.* (7,449,615 roubles), and took on board wares in return to the value of 310,000*l.* (6,955,535 ro.) whereas, in 1832, the importations did not exceed 20,700*l.* (452,317 ro.), nor the exportations 41,800*l.* (913,029 ro.) in value. In the latter of these years, however, the trade of Astrakhan was much crippled by the combined effects of the cholera and the disturbances which broke out in Daghestan. The business of buying and selling, more than one-half of which has been engrossed by the Armenians, is conducted in twenty-eight khans or bazaars, which contain 1500 stores built of stone, and 560 wooden stalls. Raw silk and silk goods, cotton and cotton-yarn, drugs, dye-stuffs, carpets, oil, rice, and other eastern productions, form the chief importations: the exportations are principally woollen cloth, linens, cochineal, velvet, iron, salt, fruits, fish, wine, liquorice, soda, hides, skins, and grain.

In speaking of the province itself, we mentioned the great fisheries carried on in the Caspian and along the Volga. The fisheries of the Volga centre principally at Astrakhan, or rather on the branches of the river some distance below it. Every wear has its group of huts, with a little church attached to it, in which from two to three score fishermen reside; they are divided into divers, catchers, salting-men, and makers of caviar and isinglass. Each little colony is provided with spacious ice-cellars, which contain compartments for storing away the fish when salted, with intervals between the compartments which are filled with ice. The spring fishery opens with the spawning season, when the ice breaks up, and the fish enter the river from the Caspian; they are preceded by innumerable shoals of small fry, some descriptions of which, particularly the obla, are caught and used as bait for the larger species which succeed them, such as the sevrouga, sturgeon, and bidonga. The fishing season, both on the Volga and Caspian, closes about the middle of May, when the fishermen return for a time to Astrakhan, and sell their stock. The fish move out of the Volga in the autumn; and this is a signal for the men to recommence their operations, which are prolonged to the depth of winter; the fish being frozen at this season when they are brought to land, are more easily preserved. Prince Kourakhin is the proprietor of the fisheries at the mouth of the river and within the territory of the town of Astrakhan, but he has gratuitously given the right of fishing to the citizens; and this is no inconsiderable donation, for there have been years in which he has ceded his entire right for 40,000*l*. Many of the Astrakhan dealers also send out parties in spring and autumn to take the seals along the shores of the Caspian islands, where they are flayed and salted, and forwarded to Astrakhan for the sake of their skins and the oil extracted from the carcass.

Besides the ruins of Adshotarkhan, to which we have already referred, vestiges of Tartar dominion in former ages lie scattered in various directions over the steppes which surround Astrakhan. The greater part of them are sepulchral mounds, here and there distinguished by uncouth figures, carved in stone: their features and attire obviously stamp them of Mongolian origin. There is probably no monument of this description more curious than the sepulchral mound near Prishibinskoi, a village on the Akhtuba. It is raised on a quadrangular substructure of earth, and consists of six flat vaults abutting one against another, the whole being about 900 feet in circuit and 18 feet in height. The mortar with which the walls are cemented has become as solid as the hardest stone, and resists the impression of the strongest instruments. It would seem, from the vessels and ornaments which have been found within it, that this structure was formerly a place of interment for some princely family. Astrakhan has a dockyard and arsenal, and is the port of rendezvous for the Russian ships of war which cruize in the Caspian. It is in 46° 21′ N. lat., and 47° 55′ E. long.

ASTRINGENTS (from *astringo*, to constringe, or bring closer together), are agents which contract the fibres of the muscles and blood-vessels, and lessen the flow of fluids, whether it be the secretions of the glands proceeding from their natural orifices in excessive quantity, or the contents of the blood-vessels escaping by their exhalant extremities, or by an unnatural opening (or rupture). They produce this effect, generally by a vital, but sometimes by a chemical action. Their power is manifested first, and often solely, on the part to which they are applied; yet in many instances it is extended by sympathy very rapidly over the whole body, as is observed when the acerb juice of the sloe is brought in contact with the tongue. The sensation then experienced may be considered the best general test of the presence of *astringency*, which cannot be ascribed to any one principle, but is owing to tannin, gallic acid, and hæmatine, in vegetable astringents, and is possessed by acids, and many metallic salts among mineral agents; and is also one of the effects of the application of cold to the body. In vegetables, the astringent principles are found chiefly in the bark (as oak), the root (as rhatany and tormentil), and the wood (as logwood). As wood and bark form parts of *exogenous* trees only, it is only from this section of the vegetable kingdom that any astringent principles can be obtained. [See explanation of the term exogenous, under the article AGE OF TREES, vol. i. p. 202.] Sir Humphry Davy found that the inner layer of the bark possessed the greatest quantity of the astringent principle: this is the natural consequence of the mode in which the sap descends from the leaves, viz., through this inner layer of bark, whence it occasionally passes into the wood, which will then be found to possess principles similar to those of the bark. Most astringent vegetables are red, owing to the presence of an acid in excess—which is often manifest to the taste, as in rumex, or sorrel. In metallic astringents, when super-salts, the excess of acid, is also very perceptible to the taste, as in alum, which is a supersulphate of alumina and potassa.

The particular principle to which any substance is indebted for its astringent power may be ascertained by appropriate tests. When *tannin* exists in plants, its presence may be proved by an insoluble precipitate taking place on the addition of a concentrated solution of gelatin. The precipitate is a compound in definite proportions of tannin and gelatin, being forty-six of tannin and fifty-four of gelatin. Gelatin has therefore been proposed by Sir Humphry Davy as a test of the quantity of tannin in different astringent vegetables. (See *Philosophical Transactions*, 1803.) But in the practical application of this test there are some sources of fallacy difficult to guard against. (See Papers by Dr. Bostock in Nicholson's *Journal*, vol. xxiv. 1809, and by Mr. E. B. Stephens, in *Annals of Philosophy*, New Series, vol. x. p. 401.) Tannin rarely exists alone, though it probably does so in catechu, but mostly along with gallic acid. Extractive is also a frequent accompaniment of tannin, and is of considerable service, assisting its action in the process of tanning. Gallic acid strikes a bluish-black precipitate with all the salts of iron, but a solution of the persulphate is the ordinary test. Hæmatine exists in logwood, along with tannin and extractive. It may be known by combining with oxide of lead without undergoing any change.

The effect of astringents which is due to their chemical action is nearly the same in dead as in living animal matter; their long-continued application to the skin will produce a condition similar to that of a tanned hide. They are, therefore, sometimes employed to effect this, when internal parts are exposed, to change them from a secreting to a non-secreting surface—such as in irreducible prolapsed uterus. Their use in this way, however, is very limited; while their vital action is extensive and important. The chief effects of astringents are to contract the muscular and vascular tissues, to diminish secretion, and lessen irritability; and in many instances to impart strength, or increased tone, to an organ or part. Their action is always greatest on the part to which they are applied. When a drop of diluted acetic or sulphuric acid is applied to the skin, whiteness of the part is observed, which soon disappears, and the natural colour, or even a more intensely red one, follows. If this is frequently repeated, the structure of the part is changed, it ceases to secrete, is no longer pliant, but becomes stiff and inflexible. The loss of colour is owing to the diminished calibre of the blood-vessels, which no longer admit the red globules. During the absence of these, the sensibility of the part is less than natural; just as cold and torpid fingers lose their fineness of touch. Nearly similar effects may be supposed to follow the internal administration of astringents, the action of which is greatest on the intestinal canal, and less on parts remote from this: yet it deserves to be remarked, that as the intestinal canal is a mucous membrane, and possesses a muscular structure, parts of a similar structure are more influenced by astringents introduced into the stomach than other parts are; hence, increased secretion from the mucous membrane of the lungs, or from the lining membrane of the bladder, or flow of blood from arteries, is more effectually checked by astringents, than increased exhalation from serous surfaces. There is reason to believe that the astringent principle of many plants does not enter into the circulation, but passes along the whole course of the intestinal canal without being absorbed: for Sir Humphry Davy found, that when tannin is present in grasses, as it is in that of *aftermath crops*, it is voided in the dung of the animals which feed upon it. (See Davy, *Elements of Agricultural Chemistry, Appendix*, p. lxi.) But that of other plants enters the system so rapidly, that the astringency of the *uva ursi*, or bear's whortleberry, can be detected in the urine forty-five minutes after it has been swallowed. In the case of those which do not enter into the circulation, any beneficial effect which they exert upon remote organs must be attributed to that sympathy which exists in so great and unquestionable a degree between the stomach and almost every organ of the body. That such vegetable substances, while passing along the intestinal canal, promote the fulfilment of its functions, is obvious, from the effects following the use of food in which astringent principles are absent. Plants possessing astringent powers and bitter principles, such as tormentil and the bog-bean, are very efficacious in preventing the rot in sheep, (as has been already stated under Anthelmintics,) while watery grasses, among which no astringent plants grow, favour the generation of worms.

The primary sympathetic effect of several of the astringents which ultimately enter into the circulation, is the most valuable in some of the cases in which they are employed, such as dilute sulphuric acid, which often checks hæmorrhage by closing a bleeding vessel, before any of it can be conceived to have been conveyed directly to the bleeding orifice; it checks the flow of blood in the same way as cold suddenly applied to the surface or skin does. The tonic effect of many astringents, after their use for some time, first on the digestive organs, and afterwards upon the whole system, and more especially upon any weak organ, must be admitted, and borne in mind, in forming our estimate of their utility in a curative point of view. Without attempting to account for the ultimate cause of the action of astringents, to do which successfully seems impracticable in the present imperfect state of our knowledge, it may be stated, that under their influence a tension of the parts is produced, during which the muscular and vascular structures acquire an increase of power, and secreting surfaces and glands produce less fluid but more natural secretions. Some, indeed, lessen the action of the heart, and so stop the flow of blood from dilated or ruptured vessels, such as the preparations of lead, which though in some degree astringent, ought to be considered as *sedatives;* while others which combine with and neutralize the unhealthy or excessive secretions, as lime and its carbonate with the secreted fluids of the intestinal canal, are more properly termed *absorbents* than astringents. When astringents are applied directly to the bleeding vessels, such as to external wounds, or to the nostrils or gums, they are termed *styptics*, and in such cases they often act chemically as well as vitally.

Before proceeding to consider the cases in which astringents may be advantageously used, an enumeration of the most common and valuable substances may be given. Of vegetable astringents the chief are *barks*, as of oak and willow, the best kind of the former of which is obtained from the *quercus robur* of Linnæus (the true British oak), which is synonymous with the *quercus pedunculata* of Willdenow, while the inferior sort is obtained from the *quercus sessiflora* of Salisb., which is synonymous with the *quercus robur* of Willdenow. The best willow-bark is procured from the *salix pentandra*, or sweet bay-leaved willow, though very excellent bark is yielded by the *salix Russeliana*, or Bedford willow.

Roots, as of tormentil, from *potentilla tormentilla;* bistort (*polygonum bistorta*); common avens, from *geum urbanum*, which are British plants; and rhatany, *Krameria triandra*; rhubarb (*rheum palmatum*); pomegranate (*punica granatum*), which are exotic plants; leaves of arctostaphylos (*uva ursi*), petals of the *rosa gallica*, fruits of *prunus spinosa*, or aloe-thorn (*punica granatum*), and secreted juices of many plants, as kino, from *pterocarpus Senegalensis*, and several others; and catechu, from *acacia catechu*, and galls, from *quercus infectoria;* in all of which the astringent principle is tannin, with more or less of gallic acid; and lastly log-wood, (*hæmatoxylon Campechianum*), in which hæmatine as well as tannin possesses an astringent property. Acetic acid must also be classed among the vegetable astringents.

The mineral astringents are, diluted sulphuric acid, and salts of iron, zinc, copper, silver, and the salts of lead. Cold, in whatever way applied, is also a valuable astringent. In treating of the employment of astringents as curative agents, it is necessary to distinguish between their action as local, direct, and often chemical, and their action as general, influencing remote organs, their effects upon which are vital rather than chemical: also between their mere astringent power and their tonic power. The beneficial effects of many of the above-named astringents in checking increased secretion, is doubtless often due to their tonic power; for as in a weak state of the system, or of any particular gland, the secretions are generally profuse in quantity, a return to the healthy proportion and quality can only be insured by increasing the power or tone of the body or gland, which astringents do by bringing the living tissues into a closer or more compact state, and which tonics do by heightening the vitality of the debilitated structures. Hence astringents are beneficially employed in diseases where a laxity of the muscular and vascular tissues exists, accompanied with imperfect discharge of the functions of the secreting organs. The stomach and intestinal canal being the channel by which is conveyed the material necessary for the nourishment and vigour of the system, and for maintaining a capacity to discharge their functions in the other organs of the body, an impaired state of the structure and functions of this canal extends to every other part. The re-establishment of its healthy condition is a primary object in endeavouring to cure many diseases. Of these, intermittent and remittent fevers may be taken as an example, since in these there is always great debility of the digestive organs and of all the parts which have the most intimate sympathy with them, such as the skin. Astringents possessed of a tonic power have therefore mostly been resorted to in order to remove this debility; cinchona-bark, willow-bark, and many others, have been used with this intention. These, however, are to be avoided whenever any acute inflammation exists, which must first be subdued by appropriate means before tonic astringents can be safely or advantageously used. In diseased states of the intestinal canal, in which greatly increased or unhealthy secretions take place, as diarrhœa, dysentery, and cholera, the most careful inquiry should be made into the cause of the disease, that if it has its origin in an inflammatory condition of the mucous membrane of the intestine, or is owing to the presence of any acrid substance, the former may be overcome by antiphlogistic measures, and the latter be removed by purgatives. When the increased flow from the intestines is connected with increased determination towards these parts, owing to the application of cold to the outer surface suppressing the secretion of the skin, which has the greatest sympathy with the internal surface, and which consequently is excited to double action, a preternatural quantity of secreted fluid is produced. The most effectual, as well as only safe, means of diminishing this, in the early stages of its occurrence, is the employment of diaphoretics, or such medicines as restore the action of the skin; after which, should the discharge continue, mild astringents may be used, of which logwood or tormentil is the best. A preliminary treatment is likewise required in dysentery: in the common cholera a purgative should generally be given before any astringent is administered.

In the bilious cholera of autumn, after the employment of suitable purgatives, nothing seems to act more effectually as an astringent than the infusion of cusparia, or angustura bark, with dilute nitric acid; to which, in some cases, a small portion of laudanum may be added at first, but afterwards omitted. Nor in the epidemic cholera, as far as a very limited experience enables us to judge, has more marked benefit followed the use of any means than has resulted from the employment of this combination, which speedily checks the liquid discharges, and restores the circulation and animal heat.

Diarrhœa, or looseness of bowels, proceeding from acid secretions, is best removed by the astringents which combine chemically with these—such as lime, or its carbonate, which are rendered more suitable by uniting them with aromatics, an excellent form of which is supplied by the *potio carbonatis calcis* of the Edinburgh pharmacopœia. Sometimes, in order to increase the astringent power, as it is supposed, carbonate of lime is prescribed along with the vegetable astringents; but nothing is more erroneous than this proceeding, by which a decomposition is occasioned, which destroys the virtues of both the ingredients. Nor is the combination of opium with chalk less objectionable.

The next most important class of diseases in which astringents may be employed are termed hæmorrhages, or a discharge of blood, either from the exhalant extremities of the arteries, when they are gorged or when they are too much relaxed, or from the wounded or ruptured coats of any blood-vessel. The above distinction refers to the differences between active and passive hæmorrhage, or that which takes place when the system is too full of blood and the vessels propel it with great force; the other, which takes place when the power of the vessel is greatly below the natural standard. In the former, astringents cannot safely be employed at the commencement of the flow of blood, but time should be allowed for the vessels to unload themselves; or a vein should be opened, cooling saline medicines administered, cold air admitted freely to the surface of the body, and, under competent medical attendance, opium or laudanum may be given; after which, astringents will either not be required, or if so, may be safely used.

In passive hæmorrhage they may be employed from the commencement; and perhaps, in most cases, a saturated solution of alum in the infusion of roses is to be preferred, though the tincture of the muriate of iron is very eligible when the kidney is the source of the bloody discharge, as acetate of lead is when the lungs are the organs whence the blood flows. So long as lead is kept in the state of an acetate, its administration is perfectly safe: it should therefore always be accompanied with dilute acetic acid.

Bleeding from the nostrils or gums may be checked by the direct application of styptics; such as preparations of zinc or copper. Nitrate of silver will frequently stop the flow of blood from a leech bite. Cold should, in most cases, be employed along with the other means; even alone it is often successful, especially in the form of water poured from a height in uterine hæmorrhage. Ruspini's styptic, which is said to be a solution of gallic acid in alcohol, is sometimes useful, where other means have failed.

The application of astringents to more limited examples of loss of tone or increased flow of secreted fluids, need not be extensively noticed here. After acute inflammation of the eye, proper antiphlogistic means having been used, astringent applications are very serviceable, especially those of zinc and nitrate of silver, either in solution or made into an ointment. Scrofulous inflammation of the eye is often benefited by them, if internal means be also used.

tion, or excessive flow of saliva, occurring either spontaneously or from the use of mercury or other means, is often effectually checked by nitrate of silver, or decoction of the rhus glabrum, or by iodine. Nitrate of silver, by lessening the inflammation which gives rise to them, also frequently removes morbid discharges from other mucous surfaces besides those we have specially noticed; an effect which also often follows the use of diluted chloride of soda. The colliquative sweats of hectic fever are best checked by giving internally dilute sulphuric acid, and sponging the skin with vinegar and water.

Astringent substances are decomposed by, or decompose, many others, which therefore should not be given at the same time with them; such, for example, as ipecacuanha with most of the vegetable astringents which contain tannin, by which an insoluble tannate of emetina is formed: when kino is united with calumba, a purgative action follows. All astringent vegetables containing tannin, except oak-bark, decompose tartrite of antimony, and are therefore the best antidotes to it.

The antient Egyptians would appear to have been acquainted with the power of astringents in preserving vegetable as well as animal substances, and they seem to have dipped the coarse cloths in which the mummies were enveloped in some astringent liquid, which tanned the skin, and rendered it less subject to change, as well as excluded the air from the interior of the body. The article employed by them with this view is supposed to have been some sort of kino. The same substance is used by the Chinese to dye cotton for their nankeens.

This property of astringents may be usefully applied for the preservation of all kinds of cordage, fishing-lines, and nets, which last much longer if steeped in an infusion of oak-bark. Though inferior in preserving power to the plan of Mr. Kyan, it may be applicable in some cases where his is inadmissible. [See ANTISEPTICS.]

For further information on astringents, see Dr. A. T. Thomson's *Elements of Materia Medica and Therapeutics*, vol. ii., in which much recent valuable matter is brought together.

[For the employment of astringents in the arts, see DYEING AND TANNING; and also *Library of Entertaining Knowledge*—Vegetable Substances; Materials of Manufactures, p. 178.]

ASTROCA'RYUM, a genus of palms found in small groups, or in single specimens, in the tropical parts of America, of middling stature, and of a very singular appearance on account of the spines with which they are armed. Their stems are covered all over, except at the places where the leaves are set on, with stiff and very numerous prickles. The leaves are pinnated. The fruit resembles cocoa-nuts.

[Astrocaryum murimuri.]

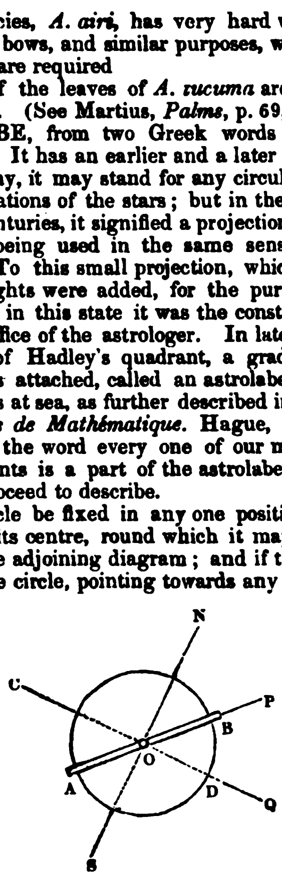
These plants are found exclusively in South America, where several species were collected by Dr. Von Martius, the great illustrator of the palm tribe. Among the more remarkable are, *Astrocaryum murimuri*, a common inhabitant of swampy places in the neighbourhood of Para, where it is called *murumurú*; the flesh of the fruit resembles the melon in flavour and the musk in odour, and is considered a great delicacy by the Americans. We give a figure of it, but so much reduced, that the armature of the stem cannot be shown. Its leaves are found to be an excellent thatch.

Another species, *A. airi*, has very hard wood, which is much used for bows, and similar purposes, where hardness and toughness are required.

The fibres of the leaves of *A. tucuma* are much valued for fishing-nets. (See Martius, *Palms*, p. 69, &c.)

ASTROLABE, from two Greek words signifying *to take the stars*. It has an earlier and a later meaning. As used by Ptolemy, it may stand for any circular instrument used for observations of the stars; but in the sixteenth and seventeenth centuries, it signified a projection of the sphere upon a plane, being used in the same sense as the word *Planisphere*. To this small projection, which had a graduated rim, sights were added, for the purpose of taking altitudes; and in this state it was the constant companion and badge of office of the astrologer. In later times, before the invention of Hadley's quadrant, a graduated circular rim with sights attached, called an astrolabe, was used for taking altitudes at sea, as further described in *Bion, Traité des Instrumens de Mathématique*. Hague, 1723. In the older sense of the word every one of our modern astronomical instruments is a part of the astrolabe, the principle of which we proceed to describe.

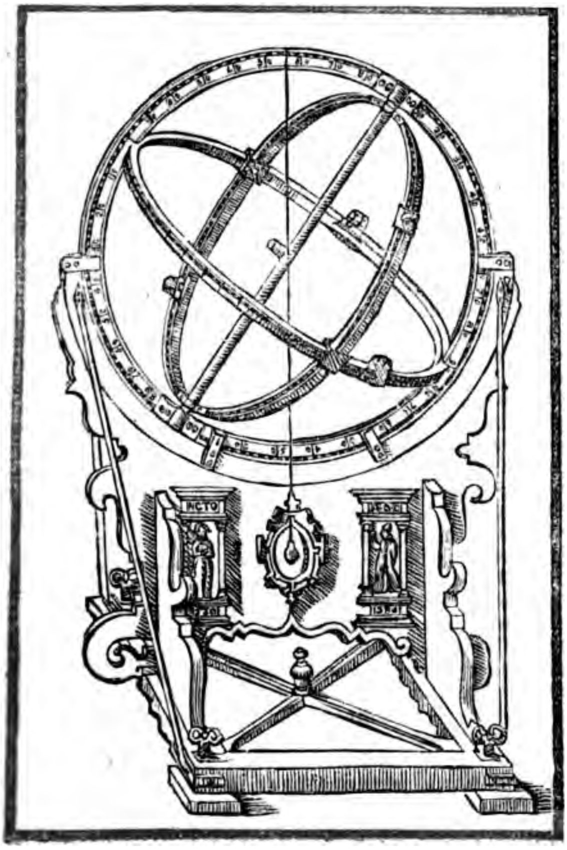
If a solid circle be fixed in any one position, and a tube be fixed upon its centre, round which it may be allowed to move, as in the adjoining diagram; and if the line C D be drawn upon the circle, pointing towards any object Q in the heavens which lies in the plane of the circle, it is obvious that, by turning the tube A B towards any other object P in the plane of the circle, the angle B O D will be the angle subtended by the two objects P and Q at the eye, or their angular distance upon a common globe. This angle may be measured, if the circumference of the circle be graduated. Thus, suppose the plane of the circle to pass through the poles N and S, and C D to point towards the equator; then when the tube points towards the star, N O B its north polar distance, or B O D its declination, may be measured. Or if the circle be fixed in the plane of the equator, and C D be made to point towards the vernal equinox at the same moment at which the tube points towards the star, then the angle D O B will be the right ascension of the star.



A collection of circles, such as the *Armillary Sphere*, might therefore, by furnishing each circle with tubes, be made a complete astrolabe. The practical difficulty consists in keeping so many circles exactly in their proper relative positions. The distinction between the astrolabe of the antients and the circular instruments of the moderns, is as follows · First, the antients endeavoured to form an astrolabe of two circles, so as to measure both latitude and longitude, or both right ascension and declination, by the same instrument; while the moderns, in most cases, measure only one of the two. Secondly, the antient instruments were made to revolve, to find the star, or were furnished with at least one revolving circle, moving round the pole of the equator or ecliptic, according as declination or latitude was to be measured. The moderns for the most part fix their instruments in the meridian and wait for the star. But the *equatorial*, the altitude and azimuth *circle*, and the *theodolite*, are strictly astrolabes, according to the antient meaning of the term.

Hipparchus is the first we know of who can be reasonably supposed to have made use of an astrolabe. But, at the same time, there are reasons for supposing that Eratosthenes, a century before Hipparchus, made use of a circle fixed in the meridian, for measuring the obliquity of the ecliptic. He is also said to have erected armillary circles at Alexandria. Ptolemy does not mention Hipparchus expressly: but he was in all respects his follower, and therefore probably, in describing his own instrument, he is only repeating that of his great predecessor. And Nicholas Cabasillas (an ecclesiastic of the fourteenth century, cited by Delambre) attributes to Hipparchus an instrument consisting of an equator, a meridian, and two tropics. It is impossible, from what we know of Hipparchus, that he could have done without something of the sort. At the same time, between Hipparchus and Ptolemy we have no observations to settle this point.

The description of Ptolemy (*Syntaxis*, book v. ch. i.) is as follows:—Fix two perfectly equal circles at right angles to each other, and let one represent the ecliptic, and the other the solstitial colure. In the poles of the ecliptic place cylinders, projecting within and without beyond the rims of the solstitial colure, and fix on these cylinders as pivots outer and inner circles, which shall revolve freely without and within the first mentioned circles. These are evidently circles of longitude. Within the innermost, and in its plane, place a lighter circle, sliding by friction, and having two sights diametrically opposite, by which the latitude of any celestial phenomenon may be observed when the instrument is adjusted, *i. e.* when the circle representing the ecliptic is in the plane of the true ecliptic. To effect this, cylindrical pivots are inserted in the solstitial colure in the points corresponding to the poles of the equator, and the whole of the apparatus is suspended within a circle which is placed in the meridian of the place of observation. The ecliptic being divided from its interior to its exterior rim, the outer of the circles of longitude is set to the division corresponding to the longitude of the sun, as given in the solar tables, and the whole is then turned round the poles of the equator until the plane of the ecliptic and the plane of the outer circle of longitude pass through the sun. The instrument is then adjusted, the inner circle of longitude and its sliding limb with sights is turned to the moon, and the angle read off upon this circle is the latitude of the moon, while the angle read off on the interior edge of the ecliptic is the longitude.



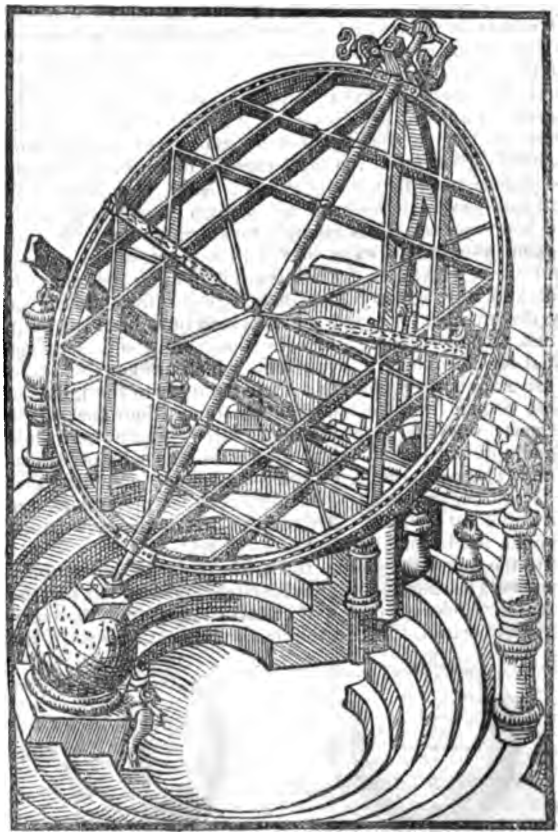
When stars are observed, it is sufficient to make the plane of the outer circle of longitude pass through the moon or any known star after setting that circle to the known longitude of the moon or star. The observation then takes place as before.

No material improvement upon this construction appears to have been made by the Arabs, who in some instances used very large instruments of the kind. A more skilful variety of the astrolabe is here shown, described by Tycho Brahé, from whose *Astronomiæ Instauratæ Mechanica* the preceding cut is taken.

The outermost circle represents the meridian; the axis passes through the poles, and there is a revolving equator and hour-circle fixed together. The sights on the circles are moveable; but instead of using opposite sights, the small cylinder which projects from the axis is employed. For example, to measure the declination of a star, the hour-circle is moved till it passes through the star, and a sight is then placed so that the star may be seen through it on the edge of the cylindrical pin which projects from the centre of the axis, both on looking above and below the cylinder, the orifice of the sight being made just large enough to admit of this. The angular distance of the sight from the equatorial circle is then the declination of the star. To measure the difference of right ascension of two stars, two observers take two sights on the equator, which they adjust till each sees his star just on the axis, both on one side of it and the other. The angular distance of the sights is then the difference of right ascension of the stars.

The plumb line shows whether the meridian is exactly vertical, and the screws at the feet are employed to raise or lower either end when necessary.

We give one more step between the antient and modern instruments, from the same work of Tycho Brahé.



The hour-circle is now disengaged from the equator and independent of it. The polar axis is directly supported, and not made to depend upon the position of the meridian. This is perhaps sufficiently near to the modern equatorial to be considered as the first instrument of the kind.

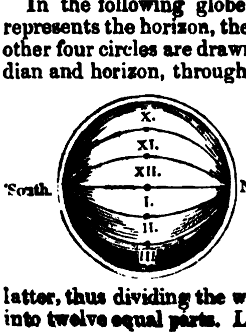
ASTRO'LOGY. If this word were used in a sense analogous with that of *geology* or *theology*, it would mean simply the *science of the stars;* while *astronomy* might mean the science of their order and arrangement. But the term, at least when coupled with the epithet *judicial*, has always signified the discovery of future events by means of the position of the heavenly bodies. The two words astrology (*ἀστρολογία*) and astronomy (*ἀστρονομία*) seem to have been used in the same sense by the Greeks, at least till about the Christian æra. Cicero (*Offic.* i. 6.) uses the word *astrologia* to express astronomical knowledge.

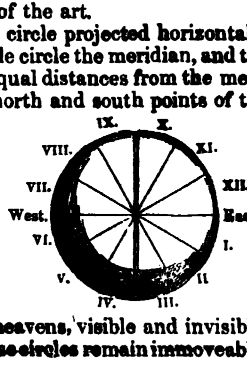
It has long been unusual to produce any arguments against this pretended science; but there are two considerations which make us think it may be useful to show those who are unacquainted with it a few of its details. The first is, that works, seriously professing to inculcate and defend the principles of astrology, have been published within the last twenty years in this country, and are still sold, almost exclusively, by some booksellers: the second, that several of our most popular almanacs do actually give astrological predictions at the present time. This may be a mere matter of amusement with the more enlightened; but we are afraid there are some who play with edge-tools in reading the fooleries of the works alluded to. The love of the marvellous is not under proper regulation, even in the minds of many who do not go the length of supposing astrology credible; and we shall therefore perhaps do good service in showing what the system really is, and what consequences its adoption must lead to.

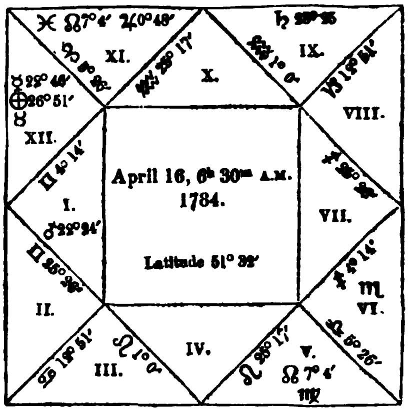
It must moreover be remembered that our old English writers, particularly the dramatists, cannot be well understood without some information upon the leading terms and principles of this art; which therefore may be as lawfully studied as the history of Jupiter and the Metamorphoses of Ovid.

The science which, under the name of astrology, or some term of equivalent meaning, found universal belief among all the nations of antiquity except the Greeks, and also prevailed through the whole world of the middle ages, is based upon the supposition that the heavenly bodies are the instruments by which the Creator regulates the course of events in this world, giving them different powers according to their different positions. This is the description of the more learned astrologers; for we need hardly say, that the ignorant have made the stars themselves the agents, just as the image of the Deity has generally come in time to be regarded by the vulgar as the Deity himself. Looking at the more credible description, it might be philosophical for a newly created being, in possession of rational powers, to suspend his opinion on such a point till he had observed facts enough to affirm or deny the connexion asserted to exist between the places of the planets and his own fortunes. That there is nothing repugnant to human nature in the basis of astrology is sufficiently proved by the number of great minds which have been led by it, when properly prepared by education; and the present age must recollect that the arguments which are now held conclusive against astrology get their strength in the minds of most people from no other circumstance than that which formerly was the prop of considerations which were held equally decisive in favour of it, namely, the bias of education. The real arguments against astrology are, first, that it is self-contradictory; secondly, that its predictions are not borne out by facts. To see the first of these, we must describe the leading principles of the art.

In the following globes, the circle projected horizontally represents the horizon, the double circle the meridian, and the other four circles are drawn at equal distances from the meridian and horizon, through the north and south points of the latter, thus dividing the whole heavens, visible and invisible, into twelve equal parts. Let these circles remain immoveable, while the diurnal revolution of the globe takes place under them. The twelve divisions are called the twelve *houses of* heaven, and are numbered in the order in which they would rise, if the circles accompanied the diurnal revolution. Every heavenly body passes through the twelve houses in twenty-four hours, but is not always in the same house with the same stars, except at the equator. For it is evident that, in order to have two bodies always in the same house, the revolution must take place round the north and south poles of the heavens, which poles are in the horizon only to a spectator on the equator itself. The principal point attended to in each house is the part of the zodiac which occupies it; and the place of any planet in the house is the distance of the body from the cusp, or boundary circle, measured on the zodiac. The following fanciful method of representing the twelve houses was in universal use, and the readers of almanacs must be familiar with it.







The twelve triangles represent the twelve houses of heaven, as marked by the Roman numerals. The time is April 16, 1784, at half past six in the morning. On the boundary of each house is written the part of the ecliptic which is to be found on it. For instance, on the cusp of the twelfth house that is just rising is the point of the ecliptic which is in 4° 14′ of Gemini. The boundary between the ninth and tenth houses is in 1° of Aquarius. The whole sign of Scorpio is in the sixth house, the boundaries of which are therefore in Libra and Sagittarius. The planets are placed in their proper positions in the houses; thus Mercury (☿) appears to be in the twelfth house, at 22° 48 from the boundary of the eleventh and twelfth.

But, on all the preceding points, it must be observed that great authorities differ very much. From among the obscurity and confusion which prevail in old treatises, we are able to collect this much, that some of them draw the boundary lines of the houses in such a way as to cut the ecliptic into twelve equal parts, instead of the prime vertical, as we have done; others draw the boundaries through the poles, instead of the north and south points of the horizon. The future destinies of mankind are rendered very uncertain by such diversity of opinion; but this we have found, that the followers of each system complain just as much of the rest, as if they had some reason to show for their own. For instance, Peletarius, or Pelletier, who introduced algebra into France, and wrote on the horoscope in 1563, expresses himself thus: 'Some cut the horizon into equal parts, some a vertical circle, some the equator, some the ecliptic, some a parallel: whence it is not wonderful that a difficult art should be involved in fresh obscurity; for who can possibly see a living likeness in a mirror which is put out of shape in so many ways?' His own system is the equal division of the zodiac; and his argument for it, independently of old authorities, is the incongruity of letting the poles of the ecliptic have nothing to do with a matter which so nearly concerns the zodiac. *Minimeque convenit, zodiaco suos polos esse inutiles in eo negotio quod zodiaco maxime proprium est.* The placing of the signs in the equator he treats as a dream, and seems perfectly satisfied with the preceding reason.

The houses have different powers. The strongest of all is the first, which contains the part of the heaven about to rise: this is called the *ascendant;* and the point of the ecliptic which is just rising is called the *horoscope.* The next house in power is the tenth, which is coming on the meridian, &c. The first is the house of life, the second, of riches; the third, of brethren; the fourth, of parents; the fifth, of children; the sixth, of health; the seventh, of marriage; the eighth, of death; the ninth, of religion; the tenth, of dignities; the eleventh, of friends; the twelfth, of enemies. Each house has one of the heavenly bodies as its lord, who is stronger in his own house than in any other, as is but fit; and of two planets equally strong in other respects, he who is in the strongest house is the stronger. Now conceive all plants, animals, minerals, countries, &c., parcelled out under the different planets, which exercise their influence in abundance of different ways, according to the houses they may happen to be in for the time, and their positions relatively to each other—the result will be as good an idea of the mysteries of astrology as it is worth any body's while to obtain.

We shall now give some examples of the application of the science; and this we do principally, because in the mystical announcements which issue from our press, the darkness of the hints which are given throw a poetical gloom over the subject. This no doubt is interesting, and is not sporting too much with the credulity of the age, or with the chance of detection; but it is a foul libel on the powers of astrology. Thus, in 1815, instead of announcing some such prediction as the following—'Mars in the house of death portends, we are afraid, some new disasters, by war or other cause; a personage will strive against the new order of things, but, if we mistake not, the conjunction of Luna and Saturn in the twelfth house bodes him no good'—instead, we say, of such an unsatisfactory prophecy, a real believer in astrology—such as it was before it fell from its high estate—might have traced Napoleon from Elba to Waterloo; have calculated the very moment of the advance of the Prussians, and described the sword-knot of the captain of the Bellerophon. Thus we have the story of a Jew, in the time of the caliph Al Mansur, who was able to detect, by means of the heavenly bodies, that certain words just written upon a paper, which he was not allowed to see, were the names of a plant and an animal. But lest any one should imagine that perhaps the later astrologers have given up the attainment of information so minute, and have confined themselves to such general indications as those of our almanacs, which, as they mean nothing, may as reasonably be drawn from the stars as elsewhere, we take the following instances from a work published in 1817, which we will not name, and which we would willingly suppose to have been written in irony, if it were not that its size (two volumes quarto, with tables) and style are both evidences either of real belief, or intentional attempt to deceive.

A man who was born June 24, 1758, at eight minutes after ten in the morning, committed a murder, and was by many supposed to be insane. Pending his trial, an astrologer was requested to point out by the stars whether this defence would be established or not. The nativity was cast, that is, the position of the heavens at the aforesaid time was laid down, and the nativity having been *rectified* (a process amounting to giving the prophet a power of making almost any change he pleases), the result was as follows:—

'Mercury being lord of the ascendant, irradiated by a malefic quartile aspect of the planet Mars, and afflicted by an opposition with Jupiter, declares that the native shall be involved in an abyss of troubles and afflictions, even to the hazard of his life.'—'The quartile of Mercury and Mars, particularly when Mercury is constituted principal significator, hath implication of high crimes and misdemeanors.'—'Upon a further inspection of the figure, we find a baneful quartile aspect of Mars and Jupiter, with a mischievous opposition of Saturn and Mars. To the first of these we are to attribute the dissolute manners of the native.'—'Here is unquestionably a favourable trine of the Sun and Saturn; but no great good can result from it, because the Sun is lord of the twelfth house, posited in the tenth, and out of all his essential dignities: at the same time that Saturn is lord of the sixth, located therein, and both the significators are under the dominion of the *evil genii*, vitiating the mind and affections of the native.'—'At the time the unhappy native was prompted to commit this barbarous act, the Moon came to an opposition of Mars by direct direction, while she occupied the cusp of the seventh house, which represents the unfortunate woman.'—'The Sun I find to be giver of life, posited in the tenth house, the house of justice; Mercury, lord of the ascendant, being in Gemini, *an airy sign*, and the Moon likewise in an airy sign, show the manner of the native's death, that *he would die suspended in the air*, while the opposition of four planets in the radix, and the mundane quartile of the Sun and Mars from the tenth, the house of justice, show the quality of it—namely, that it should be in due course of law, by the hands of the common hangman, and not by suicide.'—'I brought up the direction of death with great nicety and precision, and found he would be plunged into eternity when the Sun came to the anaretical point of the midheaven, and met the noxious beams of the Moon and Mars in opposition, which thus constituted is ever productive of a violent death.'

We now give the following opinion upon a case of a projected marriage, in which the lady, suspecting an attachment elsewhere on the part of her intended husband, inquires whether it will ever take place. The position of the heavens is supposed to be laid down at the moment of asking the question.

'The Sun is significator of the lady; and Saturn, lord of the seventh house, is significator of the gentleman. It must also be observed, that in this, and all questions relative to matrimony, Mars and the Sun are the natural significators of a woman's marriage; and Venus and the Moon are those of a man's. Now Saturn, the gentleman's significator, is remarkably well posited in the fifth house, and has Venus within his orb, applying to him by conjunction; which is a very powerful indication that his affections are sincere and honourable, and that his mind is fully bent to the marriage state. The Sun, likewise, being in a sextile aspect with Mars, the lady's significator of marriage, plainly shows her inclination to matrimony to be strongly fixed, and her affections to be perfectly sincere.'

'The next thing to be considered is, whether there be any frustration or impediting aspect between these significators, and I find the Moon and Venus, the gentleman's significators of marriage, are applying to a quartile aspect with each other. This is an evident proof that the marriage is prolonged by the interference of some other woman of this gentleman's intimate acquaintance, because the aspect is made in a feminine sign; but as the Moon, in separating from Venus, applies to a perfect trine with Mars, the querent's principal significator of marriage, and also to a sextile of the sun, her natural significator in the figure, it totally removes the evil effects of the malefic aspect, and leaves the path free and unobstructed to the gates of Hymen. This opinion is greatly strengthened by considering the mode in which their significators are severally disposed. Saturn disposes of the Sun, who is posited in the terms of Venus, and Venus, Saturn, and the Moon, are all disposed of by the benevolent planet Jupiter, who is himself disposed of by Mars, the principal significator of this lady's marriage, and who thus triumphs over every obstacle to the celebration of their nuptials. I therefore could not hesitate in declaring to the lady, in the fullest and most satisfactory terms, that the gentleman who courted her had a sincere and tender regard for her; and that, though some circumstances might have happened rather unfavourable to her wishes, yet she might rest perfectly assured that he was the man allotted to be her husband.'

'Apparently well satisfied with these declarations, she proceeded to inquire in what length of time this desirable circumstance might come to pass. To gratify her wishes in this particular, I referred again to the figure, where the Moon wants upwards of eleven degrees of forming a perfect sextile aspect with the Sun, the lord of the ascendant, and the same to Mars, her significator of marriage, and therefore, by converting the degrees into time by the rule heretofore given, I fixed her marriage at about the end of three months, assuring her it could not exceed that time.'

On looking at the examples we have chosen, we see that they refer to matters which are proverbially under the control of destiny; we therefore take another, which has more connexion with the common affairs of life. It consists of directions for dealing in the smaller sorts of cattle, such as sheep, hogs, &c., and will fully explain the risk of such speculations.

'If the lord of the sixth and the lord of the second are in conjunction, in a good house of heaven, the querent may thrive by them' (*i.e.* small cattle); or if they be in sextile or trine, the same. The lord of the sixth, casting a friendly aspect to the part of Fortune, or being in good configuration with the dispositor thereof, denotes much good to the querent by dealing in small cattle; but if, on the contrary, the lord of the sixth be unfortunate, and in evil aspect with the lord of the ascendant or second, or cast malignant rays to either of their cusps, the querent will lose by dealing in small cattle. If the lord of the sixth be in quartile, or in opposition to the dispositor of the part of Fortune, or the Moon, the querent cannot thrive by dealing in small cattle. The same if the lord of the sixth be afflicted either by Saturn, Mars, or the Dragon's Tail; or be found either retrograde, combust, cadent, or peregrine. The Dragon's Tail and Mars show much loss therein by knaves and thieves, and ill bargains, &c.; and Saturn denotes much damage by the rot or murrain.'

That the antient system of astrology contained the most contradictory assertions may be made evident in very few words. The position of the heavens at the time of birth settled every man's character of body and mind, the various fortunes he would meet with, and his relative positions with regard to friends and enemies. Thus, every one who was born at or very near the same time as Alexander the Great, in the same country, would have a right to expect a somewhat similar career; and twin brothers could never fail to have the same horoscope, and therefore the same success in life; and though the subject of a particular horoscope should travel over the whole world, and thereby come under the influence of positions of the heavens which never could have occurred at his birthplace, yet these would be always ready to tell him (when properly looked at) whether the present moment was favourable or unfavourable to any pursuit he had in view. To take a case that might have occurred: suppose two men had engaged to throw dice against each other for their whole fortunes, and that each went the night before to consult different astrologers in the same town. To them it would not be necessary to tell their names, or exhibit their horoscopes; the present position of the heavens would be sufficient for pointing out a favourable hour, and if both astrologers worked by the same rules, as they ought to do, they would both arrive at the same result: that is, the same would be recommended to both inquirers, though one of them must certainly lose.

The astrologers never made any allowance for the precession of the equinoxes. Thus, though the *constellation* Aries is now in the sign Taurus, and the influences of its stars ought to have moved with them, we find that the *astronomical* Aries, or the first thirty degrees of the ecliptic, is used for the constellation. Under the circumstances, this is of little consequence; but such a practice would be fatal to *astronomy*.

That observed facts did stubbornly refuse to fulfil the predictions of the planets need hardly be told. In the fifteenth century, Stœffler foretold a universal deluge which should take place in 1524, in consequence of three planets being then in conjunction in a watery sign. All Europe was in consternation; and those who could find the means built boats in readiness. Voltaire mentions a doctor of Toulouse who made an ark for himself and his friends. Such a circumstance shows the hold which astrology had upon men's minds, from which, had it been true, it never could have been forced; for though a *new* truth, even when capable of easy verification, is introduced with difficulty, it is altogether absurd to suppose that a science, the correctness of which was of every-day experience, should drop and become exploded, not for want of cultivators, but of believers. The former we have, perhaps, even now, and a few of the latter, though only among the most ignorant of the community. The art is, at present, under the ban of the law, in order that designing persons may have at least one access stopped to the pockets of the credulous. By the statute of the first of James I. c. 12, sorcery of all species was prohibited, though it does not appear certain that this term included astrology; but by the vagrant act, 5 Geo. IV. c. 8, sec. 4, all 'persons pretending to tell fortunes, or using any subtle craft, means, or device, by palmistry or otherwise, to deceive and impose upon any of his Majesty's subjects,' are rogues and vagabonds—that is, punishable by any magistrate, with three months' imprisonment and hard labour.

The history of judicial astrology, at least up to the middle of the fifteenth century, is very nearly that of astronomy, since the latter branch of the science, except among the Greeks, was mostly cultivated for the sake of the former. Hence to it, as to alchemy, we owe many really useful discoveries. It is a singular fact, that the first lunar tables which were constructed on the Newtonian theory were intended to be subservient to the calculation of nativities; there is no question that the necessity which the astrologer lay under, of being ready, at any moment, to lay down the positions of the heavenly bodies, produced great numbers of useful tables and observations, and the Greek works which have been preserved by the Arabs were valued principally for the use to which their mathematics could be turned in astrology. The origin of the science is beyond the reach of history, nor is it much worth while to collect all that is known on this point. It certainly came into Europe from the East, where it is mentioned in the earliest records of every nation. The Chinese are said to have placed it on the same footing with agriculture and medicine; the Chaldeans cultivated it sedulously, and the invention is attributed to them by Suidas (cited by Montucla, iv. 372). The Hindoos have long regulated the most important actions of their lives by the stars (see introduction to the *Lilawati*); but Mr. Colebrooke has shown (*Hindoo Algebra*, preface, p. 80) that several of their fundamental terms are not Sanscrit, from which he apparently leaves us to conclude that he thinks the science neither antient nor indigenous in India. Among the Egyptians, it was of great antiquity; but it is not mentioned in the books of Moses, unless included in magic or sorcery, which is most probable. The books of Isaiah and Jeremiah allude directly to it in several places, as also that of Daniel. During the captivity, the Jews appear to have learnt the art, and from that time probably, but certainly in the earlier centuries of the Christian æra, became much addicted to it. Several of the more celebrated writers on astrology under the caliphs were Jews, as Messahalah, Moses ben Maimon, Solomon Iarchus, whose almanacs we have mentioned as among the earliest published, and many others.

In Greece, at least during the classical ages, judicial astrology found no reception; nor do we trace any marks of it even in the earlier astronomical writers of that country. The system was little in harmony with the allegorical mythology which prevailed there; and the oracles afforded perhaps sufficient nourishment to the appetite for the marvellous. But among the Romans, astrology was cultivated with avidity from the time of the conquest of Egypt, in spite of several edicts of the senate. In the second century, the whole world was astrological; and even Ptolemy was infected. There is a work entitled 'Tetrabiblos' attributed to him, which is entirely devoted to astrology; and though its genuineness has been doubted by some, merely because it is astrological, there appears no sufficient reason to reject it. (See Delambre, *Hist. Ast. Anc.*, ii. p. 543.)

All the followers of Mohammed are and have been astrologers. The predestinarian doctrines of their system render the transition easy and natural; for, as we have seen, the science of astrology is based upon the notion of the necessity of human actions. The establishment of the Moors in Spain, and the crusades, caused the introduction or the increased cultivation of the art among the descendants of the barbarians who destroyed the Roman empire; probably the former, for we have no distinct traces either of astronomy or astrology among the northern nations. But the predestinarian principle assumed a modified form, more consistent with the belief of the Catholic church. It was said that the stars only incline, but cannot compel; which position, while it left the will free, was a most convenient explanation of any failure in the predictions. The Greek and Roman Christians of the earlier centuries had in many instances received the whole of astrology; in others the modified belief above mentioned. Origen, though he recognises the stars as rational beings, yet, in his *Philocalia*, contends that the stars neither incline nor compel, but only prophesy or point out what men will do without exerting any influence. He then gives a long and curious argument against their compelling power, without explaining how it does not hold equally against their predicting faculty. St. Augustin (cited by Vossius) argues against astrology altogether. The church, in its public capacity, condemned the art in the first councils of Braga and Toledo, and in the Decretals (cited by Vossius). The doctrine of astrology was among the errors imputed to the Priscillianists. But many zealous catholics in later times adopted the same opinions, and among them churchmen of the highest rank, such as the Cardinal d'Ailly (died in 1425), who calculated the horoscope of Jesus Christ. The astrology of comets, which is hardly yet out of date, has even been recognized by a Pope: in the fifteenth century Calixtus III. directed prayers and anathemas against a comet which had either assisted in or predicted the success of the Turks against the Christians.

The establishment of the Copernican system was the death of astrology; and that upon an argument not one bit stronger against it than preceding systems for it. When it was found that the earth was only one among other planets, it soon came to be reckoned absurd by many that our little globe should be of such consequence as to be the peculiar care of the whole system. But why should the principle of non-interference have been preferred to that of the balance of power? We have lost a charming opportunity of discovering what goes on in other planets.

The last of the astrologers was Morin, best known as the opponent of Gassendi. The latter had in his youth studied and believed in the art, but had afterwards renounced and written against it. The former, who worked for thirty years at a book on astrology, and was besides an opponent of the motion of the earth, predicted his opponent's death repeatedly, but was always wrong. He also foretold the death of Louis XIII., with no better success. Since his death, which took place in 1666, the science has gradually sunk, and we believe has in no case been adopted by any real astronomer.

ASTRONOMY signifies the *laws of the stars*, and is applied generally to all that relates to the motions and theory of the heavenly bodies, as well as of the earth. If we except general terms, such as *science*, there is perhaps no single word which implies so many and different employments of the human intellect. We shall therefore confine ourselves here to a slight sketch of the annals of the science, and a few general considerations, pointing out at the same time the articles which should be consulted for further details.

The work of the astronomer begins in the observatory, where means are provided for noting the positions of the stars. Of the instruments by which this is done, see the principle and details in the articles Instruments (Astronomical), Clock, Pendulum, Observatory. There are two classes of observations: the first, of known bodies, of which the places are so nearly determined that no question remains except about quantities less than a second of time, or its corresponding quantity, fifteen seconds of space [see Angle]; and for this class the consideration what phenomena shall be observed is made to rest entirely upon the instruments, those phenomena being preferred, for the observation of which the steadiest instruments can be made. These move only in the meridian, and the star is waited for. The second class of observations, such as those of comets, double stars, and all mere appearances, which require an instrument that can be pointed to any part of the heavens, or can be made to follow a star, is performed by telescopes, which are made to revolve with the heavens. [See Equatorial.]

The second division of astronomical labour is the department of the mathematician only. The observations as they come from the instruments are subject to all the errors of the latter; and no perfect instruments can be constructed. The best circle that can be made is slightly oval; the best pivot that can be turned will not be truly cylindrical. The question now comes, in what manner to compare different species or sets of observations, so that the discordances themselves shall point out the quantity and quality of the instrumental errors; and how from thence to derive the corrections necessary for future observations. Also, how to choose the time and manner of observation, so that any particular error, whether of instruments or theory, shall be least, if the observer be desirous of avoiding it, or greatest, if he wish to detect and measure it. Every-day experience shows that there is no better test of the progress of observation than the discovery of new instrumental errors, provided only the quantities in question become less and less. The angular error which now sets an observer to work to correct his result is less than the six-hundredth part of that which would have been sufficient to annoy Ptolemy or Hipparchus. And in speaking of an instrument, we may consider the observer himself as a most material part, on the combined power of whose eye, ear, and judgment, the correctness of the observation depends. It is hardly to be expected that, even under precisely the same circumstances, two observers should note the same phenomenon so as to agree within a small fraction of a second; and recent experiments on phenomena noted with both the eye and hand, have demonstrated the existence of small differences between different observers, attributable only to their different habits of pe ception or physical constitution. On this point see Equation (Personal).

When observations have been, as nearly as possible, freed from instrumental errors, the next step would be, if we could imagine a system of astronomy only in its infancy, with instruments as near perfection as our own, to deduce, by combination of mathematical reasoning and calculation, the real places of the stars for some one moment, and the magnitudes and laws of the various motions to which they are subject, whether periodical or permanent, and whether arising out of the motion of the earth or out of a proper motion of the stars themselves; and for the solar system, to determine the relative motions and positions of the planets and their satellites, which can only be done by the previous measurement of the earth and subsequent comparison of the results of one observatory with those of another. But these primitive determinations have always been in progress with the instruments, and results have increased in accuracy with the power of observing; so that instead of working afresh for the determination of *elements*, as they are called, almost the whole of modern astronomy is a process of correction of those which have been previously obtained. This greatly facilitates operations: for the reason of which see Differential Calculus, Approximation. The measurement of the earth itself, and the determination of its figure, which is the basis of planetary astronomy, so far as ascertaining the actual dimensions of our system is concerned, will be treated as a separate science under the name of Geodesy, though it is a constituent part of astronomy, both as to the methods by which it is carried on, and the objects for which it is undertaken.

The third department of astronomy, being that which requires the most extended knowledge of mathematics, and the highest exercise of thought, is that which goes under the name of *physical astronomy*, and consists in the combination of the various phenomena as actually observed, in order to find out what are their physical causes, and according to what laws those causes act. It is evident, that without some success in this branch of the science, there can be no power of *prediction*, except what arises from the presumption that preceding phenomena have run their whole possible round, so that nothing *can* happen except a repetition of what *has* happened. To a rough view this seems to be the case, and is so in a great measure; but to the instruments of an observatory there appears no such complete *periodicity*. To this head we should refer such questions as those of refraction, aberration, and gravitation. The term physical astronomy is usually applied to investigations connected with the latter only; but both etymology and analogy warrant its extension to the former. Under this, also, we must place all questions connected with the physical constitution of the various planets, so far as that can become known. Of the great increase which the predicting power of astronomy has received since Newton deduced the motions of our system from the simple law of attraction, there is no need to speak; but we shall notice one peculiar use of that principle, by which the results of observation are anticipated, and the first and second of our divisions of astronomy advanced, while at the same time the *experimentum crucis* of the truth of the principle is furnished. There are many small inequalities of the solar system, which, though not likely to show themselves, mixed up as they are with so many others, are yet certain to be found, if looked for at the time when their effects are most sensible. The results of theory point out that a certain inequality, whose law and approximate magnitude it gives, should be found in the motion of a certain body, if the Newtonian principle be correct. On being looked for in the manner which the nature of the inequality itself shows to be most advantageous, it is found accordingly, and its *exact* magnitude, as ascertained by observation, is often of use in correcting that obtained from theory. For example, had it not been for methods of this kind, our knowledge of the motions of Jupiter's satellites, which is yet far from mature, would have been in a state of the merest infancy.

If the theory had arrived at a degree of completeness, towards which it has been and is rapidly tending, nothing more would be necessary for the determination of the motions of the solar system than the knowledge of the actual positions, velocities, and directions of the velocities of the bodies composing it, at some one moment, or of any other quantities in which the above were mixed up, and from which they could be obtained by calculation. But up to the present time it has been necessary to use more *data* of observation than the preceding, and it is only within the last ten years that tables of the moon, from the first-mentioned *data* alone, have been published by Baron Damoiseau, to which we shall afterwards refer. These tables differ from the mixed tables hitherto used by about half a second of time in right ascension, and two seconds of space in declination. (This is the mean comparison of the tables of Damoiseau and Burckhardt for January, 1834, and may be deduced from the more extensive comparison given in the *Nautical Almanac* for 1835.) But the tables themselves in common use differ from actual observation by quantities of about the same (or rather greater) magnitude, and it has not yet been ascertained which of the two sets of tables are more correct. But we have no doubt that the Cambridge observatory will decide this question in the course of the present year.

For the details of the actual state of astronomy we must refer the reader to such articles as STARS, SOLAR SYSTEM, &c., and the names of the several planets. We shall now proceed to a sketch of the history, or rather the *annals*, of astronomy, referring for fuller information either to the *History of Astronomy*, published by the Society, or to the complete and magnificent works of Delambre on the subject. The latter we have followed in great measure as to disputed questions of fact; and the form in which this work is written will render verification easy in any personal matter, though chronological reference is rather difficult.

The real history of *written* astronomy, that is, of actually recorded and moderately correct observations, in sufficient number to constitute a body of science, commences with Hipparchus, about 160 years before our æra. Prior to his time, it is difficult to do more than speculate upon the few facts which are left to us. That astronomical observation of a certain description began in the very earliest ages, there can be no doubt; but here there could be but one instrument, the horizon, and but one theory, the actual motion of the heavenly bodies round the earth. The earliest observations mentioned are those of the rising and setting of stars, which led to the registration of the different appearances presented by the heavens in the course of a year, to which may be added lunar and solar eclipses, and comets. The rapid motion of the moon in the heavens would probably have caused the lunar zodiac to be first marked out, though it is clear that the solar zodiac was of a very early date. Astronomical observation has always been one of the accompaniments of civilization, both in modern and antient times; and however much we may conceive ourselves entitled to look down upon the notions of our predecessors, we must not forget that in speaking of any country which possessed an astronomical theory worth so much as laughing at in modern times, we place that country in the list of exceptions to the rule which prevailed through the greater number. If the Chaldean system appear insufficient, or the Ptolemaic complicated, these are yet real results of thought, and, to a certain extent, actual representations of fact. Mungo Park mentions an African tribe, whose opinion it was that the inhabitants of the west fried the sun when he got down to them, and after heating him sufficiently for next day's service, took him round by a private passage to the east. If we could collect the astronomy of the whole antient world, there can be little doubt that the comparatively humble efforts to which we are coming would appear miracles of sense and reflection, among theories not much superior to those of Park's Africans.

The nations who are known to have cultivated astronomy before the Christian æra are the Chinese, Indians, Chaldeans, Egyptians, and Greeks. The first made it a matter of politics, the three next of religious observance, and all four applied it to astrology. Among the Greeks only, the science had no reference either to politics, religion, or soothsaying; and here it throve with a vigour which permits us to make the astronomy of Hipparchus and Ptolemy a part of the chain which ends with Newton and Laplace. What we know of the four first-mentioned nations is not sufficiently certain or definite to warrant our drawing very positive conclusions as to the time when they began to study the science; and the question is rendered the more difficult by the pretensions to antiquity which have been advanced in favour of each by well-informed men of modern times. Each nation has its advocates, who maintain that the Chinese, the Indians, the Chaldeans, or the Egyptians, were the first astronomers: which is of itself sufficient to prove that the question is doubtful. Fortunately it is of little consequence; and also the astronomy of the first and two last is of a character and extent which will justify our saying that, be it very antient or not, there is nothing on the face of it which needs the supposition of any very long time having been expended upon it. The Hindoo astronomy, on the other hand, though certainly more extensive and correct, may have been, for anything that can be shown to the contrary, received from the Arabs of the middle ages. At least such is the opinion of Laplace, Delambre, and several celebrated Anglo-Indians, who have had means of knowing more of the subject than either. But this question is one of difficulty, and ought not to be considered as finally settled.

The Chinese have some annals which were translated by De Mailla, a Jesuit missionary at Pekin, 1777-1785. They claim to go back to the year B.C. 2857, but of astronomical phenomena they record hardly anything, except eclipses of the sun, and the appearance of comets, and of the former nothing but the fact and the day of their happening. They state that the astronomers by profession were obliged, on pain of death, to predict every eclipse that occurred, and that, even after such phenomena were found capable of prediction, it was the practice to shout, beat drums, &c., during every eclipse, to frighten away the monster which they supposed to be devouring the sun. The mathematicians, in spite of their responsibility, were forbidden to make any alteration in their theories or methods, without the consent of the emperor. The loss of many methods, asserted to have been formerly practised, is attributed to the burning of all scientific books by one of their princes, B.C. 221. But perhaps the loss was not great; for Gaubil, who recalculated their asserted eclipses, could not verify more than one of a date anterior to the time of Ptolemy; and even that one is doubtful. The fact of the motions of the planets was known to the Chinese, but not the precession of the equinoxes, till about A.D. 400. They had also the Metonic and Calippic periods. For the account of the more modern Chinese astronomy, we must refer to the article CHINA; the improvements which were gradually introduced in the earlier ages of the Christian era might have been, and probably were, the work of Europeans.

The question with regard to the Hindoos is not whether their astronomy is sufficiently high in its pretensions to make it worth while to enquire into its antiquity, but whether an astronomical system of a very advanced character, which certainly was found among them, is or is not as old as they assert it to be. This system is found in certain tables which have been brought into Europe by Legentil [see TIRVALORE, TABLES OF], and in an original work [see SURHYA SIDDHANTA]; and it may be fairly considered as about equal to the European system of the twelfth century. The epoch claimed by the tables is B.C. 3102, the beginning of the Cali-yug, or iron age of Hindoo mythology, at which time a conjunction of all the planets is asserted. But this has too figurative a character; and moreover, the elements of the tables are hardly such as would have been derived from observations actually made at that period. That the epoch is fictitious may be readily believed: but the question is, was this fictitious epoch formed by Hindoos from their own observations before the Christian æra, or was their system introduced by the Arabs, or by direct communication with the Greeks? On the one hand it is argued that the Indian tables, being in many respects a mean between those of Ptolemy and Albategnius, may have been derived from those two; on the other hand, the remarkable correctness of several points, and the known character of the people in question, whose advances in mathematics cannot be doubted, and whose habits have, throughout recorded history, induced them to repel all connexion with foreigners, are urged in favour of the originality of their system. Those who are curious may consult Bailly's *Hist. de L'Astronomie Indienne*, on the one hand, or Delambre, on the other; but this question has unfortunately been treated with considerable spirit of system on both sides.

The Chaldeans, according to Diodorus, had long observed the risings and settings of the heavenly bodies, as well as eclipses. They had the celebrated Metonic period of nineteen years, and it is supposed that Meton obtained it from them, though this point is doubtful. They had also other periods, the meaning of which has caused discussion. [See SAROS, NEROS.] Simplicius, a commentator on Aristotle relates that a series of eclipses preserved at Babylon was transmitted by Alexander to Aristotle, and contained the observations of 1903 years preceding the conquest of Babylon by the Macedonians. But Ptolemy gives only a few of them, the earliest of these not reaching higher than B.C. 720. They are of the roughest kind, the times being given only in hours, and the part of the diameter eclipsed within a quarter; but nevertheless they are the earliest trustworthy observations we possess, and led, in the hands of Halley, to the discovery of the acceleration of the moon's mean motion. We find also among the Chaldeans the use of the clepsydra as a clock, of the gnomon as an instrument for measuring solstices, and of the hemispherical dial called by the Greeks *σκαφη*, for ascertaining the positions of the sun. By the clepsydra they were enabled to divide the ecliptic nearly into twelve equal parts, and are thus said to have invented the zodiac. [See Berosus, Chaldea.]

The Egyptians have left us no observations, and few astronomical relics the meaning of which can be made very clear, though it is probable that they were the first instructors of the Greeks. Their year was of 365 days: for their method of correcting it, see Sothiac Period. They observed eclipses, but none have come to us; they foretold comets, according to Diodorus; but as this author also mentions at the same time that they foretold future events, it becomes doubtful whether we are to understand that their predictions were successful. The idea attributed to them that Mercury and Venus moved round the sun is not mentioned by Ptolemy; whose silence on this and many other points, writing as he did in Egypt, is remarkable, unless it be admitted at once as a proof of exaggeration in the preceding accounts. The correct manner in which some of the pyramids are said to be placed north and south has always been quoted as a ground of suspicion, that these buildings had some astronomical use. The zodiac has also been attributed to the Egyptians. [See Denderah, Zodiac of.] The only attempt at a measure which we have remaining is one of the diameter of the sun, the meaning of which is obscure; but if what Delambre mentions (without citing his authority) be true, that they measured time by the *distance run by a horse*, as well as by the clepsydra, we need not be surprised that Ptolemy found no assistance from their antient observations. The story of Thales teaching the Egyptians how to find the height of the pyramids by the shadow, and that in Herodotus, of his being told by them that the sun had twice risen in the west, are, so far as their credit goes, confirmations of the opinion generally formed of Egyptian astronomy. [See Manetho, Egypt.]

With regard to the astronomy of the Greeks previously to the earliest extant works, there is little to be said. The Ionian school, founded by Thales B.C. 600, followed in succession by Anaximander, Anaximenes, and Anaxagoras [see all these names], added little or nothing to practical astronomy. If Thales announced the eclipse of B.C. 610 [see Alyattes], it was the *year* only; and the opinion of the earth's motion, attributed to Anaximander (whom see), rests on slender foundation. The school of Croton, founded by Pythagoras (whom see) about B.C. 500, and sustained by Philolaus, produced no observers, though it certainly adopted the opinion of the earth's motion. Meton, B.C. 432, introduced the cycle of nineteen years; Calippus, B.C. 330, introduced the improvement on the former known by his name. Eudoxus of Cnidos, B.C. 370, brought into Greece, according to Pliny, the year of 365¼ days, and wrote some works, one of which exists in the poetical version of Aratus. Timochares and Aristyllus, B.C. 300 (?) made the observations which afterwards enabled Hipparchus to discover the precession. Pytheas, about the time of Alexander, measured the latitude of Marseilles with tolerable accuracy. The work of Aristotle on astronomy is lost; and what is still more to be regretted, that of his disciple Eudemus on the history of astronomy. The poem on the Sphere attributed to Empedocles, B.C. 450, is probably much more modern.

We now come to the period of history, and of the Alexandrian school. This article being for reference only, we shall condense as much as possible the principal discoveries of the succeeding astronomers, in order of time. This could not be done in the chain of surmises mixed with history which we have just finished, since it is important to avoid confounding what is known with what is only supposed. For further information refer to the name at the beginning of each paragraph.

Autolycus, B.C. 300. His books are the earliest which are extant in the Greek language on astronomy. They are two—1. On the sphere in motion. 2. On the rising and setting of the stars. He appears to have considered the year as exactly 365 days.

Euclid of Alexandria, B.C. 300. The Elements of Euclid show that the Greeks of his time had no trigonometry. There is another work attributed to him, entitled *Phenomena*, which is no more than a treatise on the doctrine of the sphere.

Aratus of Cilicia, B.C. 281, has left an astronomical poem, chiefly taken from Eudoxus, and valuable on account of the commentary of Hipparchus.

Aristarchus of Samos, B.C. 280. His work on the magnitudes and distances of the sun and moon is the first attempt to measure the relative distances of these two bodies, by observing their angular distance at the time of half moon. To him also is attributed the opinion that the earth revolves round the sun.

Manetho the Egyptian, B.C. 260. His history is lost, but a poem attributed to him remains. It is a description of the heavens, filled with astrology, and containing no observations.

Eratosthenes of Cyrene, B.C. 240, is said to have observed with some celebrated astrolabes which he erected at Alexandria, which remained standing till the time of Ptolemy. Various works are attributed to him, for which see his life. He observed (either with a gnomon or with a meridian circle) [see Astrolabe] the obliquity of the ecliptic, and the latitude of Alexandria; and from the latter, and the fact that at Syene the sun was vertical at the summer solstice, he deduced an approximation to the earth's magnitude. His approximation makes a degree to be 700 stadia. A catalogue of stars attributed to him (the oldest extant) is probably spurious, but shows that, in and about his time, the method of referring stars to their latitudes and longitudes was not practised. His value of the obliquity of the ecliptic—11 parts out of 166 of the whole circumference—was adopted by Hipparchus and Ptolemy.

Archimedes of Syracuse died B.C. 212. He observed solstices, and attempted to measure the sun's diameter. His writings show that trigonometry was as yet unknown.

Hipparchus (of Bithynia?), B.C. 160-125, the greatest of all the Greeks in astronomy. In his youth he wrote a commentary on Aratus. [See Aratus.] He discovered the precession of the equinoxes, by comparing his own observations with those of Aristyllus and Timochares, or others of his predecessors. He was the first who employed processes analogous to those of plane and spherical trigonometry, for which he constructed a table of chords. He first used right ascensions and declinations, which he afterwards abandoned in favour of latitudes and longitudes. He suggested the method of referring terrestrial positions to latitude and longitude, and was probably the inventor of the stereographic projection. He determined the mean motion of the sun and of its apogee, the inequality of the sun's motion, and the length of the year, to greater exactness than his predecessors. He found the mean motion of the moon, of her nodes, and of her apogee; her parallax, excentricity, the equation of her centre, and inclination of her orbit. His observations also led him to suspect another inequality in the moon's motion, which Ptolemy afterwards discovered (the evection). He calculated eclipses, and used the results in the improvement of the *Elements*. He made one of the first steps towards a correct representation of phenomena, by supposing the sun to move round the earth in a circle, the earth not being at the centre. His catalogue of the longitudes and latitudes of 1081 stars was the first at all worthy of the name. If Hipparchus had possessed the pendulum and the telescope, fifty years might have enabled his successors to place astronomy in the state in which it stood at the birth of Newton. Considering his means, his observations are perhaps unequalled.

After the death of Hipparchus there is no astronomer of eminence till Ptolemy. Between them we have

Hypsicles of Alexandria, B.C. 146, wrote the 14th and 15th books of the *Elements of Euclid*, which contain some astronomical propositions.

Geminus (of Rhodes?) B.C. 70, wrote an introduction to the heavenly phenomena, containing no new discovery. It would seem he was not an observer.

Posidonius about the same time attempted to verify the measure of the earth of Eratosthenes. His writings are all lost, but many of his opinions are preserved in Cleomedes and Strabo. He remarked (though probably he was not the first who did so) the connexion of high water with the southing of the moon.

Theodosius of Bithynia, B.C. 50, left a work on spherical geometry, another on climates, and a third on the phenomena of day and night.

Sosigenes of Alexandria, B.C. 50, corrected the calendar under Julius Cæsar.

Hyginus left an astronomical description of the heavens.

Manilius, a Roman, A.D. 10, wrote an astronomical and astrological poem.

Seneca, A.D. 50. His book on natural philosophy contains many pieces of information on astronomical history, but is principally remarkable for his bold opinions on the nature of comets. These he declares to be planets, whose laws he predicted would one day be calculated, and that posterity would wonder how things so simple could have so long escaped notice.

Menelaus, A.D. 80, has left three books of spherical trigonometry.

Theon of Smyrna, A.D. 117? wrote on astronomy, and made a collection of astronomical works. His observations are cited by Ptolemy.

Cleomedes wrote on astronomy. He certainly lived after Posidonius, but whether before or after Ptolemy is uncertain. He is usually considered as having lived under Augustus Cæsar.

We must suppose that there were many real observers between the epochs of Hipparchus and Ptolemy; but from the loss of even their names, and the silence of Ptolemy himself, it is clear that no discovery of any importance was made.

Ptolemy of Alexandria, A.D. 130—150. We must briefly mention his works, his system, and his discoveries. The *μαθηματίκη σύνταξις*, or *mathematical collection*, afterwards called *μεγάλη σύνταξις*, and, by the Arabs, the *Almagest* [see ALMAGEST, SYNTAXIS], is the work from which we derive most of our knowledge of the Greek astronomy. We find there a full account of the observations and discoveries of Hipparchus; those of Ptolemy himself; the reasons and elements of his system; various mechanical arguments against the motion of the earth, which show that the first principles of dynamics were utterly unknown; a description of the heavens and the milky way, and a catalogue of stars, which we may be nearly certain was that of Hipparchus, reduced to his own time by an assumed value for the precession, but which has been asserted to have been corrected by new observations; a theory of the planetary motions; the length of the year; the instruments he employed, &c.

The Ptolemaic system [for more detail of which see PTOLEMAIC SYSTEM] was an attempt to represent the motions of the planets by supposing them to move uniformly in circles, the centres of which circles themselves moved uniformly in circles round the earth. The angular motions of the planets, as then known, were sufficiently well represented by this system; not so their changes of distance from the earth, as seen in their apparent diameters. This was the universal system of after-times till Copernicus.

The principal discovery of Ptolemy is that of the LUNAR EVECTION (which see), an inequality such as would be caused by an alternate increase and diminution of the excentricity of the moon's orbit. He also discovered the REFRACTION (which see), and made some tolerably correct experiments to determine its law. He explained the apparent enlargement of the discs of the sun and moon when near the horizon. He extended the projection of the sphere of Hipparchus. He entered into the investigation of every point which Hipparchus had touched; in some instances finding more correct values; in others, altering without amending. He was not an astronomer only, but wrote on geography music, chronology, mechanics, and, unfortunately, on astrology. [See PTOLEMY.]

With Ptolemy the originality of the Greek school ends. We must come to the Arabs before we find anything worth particular notice.

Sextus Empiricus, A.D. 173, described and wrote against the Chaldean astrology.

Censorinus, A.D. 238, wrote an astrological work on the day of nativity, containing historical information with regard to astronomy.

Julius Firmicus Maternus, A.D. 370, wrote on astronomy.

Pappus of Alexandria, A.D. 383. His commentary on Ptolemy is nearly all lost.

Theon of Alexandria, A.D. 385, the most celebrated commentator on Ptolemy. He was a good mathematician, but no great astronomer. He has however left some tables, and a method of constructing almanacs.

Hypatia (his daughter), murdered A.D. 415, the first female on record celebrated for her scientific talents. She wrote one book of her father's commentary, and constructed some tables.

Martianus Capella, A.D. 470, in his *Satyricon*, has some astronomical notions, among which is the following: that Mercury and Venus move round the sun. Cicero and Macrobius give the same idea; but the passage of Martianus is remarkable as being reported to have turned the attention of Copernicus to the system which bears his name.

Thius of Athens, A.D. 500, has left six observations of lunar occultations and solstices: *the only observations recorded between Ptolemy and the Arabs.*

Simplicius, A.D. 546, has left a commentary on, and description of, the astronomical work of Aristotle, which we have mentioned as lost.

Proclus Diadochus (not the commentator of Euclid), A.D. 550, wrote a commentary on the astrology of Aristotle, and a description of astronomical phenomena.

Isidore, archbishop of Hispalis (Seville), A.D. 636, wrote a theological work on astronomy.

Bede, A.D. 720, and *Barlaam* the monk, A.D. 1330, are attached to the preceding by Delambre. Both wrote astronomical works of little distinct merit. The last Greek writer on astronomy, of the least note, is *Michel Psellus*, A.D. 1050.

It is remarkable that, excepting his own commentators, few of the authors immediately preceding ever quote Ptolemy. Had it not been for the Arabs, the writings of the latter must have been lost.

The Alexandrian school was destroyed by the Saracens under Omar, A.D. 640; and the rise of astronomy among the eastern Saracens dates from the building of Bagdad by the caliph Al Mansur, in the year 762. In the reign of this prince, translations of the Greek writers were begun; and with nearly the same instruments, and the same theory, as Ptolemy, a career of four centuries of observation commenced, during which many astronomical elements, and, in particular, the obliquity of the ecliptic, and the precession of the equinoxes, were more accurately determined.

In the reign of Al Mamun, son of Harun al Rashid, himself a diligent observer, great encouragement was given to astronomy. A degree of the meridian was measured, but with what accuracy cannot be known, from our ignorance of the measure employed.

Albategnius, or *Al-Batani*, A.D. 880, discovered the motion of the solar apogee, corrected the value of the precession, the solar excentricity, and the obliquity of the ecliptic; and published tables. He is the first who made use of sines (instead of chords) and versed sines. He found the length of the year more accurately. He is, beyond all doubt, the only distinguished observer of whom we know anything between Hipparchus and Tycho Brahé.

Alfraganus, or *Al-Fergani*, and *Thabet ben Korrah*, both about A.D. 950. The first has left a work on astronomy; the second is principally remarkable by his having revived an old notion of the Greeks (not mentioned by Ptolemy, but by Theon) of a variation in the position of the ecliptic, which has been called a *trepidation*. (See *Hist. Ast.*, *Library of Useful Knowledge*, p. 33.)

Ebn Yunis, and *Abul-Wefa*, about A.D. 1000. The former, an Egyptian, an observer and mathematician of great merit, has left a work containing tables and observations. He first noted the time of the beginning and end of an eclipse by taking the altitude of a star. His work shows an increasing knowledge of trigonometry. He was the first who employed subsidiary angles. Abul-Wefa first formally used tangents, cotangents, and secants, which Albategnius had overlooked. He gave tables of tangents and cotangents.

Alphetragius of Morocco, A.D. 1050, attempted a new explanation of the planetary motions, not worthy of further notice.

Arsachel, a Spanish Moor, A.D. 1080, has left some tables [see TOLEDO, TABLES OF] of indifferent accuracy. His contemporary, *Alhazen*, wrote on refraction. *Geber*, also a Spaniard, (about A.D. 1080?) made some improvements in spherical trigonometry. He introduced the use of the cosine

Abul Hassan, about A.D. 1200, has left a catalogue of stars, and some improvements in dialling.

We have Persian tables (of the eleventh century?) translated by George Chrysococca, a Greek physician, in the fourteenth century; but the best known are those of Nasir-eddin, published A.D. 1270, under the protection of Hulagu, grandson of Jenghis Khan, and conqueror of Persia. The Persians have a method of intercalating their solar years, which, though complicated, is of surprising accuracy, but when they first began to employ it is unknown. [See CALENDAR.]

Ulug Beg, grandson of Timur, A.D. 1433. This prince made a large number of observations at Samarcand. His catalogue of stars of the date above-mentioned, was, in its day, the most correct ever published. He also gave tables of geographical latitudes and longitudes. The Emperor Akbar (sixth from Timur, died 1605) also encouraged astronomy, and caused many Hindoo works to be translated into Persian.

In China, *Cocheou-King*, A.D. 1280, patronised by Kublai, brother of Hulagu, and fifth successor of Jenghis Khan in the partial conquest which that prince made of China, made a great number of good observations. He introduced spherical trigonometry, and rejected the antient chronology.

Since the fifteenth century, astronomy has declined throughout the East. The Chinese received many methods from the Jesuits, but to little purpose. Among the Hindoos, there are very few who can understand the antient writings. The Turks and Persians have little besides astrology. We now proceed with the chain of European astronomy.

Astronomy was introduced again into Europe by means of the Greek writers, mostly through translations from the Arabic. The first translation of the *Almagest* was made under the auspices of the Emperor Frederic II., about A.D. 1230.

Sacrobosco (an Englishman named *Holywood*), A.D. 1220, wrote a work on the sphere taken from Ptolemy, &c. It continued for a long time in great repute. He also wrote on the Calendar. About the same time, *Jordanus* wrote a curious work on the Planisphere.

Alonso X., king of Castile, A.D. 1252, with the assistance of Arabs and Jews, formed the first European tables. They differ little from those of Ptolemy. [See ALONSINE TABLES.]

Roger Bacon, A.D. 1255, wrote on the phenomena of astronomy. (For writers of this period, not worth naming, see Delambre, *Hist. Ast. Moy.* pp. 258, 444.)

The Cardinal *Cusa*, A.D. 1440, wrote on the correction of the Calendar. He is said to have maintained the motion of the earth.

George Purbach, A.D. 1460, extended trigonometrical tables, and published a theory of the planets based on that of Ptolemy.

John Müller, called *Regiomontanus*, (died A.D. 1476,) made an abridgment of the *Almagest*, published more extensive trigonometrical tables, extended various parts of trigonometry, and was an observer, though not, in this respect, superior to some of the Arabs. His almanacs were the first which were worthy of the name, and were in great repute.

The two last-mentioned writers deserve some special notice, though it cannot be said that they made any direct advances either in theory or observation. Their writings, and the facilities afforded by their tables, undoubtedly did much to promote a taste for astronomy.

George of Trebizond, called *Trapezuntius*, who died A.D. 1486, first translated the Almagest *from the Greek* into Latin.

Bianchini, A.D. 1495, published tables similar to those of Alonso.

Waltherus, died A.D. 1504, a pupil of Regiomontanus, made numerous observations, which were often reprinted.

The following names are inserted that the reader may know to what names to refer for the astronomy of the time immediately preceding the promulgation of the system of Copernicus. Except in this point of view, there is but little interest attached to their labours:—

Riccius, A.D. 1521, wrote a work on astronomy, containing much historical discussion.

Werner (died A.D. 1528) gave a more correct value of the precession.

Stöffler (died about A.D. 1531) published almanacs for fifty years; wrote on the astrolabe, &c.

Munster (died A.D. 1552) wrote on clocks and dials.

Fracastorius (died A.D. 1543) wrote on the heavenly motions.

In 1528, *Fernel*, who died in 1558, gave a very correct measure of a degree of the meridian, from such insufficient observations, that, as Delambre remarks, the correctness must have been accidental.

Copernicus, born 1473, died 1543. Applied himself to astronomy from A.D. 1500. In 1530, he had finished his tables of the planets, and his work *On the Revolutions of the Heavenly Bodies*, containing an explanation of the COPERNICAN SYSTEM, which, it is almost unnecessary to say, was a revival of the opinions of the Pythagorean school on the motion of the earth. It was published in 1543, and its author died immediately afterwards. Copernicus improved the lunar tables, and gave, to a considerable extent, an explanation of celestial phenomena upon his own system. His book is a mixture of his own original and sagacious notions and of the old philosophy; and he was far from being able to answer the mechanical objections of his time. What might have struck so bold a thinker, had he lived to face opposition, cannot be told, but as the history stands, we shall come to the time of Galileo before we find all objections satisfactorily answered.

From this period, at which the preservation of printed works commences, our limits will not permit our giving more than the names of many astronomers. The reader must refer to the several articles. The following is the list of those who are worth mention between Copernicus and the death of Tycho Brahé; the dates are generally those of death, but where that is not known, the date in brackets is that of the publication of some work.

Copernicus	1543	Vigenera	(1578
Apian	1552	Stadt	1579
Gauricus	(1552)	Schrekenfuchsius	1579
Reinhold	1553	Bressius	1581
Piccolomini	1553	John of Padua	1582
Orontius Fineus	1555	Raimar	(1588)
Gemma Frisius	1555	Schöner	1590
Royas	(1555)	Mœstlinus	1590
Bassantin	1557	William, Landgrave of Hesse Cassel	1592
Recorde	1558	Mercator, G.	1594
Carelli	1558	Digges	1595
Vinet	1564	Rothman	1596
Benedict	(1574)	Galucci	(1597)
Maurolicus	1575	Pini	1598
Rheticus	1576	Tycho Brahé	1601
Nonius	1577		

Of these must be mentioned—

Reinhold, the friend of Copernicus, and advocate of his doctrines, who formed the PRUTENIC TABLES (which see).

Recorde, who wrote the first *English* treatise on the celestial phenomena.

Rheticus, editor of the *Opus Palatinum*, a large trigonometrical table (which see).

Maurolicus, author and editor of several works and tables.

Nonius, inventor of an ingenious method of division of the circle, which has often caused it to be supposed that he anticipated the invention of Vernier.

Mercator (*Gerard*), who gave the first idea of the projection known by his name.

Up to this time, the means of observation had been undergoing gradual improvement, more by attention to the construction of the older instruments, than by the introduction of any new principle. The Copernican theory had its advocates, but was not yet adopted by many. Algebra had been introduced into most parts of Europe, but was not yet in a state to furnish much assistance in trigonometry. Logarithms were not yet invented, nor do we find the *instruments* fixed in the *meridian*, the *telescope*, or the *pendulum clock*. The first *observer*, who made any important additions to the phenomena of the heavens as received from the Arabs, was Tycho Brahé, to whom we now come.

Tycho Brahé, born 1546, began to study astronomy 1560; commenced his observations at Hoene, an island near Copenhagen, 1582; was driven from thence, 1597; died 1601. He made a catalogue of the fixed stars, more accurate than any which preceded: gave the first table of refractions: discovered the *variation* and *annual equation* (which see) of the moon, the variation of the motion of her nodes, and of the inclination of her orbit, and that of the obliquity of the ecliptic. What was essentially as great a service as any of the preceding, he discarded the *trepidation* of the precession, already mentioned, which had more or less infected all tables up to his time; he also ascertained that comets (those of his day, of course) were further removed from the earth than the moon; in fact, that they had no parallax which his instruments could discover, thus refuting the notion that they were atmospheric bodies. He greatly improved and extended the instruments in use as well as all the methods of observation.

Tycho Brahé did not admit the Copernican theory; but substituted for it one of his own, usually known by the name of the *Tychonic system*. This consisted in supposing the sun to move round the earth, but all the other planets to move round the sun, being also carried with it round the earth. This system explains all the appearances as well as that of Copernicus; and we must say (though it is always usual to reproach Tycho for refusing to admit the simple system of Copernicus) that by this means the *then* unanswerable arguments against the Copernican system were avoided. In fact, there is nothing but the *aberration of light* (a comparatively recent discovery), which is demonstrably conclusive in favour of the motion of the earth. [See ABERRATION, MOTION (APPARENT).] The system of Tycho is said to have been promulgated by some of the antients, at least with regard to the inferior planets.

The reformation (as it was called) of the calendar took place in 1582, under Pope Gregory XIII. As the views of those who made the change were rather theological than astronomical, we shall only here mention the fact and the disputes it gave rise to; referring for further information to CALENDAR, CLAVIUS, VIETA, SCALIGER (JOSEPH).

From the time of the death of Tycho Brahé, to that of Newton, which forms the next great epoch in the history of astronomy, we can only dwell generally on a few leading discoveries. To enable the reader to search further, we give a table of all the names between the deaths of Tycho Brahé and Newton which Delambre has thought worthy of any mention, with some few additions. The names mentioned from 1581 to 1727, which are not in this list, will be found in the next. The year of death is given opposite to each name; or where that is not known, the year of some publication is given in brackets. The dates are principally from Weidler, and several from Delambre, compared with those in the first edition of Lalande's Astronomy.

Tycho Brahé	1601
Bayer	(1603)
Vieta	1603
Nunez	(1605)
Scaliger, Jo.	1609
Clavius	1612
Pitiscus	1613
Calvisius	1615
J. B. Porta	1615
Wright	1615
Fabricius	1616
Magini	1617
Napier	1617
Ursinus	(1619)
Tarde	(1620)
Marius	1624
Adr. Romanus	1625
Gunter	1626
Snellius	1626
Wendelinus	(1626)
Blaeu	(1628)
Vlacq	(1628)
Briggs	1630
Malapertius	1630
Vernier	(1631)
Kepler	1631
Lansberg	1632
Stevinus	1633
Bartschius	1633
Byrge	1633
Norwood	(1633)
Habrecht	1634
Metius	1635
Schickhardt	1635
Peyresc	1637
Reinerius	1639
Horrox	1641
Crabtree	1641
Galileo	1642
Gascoyne	1644
Herigonius	(1644)
Langrenus	1644
Bartoli	(1644)
Rheita	(1645)
Fontana	(1646)
Cavalerius	1647
Longomontanus	1647
Durret	(1649)
Argoli	1650
Descartes	1650
Scheiner	1650
Wing	(1651)
Petavius	1652
Gassendi	1655
Licetus	1656
Morinus	1656
Tacquet	1660
Street	(1661)
Malvasia	(1662)
Levera	(1663)
Cunitia (Maria)	1664
Deusingius	1666
Lubienietsky	(1667)
Townley	(1670)
Riccioli	1671
Mutus	(1673)
Roberval	1675
De Billy	1679
Borelli	1679
Doerfel	(1680)
Lefevre	1683
Picard	1684
Hevelius	1687
Pound	(1687)
Greenwood	(1689)
Seth Ward	1689
Auzout	1693
Bouillaud	1694
Mercator, Nic.	1694
Mouton	1694
Buot	1695
Huyghens	1695
Richer	1696
Hooke	1703
Duhamel	1706
Gregory, Dav.	1708
Roemer	1710
Cassini, Dom.	1712
Cotes	1716
Leibnitz	1716
Lahire, Phil.	1718
Lahire, Gabriel P.	1719
Flamsteed	1719
Keill	1721
Wren	1723
Wurzelbaur	(1725)
Newton	1727

As we approach an age in which discoveries proceed rapidly, it would disturb the order of time if we were to enumerate those of individuals together. We shall therefore give the dates in chronological order of the principal accessions to the science, keeping, according to our original plan, only enough to direct the attention of the reader to points worthy of further reference.

1581, or thereabouts, Galileo remarks the isochronism of the pendulum.

1596. Kepler's *Mysterium Cosmographicum*, containing fanciful analogies between the orbits of the planets and the regular solids of geometry.

1603. Bayer's maps, in which the stars are first denoted by letters.

1604. Kepler approximates more nearly to the law of refraction.

1609. Galileo made a telescope from a general description of a magnifying instrument made by one Jansen, in Holland. He used a concave object glass, Jansen a convex. Kepler publishes his work on Mars, in which he establishes, from Tycho Brahé's observations, the elliptic form of the orbit, and the proportionality of the areas to the times. These are called *Kepler's first and second laws*.

1610. Galileo announces the discoveries of Jupiter's satellites—of spots on the moon—of nebulæ—of some new appearances in Saturn, afterwards found to proceed from the ring—phases of Venus. He also discovers the diurnal libration of the moon, and that in latitude. Harriot observes the spots on the sun. (This fact has only been known from examination of Harriot's papers in the present century. It appears he got telescopes from Holland.)

1611. Lyncean academy founded. Galileo observes the spots on the sun.

1614. Napier's invention of logarithms.

1616. Prohibition of the theory of Copernicus by the Roman court.

1617. Snellius measures an arc of the meridian at Leyden. This was the first done by *triangulation*, but astronomical instruments were not yet sufficiently perfect to make this method much better than the old one.

1618. *Kepler* announces *his third law*, that the squares of the periodic times of the planets are in proportion to the cubes of their distances from the sun.

1619. Snellius discovers the law of refraction from one medium into another.

1626. Wendelinus determines the diminution of the obliquity of the ecliptic. He also extended Kepler's law to Jupiter's satellites, and ascertained the sun's parallax.

1627. The *Rudolphine Tables* published by Kepler, from the observations of Tycho Brahé.

1631. Gassendi first observed the transit of Mercury over the sun's disc—measured the diameter of Mercury, and predicted that of Venus with success. Vernier publishes his invention of the instrument which bears his name.

1633. Norwood measured the meridian from York to London, and gave a more accurate value of the degree than his predecessors. Descartes produced his system of vortices. Galileo is obliged to recant his Copernican opinions by the Inquisition of Rome.

1639. Horrox and Crabtree first observed a transit of Venus over the sun's disc. The former ascertained the diameter of Venus. They were the only two who saw this particular transit.

1640. Gascoyne applied the telescope to the quadrant, and a micrometer to the telescope.

1646. Fontana observes Jupiter's belts.

1647. *Selenographia* of Hevelius, in which the moon's libration in longitude is announced.

1650. Scheiner constructs a convex object-glass telescope.

1654. Huyghens completes the discovery of Saturn's ring

1655. Huyghens discovers Saturn's fourth satellite.

1657. Academia del Cimento founded.

1658. Huyghens made the first pendulum clock.

1659. Huyghens improved the micrometer.

1660. Mouton applied the simple pendulum to observations of differences of right ascension, and measured the sun's diameter very correctly by it.

1662. Royal Society of London incorporated. Cassini begins his researches on refraction.

1663. Gregory makes his reflecting telescope.

1665. Cassini determines the time of rotation of Jupiter, and publishes the first Tables of the Satellites.

1666. Cassini determines the rotation of Mars, and makes a first approximation to that of Venus. Academy of Sciences founded at Paris, and observatory first thought of and commenced in the following year. Auzout applied the micrometer to the telescope without any knowledge of Gascoyne. Newton first turned his attention to gravitation.

1667. Auzout and Picard applied the telescope to the mural quadrant, without knowing that Gascoyne had preceded them.

1668. Cassini's second Tables of Jupiter's Satellites.

1669. Newton made his first reflecting telescope.

1670. Mouton's first use of interpolations.

1671. Picard and Lahire publish their degree of the meridian, obtained by measuring from Paris to Amiens. Richer, in a voyage to Cayenne, observes the shortening of the seconds' pendulum in approaching the equator. Cassini discovers Saturn's fifth satellite. Flamsteed begins observing at Derby. Cassini begins the observations which led to his discovery of the inclination of the lunar equator, and the coincidence of its nodes with those of the orbit.

1672. Cassini discovers Saturn's third satellite.

1673. Huyghens publishes his *Horologium Oscillatorium*, in which are found the first theorems on central forces and centrifugal force. Flamsteed explains the equation of time.

1674. Hook revived the idea of attraction, but without assigning any law, or connecting it with any observed facts. Spring watches made under the direction of Huyghens.

1675. Roemer announces his discovery of the velocity of light by means of Jupiter's satellites. Greenwich observatory founded.

1679. Halley (who went to St. Helena for the purpose) published his *Catalogue of Southern Stars*.

1679. Appearance of the *Connaissance des Tems*.

1680. Flamsteed gave the law of the annual equation of the moon, and corrected the tables accordingly.

1682. Newton, who had laid aside his theory of gravitation when he found it not capable of verification by taking the best measures of the earth in use, hears of Picard's more accurate measurement, tries it, and finds a remarkable degree of nearness to the result deduced from his celebrated law.

1683. Cassini and Lahire discontinue till 1700 the arc begun in 1680.

1684. Cassini discovers Saturn's first and second satellite.

1687. Newton publishes the *Principia*.

1689. Roemer first used the transit instrument; that is, fixed a telescope in the meridian for the purpose of observing transits.

1690. Huyghens' theoretical determination of the ellipticity of the earth. Catalogue of Hevelius published.

1693. Cassini's third tables of Jupiter's satellites. Announcement of his discoveries on libration. Halley discovers the acceleration of the moon's mean motion.

1700. The Cassinis (D. and J.) extend the arc which the former had begun southward.

1705. Halley first predicted the return of a comet, viz. that of 1758.

1711. Berlin Observatory founded.

· 1714. J. Cassini discovers the inclination of the orbit of Saturn's fifth satellite.

1715. J. Cassini discovers the divisions of Saturn's ring.

1718. Bradley publishes his tables of Jupiter's satellites. J. Cassini and Maraldi complete at Dunkirk the arc begun by Cassini.

1725. Flamsteed's *Historia Cœlestis*. Petersburg Observatory founded. Harrison's compensation pendulum.

1726. Blanchini determines the rotation of Venus.

1726 Graham invented the mercurial pendulum.

1727. Bradley discovers aberration. Death of Newton.

We have now brought the history to a most remarkable epoch. The great comparative perfection of instruments, the invention of the telescope, of the micrometer, of the clock, of logarithms, the introduction of algebra, the invention of fluxions, and the establishment of the theory of gravitation, in England at least, were so many steps each of magnitude unequalled in former times. But the most meritorious labours of the preceding table are not those which make most show. It takes as much space to say that Cassini discovered a satellite of Saturn as that Flamsteed published the *Historia Cœlestis;* but the first might have been left to the present day without much loss, whereas the latter was a new era in sidereal astronomy. It would have done more for astronomy than the mathematical Syntaxis of Ptolemy, had it been similarly circumstanced: that is, the work of Ptolemy contained only a simple account of what had been done before, with no material improvements either in methods or instruments; whereas that of Flamsteed contained both, and gave a catalogue of stars such as had not been published before. [See FLAMSTEED.] We cannot here help noticing the great use of scientific societies. The theory of Newton was lying idle in his hands for ten years, because he doubted its conformity to fact; and had he not happened one evening at the Royal Society to hear accidentally of the measurement of Picard, it is possible that the *Principia* might never have been published. Various methods and instruments have been invented over again by those who were ignorant of what their predecessors had done; the practical inconvenience of which is obvious, added to the injury accruing to science by the national feeling which discussions concerning the right to inventions has produced in several instances.

The distinct part of Newton's great discovery, which is seldom well understood by any who have not studied it, is—*not* the notion of attraction, which had occurred to many among the antients, and to Borelli, it is stated, and Hook among the moderns—*not the law*, which had been suggested by Bouillaud or Bullialdus—but the proof that the mechanical deductions from this law of attraction really do represent the celestial phenomena; a combination of improvements in mechanics and mathematics which none but the inventor of fluxions could have made, and a specimen of sagacity which it needed the author of the optics to display. Still less is it true, as many believe, that the Newtonian theory is the Copernican, when they speak of Newton as the establisher of the latter. After what we have said, it is unnecessary to discuss this further than to observe, that it was Galileo who destroyed the mechanical objections to the notions of Copernicus, by the sound system of dynamics of which he was the inventor; and who re-enforced the notions of Copernicus, by arguments of the most forcible character drawn from probability. But it was Bradley who by his discovery of ABERRATION (which see) furnished the direct and unanswerable proof of the earth's motion; and it is a coincidence worth remembering, that the year of the death of Newton was that of this remarkable accession as well to physics as to practical astronomy.

We shall now proceed to sketch the annals of astronomy from the death of Newton to the present time.

The interval between the death of Newton and the present time may be divided into two parts: the first reaching to the end of the century, abounding in magnificent discoveries both of analysis and observation; the remainder more distinguished by efforts to extend, correct, and methodize the results of the first. In giving a few, as well of the distinguished names, as of their discoveries, we cannot help observing with regret, that in all the histories which have been published, as well of astronomers as of their labours, very little attention has been paid to chronology, and the dates given in different works very often differ. In fact, we know of no work to which we can refer the reader in which he will be certain to find the exact dates of all the principal researches. Lalande's *Bibliographie Astronomique* and Professor Airy's report to the British Association are honorable exceptions in most points, and to them we have been much indebted. The latter is confined to the present century. In collecting, therefore, such facts as have come in our way, we do not pretend to give a complete list of what has been done, or even of the principal points.

The following is the list of names from the death of Newton, arranged in the same manner as the preceding:—

Leadbetter	(1728)
Maraldi, J. P.	1729
Blanchini	1729
Louville	1732
Manfredi	1739
Sharp	1742
Halley	1742
Bird	(1745)
Maclaurin	1746
Châtelet (Mad. du)	1749
Graham	1751
Whiston	1755
Marinoni	1755
Cassini II. (James)	1756
Fontenelle	1756
Ximenes	(1757)
Bouguer	1758
Maupertuis	1759
Godin	1760
Simpson, T.	1760
Dollond	1761
Bradley	1762
Lacaille	1762
Mayer, T.	1762
Bliss	1764
Horrebow	1764
Clairaut	1765
De L'Isle	1768
Beccaria	(1768)
Frisi	(1768)
Chappe	1769
Long	1770
Pemberton	1771
Fontaine	1771
La Condamine	1774
Harrison	1776
Ferguson	1776
Pezenas	1776
Zanotti	1782
Wargentin	1783
Mayer, C.	1783
Lexell	(1783)
D'Alembert	1783
Euler	1783
Cassini III. (De Thury)	1784
Boscovich	1787
Mason	1787
Pouchy	1788
Maraldi II. (J. D.)	1788
Roy	1789
Favre	1790
Legentil	1792
Hell	1792
Triesnecker	(1792)
Bailly	1793
Saron	1794
Du Sejour	1794
Pingré	1796
Maraldi, J. P. III.	1797
Borda	1799
Lemonnier	1799
Montucla	1799
Liesganig	1799
Swanberg	(1800)
Cassini IV. (Comte)	(1800)
Ramsden	1800
Cousin	1800
Bory	1801
Jeaurat	1803
Méchain	1804
La Lande, J.	1807
Cavendish	1810
Maskelyne	1811
Lagrange	1813
Wollaston, Fr.	1815
Messier	1817
Burkhardt	1817
Mudge	1821
Herschel, W.	1822
Delambre	1822
Lambton	1822
Hutton	1823
Bode	1826
Fraunhofer	1826
Piazzi	1826
Laplace	1827
Wollaston, W.	1828
Young	1829
Fallows	1831
Pons	1831
Foster	1831
Oriani	1832
Zach	1832
Groombridge	1832
Legendre	1833
Brioschi	1833
Caturegli	1833

1731. Hadley's quadrant invented

1732. Maraldi (II.) improves the theory of the satellites of Jupiter by observation. The introduction, by Maupertuis, of the Newtonian Theory into France. Wright's Lunar Tables.

1736. Maupertuis, &c. measure an arc in Lapland, and Bouguer and La Condamine in Peru.

1737. Lacaille and Cassini de Thury re-measure the arc of D. Cassini. Clairaut improves the theory of the figure of the earth.

1739. Dunthorn's Lunar Tables.

1740. J. Cassini's Astronomy published, containing many new tables from his own and his father's observations.

1744. Euler's *Theoria Motuum*, &c. the first analytical work on the planetary motions.

1745. Bradley discovers the nutation. Bird began to improve the graduation of mathematical instruments.

1746. Euler's Solar and Lunar Tables. Wargentin's Tables of Jupiter's Satellites.

1747. Euler, Clairaut, and D'Alembert. Various researches in the planetary theory. Mayer's confirmation of Cassini's theory of libration, by observation.

1748. Bouguer proposes a micrometer with two object-glasses, but not that of Dollond. Euler's prize essay on the motions of Jupiter and Saturn.

1749. Euler's and D'Alembert's researches on the precession, D'Alembert's on the nutation, Clairaut's on the motion of the Lunar Apogee. Halley's Tables.

1750. Mayer first uses *equations of condition*. Boscovich measures an arc at Rimini.

1751. Lacaille goes to observe at the Cape of Good Hope.

1752. Lacaille measures an arc at the Cape.

1753. Dollond makes his double object-glass micrometer. Mayer's first idea of the repeating circle.

1754. Chappe publishes the solar and lunar tables of Halley. Clairaut's Lunar Tables.

1756. D'Alembert's researches on the figure of the earth; Euler's on the variation of the elements of elliptic orbits. Mayer's catalogue of zodiacal stars. Clairaut's researches on the perturbations of comets.

1757. Lacaille's *Astronomiæ Fundamenta.*

1758. Lacaille's Solar Tables. Dollond's achromatic object-glass. Clairaut and Lalande's researches on Halley's comet.

1759. Lalande publishes Halley's Planetary Tables.

1761. Transit of Venus. Maskelyne at St. Helena.

1762. Euler and Clairaut's researches on the perturbations of comets.

1763. Lacaille's catalogue of southern stars.

1764. Lalande confirms Mayer's observations of libration. Lagrange's prize essay on libration, containing the first application of the principle of vertical velocities. Mason and Dixon begin the measurement of an arc in Pennsylvania.

1765. Harrison gains the parliamentary reward for his chronometer.

1766. Lagrange's theory of Jupiter's Satellites. Bailly's ditto.

1767. First *Nautical Almanac*

1768. Beccaria measures an arc in Piedmont, and Liesganig in Hungary.

1769. Transit of Venus.

1770. Mayer's Solar and Lunar Tables.

1771. Bailly's further researches on Jupiter's satellites.

1772. *Bode's law* of the distances of the planets.

1773. Lagrange's researches on the attraction of spheroids. Laplace on the secular inequalities of the solar system.

1774. Maskelyne's observations on local attraction at Schehallien.

1780. Mason's Lunar Tables.

1781. Herschel discovers the new planet now called Uranus. Messier's catalogue of Nebulæ.

1782. Laplace finds the elements of the orbit of Uranus. Laplace's researches on the attraction of spheroids.

1783. Nouet's tables of Uranus.

1784. Laplace's researches on the stability of the solar system, on the relation between the longitudes of Jupiter's first three satellites, and on the great inequality of Jupiter and Saturn. General Roy measures a base on Hounslow Heath for the connexion of the observatories of Paris and Greenwich. Herschel's catalogue of Nebulæ.

1786. Lagrange gives the differential equations for the variations of the elliptic elements.

1787. Laplace's theory of Saturn's ring, and explanation of the acceleration of the moon's mean motion. Herschel discovers two satellites of Uranus. Legendre and General Roy finish the connexion of the observatories of Paris and Greenwich. Beginning of the trigonometrical survey in England. Herschel's first observations with his forty-foot telescope.

1788. Lagrange's *Mécanique Analytique.*

1789. Herschel measures the rotation of Saturn, and discovers the first and second satellites of Saturn. Delambre's tables of Jupiter and Saturn.

1790. Herschel determines the rotation of Saturn's ring, and discovers two more satellites of Uranus. Delambre's tables of Uranus. Maskelyne's catalogue.

1792. Beginning of the French survey. Taylor's Logarithms. Lalande's improved Planetary Tables. Zach's first Solar Tables, and Catalogue of Stars. The *eightieth* comet, whose orbit has been calculated, discovered by Miss Herschel.

1793. Laplace on the satellites of Jupiter and figure of the Earth. Schrœter determines the rotation of Venus.

1794. Herschel discovers the fifth and sixth satellites of Uranus. No one, except Sir W. Herschel, has ever seen all the satellites of Uranus. Sir J. Herschel has very lately determined some elements of the first and second, which accord very closely with those given by his father. He has not found the rest, which may arise from the unfavourable southern position of the planet.

1795. Herschel's observations on variable stars, and separation of the milky way into stars.

1796. Establishment of the French Institute. Herschel gives strong presumptions that the rotations of Jupiter's satellites are of the same duration as their orbital revolutions. Oriani on the perturbations of Mercury.

1797. Delambre's observations on refraction. Laplace's theory of tides.

1798. Cavendish demonstrates and measures the mutual attraction of metal balls.

1799. Commencement of the *Mécanique Céleste.*

1799-1804. Humboldt's voyage and observations in South America.

1800. Wollaston's circumpolar catalogue. Bode's maps and catalogue. Mudge begins his great arc of the meridian, from the Isle of Wight to Clifton in Yorkshire.

1801. Lalande's catalogue. Piazzi discovers the planet Ceres. Swanberg begins the measurement of an arc in Lapland.

1802. Olbers discovers the planet Pallas. Lambton begins the measurement of an arc in India. Herschel's catalogue of Nebulæ.

1803. Cagnoli's catalogue. Herschel observes the changes in the position of double stars.

1804. Harding discovers the planet Juno. Piazzi gives the proper motion of 300 stars. Zach's Solar Tables.

1805. Legendre, method of least squares. Discussion on the parallax of the fixed stars, from this date to 1825.

1806. Completion of the French survey by Méchain and Delambre. Delambre's Solar Tables, and Tables of Refraction. Burg's Lunar Tables. Carlini's Tables of Refraction. Pond's catalogue of North Polar Distances (altitude and azimuth instrument). Herschel suspects the motion of the whole solar system towards the constellation Hercules.

1807. Olbers discovers the planet Vesta. Extension of the French arc into Spain. Piazzi's catalogue of 120 stars.

1808. Lagrange and Laplace's Researches on the Planetary Theory.

1809. Troughton improves the division of graduated instruments. Ivory's Theorems on the Figure of the Earth.

1810. Groombridge's Tables of Refraction. Carlini's Solar Tables. Lindenau's Tables of Venus.

1811. Lindenau's Tables of Mars.

1812. Troughton's mural circle mounted at Greenwich. Zach's Tables of Aberration. Burckhardt's Tables of the Moon.

1813. Bessel's Refractions (from Bradley). Lindenau's Tables of Mercury. Pond's catalogue of North Polar Distances (circle).

1814. Piazzi's catalogue of 7646 stars, the best and largest extant.

1815. Brinkley's Tables of Refraction.

1816. Lindenau's Determination of the Nutation. Poisson's Researches on the Planetary Perturbations.

1817. Delambre's Tables of Jupiter's Satellites.

1818. Bessel's *Fundamenta Astronomiæ.* Pons discovers a comet of short period, now called by the name of Encke.

1820. Astronomical Society of London founded.

1821. Observatory of the Cape of Good Hope founded. Bouvard's Tables of Jupiter, Saturn, and Uranus. The Greenwich Observatory first introduced circle observations by reflexion. Poisson on the Precession of the Equinoxes.

1822. Paramatta observatory founded. Harding's *Atlas Cœlestis.*

1823. Beginning of the erection of Cambridge observatory. Ivory's Researches on Refraction. Encke infers a resisting medium of very little density, from observations of the comet of 1818 (an unsettled point).

1824. Herschel, J., and South, Catalogue of Double Stars. Damoiseau's Lunar Tables.

1825. Commencement of *Berlin zones.* Second mural circle (Jones) erected at Greenwich.

1826. Biela discovers the comet of short period known by his name.

1827. Astronomical Society's Catalogue. Struve's Catalogue of 3112 Double Stars.

1828. Professor Airy discovers a long inequality in the motions of the Earth and Venus. Captain Kater's vertical collimator.

1829. Pond's Catalogue of 720 Stars. Poisson on the Attraction of Spheroids.

1830. Sir J. Herschel's Measures of 1236 Double Stars.

The following list of *public* observatories now in action is taken from the Report to the British Association above cited:—

Greenwich.
Oxford.
Cambridge.
Edinburgh.
Dublin.
Armagh.
C. of Good Hope.
Paramatta.
Madras.
Bombay.
St. Helena.
Paris.
Marseilles.
Geneva.
Turin.
Milan.
Padua.
Bologna.
Modena.
Naples.
Palermo.
Abo.
Altona.
Bremen.
Christiania.
Dorpat.
Copenhagen.
Königsberg.
Berlin.
Gotha.
Mannheim
Speyer.
Munich.
Göttingen.
Vienna.
Cracow.
Warsaw.
Wilna.
Ofen.
Kremsmünster.
Brussels.
Cadiz.

There is no public observatory in America. We find in Lalande (*Bibliographie, &c.*) notices of the following, not mentioned in the above list, and, we presume, extinct:—St. Petersburg, Malta, Danzig, Lisbon, and Weissenburg. That of St. Petersburg is about to be re-established. There is much information on different observatories in Bernouilli's *Letters* (Berlin, 1777), and in Quetelet's *Correspondance, &c.*, a mathematical periodical now published at Brussels. The *Nautical Almanac* always contains a list of observatories, with their latitudes and longitudes.

To attempt to describe what is now doing and has been done within the last few years would be difficult, and would lead us beyond moderate limits. Undoubtedly, the principal actual accession to our knowledge of the system of the universe is the investigation of the law and quantity of the rotation of double stars. By this, for which the world is principally indebted to Sir J. Herschel and Professor Struve, many new connected systems are added to our list, and the computation of the orbits has proceeded, in several instances, to that degree of precision which justifies the prediction of future positions. [For further details, see STARS (DOUBLE).]

The enormous masses of observations which are now published every year are silently affording the means of increased accuracy in every department, and are rapidly seized and applied for the improvement of the theory. Though we give no account of what is actually in progress, we shall, in various succeeding articles, perhaps be able to supply this defect; and there are some channels which we hope will become open to us during the course of this work.

Among the subjects which we have touched on slightly, we must refer to COMETS, PENDULUM, GEODESY.

Works on the History of Astronomy.—Sherburn's edition of Manilius (London, 1675) contains a list and short account of a very large number of astronomers, and has been much used by succeeding authors. It is superseded by the *Bibliographie* of Lalande (Paris, 1803), which gives a list of every astronomical work, with its title, and also an enormous alphabetical list of astronomers. This work also contains the history of astronomy from 1781 to 1802. Weidler's *Historia Astronomiæ* (Wittenberg, 1741) is a valuable collection of facts, and may be consulted with better chance of finding a date than any we have seen. Costard's *History of Astronomy* (London, 1767) is of little use for reference, but would be instructive to a reader who has not much mathematics. It is well spoken of by Lalande. Bailli's *Histories*—1. Of Antient Astronomy (Paris, 1775); 2. Of Modern Astronomy up to 1730 (Paris, 1778); 3. Of Modern Astronomy from 1730 to 1781 (Paris, 1782); 4. Of Indian and Oriental Astronomy (Paris, 1787)—are entirely devoted to a system, and should be looked at with caution. *The Histories of* Delambre—1. Of Antient Astronomy (Paris, 1817); 2. Of the Middle Ages (Paris, 1819); 3. Of Modern Times (Paris, 1821); 4. Of the Eighteenth Century (posthumous) (Paris, 1827)—contain a full description and discussion in order of *persons,* not of *time,* which render them difficult of reference, but still they are the best works of the kind. The historians of *mathematics*—Vossius, Montucla, Kästner, Bossut, and Delambre, *Rapport Historique, &c.* (Paris, 1810)—treat astronomy as a part of their subject. The small work of Laplace, *Précis sur l'Histoire de l'Astronomie* (Paris, 1821), which is also to be found in the *Système du Monde,* is delightfully written; and there is also much information in the historical chapters of the fifth volume of the *Mécanique Céleste,* and occasionally in the other volumes. Lalande's *Astronomy* was called *La Grosse Gazette* by a rival, on account of the varied historical and mythological information which it contains. Hutton's *Dictionary,* and Martin's *Biographia Philosophica,* contain information on English astronomers which is not to be found in the foreign works;

and there is a good deal in Thomson's *History of the Royal Society*. For the history of astronomy from 1781 to 1810, there is Voiron, *Histoire, &c., depuis* 1781 *jusqu'à* 1811, which contains an interesting account of physical discoveries, and the measures of the earth; but it is very imperfect in dates. There is a tract on the history of astronomy by Dominic Cassini, published in 1693, which we have not seen. For a further list of writers, see Lalande's *Bibliographie*. The general reader may consult with advantage the History of Astronomy, and the Lives of Kepler and Galileo, in the *Library of Useful Knowledge*, or of Natural Philosophy in the *Cabinet Cyclopædia*.

In addition, we may refer to the *éloges* published by the Academy of Sciences, which are to be found in their *Memoirs;* to the two separate collections of *éloges* by D'Alembert and Condorcet; to the *Annual Reports of the Royal Society, Astronomical Society*, and *British Association*.

ASTRUC, JOHN, a French physician of great eminence, was born at Sauve, in Languedoc, in the year 1684: he studied in the University of Montpellier, and took the degree of doctor in medicine in 1703. In 1706, being then only twenty-two years of age, he began to teach medicine in the same university, acting as substitute to Chirac, one of its professors, who had been forced to attend the French army. In 1710 Astruc obtained by competition the chair of anatomy and medicine in the University of Toulouse, where he revived the study of anatomy. The reputation, however, which he now acquired caused him to be soon recalled to Montpellier, where he occupied a medical chair from 1715 to 1728, when he resorted to Paris, chiefly urged, it is said, by the desire to have access to the great literary stores of that capital. On his arrival at Paris, he was induced to accept the situation of first physician to the king of Poland and elector of Saxony, but after a very short stay at Dresden he returned to Paris, and was, in 1730, appointed a consulting physician to the king of France, and in 1731, professor of medicine in the College of France. He became a member of the medical faculty of Paris in 1743, and died in 1766, at the advanced age of 82.

Astruc does not seem to have been endowed with an intellect of a very superior cast, and no great discovery is attached to his name; nevertheless, he acquired great celebrity among his contemporaries, both as a teacher and as an author; and the integrity of his character was justly appreciated. A simple and happy method in treating the subjects which he taught, and an easy, clear, and eloquent language, recommended him as a lecturer. His writings displayed a solid and extensive acquaintance with the history of literature and science, unusual among his countrymen even at that time,—the result of the unvaried assiduity with which from his early youth, and during the whole of his long career, he applied himself to bibliographical learning. Astruc has left a considerable number of works on medicine, on the topography of Languedoc, his native country, on metaphysics, and even on sacred history. We shall allude only to the more important of his literary labours.

His first writings referred to the theory of *digestion*, which he endeavoured to explain according to the principles then prevalent of the philosophy of Descartes. This subject led him at one time into a discussion with Vieussens, and at another into a dispute with Pitcairn, in which both adversaries probably were equally distant from the truth; but Astruc had greatly the advantage, in as far as he always kept within the bounds of calm and dignified language, while Pitcairn was full of violence and abuse. When, in 1720, the plague spread its ravages in Marseilles and its environs, Astruc published three successive treatises on this subject, in which he showed the disease to be contagious, and insisted on the necessity of quarantine measures. After his arrival in Paris, he took an active part on the renewal of those contests which had so long prevailed between the physicians and the surgeons of that capital, and his pamphlets seem to have materially contributed to bring about the victory which the physicians gained on this occasion (in 1738) in a court of law. A treatise on *Tumours and Ulcers*, which appeared in 1759, and which, being merely an abstract of Astruc's lectures, contains nothing new, was, in 1761, followed by a treatise on the *Diseases of Women*, in which the author displayed his usual erudition. Astruc's most extensive work, however, and that which has more than all others served to establish his high reputation, is the book *De Morbis Venereis*, first published in one vol. 4to., Paris, 1736, and afterwards enlarged to two vols. 4to. in the second edition, 1740. The practical part of this work has ceased to have any value, in consequence of the various changes which time has brought about in our notions of the diseases treated of; but the literary history of the disease, which occupies the latter half of the work, and embraces a chronological account of above six hundred authors on the subject, will always be referred to as a valuable document of bibliographical research. Yet the list of authors collected by Astruc is by no means complete—a German writer, Gertanner, having since added about 300 names not mentioned by Astruc. Astruc was a strenuous partisan of the opinion that syphilis had been imported into Europe by the discoverers of America, and the historical evidence brought forward by him in support of this hypothesis has been the chief cause of its general adoption. He does not, however, seem to have been altogether impartial in this inquiry, and more recent investigations have tended to invalidate his hypothesis, by showing on the one hand that traces of syphilis have occurred in Europe at all periods of history; and on the other, that the silence of the great majority of Spanish and Portuguese contemporary chronicles on the events supposed to have attended the introduction of the new disease, is irreconcilable with the statements on the authority of which the American origin of syphilis is maintained. The first edition of this work was translated into English by William Barrowby, M.D., Lond. 1737, 2 vols. 8vo.

A full account of Astruc's life has been given by Lorry in his posthumous edition of that author's *Mémoires pour servir à l'Histoire de la Faculté de Montpellier*, Paris, 1767. See also Hazon, *Notice des Hommes Célèbres de la Fac. Méd. de Paris*, (Paris, 1778,) p. 256; and the *Biographie Médicale*, tom. i.

ASTUR, in Zoology, a genus of hawks formed by Bechstein, and characterised by a short beak bent downwards from the base and convex above, with somewhat oval nostrils. The feet are rather short, and the toes (of which the exterior are united at the base by a membrane) are long.

Numerous species of this genus are diffused over all parts of the world; but Europe only contains one, *Astur palumbarius*, the goshawk, so highly prized by the falconers of old, and famous for its flights at cranes, geese, pheasants, and partridges.

ASTURIAS, Principality of, a province of Spain, situated between 42° 58′ and 43° 40′ N. lat., and 4° 30′ and 7° 8′ W. long.: it is bounded on the east by that district of Old Castile commonly called Montañas de Santander, on the west by Galicia, on the south by the kingdom of Leon, and on the north by the Bay of Biscay. A chain of mountains, called by some geographers the Asturian Pyrenees, forms the entire southern boundary. This boundary runs from near the source of the Ebro, in a western direction, taking the different denominations of Sierra de Sejos, the highest point of which is at an elevation of 5700 feet above the level of the sea; Sierra de Alba, 6960; Sierra de Pajares, 8628; Sierra de Peñaranda, 11,031; Sierra de Peñamellera or Peñamelera, 9465. To this last point, the range bears the name of Montañas de Asturias, the Mons Vindius of Ptolemy. It then branches out in different directions, and crossing the provinces of Leon, Galicia, and the north of Portugal, abuts on the ocean at the points of Cape Ortegal, Finisterre, and Silleiro, north of the Minho. The southern slope of this range is very abrupt; but on the north it gradually diminishes in height as it approaches the sea. The main mass is composed of calcareous rocks, little inferior in height to the Aquitanian Pyrenees, and covered with snow the greater part of the year. Marble and a hard sort of sand-stone used for grinding stones, are also found, as well as copper, succinum or mineral amber, though not of the purest kind, cinnabar, iron, zinc, lead, antimony, jet, and coals, of which the Asturians transport every year 4500 tons into the interior of the peninsula. About three miles west of Oviedo, at a place called Las Caldas, is a spring of mineral water almost at the boiling point, which flows out of a calcareous rock. At the distance of a musket-shot from that spring is a ruined castle built of limestone, in which a sort of inferior amethyst is found imbedded, erroneously taken for diamonds by Casal in his *Historia Natural y Medica de Asturias*.

The mountainous parts of the province are covered with forests of oak, beech, chestnut, and other trees, which supply the arsenal of Ferrol with excellent timber. It is a common practice in Asturias to cut large boards out of the chestnut trees without entirely destroying them. Don Mariano Lagasca says, that he saw several of these trees, half of the trunk of which had been sawed off in this manner, and still continued, for several years, to produce abundant fruit, without presenting any outward appearance of decay. These forests abound with bears, wolves, foxes, and other species of wild animals. There are likewise several medicinal plants, among which is the hellebore; six species of the erica or heath, two of the angelica, the sarsaparilla, and the dulcamara, have been made known by the celebrated botanist just quoted, Don M. Lagasca. The hills are covered with brush-wood, cistus, and furze, which the inhabitants use for fuel. They make the same use of the turf or peat, which is found in great abundance in the western districts.

The offsets of the great range form numerous lateral valleys, drained by a number of rivers which flow from the mountains, generally in a direction from south to north. The principal of these rivers are the Sella, in the eastern part of the province, the Nalon, the Navia, and the Eo in the extreme west, which also forms the boundary between Asturias and Galicia in the lower part of its course.

The coast of Asturias is so exceedingly bold and rocky, that its ports can only receive small trading vessels and fishing boats. There are a great number of small ports and *rias* (mouths of rivers), up many of which the sea-water ascends three or four miles into the interior. The principal ports, from east to west, are Llanes, Ribadesella, Lastres, Villaviciosa, Gijon, Candás, Luanco near the cape of Peñas, Avilés, Mures on the ria of Pravia, Cudillero, Luarca, Navia, and Castropol opposite to Ribadeo in Galicia. The harbours of Ribadesella and Cudillero are safe and commodious; and the former has good docks capable of receiving ships of forty guns.

The Nalon has its source on the northern slope of the Asturian mountains (43° N. lat., and 5° 24′ W. long.), and flows W.N.W. by Oviedo, forming, as it empties itself into the sea, the ria of Pravia. Its affluents are the Caudal, the Trubia, and the Narcea, all on the left bank. The Navia rises near the village of Zebrero in Galicia, enters Asturias on the west, and flowing almost due north forms the ria to which it gives the name. The course of these two rivers cannot much exceed sixty miles.

The valleys are exceedingly fertile, and afford pasture for numerous horned cattle, pigs, and horses. The horses are of small size, but renowned for their strength and swiftness. The rocks on the sea-shore are covered with sea-weeds, polypi, and zoophytes, which the farmers use as manure. On some of these rocks the *roccella tinctoria*, or true dyers' orchil or archil, is found. Fruit is also very plentiful in this province. Chestnuts, hazle-nuts, apples, and pears, are the chief varieties. The vine is cultivated in the commune of Cangas de Tineo, and near Avilés, in a district called Candamo: in both places a sort of light and agreeable wine is made for home use, far superior to the chacoli of Biscaya. There is however a deficiency of this article, which is abundantly compensated for by the excellent cider, easily obtained in every part of the province. Common wheat is not generally cultivated here; not however, as Antillon says, on account of the dampness and cold of the climate, but because the Asturians prefer the *escanda* or spelt-wheat, and the Indian corn, to any other sort of grain. The best species of common wheat is raised in great perfection; but the escanda is better adapted to the climate, and the species cultivated in Asturias is so much esteemed by the natives, that in many districts the leases, which provide for the payment of the rent in kind, contain a stipulation that no sort of corn shall be offered in payment except escanda. Besides the excellent quality of the bread made from escanda, it is observed that it keeps moist and fresh much longer than that made from any other sort of grain. The Indian corn being planted much thinner than any other sort of corn, leaves sufficient space between the rows for the growth of pumpkins. The Asturian farmers also plant *judias* or scarlet-runners together with the Indian corn, so that the judias climb up its stem; and thus they have three kinds of produce growing together on the same ground. The stem of the Indian corn affords a nutritious food for the cows in winter; with the grain they make bread, and with it they also feed their fowls and pigs; the ear or head they use for fuel after the corn has been thrashed out.

The climate of Asturias is exceedingly damp and cold in the mountainous parts; but in the valleys, and particularly on the sea-coast, it is so mild and temperate, that orange and lemon trees grow in the open air. In the seventeenth century great quantities of this delicious fruit were exported from Asturias to the northern countries of Europe; but since the free trade between South America and the ports of the Mediterranean has been established, the raising of those trees has been abandoned in Asturias, the fruit of that principality not being able to compete in its abundance and quality with that produced in the southern provinces, which is carried back by foreign vessels that visit the Spanish ports on the Mediterranean. Among the other vegetable productions, the parsnip may be mentioned as indigenous in Asturias.

Both the seas and rivers of this province produce the most delicate fish in the peninsula, which is sent to the market of Madrid both fresh and pickled.

Asturias is divided into *concejos*, or communes, of which there are 118. The superintendence of these concejos is distributed among fifty-six towns: they contain 668 parishes, 3665 villages, and 23 convents for both sexes. The population, according to the census of 1808, amounted to 364,238 souls, upon a surface of about 2148 English square miles; but the *Mapa de España*, published by the geographical establishment at Madrid in 1834, estimates the population at 434,635. The area, however, seems a great deal less than what is marked on some maps as belonging to Asturias. The area given by Antillon is calculated on the maps of Lopez, which are far from correct. Bory St. Vincent says, that Asturias is forty leagues long, and from ten to twelve wide. Miñano allows it thirty-six leagues in length and sixteen in breadth. If we allow it an area of 400 square leagues of twenty-five to a degree, the area will be above 3000 square miles.

A military governor, an intendant, and an *audiencia*, or a civil and criminal high court of law, preside respectively over the military, fiscal or financial, and judicial affairs of the principality. The internal administration is directed by the common council of the respective concejos. There is also an ecclesiastical tribunal and one bishop. For the education of the youth there is a university at the capital, Oviedo, several seminaries, and the Instituto Asturiano at Gijon, on the coast, founded by the illustrious patriot Don Gaspar M. de Jovellanos in 1794, and provided with professors of mathematics, mineralogy, and navigation.

The only manufactories of Asturias are, a royal manufactory of fire-arms at Trubia, a few others belonging to private individuals for the fabrication of copper and earthenware, jet trinkets, some tanneries, and looms for common woollen and linen stuffs, principally for home consumption. With these exceptions, its manufactories are not in a more advanced state than in the rest of the peninsula. The real cause of this deficiency is the want of inland communication with Castile. Till within a few years there was not a single road for carriages of any sort, and all the traffic with that part of the kingdom was carried on by means of mules and horses. The principal road, which is the new Camino Real de Asturias, and runs from Madrid to Medina-de-Rio-Seco, passing through Mayorga, Mansilla, Leon, Pola-de-Lena to Oviedo, has been recently made. There is also another road between Oviedo and Grado, about twelve miles N.N.W. of Oviedo. The principal *puertos*, or passages across the mountain, are, reckoning from east to west Tarna, Piedrafita, Pajares, Somiedo, Leitariegos, Cerredo and Peñamellera.

According to the historian Garibay, a Celtic tribe called Astixos, or Astiros, at a very early period passed from Gaul into Spain, and settled in the north and north-west districts. They inhabited a territory much more extensive than the modern Asturias, for it reached to the banks of the Duero. Their chief town was Asturica, now Astorga, in Leon. They were but very imperfectly known by the Romans, who often confounded them with their neighbours, the Gallaici. For a long period they lived unknown in their valleys, without exciting either the envy or jealousy of the neighbouring nations. Augustus Cæsar partly subdued them, and at the fall of the Roman empire, they shared the same fate with the other Roman provinces in the Peninsula. When the hordes of Tarik and Muza overthrew the Gothic monarchy in the Peninsula, those few who escaped the sword of the infidels, or refused to bend their necks beneath the ignominious yoke, sought an asylum in the fastnesses of the Asturian mountains, and headed by the immortal Pelayo, dared alone to defy the power of the victorious Crescent. Alxaman Suleyman, and Munuza, or Manuza, who successively attempted to penetrate into this province, remained with their hosts buried in the deep ravines of Cobadonga; and these were the first of a succession of triumphs, which at length ended with the total expulsion of the Mohammedans from Spain. Twelve kings reigned successively in Asturias, from 718, in which Pelayo was proclaimed, until 914, when having extended their conquests over almost one-fourth of the Peninsula, they assumed the title of kings of Leon; Ordoño the Second was the first who established his court at the city of Leon. In 1388, the Infante Don Enrique, the eldest son of Juan I., was styled Principe de Asturias, from which period the eldest sons and daughters of the kings of Spain have taken that title. 'It is in the inhabitants of Asturias,' says Bory de Saint Vincent, 'that the naturalist can discover the characteristic features of that Celtic race, which we consider to be the third of the Japhetic race.' The Asturians speak the Castilian language.

The Asturians are strong and robust, frugal, honest, intelligent, not very active, but constant in their labours, passionately fond of their country, proud of their noble descent, and of having never mixed their blood with any of the nations that have had dominion over the Peninsula. (See Antillon, Miñano, Garibay, and Casal, *Historia Natural y Medica de Asturias; Orographie de l'Europe*, &c.)

ASTYAGES. [See **Media.**]

ASY, or AZY, the river of Antioch. [See **Orontes.**]

ASY'LUM, the Latin and English form of the Greek *Ἄσυλον*, which is generally supposed to be made up of *a privative* and the root of the verb *συλάω*, 'to plunder,' and therefore to signify, properly a place free from robbery or violence. Some, however, have derived the Greek word from the Hebrew אשל, 'a grove;' the earliest asylums, it is said, having been usually groves sacred to certain divinities. It is a pretty, rather than perhaps a very convincing illustration of this etymology, which is afforded by Virgil's expression as to the asylum opened by Romulus,—

> 'Hinc lucum ingentem, quem Romulus acer asylum
> Retulit.'—*Æn.* VIII. v. 343.

The tradition was, that Romulus made an asylum of the Palatine Hill preparatory to the building of Rome. Plutarch tells us that he dedicated the place to the god Asylæus. (Plut. *Romul.* 9.)

Probably all that is meant by these stories is, that in those ages whoever joined a new community received shelter and protection; and even if he had committed any crime, was neither punished by those whose associate he had become, nor surrendered to the vengeance of the laws or customs he had violated. Such an asylum was not an appointed place of refuge established by general consent; it was merely a congregation of outlaws bidding defiance to the institutions of the country in which they had settled, and proclaiming their willingness to receive all who chose to come to them.

But both in the Grecian states, and in Rome, the temples, or at least some of them, were endowed with the privilege of affording protection to all who fled to them, even although they had committed the worst crimes. The practice seems to have been, that they could not be dragged from these sanctuaries; but that, nevertheless, they might be forced to come out, not only by being prevented from receiving food while they remained, but even by such compulsory measures as the application of fire to the building. (See Thucyd. i. 126. 134.; Herodot. vi. 80.) Anything appears to have been permitted except the actual dragging forth of the criminal. Eventually, these places of refuge became great nuisances, being, especially among the Greek cities, established in such numbers as sometimes almost to put an end to the administration of justice. After Greece had become a part of the Roman empire, an attempt was made to repress this evil by an order of the senate, directed to all the pretended asylums, to produce legal proofs of the privilege which they claimed. (Tacit. *Annal.* iii. 60, &c.) Many were put down in consequence of not being able to satisfy this demand. At last, all the asylums throughout the empire were abolished by an edict of the Emperor Tiberius. (Sueton. in *Vitâ Tiberii*, cap. 37.)

The term *Ἄσυλος* was given as an epithet to certain divinities; as, for example, to the Ephesian Diana. It is also found on medals as an epithet of certain cities: in which application it probably denoted that the city or district was under the protection of both of two otherwise belligerent powers, and enjoyed accordingly the privileges of neutral ground.

After the decline and fall of Paganism, the privilege of serving as asylums for malefactors was obtained by the Christian temples. The credit of conferring this honour upon churches in general is attributed to Pope Boniface V., in the beginning of the seventh century; but more than two hundred years before, certain sacred buildings of the new religion are said to have been declared asylums by the Emperor Honorius. The asylums thus established eventually grew throughout all Christendom to be a still more intolerable abuse than those of the antient world had been. In most countries, not only churches and convents, with their precincts, but even the houses of the bishops, came to be at length endowed with the privilege of sanctuary. In all these places the most atrocious malefactors might be found bidding defiance to the civil power. At the same time, there can be no doubt, that while in this way criminals were frequently rescued from justice, protection was also sometimes afforded to the innocent, who would not otherwise have been enabled to escape the oppression or private enmity which pursued them under the perverted forms of law. The institution was one of the many which then existed, having the effect of throwing the regulating power of society into the hands of the clergy, who certainly were, upon the whole, the class in whose hands such a discretion was by far least likely to be abused. When communities, however, assumed a more settled state, and the law became strong with the progress of civilization, the rights which had at one time armed the church as a useful champion against tyranny, became not only unnecessary but mischievous. The church maintained a long and hard struggle in defence of its old supremacy; and in the face of the stand thus made, and in opposition to antient habits, and the popular superstition by which they were guarded, it was only very cautiously that attempts could be made to mitigate the evil. For a long time the legal extent of the privilege of sanctuary appears to have been matter of violent dispute between the church and the civil power. In this country, it was not till the year 1487, in the reign of Henry VII., that by a bull of Pope Innocent VIII. it was declared, that if thieves, robbers, and murderers, having taken refuge in sanctuaries, should sally out and commit fresh offences, and then return to their place of shelter, they might be taken out by the king's officers. It was only by an Act of Parliament passed in 1534, after the Reformation, that persons accused of treason were debarred of the privilege of sanctuary. After the complete establishment of the Reformation, however, in the reign of Elizabeth, neither the churches nor sanctuaries of any other description were allowed to become places of refuge for either murderers or other criminals. But various buildings and precincts in and near London, continued for a long time after this to afford shelter to debtors. At length, in 1697, all such sanctuaries, or pretended sanctuaries, were finally suppressed by the Act 8 and 9 William III. chap. 26.

In Scotland, the precincts of the palace of Holyrood in Edinburgh still remain a sanctuary for debtors. The boundaries of this privileged place are somewhat extensive, comprehending the whole of what is called 'the King's Park,' in which is the remarkable hill called 'Arthur's Seat.' The debtors find lodgings in a short street, the privileged part of which is divided from the remainder by a kennel running across it. Holyrood retains its privilege of sanctuary as being a royal palace; but it is singular as being now the only palace in this country any part of the precincts of which is the property, or at least in the occupation, of private individuals, and therefore open to the public generally.

In England, a legal asylum, or privileged place, is called a sanctuary; and this use of the word sanctuary appears to be peculiar to the English language. Both in this country and in America, the name of asylum is commonly given to benevolent institutions intended to afford shelter neither to criminals nor to debtors, but to some particular description of the merely unfortunate or destitute. Thus there are in London,—the Asylum for Recovery of Health, Asylum for the Deaf and Dumb Children of the Poor, Asylum for the Cure of Scrofula and Cancer, Licensed Victuallers' Asylum, Surrey Asylum for Employment of Discharged Prisoners, Westminster Asylum for Persons who have been Prosecuted for First Offences, Invalid Asylum for Females, &c.

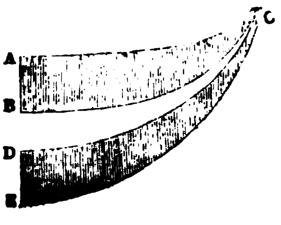
The Jewish Cities of Refuge, established by Moses and

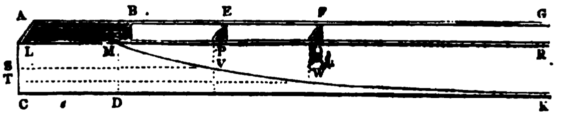
Joshua, may be quoted as the most remarkable instance on record of a system of asylum founded and protected by the state itself for the shelter of persons who had violated the law. These cities, as we are informed in the twentieth chapter of the Book of Joshua, were six in number, three on each side of the Jordan. They only, however, protected the person who had killed another unawares. With regard to such a person the command was, 'If the avenger of blood pursue after him, then they shall not deliver the slayer up into his hand; because he smote his neighbour unwittingly, and hated him not beforetime. And he shall dwell in that city, until he stand before the congregation for judgment, and until the death of the high priest that shall be in those days; then shall the slayer return, and come unto his own city, and unto his own house, unto the city from whence he fled.' (Joshua xx. 5, 6.) This institution may be regarded as an ingenious device for protecting, on the one hand, the guiltless author of the homicide from the popular resentment, which his unfortunate act would have been likely to draw upon him; and cherishing, on the other, in the public mind, that natural horror at the shedding of human blood, which, in such a state of society, it would have been so dangerous to suffer to be weakened. We see the same principle in the deodand awarded by our law in the case of the accidental destruction of life by any inanimate object.

One of the most curious instances of the privilege of sanctuary, is that long enjoyed in Scotland by the descendants of the celebrated Macduff, Thane of Fife, the dethroner of the usurper Macbeth. It is said to have been granted at the request of the thane by Malcolm III. (Canmore), on his recovery of the crown of his ancestors soon after the middle of the eleventh century. By this grant it was declared that any person, being related to the chief of the clan Macduff within the ninth degree, who should have committed homicide without premeditation, should have his punishment remitted for a fine, on flying to Macduff's Cross, which stood near Lindores, in Fifeshire. Although this, however, is the account of the old Scottish historians, it is probable that the privilege only conferred upon the offender a right of being exempted from all other courts of jurisdiction, except that of the Earl of Fife. Sir Walter Scott, in his *Minstrelsy of the Scottish Border*, has printed a Latin document of the date of A.D. 1291, in which the privilege to this latter extent is pleaded in favour of an Alexander de Moravia, an ancestor of the present Mr. Moray of Abercairny. The original deed still exists. Of Macduff's Cross only the pedestal now remains, the cross itself having been destroyed at the Reformation. It bore a metrical inscription, in a strange half-Latin jargon, the varying copies of which, still preserved, have given much occupation to the antiquaries. (See Sibbald's *History of Fife*, particularly the second edition, 8vo. Cupar-Fife, 1802; Cunninghame's *Essay upon Macduff's Cross;* and Camden's *Britannia*, by Gough.)

A'SYMPTOTE (ἀσύμπτωτος), a compound Greek word signifying *which does not fall with*, if taken literally with respect to two lines, it would mean that they do not meet one another. But it is used only in speaking of two lines (one of which at least must be curved) which continually approach each other, but never meet; so that the distance between them diminishes without limit, or they may be brought to any degree of nearness, without ever actually meeting.

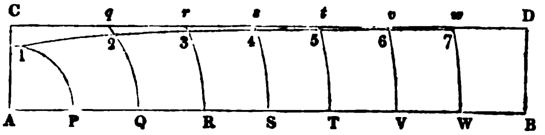
This appears a paradox to beginners in geometry, who are generally unable to imagine it possible that two lines should continue to approach one another for ever, without absolute contact. But this arises from their confounding the thing called a straight line in practice (which is not a straight line, but a thin stroke of black lead or ink, as the case may be) with the straight line of geometry, which has neither breadth nor thickness, but only length. And they also imagine that if two lines might be asymptotic, the fact might be made visible, which is impossible, unless the eye could be made to distinguish any distance, however small. But if the unassisted eye cannot detect a white space between two black lines, unless that space be a thousandth of an inch in breadth, which is about the truth, it is evident that two geometrical surfaces with asymptotic boundaries, such as A B C, D E C would appear to coincide from the point where the distance between them is about the thousandth part of an inch. The idea of a geometrical asymptote is therefore an effort of pure reason, and the possibility of it must be made manifest to the mind, not to the senses.





A L M B C D is a vessel of water, of which the sides and bottom are extended indefinitely towards G and R; the end A L is fixed, but the end B M is moveable parallel to its first position, so as always to form a water-tight obstacle; by which means the length of the vessel may be increased to any extent, while its breadth and height remain the same. Let the water be a perfect fluid, without any adhesion to the sides of the vessel (which is mathematically possible, though not physically), and let the bottom of the vessel be geometrically horizontal. Then, as the end M B changes its position and moves towards G R, it is manifest that the vessel will grow larger, and the level of the water will fall. Suppose the side L K to be of glass. Thus when the vessel ends at E P, the water may stand at S V; when the end is at F Q, the water may stand at T W, and so on. But the level of the water never can fall absolutely to the bottom C K; for so long as the preceding mathematical suppositions hold good, and there is some water in the vessel, it must stand at some determinate height above the bottom. As the end B M moves to the right, let the curve M V W, &c., mark out the positions of the level upon the edge of the moving end, as is done in the diagram. Then for the reason above given, this curve never can meet the line C K, though obviously in a state of continual approach towards it. Hence the curve M V W and the line C K are asymptotes.

As another illustration, let there be two parallel lines A B, C D, the perpendicular distance of which is A C; and from A, with different radii, describe arcs of circles P 1, Q *q*, R *r*, S *s*, &c. From A B on all these circles measure *arcs* equal in length to the *straight line* A C; that is,



let P 1, Q 2, R 3, ... W 7, &c., be all equal to A C. Now it is plain that the arcs Q *q*, R *r*, &c., are all greater than A C, and will continue so, however great the radius may be; for A C is the shortest distance which can be drawn from one parallel to the other. But as the radius is extended, the arcs T *t*, V *v*, &c., become *more upright*, as a person unused to geometrical phraseology would say, that is, more and more nearly coincident with a perpendicular drawn from A B; they also become more and more nearly equal to A C. Hence the points 5, 6, 7, &c., come nearer and nearer to C D, with which they would actually coincide, if it were possible that one of the arcs could become equal to A C. Hence the curve, 1, 2, 3, &c., is an asymptote to C D.

The mathematical theory of asymptotes will be found in all works on the theory of curves, and in most on the differential calculus. The following are the most general notions which it will be within our limits to give, and will be understood by a moderately well-informed mathematician. If the equation of a curve be $y = \phi(x)$, and if the function $\phi(x)$ can be separated into two others, say $\psi(x)$ and $\chi(x)$, of which $\chi(x)$ diminishes without limit either when x is increased without limit, or made to approach without limit to any given quantity; then the curve whose equation is $y = \psi(x)$ is an asymptote to the curve whose equation is $y = \phi(x)$ or $\psi(x) + \chi(x)$. For the difference of the ordinates of the two curves (to a common value of x) is $\chi(x)$, which diminishes without limit. For instance, let the first curve have the equation

$$y = \frac{bx}{x-a}$$

since $\frac{bx}{x-a}$ is $b + \frac{ab}{x-a}$, of which $\frac{ab}{x-a}$ decreases without limit when x is increased without limit, it follows that the straight line having the equation $y=b$ is an asymptote to the curve. If the preceding equation be reversed and put under the form

$$x = \frac{ay}{y-b}$$

similar reasoning will show that the straight line where equation is $x=a$ is also an asymptote. If the first expression be developed in inverse powers of x, giving

$$y = b + \frac{ba}{x} + \frac{ba^2}{x^2} + \frac{ba^3}{x^3} + \text{\&c.}$$

the equations of curves which are asymptotes to the preceding may be found by taking any of the preceding terms for y, provided b be always one. Such are

$$y = b + \frac{ba}{x}$$

$$y = b + \frac{ba^2}{x^2} + \frac{ba^3}{x^3}$$

or generally, any curve whose equation is

$$y = b + \chi(x)$$

where $\chi(x)$ diminishes without limit, when x is increased without limit, is an asymptote to the preceding. Observe that a curve may first cut another, then recede from it, and afterwards become an asymptote to it.

The following is a mere sketch of the most general method of finding asymptotes to *algebraical* curves. The first part of the method detects the number and direction of the *rectilinear* asymptotes, those only excepted which are parallel to either axis of co-ordinates, which will easily admit of a separate determination.

Clear the equation of all radicals. Suppose it then of the second degree, though the same reasoning applies to all degrees. Its form will then be (putting all the highest terms on one side)

$$ay^2 + bxy + cx^2 = dy + ex + f.$$

The following theorem can then be demonstrated. If the equation

$$ay^2 + bxy + cx^2 = 0 \qquad \text{(A)}$$

be possible, then it is the collective equation of two lines passing through the origin of co-ordinates, which two lines are parallel to two asymptotes of the curve and the curve can have no others. It is a well-known theorem that any *algebraical* equation between x and y, which is homogenous with respect to these letters, is not the equation of a curve, but of a collection of straight lines passing through the origin. Thus the asymptotes of the curve of the third degree will be determined by the solution of an equation of the form

$$ax^3 + bx^2y + cxy^2 + dy^3 = 0$$

which may belong either to one or three straight lines.

If $y=kx+l$ be the equation of an asymptote, the value of k may be any one of the values of $\frac{y}{x}$ determined from the equation (A). To find l, remember that any homogeneous algebraical expression of the mth degree, containing x and y, may be expressed by the form

$$x^m \phi\left(\frac{y}{x}\right)$$

and let the equation of the curve, when its various sets of homogeneous terms have been collected, be

$$x^m \phi\left(\frac{y}{x}\right) + x^{m-1} f\left(\frac{y}{x}\right) + \text{\&c.} = 0$$

Then if $\phi'(k)$ represent the differential coefficient of $\phi(k)$, the equation of the asymptote is

$$y = kx + \frac{f(k)}{\phi'(k)}$$

when the highest dimension in the equation exceeds the next highest by more than one, all the asymptotes must pass through the origin of co-ordinates.

The term asymptote is first found in the Conic Sections of Apollonius; and the properties of the hyperbolic asymptote are found in the second book of his Conic Sections.

ASZOD, a well-built market-town of Lower Hungary, in the circle of Waitzen, and on the Galga, about twenty-three miles N.E. of Pesth. The Podmanitzky family have a large and handsome mansion near it, which is celebrated for its extensive cabinet of coins and its museum of natural history. The inhabitants are remarkably industrious, good mechanics, and carry on considerable trade, as well in cloaks lined with sheepskins, which they dye blue and green and export to distant markets in great quantities, as in corn and wine, the produce of the delightful valley in which the town is situated. Aszod contains two churches, a synagogue, and nearly 5000 inhabitants. 47° 39′ N. lat., 19° 29′ E. long. (Bertuch.)

ATABEKS are the rulers of several of the small principalities into which the empire of the Seljuk Turks, soon after its establishment, became divided, during the eleventh, twelfth, and thirteenth centuries. The word Atabek is of Turkish origin, and properly signifies 'The Father of the Prince,' or, as Abulfeda explains it (*Ann. Mosl.* t. iii. p. 226. ed. Reiske), 'a faithful Parent.' According to the same author, the first chief honoured with the title of Atabek was Nizam-al-Mulk, the vizir of the third Seljuk sultan, Malek-shah, who at the same time gave him the town of Tus as his property; yet neither the title nor the honours of sovereignty remained hereditary in his family. But several powerful emirs at the court of the Seljuks, on whom this title was conferred, continued to use it after they had made themselves the almost independent masters of separate provinces, in which they enjoyed all the prerogatives of sovereignty, with this exception only, that in the public prayers at the mosques the name of the reigning Seljuk prince was mentioned before theirs. Four dynasties of Atabeks are particularly noticed in eastern history; those of Syria (and Irak), those of Azerbijan, those of Persia, and those of Laristan.

Atabeks of Syria and Irak.—The founder of the first dynasty of Atabeks was Kasim-addaulah Aksankar, originally a mamluk or slave, but who had by degrees raised himself to a station of great influence at the Seljuk court. Sultan Malek-shah, the son of Alp Arslan, yielding to the request of the nobles, who were jealous of the power of Aksankar, in order to get rid of his presence at court, appointed him governor of the towns of Haleb, Hama, Manbej, and Laodicea (A.D. 1086). After Malek-shah's death, Aksankar, instead of taking the part of his children, became the supporter of Tutush, another Seljuk prince in Syria. But Tutush, so far from rewarding the services which Aksankar had rendered him, deprived him of a portion of his previous government, and finally of his life (A.D. 1094). Emad-eddin Zenghi, the son of Aksankar, who was only ten years old when his father was executed, early distinguished himself by military services in several Seljuk armies, and in A.D. 1122 received Basra as a fief from the Seljuk sultan Mahmud, besides which he was appointed governor of Bagdad. In consequence of the then alarming ascendency of the Christian kingdom established by the crusaders in Palestine, Emad-eddin was sent to Mosul, in order to resist their further encroachments. He succeeded (A.D. 1127) in making himself master of Haleb, and of a considerable portion of Syria, over which country he thenceforward ruled as an independent sovereign. European chroniclers of the history of the crusades call him Sanguin, which is a corruption of Zenghi. After his death (A.D. 1145) a dissension arose between his two sons, Seif-eddin Ghazi and Nureddin Mahmud: they agreed at last that Seif-eddin should reign at Mosul, and Nureddin at Haleb. The Mosul branch continued to govern till the incursion of the Mogols into Syria, when Mosul fell into their power, A.D. 1260. To the dominion of the Atabeks of Haleb an end was put by Saladin, A.D. 1183; who, however, allowed a side-branch of this dynasty to continue in the cities of Sanjar and Nisibin till A.D. 1219.

Atabeks of Azerbijan.—Ildeghiz, who, from the condition of a slave, had successively risen to the rank of an officer at the court of the Seljuk Sultan Mas'ud, was, in A.D. 1136, invested with the dignity of Atabek, and at the same time appointed governor of Azerbijan and Kurdistan. He kept an army of fifty thousand horse, and increased his dominions by conquest. Though still under allegiance to the sultan, he was almost independent in the government of Azerbijan.

Four of his descendants successively ruled over Azerbijan till the year 1225, when they were obliged to yield to the power of Jelal-eddin, sultan of Khowarezm.

Atabeks of Persia.—A line of Atabeks, of Turcoman origin, the descendants of Salgar, ruled over Fars, or Persia Proper, from A.D. 1148 till 1264. The first of these Atabeks was Mozaffer-eddin, and he was followed by ten others, the reigns of some of whom were, however, of very short duration. Their residence was at Shiras. The last of this dynasty was Ayesha Khatun, a princess, who was confirmed by Hulagu in her character as sovereign, but reigned no longer than one year, and died in A.D. 1264. From their ancestor, Salgar, these Atabeks of Persia are sometimes named Salgarides.

Atabeks of Laristan.—Abu Taher, an officer of the Atabeks of Persia, had been sent with an army into Laristan, a province on the north-eastern side of the Persian Gulf. He conquered it, but instead of giving it up to his masters, he assumed himself the independent dominion over it, and took the title of Atabek. Takla, the grandson and third successor of Abu Taher, was reigning over Laristan when Hulagu invaded the country, who deposed and killed him, but allowed his son, Shems-eddin Alp Argun, to succeed him in the government. By the permission, and with the support, of the Mogol emperors, Yussuf Shah, the son of Alp Argun, followed next, and he was succeeded by his son Afrasiab. The latter had, by several acts of cruelty, drawn upon himself the displeasure of the emperor Gazan Khan, who ordered him to be executed, and appointed Nosrat-eddin Ahmed, a son of Alp Argun, as his successor. He was followed by Rokn-eddin, a son of Yussuf Shah. Mozaffer-eddin Afrasiab, the son and successor of Rokn-eddin, was the last of the Atabeks of Laristan. (See D'Herbelot, *Bibliothèque Orientale*, art. Atabekian. De Guignes, *Histoire des Huns*, vol. i. p. 254, &c.)

ATACA'MA is a district belonging to the department of Potosi in Bolivia, in South America, and comprehends all the country of that republic which lies to the west of the Andes along the Pacific Ocean. It is of considerable extent, its northern boundary being formed by the river Loa, which separates it from Peru, and runs between 21° and 22° S. lat., and its southern by the river Salado, which partly divides it from Chili, and flows near 26° S. lat., so that it extends along the coast upwards of 210 miles, with a breadth of from 25 to 40 miles. It is divided into the Upper (Sierra) and Lower country. The Sierra comprehends the smaller part of its surface, that which lies on the N.E. within the chain of the Andes, and contains some fertile valleys, in which the common fruits and seeds of the South American Sierras are cultivated. The surrounding mountains contain mines of gold and silver, but they are not worked, and are inhabited by numerous herds of vicuñas, which the Indians hunt, selling their skin and eating their flesh, which is tender and of excellent taste. The Lower country presents over nearly all its surface nothing but an uninhabited and uninhabitable desert, consisting of wide plains covered with a dark brown, and in some places quite black sand, with here and there a streak of white. On the plains rise some high ridges and a few immense rounded knolls; but in no part are any traces of vegetation to be discovered. This description is particularly applicable to the southern part, which extends towards the boundary of Chili, in which many Spaniards perished for want of water at the time of the first conquest, and which is known under the name of the desert of Atacama. Towards the boundary of Peru, a few rivers descend from the Andes, and along their courses valleys extend, in which a rich vegetation is displayed, the soil producing bananas, cotton, figs, vines, and other fruits and vegetables. The most considerable of these rivers is the Cobija, at the mouth of which is a good harbour and a small town, the inhabitants of which are principally occupied with fishing for congers, which they salt and export to the interior and to other ports: this town is now called Puerto de la Mar. In other parts of the coast a species of cod, called *tollo*, is caught in abundance and likewise exported. The interior districts contain veins of crystal of various colours, of jasper, talc, copper, blue vitriol, and alum. No rain ever falls on this coast, but in a few places the soil is occasionally refreshed by mists and dews. In the desert, sand-spouts are of frequent occurrence. (Alcedo, Captain Basil Hall, Humboldt.)

ATAHUALLPA, called by some historians **ATABALIPA**, was the son of Huayna Capac, the eleventh Inca of Perú, by a princess of Quitú, or Quito. According to the laws of Perú the incas were only allowed to marry their sisters, or some other female of their own family: every other union was considered unlawful, and the fruit of such a union illegitimate. Atahuallpa could not, on this account, succeed his father. Huayna Capac, who loved him passionately, considering, moreover, the rank of his mother, was desirous that Atahuallpa should succeed him in the throne of Quito, which kingdom had been added to his empire. He accordingly communicated his desire to the hereditary prince Huascar, who acquiesced in the will of his father; and at the death of the inca, which, according to Garcilaso, took place in 1523, Atahuallpa ascended the throne of Quito. Huascar promised his brother to leave him undisturbed in the possession of his kingdom, on condition that he should not make any new conquests on his own territory, and that he should render him homage as his liege lord. Atahuallpa replied submissively to this proposal, and asked his brother's permission to visit Cuzco to celebrate the obsequies of their deceased father, and likewise to render him homage. Having obtained this permission, he gave secret orders to his principal officers to assemble as many men as they could, and without making any warlike appearance, to march towards Cuzco in small bodies. In this manner he assembled an army of more than 30,000 veterans who had served under his father. These preparations, secretly as they were made, excited suspicion in the minds of some of the old governors of the provinces, who acquainted Huascar with their fears. But before the inca had time to prepare himself, more than 20,000 men belonging to Atahuallpa had crossed the Apurimac, and were within a hundred miles of Cuzco. They then cast off the mask, and presented themselves as enemies. Huascar assembled as large an army as he could muster, and offered them battle in a plain six miles from Cuzco. The battle was obstinate and bloody, and at last victory declared in favour of Atahuallpa. Huascar attempted to escape with a thousand men, but was taken prisoner. A messenger was sent to his brother, who was at Saussa, or Jauja, to acquaint him with the result of the battle. He ordered Huascar to be kept in chains, and summoned all the individuals of the inca's family to appear at Cuzco, under the specious pretext of some affairs of importance both to the family and to the state; but his real intention was to destroy them, that he might possess the throne without fear of being disturbed. Atahuallpa accordingly gave orders to his general, who caused more than 200 of the inca's family to be put to death, without sparing either age or sex. Some were beheaded, others precipitated from rocks, women and children were hung by their hair from trees, and left to die there. These inhuman executions, which were continued during two years, took place in a field near Cuzco, called, on that account, Yahuarpampa, or the field of blood. The unfortunate Huascar whenever one of these atrocious acts took place, was brought to the scene of blood, dressed in mourning, and with a rope tied round his neck, to witness the death of his relations. The servants of the household of the inca were likewise destroyed, and as these were the inhabitants of all the towns in the neighbourhood of Cuzco, the number of the victims cannot be estimated.

In the midst of these civil discords, the Spaniards arrived in Peru. Atahuallpa, who was at Cassamarca, or Caxamarca, terrified at the accounts which he received of them, and knowing that the unfortunate Huascar had sought their assistance, sent an embassy, accompanied by a rich present, with a view to gain the favour of the invaders. The ambassador was very civilly received by Francisco Pizarro, who, on his part, sent his brother Hernando to visit Atahuallpa, to offer him his friendship, and to acquaint him with his intentions, which were no other than to contribute with all his power to the happiness of both him and his subjects. On the following day, Atahuallpa, accompanied by 8000 men unarmed, went to visit Pizarro. On his arrival, Father Valverde, in a long harangue, endeavoured to acquaint the inca with the doctrines of the catholic religion, and declared to him that his kingdom had been given by the pope, the vicar of God, to the mighty Emperor Carlos, and that consequently he was bound to surrender it, otherwise both he and his subjects would be destroyed with fire and sword. The inca, amazed at such a proposal, and, uttering a deep sigh, answered by his interpreter, that, comparing the tenour of their former with their present discourse, he could infer nothing else but that both they and their king were either tyrants, who went about the world plundering and usurping the kingdoms of others, or a scourge sent by God to punish mankind: that he could not conceive how he was to acknowledge three lords, and surrender his kingdom only to one: that if, with any justice, he could be bound to pay tribute to any, it should be to the pope, or rather to God, and not to the emperor. The Spaniards would not suffer the inca to finish his discourse. The cavalry fell upon the unarmed multitude who had assembled, attracted by the novelty of the sight, sabring and trampling under the feet of their horses old men, women, and children. Francisco Pizarro, at the head of the infantry, attacked the guard of Atahuallpa, who, at the command of their inca, offered no resistance; the Spaniards, after seizing Atahuallpa, and loading him with chains, conducted him as a prisoner to the royal seat of the incas at Caxamarca.

Atahuallpa offered Pizarro, for his ransom, to cover the pavement of his prison with vessels full of gold and silver; and having observed, by the countenances of the Spaniards, that they either were not satisfied with the offer, or doubted the possibility of its accomplishment, he raised his hand as high as he could reach, and making a mark in the wall, promised to fill the room up to that height with the same precious metals. Pizarro agreed to this proposal, and the inca gave the necessary orders for procuring the ransom. Atahuallpa, though imprisoned, was in communication with his generals, and ordered them to remove his brother to Jauja. Here Huascar saw two officers of Pizarro, and again implored their interference in his behalf. This circumstance having reached the ears of Atahuallpa, he ordered him to be put to death. The unfortunate Huascar, in his last moments, said, 'I am deprived of my kingdom and existence by a tyrant, but he will not enjoy long his usurped power.'

A Peruvian renegado, called Felipillo, who served as an interpreter to the Spaniards, aiming at the possession of one of the wives of Atahuallpa, falsely accused him of having secretly given orders to his subjects to arm against them. The inca was accordingly brought to trial. Some of the Spanish officers, whose names are mentioned by Garcilaso, remonstrated against the injustice of such proceedings, and endeavoured to prove to those who were of a contrary opinion that they would disgrace the Spanish character by their ungrateful behaviour to a man who had received them with such kindness, and to whom they had moreover pledged their word to set him at liberty after having received the sum agreed upon for his ransom; and finally, that if he was to be tried, he should be sent to Spain to be judged by the emperor. Almagro and his party, who had just arrived, and were eager to seize upon the treasure of Atahuallpa, pretended that he ought to be tried by a military commission. This last opinion prevailed. He was tried and condemned to be burned alive on several false and ridiculous charges, the chief of which were the false one abovementioned, and the murder of his brother. On his way to the place of execution, he desired to be baptized, in consequence of which he was strangled only. It is said that he exhibited great courage and firmness in his last moments. Atahuallpa is described by the Spanish historians as a man of handsome and noble presence, of a clear, quick, and penetrating mind, cunning, sagacious, and brave. Garcilaso relates of him the following anecdote:—while in prison he had observed some Spaniards reading and writing, and he thought that this accomplishment was not a thing learnt, but a faculty which all the Spaniards possessed; and in order to verify his opinion, he asked one soldier to write the word Dios (God) on the nail of his thumb. He then asked every Spaniard that came near him to read it, and as he received from all the same answer, he was confirmed in his opinion; but on putting the question to Francisco Pizarro, and finding that he was unable to answer it, he discovered that it was a science acquired. From that moment he formed so mean an idea of Pizarro, that he treated him with the greatest contempt.

See Vega (El Inca Garcilaso), *Comentarios Reales de los Incas*, part i., book 9, chap. 2 to the end; part ii., book 10, chap. 17, folio edition, Madrid, 1723.

ATA-MELIK, or with his complete name, **ALA-EDDIN ATA-MELIK AL-JOWAINI**, was born (probably A.D. 1226 or 1227) in the district of Jowain near Nishabur in Khorasan, in which country his father Boha-eddin successively filled several offices of importance under the Mogol government. Ata-Melik received a careful education, but at an early age political employments withdrew his attention from literary pursuits. Argun, the governor of Khorasan, chose him for his companion on two journeys into Tartary, and in 1251 introduced him at the court of the Mogol emperor Mangu Khan, at Karakorum. Here Ata-Melik remained for a considerable time, and began to write his great work on the history of the Mogols, on account of which he undertook several excursions into Mawaralnahr, Turkestan, and the antient country of the Uighurs. We are not informed of the precise period at which Ata-Melik quitted Karakorum. But when Argun was, in A.D. 1255, again called to the court of Mangu Khan, he left his son Kerai-Melik, with Ata-Melik, in the camp of Sultan Hulaku, the brother of Mangu Khan, as governors of Khorasan, Irak, and Mazenderan, during his absence. Ata-Melik soon gained the entire confidence of Hulaku: as a proof of this, it is recorded that he induced him by his intercession to rebuild the town of Jenushan, which had been destroyed by the Mogols when they first conquered Khorasan. He afterwards accompanied Hulaku in his expedition against the Abbaside caliph Mostasem; and after the capture of Bagdad by the Mogols (A.D. 1258), he was appointed prefect of that city, while on his brother Shems-eddin the dignity of vizir was conferred. Both continued to hold these offices under Abaka Khan, the successor of Hulaku, and the province of Bagdad, which had suffered much from the incursion of the Mogols, began to flourish again under their administration. But in consequence of a charge of peculation brought against Ata-Melik, he was thrown into prison, and deprived of every thing he possessed, even of his wife and children, who were sold as slaves. Sultan Ahmed, the successor of Abaka Khan, relieved him from this distressing situation, and prevailed upon him, much against his wish, to resume his former office. But soon after this Argun, the son of Abaka Khan, defeated Ahmed and made himself master of Bagdad; and it appears that the apprehension of a renewal of the former rigorous judicial proceedings against himself accelerated the death of Ata-Melik, which took place a few days after Argun's entry into Bagdad (A.D. 1282). His work on the history of the Mogols, entitled *Jehan-kushaï* (*i. e.* the conquest of the world), is by some of the most esteemed Oriental writers (*e. g.* Abulfaraj, Mirkhond, &c.) referred to as the principal authority on that subject. A manuscript, said to contain the greater part of it, is preserved in the Royal Library at Paris. (See a Memoir on the life and writings of Ata-Melik, by Quatremère, in the *Mines de l'Orient*, vol. i., p. 220, &c.)

ATAULPHUS, brother-in-law of Alaric, king of the Visigoths, assisted him in his invasion of Italy. After Alaric's death, near Cosenza, Ataulphus was elected his successor, A.D. 411. In the following year he led his bands out of Italy into Gaul, with the intention, as it would appear, of joining Jovinus, who had revolted against the empire, and of sharing the Gauls with him. Jovinus not being inclined to an alliance with the Goths, Ataulphus sent messengers to Honorius offering him peace, and at the same time attacked and defeated Jovinus, who was taken and put to death. Placidia, the sister of Honorius, had been for some time a captive with Ataulphus, who at last prevailed on her to give him her hand. The marriage took place at Narbo (Narbonne) in southern Gaul, at the beginning of the year A.D. 414. Ataulphus appeared on the occasion dressed after the Roman fashion, and presented his bride with many vases full of gold and jewels taken at the plunder of Rome in A.D. 410. Ataulphus afterwards passed into Spain, where he was treacherously killed at Barcelona by one of his equerries, A.D. 417. A child that he had by Placidia, and to whom he had given the name of Theodosius, died before him. Vallia, the successor of Ataulphus, restored Placidia to her brother Honorius, who gave her in marriage to the consul Constantius. (Jornandes, Zosimus, Orosius, and Gibbon.)

ATBARA, a river of Nubia. [See Tacazze and Nile.]

ATCHAFALAYA (an Indian word, signifying *lost water*) is the upper outlet of the Mississippi, which detaches itself from the main stream on the right bank in 31° N. lat., and 14° 47′ W. long. from Washington. The Atchafalaya is here about 110 yards wide, and the Mississippi nearly half a mile. When the Mississippi is low, the water sometimes runs backward from the Atchafalaya into the Great River; but when the Mississippi is at its height, there is an immense mass of water sent down the Atchafalaya, and a great extent of country between the Atchafalaya and the Mississippi, and also to the west of the Atchafalaya, is thus annually inundated. The Atchafalaya has a general southern course for thirty-five miles till it is joined by the Courtableau from the N.W., which comes from the hilly pine-forests between the Red River and the head of Calcasiu. From the junction of the Courtableau, the Atchafalaya runs S.S.E. for twenty miles; here one stream runs into the long narrow lake called Cheetimaches, and the other branch runs eastward fifteen miles, and receives the Plaquemine, another branch of the Mississippi detached from the main stream, on the right. The Atchafalaya now runs a little E. of S. for thirty miles, and enters the bay called Atchafalaya Bay. About twenty miles above its mouth it is joined on the west by the Teche, which rises in the prairies of Opelousas, and has an entire course of about 200 miles.

The Atchafalaya is remarkable for a phenomenon called the Raft, which occurs in several places in its course. This raft consists of the rubbish brought down the Mississippi and thrown at some remote time into the Atchafalaya, where it has been caught in the bends of this narrow and tortuous stream, and has received successive augmentations by more recent floating trees. This raft is not always stationary, but when disturbed by the rise of the waters, it breaks off in large masses, which soon lodge again in some angle of the river. Several points are marked in Darby's map where the navigation is impeded by these accumulations of interlaced trees. The timber rises and falls with the river floods. The spring-tides in the Gulf of Mexico, which are not more than three feet, ascend the Atchafalaya when its waters are low to a point above the junction of this stream with the Courtableau—a fact which shows that this portion of the country has a very small elevation above the Gulf, or perhaps none at all. (See Darby's *Geography of the United States*.)

ATCHEEN, or ACHEEN (properly ACHEH), is one of the petty kingdoms into which the island of Sumatra is divided. It occupies the north-western extremity of the island, and borders generally on the country of the Battas. The kingdom does not extend inland farther than about fifty miles. It stretches along the coast to the south-westward as far as the town of Barus, in 2° N. lat. and 98° 30′ E. long. On the northern coast the territory of Atcheen reaches as far eastward as Karti, in 5° 10′ N. lat. and 97° 40′ E. long.

When the Portuguese, early in the sixteenth century, were prosecuting their discoveries and conquests in the Indian Seas, a fleet of five ships, under the command of Diego Lopes de Sequeira, first reached the island of Sumatra, and anchored at Pedir, then a principal port on the north-west coast, within the kingdom of Atcheen. Here the Portuguese found trading vessels from Pegu, from Bengal, and from other eastern countries: this was in September, 1509. It was nearly a century later (June, 1602) when the first English ships visited that country. These were the fleet under the command of Sir James Lancaster, who bore a letter from the queen of England, and was received by the sovereign of Atcheen with every mark of respect. On this occasion a regular commercial treaty between the two governments was drawn up and executed. The chief object of contemplated traffic was pepper, for which article Europe was principally dependent at that time upon the Dutch. Very little advantage was taken of the treaty here mentioned until the year 1659, when the reigning queen of Atcheen, having granted some additional privileges to the English East India Company, a factory was established by that body in the capital of her dominions. The trade, however, was never very flourishing in this quarter, and may be said to have ceased upon the establishment of the Company's settlement at Bencoolen, on the south coast of Sumatra, from the neighbourhood of which place the pepper was principally collected.

A 'treaty of friendship and alliance' was concluded with the Sultan of Atcheen, in April, 1819, by Sir Stamford Raffles, acting on behalf of the government of the East India Company, whereby the right of trading freely to all the ports of that kingdom was assured to the British upon the payment of 'fixed and declared rates of duty.' By this treaty His Highness likewise engaged 'not to grant to any person whatever a monopoly of the produce of his states, and to exclude the subjects of every other European power, and likewise all Americans, from a fixed habitation or residence in his dominions.'

On the occasion of concluding this treaty, the East India Company advanced to the Sultan of Atcheen a loan of 50,000 dollars, and presented to him as a gift six pair of brass field-pieces, and a considerable quantity of ammunition and military stores.

The government of Atcheen is an hereditary monarchy, and the king or sultan is limited in his authority only by the power of the greater vassals, so that the bulk of the people are not in the enjoyment of much political liberty. The whole kingdom is divided into about 190 small districts or communities, equivalent to our parishes. These districts are grouped together in various numbers, varying from 20 to 26, under the management of a provincial governor. The state revenues are made up of offerings in grain, cattle, and money, sent from each district, and delivered at the king's store; but the principal income of the crown consists in customs-duties imposed upon the import and export of merchandise.

The climate of this part of the island is comparatively healthy. The country is more free than most of the other parts from stagnant waters and from woods, for which reason the inhabitants are likewise less liable to fevers and dysenteries.

A chain of mountains, in some parts double and in others treble, runs from near the north-western point through the whole extent of Sumatra, including, of course, the territory of Atcheen. These mountains, as well as the rivers and other principal geographical features of the country, will be described in our general account of the island.

The Atchinese are in general taller and stouter, and their complexions darker, than those of the other inhabitants of Sumatra. They are likewise considered to be of more active and industrious habits, as well as more sagacious. They are fond of commercial adventure, and their degree of knowledge, more particularly as regards other countries, is greater than that possessed by other races of Sumatrans who do not engage so largely in commerce. This superiority of character and intelligence has been attributed as much to a considerable admixture of Malay blood, as to the great intercourse which has for ages existed between their ports and the western parts of India.

The language in use among the Atchinese is one of the general dialects of the Eastern Islands: in writing they make use of the Malayan character. In religion they are followers of Mohammed, and maintain the forms and ceremonies of the Moslem faith with much strictness.

Atcheen is now no longer, as it once was, the great mart for Eastern products, but it still carries on a very considerable traffic with the Coromandel coast, to which it furnishes gold-dust, raw silk, betel-nut, pepper, sulphur, camphor, and benzoin; receiving in return salt and cotton piece-goods. The camphor and benzoin exported from Atcheen are mostly procured by internal commerce from their neighbours the Battas. A considerable trade is also carried on between Atcheen and the British settlements of Singapore and Prince of Wales's Island.

The few arts and manufactures known in other parts of Sumatra are likewise pursued in the kingdom of Atcheen, where some of them are carried to a greater degree of perfection. A fabric of thick cotton cloth and of striped or chequered stuffs is carried on, and affords a considerable supply for the Malayan peninsula. A sort of rich silk goods is also manufactured, but not to so great an extent now as formerly. This falling off has been attributed to a failure in the breed of silk-worms, but as such an accident could have been very easily repaired, it is probable that there are other causes for the decay.

The soil throughout the kingdom is for the most part light and fertile, producing abundant crops of rice and esculent vegetables, as well as of cotton and the finest tropical fruits, including the mango and mangustin, which are here of delicious quality. Cattle and all kinds of provisions are abundant and at reasonable prices, and the Atchinese display their superior intelligence as much in their better skill in agriculture as they do in their greater commercial enterprise. This kingdom furnishes the same description of animals as are common throughout the island. Elephants are found here domesticated, and were probably originally imported.

(See Marsden's *History of Sumatra*, Captain Forrest's *Voyage to the Mergui Archipelago*; and *Early Records of the East India Company, as given in the Appendix to the Report of the Select Committee of the House of Lords* *on Foreign Trade in* 1820-21 · Barros, *Asia*, Dec. II. liv. iv. cap. 3.

ATCHEEN, or **ACHEEN**, the capital of the kingdom of the same name in Sumatra, is situated at the north-western extremity of the island in 5° 35′ N. lat., and 95° 45′ E. long.

The town stands on a river which empties itself by several channels near to Atcheen-head, and is about a league from the sea, where the shipping lie in a roadstead, which is securely sheltered by several small islands. The river having a bar at its mouth, with a depth of no more than four feet at low water during spring-tides, only the small vessels of the country can enter; and even of these many are prevented from passing over the bar during the dry monsoon.

The town, which is said to be populous and to contain 8000 houses, is situated on a plain in a wide valley formed like an amphitheatre by ranges of lofty hills. The houses are all detached; they are built of bamboo and rough timber, and are mostly raised on piles some feet above the ground in order to guard against the effects of inundations. The wealth of the inhabitants has occasioned the erection of a greater number of mosques and other public buildings than are usually seen in towns of similar magnitude in the Malayan peninsula. The palace of the Sultan is built more with a view to strength than beauty, and is surrounded by a moat and strong walls. Near to the gate are several pieces of brass ordnance of an extraordinary size. Most of these are of Portuguese make, but two among them are English, and were sent as a present by King James the First to the Sultan of Atcheen; the bore of one of these pieces is eighteen inches, and of the other twenty-two inches diameter.

Owing to the plan of its construction, and the luxuriant growth of the numerous trees which surround and intersect it, the town, when seen from a short distance, has a very pleasing and picturesque appearance. The country beyond it exhibits a high degree of cultivation, and contains many small villages with white mosques, which add to the beauty of the scene. (See Marsden's *History of Sumatra* and Forrest's *Voyage to the Mergui Archipelago*.)

ATCHUJEFF, ATCHUK, or **ATCHU**, an island on the eastern shore of the Sea of Azof, one side of it being formed by the Sea of that name, and the other three sides by branches of the Kuban. It lies to the N.E. of Taman, or Phanagoria, but is more mountainous and as full of swamps as that island. Among the spots of note upon it are a castle with a port, also called Atchujeff, the fortifications of which are of wood; Kirman, on the principal branch of the Kuban, which was the most considerable place in this part of the world in the fourteenth century; and Cozadji, a small town on the Kumli-Kuban. The inhabitants of the island, who are Cossacks of the Black Sea, consist wholly of fishermen, and despatch large quantities of sturgeons in a dried state, caviar, fish-fat, and isinglass, to Constantinople. It is comprised at present in the Russian government of Tauria.

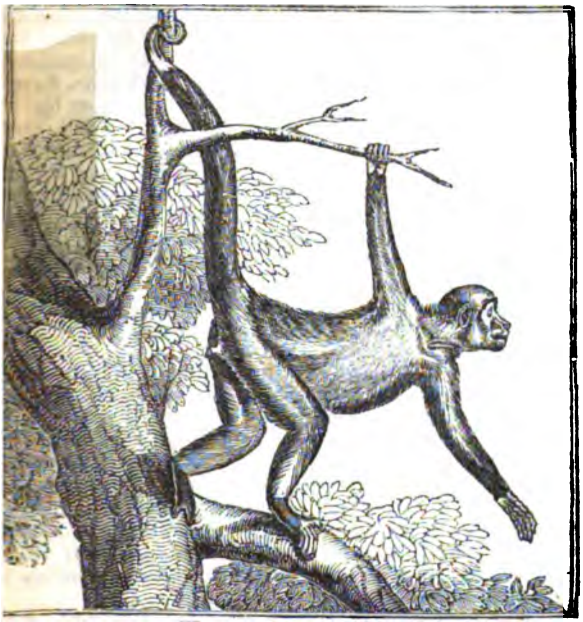
A′TELES, in zoology, a genus of *Sapajous*, or American monkeys, formed by M. Geoffroy St. Hilaire, and presenting numerous and remarkable modifications of organic structure, which readily distinguish them from all other groups of quadrumanes. The most prominent characters of the genus consist in their long, attenuated, and powerfully prehensile tails; fore-hands either entirely deprived of thumbs, or having only a very small rudiment of that organ; and their dental system, which, like that of all the American quadrumanes, consists of two molar teeth in each jaw, one on each side, more than are found either in man, or in the kindred genera of the old world. The first and last of these modifications are common to the ateles and other American genera; the second is shared with them only by the *colobi*, a small African genus, consisting only of two species, neither of which has been observed by any zoologist since the days of Pennant, and with whose other characters we are very imperfectly acquainted. The ateles are further distinguished by their small round heads, corpulent bodies, and remarkably long slender limbs, which characteristics giving these animals much of the general appearance of a spider, have procured for them the appellation of *spider-monkeys*, by which they are commonly known. Like all the other quadrumanes of the new world, they are destitute of cheek pouches and callosities, characters which approximate them in some measure to the real apes. The skull of the ateles is rounder and the brain larger than in the common monkeys; the forehead also is more elevated, and the muzzle less prominent. The eyes are widely separated from one another by the base of the nose; the nostrils open laterally, and are separated by a thick cartilaginous partition; the ear only differs from that of man in having no inferior lobe; the mouth is small; the lips thin and extensible; and the hair generally long, coarse, and of a glossy appearance.

But the organs of locomotion chiefly distinguish the ateles. The anterior extremities, in particular, are by their length and the slenderness of their form out of all proportion with the other parts; they are in general, as above observed, destitute of thumbs; or if some species are provided with this organ, it is only in a rudimentary form, and consists merely of a flat nail, or at most of a single joint. On the posterior extremities, on the contrary, the thumb is largely developed, placed far back towards the heel, and is completely opposable to the fingers. But these animals possess, in their long and muscular tail, an organ of prehension much more powerful than the other extremities; it executes, in fact, all the functions of a fifth limb, though probably, on account of its distance from the seat of sensation, it is not endowed with a very delicate sense of touch. For six or seven inches from the point it is naked and callous on the under surface; and it is by this portion that the animal hangs suspended from the branches, or swings itself from tree to tree with an ease and velocity almost incredible.

Their entire organization is adapted exclusively to an arboreal life; on the earth nothing can be more awkward and embarrassed than their motions. They trail themselves along with a slow and vacillating gait, sometimes using their long fore-arms as crutches, and resting upon their half-closed fists whilst they project the body and hind legs forward; at other times walking in a crouching position on the hind legs only, balanced by the long arms and tail, which are elevated in front and rear respectively, and always ready to take advantage of any object by which to avail themselves of their natural powers of progression. But in proportion to their embarrassment on a plain surface is their dexterity and agility among the trees of their native forests. Here they live in numerous troops, mutually support one another in danger, beat and expel the less favourably organised *sakis* from the vicinity of their cantonments, and exercise a perfect tyranny over all the other arboreal mammals of their neighbourhood. Though leaves and wild fruits compose the principal part of their food, yet they do not reject flesh, but hunt after insects and the eggs and young of birds, and are even said to adopt the stratagem of fishing for crabs with their long tails. They are exceedingly intelligent, easily domesticated, and soon become strongly attached to those who treat them kindly: they exhibit none of the petulance and insatiable curiosity of the common monkeys; their character, on the contrary, is grave, and approaches even to melancholy; but if their passions are less violent, and more difficult to excite, their affections are infinitely stronger; and if they are without the amusing tricks of the monkeys, so likewise are they without their fickleness and mischief.

Dampier relates, that when a troop of ateles have occasion to pass any of the larger rivers of South America, they select a situation in which the trees are highest and project farthest over the stream; then mounting to the topmost branches, they form a long chain by grasping one another's tails successively. This chain being allowed to hang freely at the lower end, whilst it is suspended from the top, is put in motion, and successively swung backwards and forwards till it acquires an impetus sufficient to carry it over to the opposite bank. When this is accomplished, the animal at the lower end catches the first branch which comes within his reach, and mounts to the highest, where as soon as he is firmly attached, the other end of the chain is permitted to swing, and thus the whole troop are passed over. The ateles, as well indeed as all the other American quadrumanes, are esteemed as an article of food by the native Indians; and even Europeans, whom curiosity or necessity has induced to taste it, report their flesh to be white, juicy, and agreeable. The only thing disgusting about it is a strong resemblance which the whole body, and particularly the head and hands, bear to those of a young infant. Nor is it without being strongly disposed to question the nature of the act, that European sportsmen, unaccustomed to shooting monkeys, witness for the first time the dying struggles of these animals. Without uttering a complaint, they silently watch the blood as it flows from the wound, from time to time turning their eyes upon the sportsman with an expression of reproach which cannot be misinterpreted: some travellers even go so far as to assert that the companions of the wounded individual will not only assist him to climb beyond the reach of further danger, but will even chew leaves and apply them to the wound for the purpose of stopping the hemorrhage. The following species of ateles have been distinguished and characterised by naturalists and travellers:—

1. The *Quata* (*A. paniscus*, Geoff.), or, as the French write it, *coaïta*, is a large species, covered with long coarse hair, of a glossy black colour; the belly is protuberant, the head small and round, the limbs long and slender, the fore-hands entirely deprived of thumbs, the tail robust and powerful, the eyes and cheeks deeply sunk, and the face copper colour. On the back and outsides of the limbs the hair is very long and thick, but the belly and groins are nearly naked, and the mammæ of the females are placed in the armpits. The hair of the head is directed forwards, and the ears, concealed beneath it, differ from those of the human species only in having no inferior lobe. This species is very common in the woods of Surinam and Brazil. It is active and intelligent, and unites considerable prudence and penetration to great gentleness of disposition. They go in large companies, and when they meet with a man or any animal which is strange to them, come down to the lower branches of the trees to examine them, and having satisfied their curiosity, begin to pelt them with sticks, and endeavour to frighten them away. They cannot leap, but exhibit the most surprising agility in swinging from tree to tree. Acosta, in his *History of the West Indies*, relates the following anecdote of a quata which belonged to the Governor of Carthagena —'They sent him,' says he, 'to the tavern for wine, putting the pot in one hand and the money in the other; they could not possibly get the money out of his hand before his pot was full of wine. If any children met him in the street, and threw stones at him, he would set his pot down and cast stones against the children, till he had assured his way, then would he return to carry home his pot. And what is more, though he was a good bibber of wine, yet he would never uch it till leave was given him.'

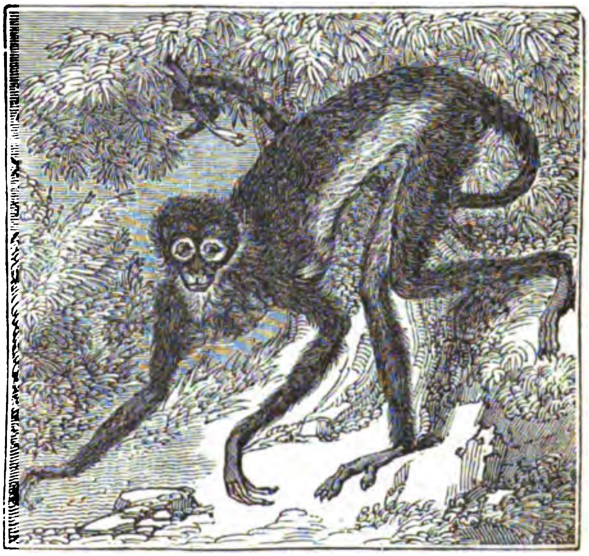


[The Quata. Ateles paniscus.]

2. The *Chuva* (*A. marginatus*, Geoff.) closely resembles e quata in physiognomy, size, and proportions; the quality d colour of the hair are also the same in both, except that e face of the chuva is surrounded with a rim of white, ich, on the forehead particularly, is broad, and directed wards, so as to encounter the hair of the occiput, and m a low crest on the top of the head. The hair of the e-arm is directed partially towards the elbow; like that the body it is long and coarse, and though perfectly black, has not the glossy appearance of the quata's covering. The face is nearly naked, and tan-coloured; the palms of the hands, soles of the feet, and callous part of the tail, are violet black, and the whole skin beneath the hair appears to be of the same hue. According to Humboldt, who discovered this species on the banks of the Amazon, the male and female differ in the colour of the circle which surrounds the face, and which he describes as yellow in the former and white in the latter. A young male, examined by M. Geoffroy St. Hilaire, did not present this difference; but, as in many other instances, it is probable that the young males of this species have at first the colours of the female, and that it is only on attaining their adult state that they assume those marks which distinguish their sex. It appears also that individuals differ considerably in the extent as well as the colour of this circle. The specimens described by MM. Humboldt and Geoffroy had it entirely surrounding the face; that examined by M. F. Cuvier had only the hair of the cheeks and forehead white; and, finally, there is at present a female in the gardens of the Zoological Society of London, in which the latter part alone differs in colour from the rest of the head. In this individual the hair of the forehead is much shorter and more thinly scattered than on other parts; it covers the whole extent of the forehead, is turned upwards, and is of a silvery-grey colour, whilst that of the surrounding parts is deep black. The disposition and manners differ in no respect from those of the quata.

3. The *Cayou* (*A. ater*, F. Cuv.) is considered by MM. Geoffroy and Desmarest as a variety of the quata; but M. F. Cuvier, from observations made upon the living animal, has recognised and described it as a distinct species. It must however be confessed, that it approaches so nearly to the quata as to render further observations necessary to determine the question of their specific difference. The size, form, and colour are the same in both, and the only marked distinction reported by M. Cuvier consists in the colour of the face, which is black in the cayou and copper-coloured in the quata. 'The hair,' says M. Cuvier, 'is long, and of a harsh silky quality. It is rather shorter on the head and tail than on the rest of the body, where it falls backwards in the ordinary way, but on the head it is directed forward, and falls over the face.'

4. The *Marimonda* (*A. Belzebub*, Geoff.) has the top of the head, the back, sides, and external surface of the extremities black, and all the under parts, the cheeks, throat, breast, belly, inside of the limbs, and under surface of the tail for its first half, white, with a slight shade of yellow. The naked parts are violet black, except immediately about the eyes, which are surrounded by a flesh-coloured circle.



[The Marimonda. Ateles Belzebub.]

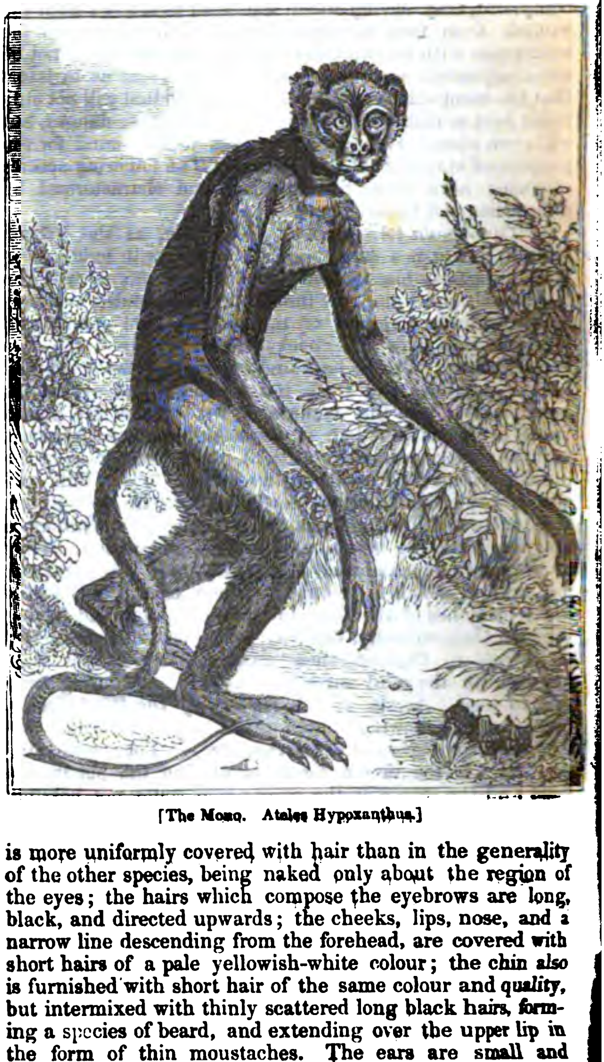
This species, according to Humboldt, replaces the common quata in Spanish Guyana, where it is extremely common, and is eaten by the Indians. 'It is,' says this celebrated traveller, 'an animal very slow in its movements, and of a gentle, melancholy, and timid character; if it occasionally bites, it does so only in its fits of terror. The marimondas unite in great companies, and form the most grotesque groups. All their attitudes announce the extremity of sloth

I have frequently seen them, when exposed to the heat of a tropical sun, throw their heads backwards, turn their eyes upwards, bend their arms over their backs, and remain motionless in this extraordinary position for many hours together.' The young of this species appear to have the upper parts of the body mixed slightly with grey, but this mixture gradually disappears as it grows towards maturity, till the adult animal presents the uniform black above and white below, as already described.

5. The *A. melanocheir* (Geoff.), of which we are unacquainted with the native Indian name, is also a distinct species. The head, members, and tail are black, or dark brown, on the superior surface; the internal face of the arms and fore-arms as far as the wrists, and of the thighs and legs, the under surface of the tail, the throat, breast, belly, and sides of the hips, are white or silvery grey; the shoulders are yellowish grey, and the remainder of the upper parts of the body, as well as the whiskers, are pure grey: the four hands and the naked part of the tail are black, as are also the face, the cheeks, and the under half of the nose; but round the mouth and eyes is flesh-coloured. The hair is uniformly of a silky quality: that on the black and white parts is of the same colour throughout, but on the grey parts it is annulated with alternate rings of black and white. This species, as well as all those hitherto described, is entirely deprived of the fore-thumb, and does not even exhibit a rudiment of that organ. Only a single individual has been observed alive; its manners are the same as those of the ateles in general, but its habitat has not been definitely determined. A specimen preserved in the Museum of the Jardin des Plantes presents a distribution of colours which differs in some degree from what is here described; but it is not improbable that the difference arises in a great measure from the fading which naturally takes place in the colours of skins which have been long mounted and exposed to the action of the atmosphere, if indeed it be more than an accidental or individual distinction.

6. The *A. Arachnoïdes*, or Brown Quata, as it is called by Baron Cuvier, partakes, in fact, very much of the characters and appearance of the common quata, from which it is principally distinguished by its uniform reddish-brown colour. This species, when full grown, measures rather better than two feet in length; the tail is about a couple of inches longer than the body; the fore legs are one foot nine inches long, the hind legs one foot eight, and the hand six inches. The hair is short, fine, and soft, and that of the forehead is directed backwards, contrary to what is usually observed in the other ateles; the back and upper parts of the body are, generally speaking, well furnished, but the breast, belly, and groins are nearly naked, or at least but sparingly covered with scattered hairs, of a longer and coarser quality than those on other parts; the root of the tail is rather thick and bushy, but it is gradually attenuated towards the point, and for the last ten inches, naked underneath. The general colour is uniform chestnut-brown, the first of these colours becoming clearer and more intense upon the head, and more especially round the eyes: the forehead is bordered by a circle of stiff coarse black hairs, beneath which a semicircle of light silvery grey passes over the eyes in the form of brows, and becomes gradually more and more obscure, till it is finally lost in the uniform reddish-brown of the temples. The face is naked and flesh-coloured, the under parts of the body of a silvery grey slightly tinged with yellow, with the exception of the abdomen, which, as well as the inner surface of the thighs, and the naked stripe underneath the tail, are of a bright red colour. The manners and habits of this species are unknown in its native forests: those which have been observed in a state of confinement exhibited all the gentleness and listless apathy of character which distinguish the ateles from the common monkeys of South America, as eminently as they do the gibbons of the Indian isles from the other quadrumanes of the Old World. Except in the total want of the thumb on the anterior extremities, the *A. Arachnoïdes* approaches very nearly to the following species, and appears, indeed, to be intermediate between it and the common quata.

7. The mono, or miriki (*A. hypoxanthus*, Kuhl) inhabits the forests in the interior of Brazil, and, as has just been observed, approaches very nearly to the *A. Arachnoïdes*, as well in the colour of its fur as in the general form and proportions of its body and members; but it is readily distinguished from that species as well as from all the other ateles hitherto described, by the presence of a small rudimentary thumb on the fore-hands. The face also is more uniformly covered with hair than in the generality of the other species, being naked only about the region of the eyes; the hairs which compose the eyebrows are long, black, and directed upwards; the cheeks, lips, nose, and a narrow line descending from the forehead, are covered with short hairs of a pale yellowish-white colour; the chin also is furnished with short hair of the same colour and quality, but intermixed with thinly scattered long black hairs, forming a species of beard, and extending over the upper lip in the form of thin moustaches. The ears are small and nearly concealed by the hair of the head, which though not very long, is thickly furnished, and of a pale grey colour slightly tinged with yellow. The whole body and members are of a uniform greyish fawn colour, only differing in the greater degree of intensity which distinguishes the back and upper parts from those beneath, and in the lighter grey tinge which predominates on the extremities. The backs of the fingers are hairy down to the very nails, and there is a rudiment of a thumb on the fore feet, covered with a short compressed nail.



[The Mono. Ateles Hypoxanthus.]

The mono was discovered by Prince Maximilian of Neuwied, during his travels in Brazil. It is the largest species of the quadrumanes which inhabit the part of the country through which that scientific traveller passed, and though sufficiently common in particular districts, appears to have upon the whole but a very limited geographical range. Its hide is said to be more impervious to moisture than any other description of fur known in that part of the world, and for this reason the Brazilian sportsmen have cases of the skin of the mono made to protect the locks of their guns from the rain.

8. The chameck (*A. subpentadactylus*, Geoffroy), the last species of the genus distinctly known at present, resembles the mono in having a small rudimentary thumb on the anterior extremities, but it is without a nail, and in other respects the two animals are sufficiently distinguished by their difference of colour and habitat. The chameck indeed approaches more nearly in external form and appearance to the quata than to any other of its congeners, being furnished with a similar coat of long dense hair, of an intense and uniform black colour; but it may be readily distinguished from that species by the presence of the rudimentary thumb on the anterior members, as well as by its

size, which considerably exceeds that of the quata. It has a protuberant muzzle, and its lips, like those of the quata, are capable of prolongation; the forehead is high; the face, cheeks, ears, and chin, are naked and of a brown colour, with a few long black hairs thinly scattered over them; the hair of the head is long, matted, and directed forwards over the forehead, that of the body and members very long and thick; the fingers, both upon the anterior and posterior extremities, are long, slender, and nearly naked; the tail is considerably longer than the body, very thick and covered at the base with close shaggy hair, but attenuated towards the point, where it is more sparingly furnished with shorter hair, and entirely naked underneath.

This species inhabits Guyana and some of the neighbouring provinces of Brazil. Von Sack, in his *Voyage to Surinam*, gives the following account of its manners under the name of quata, with which species its general appearance probably causes it to be frequently confounded. 'The quatta,' says this author, 'is of a very docile disposition, and capable of being quite domesticated: I have seen a pair of them at a gentleman's house at Paramaribo, which were left quite at liberty; when the female negroes were employed at their needlework, they used to come and sit amongst them, and play with a piece of paper, and afterwards go out to gambol upon the trees, but never went over to the neighbouring gardens; and they knew well the usual hour of dinner at their master's, when they would come to the gallery, look in at the windows, though without attempting to enter into the room, being aware that this was a liberty not allowed them; they therefore patiently waited for their dinner on the outside.'

ATELLA'NÆ FA'BULÆ, a species of comedy which was common among the people of Campania, and was thence introduced at Rome, where it met with much favour. The name of Atellanæ, or Atellanicæ, was derived from Atella, an antient town of Campania, now ruined, the site of which is about two miles S.E. of the modern town of Aversa, and near the village of Sant Elpidio. The Atellanæ were also known by the name of 'Ludi Osci,' on account of the name of the people among whom they originated. The Roman writers have transmitted to us a few brief detached traits of the nature of these plays, of which no specimen has reached us. The Atellanæ seem to have somewhat resembled the Greek Satyric drama, with this difference, that, instead of satyrs and other fantastic characters, they had real Oscan characters, or actors speaking their own dialect, and who were the representatives of some peculiar class or description of people of that country, much in the same manner as the Brighella, Arlecchino, Polecinella, &c. of the modern Italian stage, who are meant as caricatures of the peculiarities of certain classes in their respective provinces, and who speak each his own dialect in all its native humour. Indeed these modern *maschere*, as the Italians call them, may be considered as the descendants of the old Oscan characters in the Atellanæ. One of these Oscan characters was Macchus, a sort of clown or fool. There were others called Buccones, *i. e.*, babblers, empty talkers. (Diomedes *de Grammatica*, lib. i. and iii.) The Atellanæ differed from the *comœdia prætextata*, which represented high characters, as well as from the *tabernaria*, which exhibited vulgar ones; the Atellanæ were a mixture of high and low, pathetic and burlesque, without however degenerating into trivialities or buffoonery. They seem to have been a union of high comedy and its parody. They were also distinct from the performances of the *mimi*, who indulged in scurrilities and in obscene jokes and gestures. (Cicero, *Epistola ad Papirium.*) Macrobius (*Saturn. III.*) draws the distinction between the Atellanæ and the mimi; 'the latter made use of the Roman language, and not of the Oscan, like the Atellanæ; the performances of the mimi consisted of one act, while the Atellanæ and other comedies had five, with *exodia* (interludes consisting of songs) between the acts; lastly, the mimi had not the accompaniment of the tibicina, nor of vocal music like the others.' Valerius Maximus (lib. ii. ch. 4), speaking of the Atellanæ, says, that their jests were tempered by Italian strictness of taste; and Donatus extols their antique natural elegance. Even in their satirical allusions their object was to provoke joyous laughter, rather than excite feelings of hatred or contempt. It would appear that their humour dealt chiefly in ingenious allusions and equivocations clothed in decent words, the meaning of which could only be caught by the better-educated and more refined classes. The Atellanæ were performed by Roman citizens, who were not thereby disgraced, like the common *histriones*, or actors; their names were not erased from the roll of their tribes, and they were not obliged to take off their masks at the will of the audience. In course of time, however, and in the general corruption of morals under the empire, the Atellanæ degenerated; common mercenary players appeared in them, and they became as loose in their language as the performances of the mimi. This may explain the different judgments given of the Atellanæ by different writers. The exodia, or interludes played between the acts of the Atellanæ, are mentioned by Juvenal (*Sat. VI.*), and Suetonius quotes from one of them a line in which Tiberius was alluded to as an old goat; the pun resting on the word *capris*, which means goats as well as the island (Capreæ) noted as the scene of Tiberius's depravity. When Galba entered Rome, an actor in one of the Atellanæ began singing the first line of a familiar tune: 'Venit io Simius a villa,' i. e. *the baboon is come to town*, which the audience immediately took up, and continued the song in chorus, repeating the first line as a burthen.

The Atellanæ were written in verse, chiefly iambic, with a frequent recurrence of tribrachs and other trisyllabic feet. Lucius Sylla, the famous dictator, is said to have written Atellanæ. Quintus Novius, who flourished soon after Sylla's abdication, wrote about fifty plays of this kind the titles of some of them have come down to us; as *Macchus Exul*, i. e. Macchus in Exile; *Vindemiatores*, or the Vintagers; *Gallinaria*, or the Poulterer; *Surdus*, the Deaf Man, &c. Lucius Pomponius of Bononia, who lived about the same time, wrote *Macchus Miles*, i. e. Macchus Soldier, the *Pseudo Agamemnon*, &c. The Atellanæ afterwards fell into neglect, but were revived by a certain Mummius, mentioned by Macrobius, who however does not state the epoch of the revival. They were, as we have seen, in full vigour under the emperors. (Scaliger, *Poetices*, lib. i.; Pitiscus, *Lexicon Antiquitatum Romanarum*, &c.)

A TEMPO, in music (Ital. *in time*), signifies, that after any change in motion, by retardation or acceleration, the original movement is to be restored.

ATFI'H, a province of Vestânieh, or middle Egypt, stretching along the right or eastern bank of the Nile for nearly one hundred miles in length. It is bounded on the north by the province of Cairo; on the west by the Nile, which separates it from the province of Benisouef; on the south by the province of Minieh; and on the east by the desert and mountains which extend to the coast of the Red Sea. Atfih, the capital of the province, is a small town of about 4000 inhabitants, near the site of the antient Aphroditopolis, or city of Venus, 40 miles south of Cairo and 20 miles N. by E. of Benisouef, in 29° 28′ N. lat., and 31° 28′ E. long. From the village of Bayâd, which stands on the Atfih side of the Nile, opposite Benisouef, is a path leading eastwards through the rocky desert and over Mount Kaleel into the sandy plain of El Arabah, *i. e. of the chariots*, and thence to the monasteries of St. Anthony and St. Paul on Mount Kolzim, near the coast of the Red Sea. Rich quarries of marble of different colours were worked in this district in antient times. The province of Atfih is not so rich as the opposite one of Benisouef, the stripe of productive land being here much narrower on the right than on the left bank of the Nile. It contains many villages, but no place deserving the name of a town, except Atfih. (Belzoni's and Burckhardt's *Travels*, and the French work, *Description de l'Egypte.*)

ATH or **AATH**, a handsome town in the kingdom of Belgium and the province of Henegouwen (Hainault), on the Dender, an affluent of the Schelde, 50° 36′ N. lat., 3° 46′ E. long., and 32 miles W.S.W. of Brussels.

This town was enlarged and strengthened by Albert of Beijeren, Count of Holland and Hainault. In 1667, on the French taking Ath, it was strongly fortified by Vauban: the French lost it again in 1678. The Hôtel-de-Ville is a handsome building, and the spire of the church of St. Julian is also much admired. Ath has a new arsenal, with seven bomb-proof magazines. It has also a college with 150 pupils at present, a school of design, a school for poor children of both sexes, and eight private schools. it has also an hospital, a theatre, and an establishment for orphans. The manufactures are caps, hats, gloves, cotton and linen cloth, bleaching, and asbestus cloth. It carries on also some trade in grain, and in the products of the neighbouring country, among which are tobacco, poppies, and rape. The population is 8789, of whom 4322 are males, and 4467 females. (Van der Maelen's *Tables*.)

Ath is also the name of one of the six districts into which Hainault is divided. It contains about 194 square miles, of which only a small part is uncultivated. The urban population is 11,831, and the rural 78,564, making a total of 90,395. The district sends one senator and two representatives to the chambers at Brussels. The whole number of children of both sexes in the schools for primary instruction (both communal and private) was 8695 in 1832, of whom 4986 were boys and 3709 girls.

ATHABASCA, or ATHAPESCOW, the name of a river and lake in the north-western territory of America. The Athabasca river, which is also called the Elk river, has its sources near the Rocky Mountains, but has not yet been sufficiently explored to admit of its course being minutely described. It flows generally in a northerly direction, but sometimes runs due east, and in its windings receives the waters of the lesser Slave Lake by its outlet the lesser Slave River; it is also joined by the Pembina, Red-Deer, Clear-Water, and Red Willow Rivers. Athabasca River falls into the lake of the same name by several channels, the principal one of which is at the south-western extremity of the lake nearly opposite to Fort Chipewyan and Fort Wedderburn, which are trading stations established by the North-West and Hudson's Bay Companies, during the time of their rivalry. In the remoter part of its course and above its confluence with Clear-Water river, the Athabasca is likewise known under the name of *Rivière à la Biche*.

Athabasca Lake, frequently called the Lake of the Hills, is situated about 170 miles south-west of the great Slave Lake. It is of an elongated shape, lying in a direction nearly east and west. It is nearly 200 miles long, but its general width, which gradually decreases towards its eastern extremity, does not exceed fourteen or fifteen miles. The northern shore of this lake is high and rocky; and to this circumstance it owes its title of Lake of the Hills. The rocks here mentioned are composed of sienite, over which a thin soil is spread, which is sufficient for the support of a variety of firs and poplars, as well as many shrubs, lichens, and mosses. The south shore of the lake, near to the forts, is quite level, and consists of alluvial soil. Lying between the different mouths of the Elk River, it is marshy in many parts and subject to be flooded. Advancing towards the east, the shore rises into barren sandy hills, incapable of supporting vegetable life; and still further in the same direction, near the mouth of Stone River, the soil is composed of primitive rocks. Fort Chipewyan, which, as already stated, is near the south western extremity of the lake, was observed by Franklin to be situated in 58° 42′ N. lat., and 111° 18′ W. long.

This establishment is conveniently situated for communicating with the Slave and Peace Rivers, from whence the canoes of the traders assemble in the spring and autumn. In the spring they bring the collection of furs that has been made at the different out-ports during the winter; and in the autumn they receive a supply of stores for the equipment of the Indians during the hunting season.

The residents of the two establishments at Athabasca Lake depend for subsistence almost entirely upon the fish which it supplies. The kinds which are most abundant are trout, carp, pike, methye, and attihawmegh. These are usually taken in sufficient abundance throughout the winter, at the distance of eighteen miles from the stations. On the thawing of the ice, the fish remove into some smaller lakes and the rivers on the south shore, where they are nearer to the forts; but the mode of transport by water being less certain than over the ice, it sometimes happens that the residents are kept without a supply of food for two or three days together.

The traders are also supplied with the flesh of the buffalo and moose deer by the hunters, who find these animals at some distance from the forts, and convey the meat there in a dried or pounded state.

(See Franklin's *Journey to the Shores of the Polar Sea*: Bouchette's *Statistical Survey*; M'Gregor's *British America*.)

ATHALIAH. The name עֲתַלְיָה, or עֲתַלְיָהוּ, means *whom the Eternal remembered.*

Athaliah is considered to be the daughter of Ahab, king of Samaria (who 'did evil above all that were before him'), and of his wife Jezebel, the daughter of Ethbaal, king of the Zidonians. She is also called the daughter of Omri, who was the father of Ahab; but by comparing the various passages, it seems that she was the daughter of Ahab, and grand-daughter of Omri.

Athaliah became the wife of Jehoram, king of Judah, who walked in the idolatrous ways of the house of Ahab, for 'he had the daughter of Ahab to wife, and he wrought that which was evil in the eyes of the Lord.' Jehoram died in the year B.C. 885, and the kingdom devolved upon Ahaziah his youngest son. Ahaziah reigned one year. Athaliah, who possessed much influence in the government of her son, used it for bad purposes. On the untimely death of Ahaziah, Athaliah conceived and executed the horrid purpose of a general massacre of all the male branches of the royal family. 'She arose and slew all the seed-royal of the house of Judah;' thus, by imbruing her hands in the blood of her grand-children, she completed the work of devastation which Jehu had begun.

Athaliah ascended the throne which she had thus rendered vacant B.C. 884, and reigned during six years. In the seventh year of her reign the sound of rejoicing within the precincts of the temple reached her ears, and the acclamations of the soldiers and priests proclaiming a king, brought Athaliah in person to the scene of tumult. She there found, to her great consternation, a son of Ahaziah with a crown upon his head, and acknowledged as sovereign of Judah by the assembled multitude. Jehosheba, the daughter of Jehoram, king of Judah, sister of Ahaziah (2 Kings xi. 2) and wife of Jehoiada the high-priest, had saved an infant from the general slaughter of the royal race, and had concealed him during six years within the temple, guarding him so carefully that no notice of his existence had reached Athaliah. When Joash had attained the age of seven years, Jehoiada assembled the priests and soldiers, and producing Joash before them, anointed him king. Athaliah, on reaching the crowd, endeavoured to excite a reaction in her own favour, by raising a cry of 'treason;' but in vain, for Jehoiada gave instant orders that she should be removed from the sacred inclosure and slain. The command was immediately obeyed, B.C. 878. (See 2 Kings ix. 25; xi.; 2 Chron. xxi. 5, 7—12; xxii. 2—10; xxiii.) The discovery of Joash is the subject of a fine tragedy of Racine, written by command of Madame de Maintenon, to be performed before Louis XIV. by young ladies of well-reputed families, educated in the seminary established by Madame de Maintenon at St. Cyr. The tragedy was composed for the express purpose of affording a combination of poetic beauty and dramatic interest with purity of moral sentiment and the inculcation of religious instruction.

ATHANAGILDE, a captain of the Spanish Goths, revolted against his king, Agila, and being joined by a Roman force from Gaul, sent by the emperor Justinian, defeated and killed Agila, near Seville, A.D. 554. Athanagilde was then proclaimed king of the Goths in Spain. He afterwards quarrelled with his Roman allies, whom he endeavoured, but not successfully, to drive out of Spain. He reigned, however, fourteen years over that part of the country which was occupied by the Visigoths, and his administration has been spoken of by the historians as firm and judicious. He had two daughters, one of whom, Galsuinda, he gave in marriage to Chilperic, the French king of Soissons; and the other, Brunehaut, married Siegbert, king of Metz, or Austrasia, and became famous in French history. [See BRUNEHAUT.] Athanagilde died at Toledo in 567. After an interregnum, he was succeeded by Liuva. Mariana, in his *History of Spain*, mentions a village near Guimaraens, in Portugal, which was still in his time called Athanagilda, having been built during the reign of this king.

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